THE IRISH RED DATA BOOK
1 Vascular Plants

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This version of the Red Data Book was scanned from the original book. The original book is A5-format, with 168 pages. Some changes have been made as follows:

NOMENCLATURE has been updated, with the name used in the 1988 edition in brackets. Irish Names and family names have also been added.

STATUS: There have been three Flora Protection Orders (1980, 1987, 1999) to date. If a species is currently protected (i.e. 1999) this is stated as **PROTECTED**, if it was previously protected, the year(s) of the relevant orders are given.

IUCN categories have been updated as follows: EN to **CR**, V to **EN**, R to **V**. The original (1988) rating is given in brackets thus: "**CR** (EN)". This takes account of the fact that a rare plant is not necessarily threatened. The European IUCN rating was given in the original book, here it is changed to the UK IUCN category as given in the 2005 Red Data Book listing.

MAPS and APPENDIX have not been reproduced here.

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PREFACE

By the year 2050, as many as 60,000 plant species, approximately one in four to one in five of the world's total are estimated to become extinct if present trends continue.[1] This is the greatest loss of plant species that has ever occurred during such a short period of time! Even more horrifying is the thought that a major proportion of this extinction is likely to occur during the lives of those reading these words. The responsibility for their protection, therefore, lies with ourselves and now.

Many may ask, why bother? The answer to this is an exceedingly straight- forward one, but one which the western world in particular too often forgets or tries to ignore; plants feed us, they provide the material for clothing, shelter, medicines and a host of other products of value to people, not to mention the aesthetic pleasure they give us; they also protect watersheds, resist desertification, regulate the oxygen and carbon dioxide content of the atmosphere and have a major stabilising influence on our climate. Certainly, it is upon tropical rather than temperate floras that we rely for most of these, yet the same principles apply wherever we are.

I feel it is pertinent in this preface to refer to the IUCN/WWF[2] International Plant Conservation Programme, since this provides a strategic basis for the way forward for plant conservation internationally, and oversees some 90 projects derived from the philosophy and principles of the World Conservation Strategy. Moreover, a vital prerequisite for the success of many of these activities is sound, documentary evidence about the wild plants concerned, where they grow, why they are declining and what steps are needed to prevent their extinction. In many parts of the world, not least in Europe, the Red Data Book approach has already proved itself to be an effective mechanism for providing such information. Only six European countries are still without their own national plant Red Data Book or threatened plant lists; so the preparation of this one for Ireland (including both the Republic and Northern Ireland) to help complete this coverage is, therefore, particularly timely.

The latest figures for plants identified as rare and threatened throughout their European range totals some 2,500 species, out of a total flora of around 11,500. By providing species by species case-studies on each of these, European national Red Data Books are becoming a powerful force in promoting their successful conservation. The threats to the Irish flora are very similar to those experienced in the rest of western Europe, and therefore, its conservation is just as vital. It is hoped that by applying the data from this Red Data Book to the situation on the ground, its full potential as a springboard for effective plant conservation activities in Ireland will soon be realised.

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[1] Source: IUCN/WWF Plant Advisory Group (second meeting, November 1985).
[2] IUCN: International Union for the Conservation of Nature and Natural Resources; WWF: World Wide Fund for Nature.

INTRODUCTION

Preamble

Europe contains some 11,000 species of vascular plants of which 1,500 are considered threatened throughout their distributional range across the continent. That such statistics are available is due to the work of the Threatened Plants Committee of the International Union for the Conservation of Nature (IUCN) who in 1977 compiled a preliminary report of Europe's rare and threatened flora in conjunction with the Council of Europe. This work was subsequently updated in 1983. In 1978 the IUCN Plant Red Data Book appeared in which case studies covering 250 of the world's most threatened plant species were presented. This publication urged each country to prepare its own national Red Data Book listing all those species which are threatened at national level. Many countries have or are in the process of doing just that and a total of 15 Red Data Books have been published by developed countries. But to date Ireland's flora has not yet been considered and this publication is an attempt to rectify that situation and to discharge Ireland's responsibility, as a Council of Europe member, which in 1977, accepted responsibility for the survival of plant species and undertook to initiate appropriate action to safeguard their future.

Ireland's Flora

Ireland's flora is considered to be an impoverished sample of the flora of north-west Europe with, according to Webb (1983), only 815 undoubtedly native species though this is a conservative estimate and the total may be as high as 1,000. The total flora, according to a count made by the authors, is 1,309 vascular plants, which includes definite introductions which are well established in the wild. A full list of the vascular plant flora with a synopsis of its Irish distribution is given in Scannell and Synnott (1987). About one half of the species are widespread in Europe and the rest of the flora is said to be made up of groups of species representing several distinct, distributional elements. Among these are the putative elements of Atlantic-Mediterranean and Arctic-Alpine affinities, 73 species belonging to the former category and about 16 to the latter (Webb, 1983). In addition there are 15 Irish species which are not found in Britain. Endemism is not widely expressed amongst the flora and is notable only in some apomictic groups such as *Sorbus* and *Hieracium* or at sub-specific level as in the case of *Saxifraga hartii*, which is probably a sub-species of *Saxifraga rosacea* (Webb op. cit.).

Ireland's uniqueness, botanically, rests not strictly on its species complements but rather on the ecological groupings into which they associate themselves. In particular the Burren region of Co. Clare, Connemara in west Galway and the south-western portion of the country in Cork and Kerry are renowned not only for the lushness of their growth, landscape ruggedness and scenic beauty but also for what the European botanist would consider the bizarre association of species into ecological groups never seen on the continent. The features of most Irish plant associations have been described by White and Doyle (1980) and the best example of the unique associations occurring is seen in the Burren region. There, species of a range of ecological and distributional types occur alongside each other at sea-level. Ireland is also particularly rich in bogs and wetlands, though the former are being increasingly exploited for fuel and afforestation and are fast disappearing. Many wetland species are still commoner in Ireland than on the continent or in Britain and some of these have been designated as being rare and threatened in Europe. We have a special responsibility to protect species such as these.

Background and History to the Study of the Threatened Flora

As threats to the Irish flora became more apparent in the late 1970s, the Wildlife Service in the Irish Republic requested the Irish Regional Branch of the Botanical Society of the British Isles to furnish it with a list of rare species which might be protected under the Wildlife Act (1976). The committee of the Irish Regional Branch then requested submissions from botanical recorders and other interested botanists for possible candidates and requested the present Chairman. Dr Ralph Forbes, to prepare a list of the rare and threatened plants of the Irish Republic. From this list and from the recorder's returns, 60 species were suggested for protection. In 1980 the Flora Protection Order protected 52 of these throughout the state. The species included on the Order were of two types (a) those which were considered to be of restricted distribution in the Republic (b) species, which though common in Ireland were rare throughout Europe. The rare and threatened flora of Northern Ireland was not considered by the BSBI or the relevant Northern Irish authorities at this stage but a schedule of species appeared in 1984. This list protects 55 species throughout Northern Ireland under the Wildlife (NI) Order, 1985 (NIO).

In 1982, one of us (T.C.) was given responsibility in the Wildlife Service, for the conservation of rare and threatened species in the Irish Republic and in particular with providing details of the status, and threats to the 52 species scheduled under the Flora Protection Order (FPO) (1980). Part of the survey work undertaken to provide the necessary background material for the implementation of the Order was carried out by contract culminating in Report on the Conservation of Rare and Protected Plants in Ireland (Bassett, 1984). During the course of this work it became clear that some of the species on the FPO were commoner than had been thought and might possibly be replaced by more rare and threatened species. In order to obtain a consensus among Irish botanists as to suitable candidates for inclusion in a Red Data Book, T. C. proposed to the Irish Regional Branch of the BSBI, in 1983, that the Society, Wildlife Service and Trinity Botanic Garden should collaborate in producing a modified list of the rare and threatened Irish species. Trinity Botanic Garden have been active in building up a collection of the protected species. A sub-committee met on two occasions and an extra 43 species were considered on the basis of their restricted distribution. The list was subsequently modified by including all species which had been found in ten or less than ten, 10 kilometre (km) squares or which had declined more than 66% since 1970, using the Irish National Grid as the basis for plotting distributions. Initially these estimates were based on the data in the Atlas of the British Flora - which included Irish data - (Perring and Walters, 1976) but the maps in that publication were not accurate enough for Ireland due to an initially inadequate survey coverage there. In addition up to date details on decline were not available in the Atlas, though more accurate information was forthcoming for the pteridophytes from Jermy et alia (1978). Consequently an attempt at a more up to date and accurate assessment of status was attempted by involving the network of Irish botanical recorders of the BSBI. In January 1984, all recorders were requested to supply detailed distributional data on a selected list of species found within their vice-counties .These recording units correspond mostly to the present administrative county areas but in the case of the larger counties, such as Kerry and Cork, are divided into two or more units. Recorders were asked to indicate which 10 kilometre squares each species on the list had been noted from both before and after 1970. Northern Irish recorders were also included in this survey and asked to return data. It was hoped that ultimately data from all Ireland would provide the firm foundation for

the production of an Irish Red Data Book. The response to the request were mixed in that just over half of the recorders replied and records from 22 vice-counties were received.

By May 1985, the recorders returns had indicated how many species might be considered rare and threatened in the island and a final list of 130 species, including the 52 species protected on the FPO (1980), were considered as the draft Red Data List. In 1984 the Northern Irish authorities had scheduled 55 species for full protection and these were then added giving a total list of 159 species, allowing for duplication on each list. In 1985, the authors began the necessary fieldwork in an attempt to get an up to date account of the status of some species which were still unclear. At the end of 1985, a FWS report entitled Report on the Status of Rare and Threatened Plants in the Republic of Ireland, appeared (McGough, 1985). This summarised the results of the research conducted on the species whose status had been unknown and as well provided a detailed account of the status of each of the threatened plants of the Irish Republic. The present Red Data Book is based for the most part on that report with the addition of information principally from Northern Ireland. A logical outcome of the research carried out has been that it has allowed us to pinpoint with greater accuracy which species now need protection. The result has culminated in a revised version of the Flora Protection Order (1987) which now protects 68 species of vascular plant throughout the Republic.

A useful feature of a book such as this will hopefully be its reference value for framing conservation policy with respect to single species conservation. As well as being a reference work on the rare and threatened plants of the island we hope it will also be a useful source and summary work for planners, administrators and scientists and all interested in conservation. However, it will need constant updating as threats to our flora increase or diminish for species and their habitats. In particular, as the account of the history of plant protection in the Republic has demonstrated, the Northern Irish List may also be much amended after detailed status research is carried out on the scheduled species.

COMPILING THE IRISH RED DATA BOOK

Area Covered

This book covers the entire island of Ireland which includes the Republic of Ireland, and Northern Ireland. The whole island is taken as one biogeographical unit as historically, the flora has been studied in that context. The biological subdivision of the island has been traditionally into forty vice-counties of one larger unit — in this case Hibernia (see Praeger, 1896). Since 1846 Irish botanists have centralised their effort in the study of Ireland's plants especially since 1960 when an Irish Regional Branch of the BSBI was set up to accommodate all botanists north and south of the border in a centralised body. It is this body which has supported survey work on county floras, publications on the Irish flora and lately the listing, identification and protection of the rare and threatened species of the whole island. Under the Wildlife Act, 1976, responsibility for wildlife conservation rests with the Wildlife Service. The corresponding body in Northern Ireland is the Wildlife and Countryside Branch of the Department of the Environment for Northern Ireland (DoE (NI)). We have been in close co- operation with our Northern Irish colleagues, during the preparation of this Red Data Book, and to allow for easier abstraction of data for scientific and

administrative purposes we have separated the Republic and Northern Irish status data in synoptic form at the end of the species accounts. In the standard floras covering Great Britain, Ireland is traditionally included and following this trend the British Red Data Book (Perring and Farrell, 1983), as part of their larger survey of threatened British species, summarised the status of some rare and threatened species which are found in Ireland. However many Irish threatened species were omitted as many of the rarest Irish species were to be abundantly found in Britain. In addition, several Irish species do not occur in Great Britain and so the authors were forced to conclude that on biogeographical grounds it was difficult to justify the preparation of a Red List covering both Britain and Ireland. Consequently there are many reasons for dealing with the whole island of Ireland as one unit and separate from Great Britain.

Species Covered

The following species are included in the Red Data Book:

(i) Rare Species which are defined as-

Species which occur in ten or less than ten, 10 kilometre squares on the basis of their distribution on the Irish National Grid.

(ii) Threatened species which are defined as-

Species which have declined more than 66 per cent since 1970 on the basis of their 10 kilometre distribution on the Irish National Grid. The distribution data were obtained from analysis of botanical recorders returns, literature and herbarium records and fieldwork results.

(iii) Species which are not threatened on the island as a whole but are considered under threat on the continent of Europe (see section on Ireland in a European Context).

Species conforming to the definitions in (i), (ii) and (iii) above are termed Red List species and are un-bracketed in the species accounts.

(iv) All species formerly protected in the Republic of Ireland under the Flora Protection Order (1980) and all Northern Ireland Scheduled (1984) species and all candidates thought, at the time of selection to be rare and/or threatened.

The last category includes species that are not now considered rare or threatened on an all island basis, as they do not agree with the criteria above or are of doubtful taxonomic status. In the text such species accounts are bracketed[3] to emphasise their non-threatened status either in Europe or Ireland.

In addition, we have not included apomictic groups such as *Hieracium*, *Sorbus* and *Rubus*. We would find it hard to justify their inclusion on the grounds of their well documented production of an abundance of apparently distinct forms even within a small geographical area. Logically, to include one biotype would demand including all others on the grounds of their distinctness. Pragmatically, the size of the groups and their taxonomically critical nature make them difficult to include in a work of this type. We have included all rare and threatened species regardless of their native or introduced status as long as the species is well established in our flora. Many of our arable weeds originally introduced by man, are highly threatened but they still represent a genetic resource which should be identified as being of potential value and possibly protected. Consequently we have not prefixed each species account with a

[3] In this version, these species are not bracketed, but are indicated in the Status line with **(nt)**

symbol of native/introduced status as in some cases there is clearly no agreement amongst the authors of the standard floras and we have no need to contribute to further controversy. Reference to the standard works on the Irish flora will provide the necessary information for those interested (c.f. Webb 1977; Clapham, Tutin & Warburg 1981; Scannell & Synnott 1987).

Record Collation and Fieldwork

A search of all relevant literature was carried out by us for all records of the species being included. The background literature surveys provided much historical information on both the north and south of the island, whilst the herbarium at Glasnevin, Dublin (**DBN**) provided us with much information on the more recent field records. The county recorders of Northern Ireland and our colleagues in the Department of the Environment were our sole source of recent records for Northern Ireland. It must be emphasised that fieldwork conducted with the specific goal of providing a background status report on threatened plants was only undertaken in the Irish Republic by the authors for the Wildlife Service. The work was initiated in 1984 and its first phase completed in 1986 but the necessary updating of the records will continue and so the project is ongoing.

The Wildlife Service survey concentrated on counties Galway, Kerry, Cork, Wicklow and Donegal as these had particularly high numbers of rare plant sites. In addition any species or sites in the Republic which were considered to be especially threatened were investigated. The total number of sites was in excess of 2,000 and with the limited manpower and resources available it was only possible to visit some 10 per cent of these.

At each site selected for investigation, and where the species was located the population was surveyed using a Plant Population Form (see Figure 1). The minimum amount of data necessary to obtain an accurate picture of the status of the species at that site and the possible conservation measures that might be taken to safeguard it were collected using this form.

In addition the ecology of the species was examined by sampling the associated species using the releve technique of Braun-Blanquet. If the species was considered to be particularly endangered or was not yet in cultivation in a botanic garden, plants or cuttings were taken, with due authorisation, and placed in the care of Trinity Botanic Garden, Palmerston or/and the National Botanic Gardens, Glasnevin. The former holds a seed bank of rare and threatened Irish species in cold storage.

Computer Storage of Data and its Retrieval

In the Wildlife Service, data on all species have been collated on IBM microcomputers and are stored on three files on hard disks. The first of these files (see Figure 2), contains all records of the Protected Species (FPO 1987) in the Irish Republic and numbers 950. The contents of each record are arranged in 14 fields detailing the species name referred to, and including information on location, grid reference, when first and last seen and relevant literature. The second file contains similar synoptic details of 1,500 sites for threatened species which are not Protected Species (see Figure 2). The third file, called the Table of Threat Numbers, synopsises the status, habitat and threats to each species and includes Northern Irish data. All data are stored in accordance with the form specified by the information management system of dBase III. Using this package, a suite of programs have been devised to extract records satisfying any combination of criteria depending on the nature of the possible query. Data collected from fieldwork have also been inputted into the three

databases. In conjunction with these files all sites for each of the Red List species in the Irish Republic have been colour coded onto Ordnance Survey ½ inch sheets. All of these storage methods allow us to file, access and extract information very rapidly, A feature also is the ability to extract grid references and map the distributions of any one of the species on the list on a 10 kilometre grid basis.

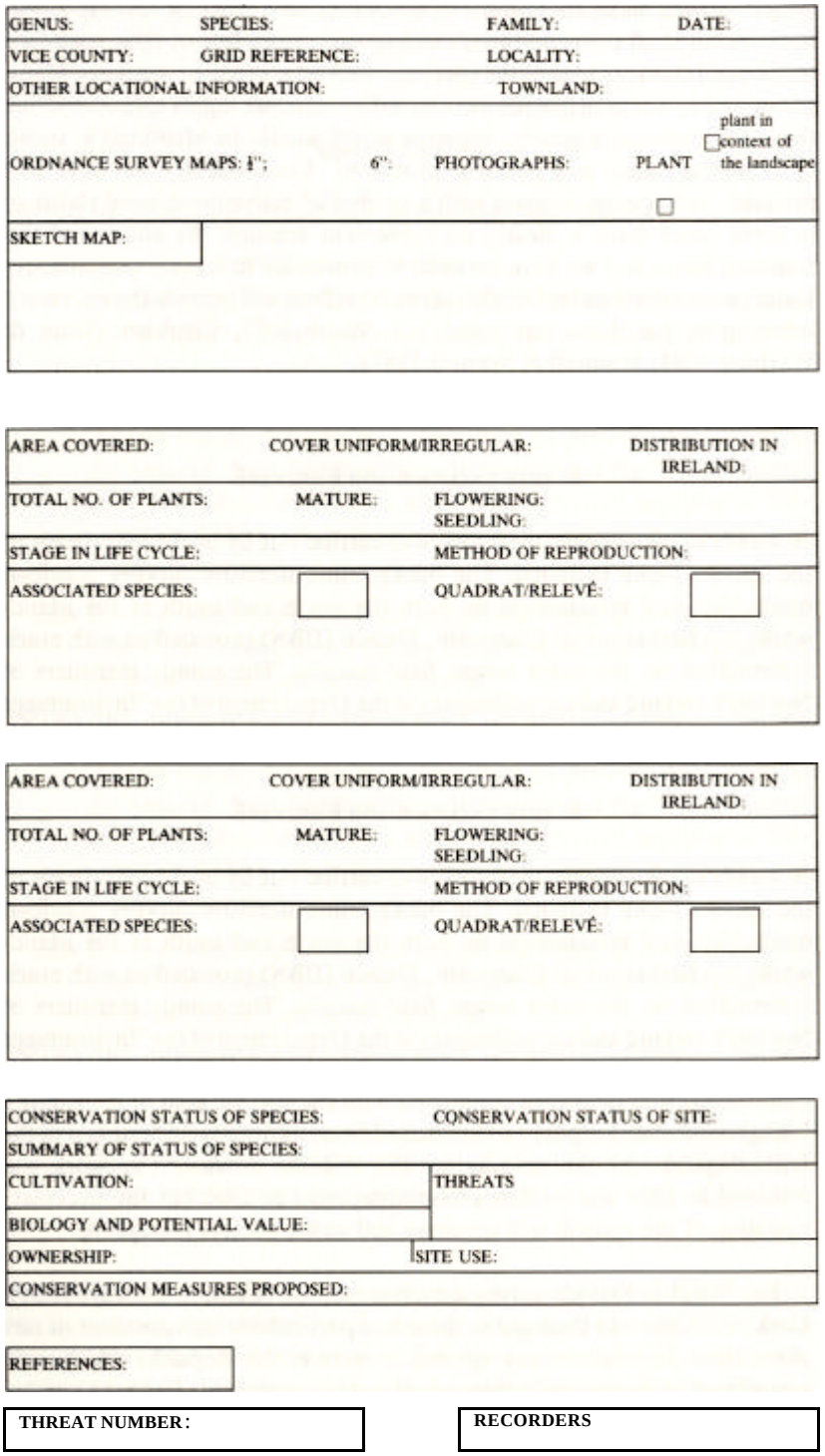

FIGURE 1: PLANT POPULATION FORM

PROTECTED PLANT RECORD Number 249

V. C. SITE	31238
TAXON	Hammarbyapaludosa SPECIES CODE 345100
COUNTY	Louth GRID REFERENCE J102160
LOCATION	Clermont Pass
STATION	Valley of stream above Pass 4 kms W.SW. of Omeath
CONSERVATION STATUS	RPS SITE SURVEYED N
HALF INCH MAP	09 SIX INCH MAP 005
FIRST RECORDED	McClintock, Hamson & Harron 1973
LAST SEEN	1973 McClintock, Harrison & Harron
LITERATURE:	Ref1 McClintock, D. Hamson, W.E. & Harron, J. (1973). Some new plant records for Co. Louth H31. lr.Nat.J.,18, 87.

THREATENED PLANT RECORD Number 449

VICE COUNTY/SITE NO.	010415
TAXON	Hyoscyamus niger
SPECIES CODE	325100
COUNTY	Kerry
GRID REFERENCE	062
LOCATION	Magharee Islands
FIRST RECORDED	Scully 1889
LAST SEEN	1889 Scully

FIGURE 2: SAMPLE RECORDS FROM THE DATABASES

Threat Numbers

The third computer file. Table of Threat Numbers, enables one to assess how actually threatened a species is. In this table the summary data for nine attributes of each species are presented. Six of these attributes are used in compiling an overall Threat Number for each species for the whole island. Such a Threat Number attempts, like that in Perring and Farrell (1983), to provide a more objective assessment of threat status. In the Threat Table given in Appendix I, columns 3-8 give the value for each of the Threat attributes scored for and which when summed, give a final Threat Number which is presented in column 9. The methods by which these attributes are applied as well as descriptions of the other columns in the Threat Table now follows.

Column 1: Taxon Name

The name of each species occupies the first column

Column 2: Number of Localities

Number of sites that the species is known from in the whole island.

Column 3: Scale of Localities

The first of the criteria assessing Threat Number and scored according to the following scheme:-

Species occurs in 10 localities or more	0
Species occurs in 6-9 localities	1
Species occurs in 3-5 localities	2
Species occurs in 1-2 localities	3

Column 4: Percentage Decline since 1970

This column indicates the percentage decline in the island as a whole. This was calculated as the number of post-1970 squares expressed as a percentage of the total number of squares the species has been recorded from. It is the second of the criteria used in assessing Threat Number and is scored according to the following scheme:-

No decline	0
Decline less than 33 per cent since 1970	1
Decline 33-66 per cent since 1970	2
Decline greater than 66 per cent since 1970	3

Column 5: Attractiveness

A semi-objective attempt to assess attractiveness, the reasoning behind it being that an attractive plant is more vulnerable than an insignificant one. This includes the vulnerability of plants to collectors. This is the third of the criteria assessing Threat Number and is scored according to the following scheme:-

Species not attractive	0
Species moderately attractive	1
Species highly attractive	2

Column 6: Remoteness

An attempt to assess how easily a species can be reached comparing, for example, a species of sand dunes with one found only on mountain ranges. This is the fourth of the criteria making up Threat Number and is scored according to the following scheme:-

Species very remote	0
Species moderately remote	1
Species easily reached	2

Column 7: Accessibility

An attempt to assess how easily a species can be reached, on site, comparing for example, species found only on high mountain cliffs with another found growing on the talus at the base of such cliffs which is more easily reached. The fifth of the criteria assessing Threat Number and scored according to the following scheme:-

Species inaccessible	0
Species moderately accessible	1
Species easily accessible	2

Column 8: Habitat Vulnerability

This category attempts to assess how threatened the habitat of the species is in that bogs are clearly more threatened than mountain cliffs. This is the final criterion by which Threat Number is scored and is assessed in the following way:-

Habitats least vulnerable	0	Sea-cliffs, Mountain cliffs, Waterfalls
Habitats moderately vulnerable	1	Estuaries, Marshes and Fens, Heaths, Lakes, Rivers, Salt-marsh, Sand-dune, Acid woodland, Basic woodland, Shingle bar, Ponds and streams, Marginal wetland
Habitats most vulnerable	2	Arable land, Bogs, Eskers, Meadows, Pastures, Roadsides, Scrub, Hedgerows, Walls, Waste places

Column 9: Threat Number for whole Island

The additions of all scores for columns 3-8 for each species gives the overall Threat Number, which if low indicates a species is not threatened and if high that the species is markedly so. The maximum score possible is (14). We have adopted a scheme whereby those species with a Threat Number of 12 or greater are considered to be Endangered and in need of urgent conservation. Threat Numbers of 9 to 11 indicate species which might move into the last category if there is a slight change in the status of the sites that they are found in at present and are considered Vulnerable. Threat Numbers of 8 or less indicate Rare but not threatened species. Threat numbers are not always applicable and a further two categories are used in the text. These and the equivalence of the Threat Numbers with the IUCN categories are described more fully in the section on Ireland in a European context.

Column 10: Habitat Type

This column contains a contraction of the name of the main habitat in which the species is found.

THE DESIGNATION AND PROTECTION OF RARE AND THREATENED SPECIES

Ireland in a European Context

The Council of Europe (CoE) set up a specialist group in 1974 in order to investigate which species of plant were rare or threatened on a European scale. The preliminary results of this work were published in 1977 (Council of Europe, 1977). Prompted by the publication of this report, member states were encouraged to either compile more accurate lists of threatened species for their country or to commence compiling lists if they had not already done so. In 1983, drawing on this update of material a final report on the Rare and Threatened and Endemic Plants of Europe was published (Council of Europe, 1983). We have listed in Table 1 all those species which occur in Ireland and that were listed in the CoE report as rare and threatened in Europe, with the exception of putative endemics and those taxa which have since proved to be taxonomically unsound.

TABLE 1. A list of European rare and threatened plants that occur in Ireland with their IUCN Irish and European threat categories (After Council of Europe, 1983).

Species	1983 Country (Irish) Category	Regional (European) Category
Dryopteris aemula	--	Vulnerable
Deschampsia setacea	Rare	V
Eriophorum gracile	--	V
Hammarbya pauldosa	R	V
Hypericum canadense	R	R
Najas flexilis	nt	V
Pilularia globulifera	V	V
Pyrola rotundifolia ssp. Maritime	--	V
Spiranthes romanzoffiana	R	R
Trichomanes speciosum	V	V

In this Red Data Book, an endemic category does not feature as Ireland does not have any true endemic taxa in the strict sense of the concept. Consequently we would propose deleting several taxa from the 1983 CoE list. Two endemics, *Saxifraga hartii* and *Arabis brownii* were listed for Ireland in the CoE report. We do not believe these are sufficiently distinct, taxonomically, to warrant specific status. The former is now considered by Webb (1983) to be a subspecies of *Saxifraga rosacea*, a noted critical species. The latter does not have any definite suite of characters by which it can be separated with certainty from *A. hirsuta.* At best it is a coastal variant of the type. We may have endemic taxa amongst the apomictic groups such as *Sorbus* and *Hieracium* but their taxonomy and consequently their conservation status is quite unclear and extremely difficult to deal with in the normal way. As the Council of Europe may well update its List of Rare, Threatened and Endemic Plants in Europe, we would recommend that as no true endemic taxa are found in Ireland no species should be listed in further issues of the Report in that category for Ireland. We would also propose the deletion from the CoE list of the two *Limonium* species, *L. paradoxum* and *L. transwallianum*. These species which were protected in the Republic in the 1980 Flora Protection Order on account of their apparent endemic status have since been shown to be minor segregates of the genus *Limonium* and are therefore not candidates for inclusion.

The only species in Table 1 that is not included in the Irish Red Data Book is *Dryopteris aemula*. This species is so common in Ireland that it would seem unnecessary at this stage to take special note of the species as on the basis of its present Irish distribution it cannot be considered rare or threatened in Europe. Consequently we do not include it in this Red Data Book.

As has already been pointed out our concept of degree of threat is arrived at using a system of semi-objective scoring of Threat Number. Obviously to allow the easy integration of Irish data into Council of Europe lists or databanks, it would seem desirable that a Red Data Threat Category scheme for Ireland could be produced which would be equatable with the IUCN scheme. That scheme is as follows:-

EX: **Extinct species**

E: **Endangered species** (n.b. updated to CR, Critically Endangered in this version)

> Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers have been

reduced to a critical level or whose habitats are so drastically reduced that they are deemed to be in danger of extinction.

V: **Vulnerable species** (n.b. updated to EN, Endangered in this version)

Taxa believed to move into the Endangered category in the near future if the causal factors continue operating. Included are taxa of which most or all the populations are decreasing, or with populations seriously depleted, or those with still abundant populations but under threat from several factors.

R: Rare (n.b. updated to V, Vulnerable in this version)

Taxa with small populations that are not at present endangered or vulnerable. but are at risk

I: Indeterminate (updated to DD, Data Deficient)

Species which are Endangered, Vulnerable or Rare but there is not enough information to say which of these categories is appropriate.

nt: Species which are not now rare or/and threatened

To allow the easy comparison of Irish data with the rest of Europe, we propose that the above categories listed by IUCN have the Irish Red Data Book Threat Number equivalent according to the scheme below.

IUCN Threat Category	Irish Red Data Book Threat Number Category
Endangered	14-12
Vulnerable	11-9
Rare	8 or less
Indeterminate	Indeterminate
Extinct	Extinct
Nt	Any value (see list of Contractions)

The IUCN Country (Irish) Categories used throughout the text of the Irish Red Data Book were obtained from their equivalent Threat Number in the scheme above. This has resulted in a modification of the Country Category value given in the CoE lists of 1983 for the species listed in Table 1. In the species accounts the Category for Ireland is followed by the IUCN European Category if appropriate[4]. The entries for the Country (Irish) category for those species listed in the 1983 *List of Rare, Threatened and endemic Plants in Europe* for Ireland should be modified accordingly.

Ireland has ratified the Bern Convention on the Conservation of European Wildlife and Natural Habitats which was opened for signature in 1979. This aims to conserve wild flora and fauna and to give particular attention to endangered and vulnerable species. Species of flora strictly protected are listed in Appendix 1 of the Convention. Ireland holds one of these which was the putative endemic *L.paradoxum*. However this is best considered as a microspecies of *L.binervosum*. But there are other candidates worthy of consideration. Suggested modifications to the flora entries in Appendix 1 of the Convention, are that *Limonium paradoxam* be removed and *Hammarbya paludosa* and *Pilularia globulifera* be added. The last two are the most

[4] In this version (2005), this has been updated to the current UK category (2005 Red Data List).

threatened European species found in Ireland and are apparently declining rapidly there as well as in Europe as a whole.

Legislation to Protect the Flora

Legislation to protect the flora in the Irish Republic is administered by the Wildlife Service formerly of the Department of Tourism, Fisheries and Forestry as established under the Wildlife Act, 1976. Legislation to protect the flora in Northern Ireland is administered by the Wildlife and Country- side Branch of the Department of the Environment (NI) as established under the Wildlife (NI) Order, 1985. Areas of Scientific Interest and Nature Reserve protection are covered under the Nature Conservation and Amenity Lands (NI) Order, 1985. In summary, the legislation in the Republic states that under Section 21 of the Wildlife Act, the Minister is empowered to protect wild species of flora anywhere in the State. In 1980, 52 species of wild plant were protected under the Flora Protection Order (1980). This Order prohibited, except under licence, the picking, uprooting or otherwise taking, purchasing or selling of a species mentioned in the Order or wilfully to alter, damage, destroy or interfere with the habitat of such a species. In 1987, a revised Flora Protection Order listed 68 species for protection throughout the State. All species having a Threat Number between 12 and 14 were included on the list for protection i.e. Endangered species. In addition some lower Threat Number species were included if they satisfied the following criteria:-

— found only at one site in the Irish Republic

— they had decreased markedly in range since 1970 and were not apparently under-recorded

— they were listed by the Council of Europe as being threatened in Europe.

Of the original list of 52 species protected in 1980, fifteen species have been removed from the list. In most cases these are commoner in distribution than had been supposed and included species such as *Crambe maritima*, *Orobanche rapum-genistae* and *Saussurea alpina*. Six species were removed as they were apomicts, were of uncertain taxonomic status or else were no longer recognised as good species. These included *Taraxacum gotlandicum, Epipactis phyllanthes* and two species of *Limonium*. The 1987 list includes several weed species, notably *Kickxia elatine* and *Misopates orontium* of root crops, *Papaver hybridum* of cereal crops and waste places and two species of orchid which are rapidly declining, *Orchis morio* and *Pseudorchis albida*. There are 26 other species added ranging from *Mertensia maritima* of shingle bars to the montane *Polygonum viviparum*. The status of a species with respect to its nativity was not a criterion for inclusion as it was felt that a species well naturalised and established in the Irish flora was as valuable a genetic resource to be conserved as a native species and consequently should be protected. Clearly the Flora Protection Order (1987) will require modification as changes in species status become apparent and we would propose that the list be updated every seven years.

The 1987 Flora Protection Order is as follows:-

FLORA PROTECTION ORDER 1987

Scientific name	Synonym (in RDB 1988)	Common Name
Clinopodium acinos	*Acinos arvensis*	Basil Thyme
Allium schoenoprasum		Chives
Arenaria ciliata		Fringed Sandwort
Sarcocornia perennis	*Arthrocnemum perenne*	Perennial Glasswort
Asparagus officinalis subsp. *prostratus*	*Asparagus officinalis*	Wild Asparagus
Asplenium obovatum subsp. *lanceolatum*	*Asplenium billotii*	Lanceolate Spleenwort
Asplenium septentrionale		Forked Spleenwort
Astragalus danicus		Purple Milk-vetch
Calamagrostis epigejos		Wood Small-reed
Campanula trachelium		Nettle-leaved Bellflower
Cardamine impatiens		Narrow-leaved Bitter-cress
Arabis petraea	*Cardaminopsis petraea*	Northern Rock-cress
Carex depauperata		Starved Wood-sedge
Centaurium pulchellum		Lesser Centaury
Colchicum autumnale		Meadow Saffron
Cryptogramma crispa		Parsley Fern
Deschampsia setacea		Bog Hair-grass
Epilobium alsinifolium		Chickweed Willowherb
Erica ciliaris		Dorset Heath
Eriophorum gracile		Slender Cottongrass
Galeopsis angustifolia		Red Hemp-nettle
Groenlandia densa		Opposite-leaved Pondweed
Gymnocarpium robertianum		Limestone Fern
Hammarbya paludosa		Bog Orchid
Helianthemum nummularium		Common Rock-rose
Hordeum secalinum		Meadow Barley
Hydrilla verticillata		Hydrilla
Hypericum canadense		Irish St John's-wort
Hypericum hirsutum		Hairy St John's-wort
Inula salicina		Irish Fleabane
Kickxia elatine		Sharp-leaved Fluellen
Lathyrus japonicus subsp. *maritimus*	*Lathyrus japonicus*	Sea Pea
Filago minima	*Logfia minima*	Small Cudweed
Lotus subbiflorus		Hairy Bird's-foot-trefoil
Mentha pulegium		Pennyroyal
Mertensia maritima		Oysterplant
Minuartia recurva		Recurved Sandwort
Misopates orontium		Weasel's-snout
Najas flexilis		Slender Naiad
Oenanthe pimpinelloides		Corky-fruited Water-dropwort
Gnaphalium sylvaticum	*Omalotheca sylvatica*	Heath Cudweed
Anacamptis morio	*Orchis morio*	Green-winged Orchid
Ornithopus perpusillus		Bird's-foot
Otanthus maritimus		Cottonweed
Papaver hybridum		Rough Poppy
Pilularia globulifera		Pillwort
Polygonum maritimum		Sea Knotgrass

Persicaria vivipara	*Polygonum viviparum*	Alpine Bistort
Pseudorchis albida		Small-white Orchid
Puccinellia fasciculata		Borrer's Saltmarsh-grass
Pyrola rotundifolia		Round-leaved Wintergreen
Ranunculus tripartitus		Three-lobed Crowfoot
Sanguisorba officinalis		Great Burnet
Saxifraga granulata		Meadow Saxifrage
Saxifraga hartii		Hart's saxifrage
Saxifraga hirculus		Marsh Saxifrage
Saxifraga nivalis		Alpine Saxifrage
Schoenoplectus triqueter	*Scirpus triqueter*	Triangular Club-rush
Simethis planifolia		Kerry Lily
Spiranthes romanzoffiana		Irish Lady's-tresses
Stachys officinalis		Betony
Trichomanes speciosum		Killarney Fern
Trifolium glomeratum		Clustered Clover
Trifolium subterraneum		Subterranean Clover
Trollius europaeus		Globeflower
Vicia orobus		Wood Bitter-vetch
Viola hirta		Hairy Violet
Viola lactea		Pale Dog-violet

Northern Ireland

Fifty-five species are protected under the Wildlife (NI) Order, 1985 in Northern Ireland where it is an offence to. intentionally pick, remove, uproot or destroy any wild plant listed on Part I of Schedule 8 of the Wildlife (NI) Order or to sell species on Part I or Part II - which lists the Primrose. An added provision are the regulations governing the introduction of species. The Schedule is as follows:-

SCHEDULE 8

Part 1

Scientific Name	Common Name
Adoxa moschatellina	Moschatel
Ajuga pyramidalis	Pyramidal Bugle
Anacamptis morio (Orchis morio)	Green-winged Orchid
Andromeda polifolia	Bog-rosemary
Calamagrostis stricta	Narrow Small-reed
Carex magellanica	Tall Bog-sedge
Carex pauciflora	Few-flowered Sedge
Centaurium littorale	Seaside Centaury
Cirsium heterophyllum (Cirsium helenioides)	Melancholy Thistle
Dactylorhiza traunsteineri	Narrow-leaved Marsh-orchid
Dryas octopetala	Mountain Avens
Elatine hydropiper	Eight-stamened Waterwort
Eleocharis parvula	Dwarf Spike-rush
Epipactis palustris	Marsh Helleborine
Epipactis phyllanthes	Green-flowered Helleborine
Erica vagans	Cornish Heath
Erigeron acer	Blue Fleabane
Frangula alnus	Alder Buckthorn

Geranium sylvaticum	Wood Crane's-bill
Gymnocarpium robertianum	Limestone Fern
Hammarbya paludosa	Bog Orchid
Hierochloe odorata	Holy-grass
Hordelymus europaeus	Wood Barley
Hottonia palustris	Water-violet
Hypochaeris glabra	Smooth Cat's-ear
Lathyrus palustris	Marsh Pea
Limonium binervosum agg.	Rock Sea-lavender
Limosella aquatica	Mudwort
Lycopodiella inundata (Lycopodium inundatum)	Marsh Clubmoss
Melampyrum sylvaticum	Small Cow-wheat
Mentha pulegium	Pennyroyal
Mertensia maritima	Oysterplant
Monotropa hypopitys	Yellow Bird's-nest
Neottia nidus-avis	Bird's-nest Orchid
Ophrys apifera	Bee Orchid
Orobanche hederae	Ivy Broomrape
Orthilia secunda (Ramischia secunda)	Serrated Wintergreen
Pilularia globulifera	Pillwort
Polystichum lonchitis	Holly-fern
Primula veris	Cowslip
Pseudorchis albida	Small-white Orchid
Ranunculus fluitans	River Water-crowfoot
Rubus chamaemorus	Cloudberry
Saussurea alpina	Alpine Saw-wort
Saxifraga aizoides	Yellow Saxifrage
Saxifraga hirculus	Marsh Saxifrage
Saxifraga oppositifolia	Purple Saxifrage
Silene acaulis	Moss Campion
Sisyrinchium bermudiana	Blue-eyed-grass
Spiranthes romanzoffiana	Irish Lady's-tresses
Stachys officinalis	Betony
Teesdalia nudicaulis	Shepherd's Cress
Trichomanes speciosum	Killarney Fern
Trollius europaeus	Globeflower
Viola persicifolia	Fen Violet

The list can be divided into three groups. In the first group can be included species which are widespread in the Republic but within Northern Ireland are restricted to one or two sites or are sufficiently uncommon to be protected. Examples of such species are *Andromeda polifolia* and *Primula veris* respectively. In the second group are species such as *Mertensia maritima* and *Mentha pulegium* which are rare and decreasing in range in Northern Ireland and which are also protected in the Republic for that reason. The third group includes species such as *Hypochoeris glabra*, *Melampyrum sylvaticum* and *Hierochloe odorata*, which are confined to Northern Ireland. The last two groups constitute true rare and threatened species on an all island basis. There may be grounds for revising the schedule for Northern Ireland on the basis of the data presented in the Red Data Book. It is clear from the text that some species are very much more common than was once thought.

THE SPECIES ACCOUNTS

Introduction

Each species account gives a brief description of that species and summarises its status on the island in the past and today together with a comment on why the species is rare or declining at present. The distribution is then given with usually a general comment on the county distribution. We might have selected the vice-county system for describing species distributions within the island, but we could gauge threatened status more accurately using the grid square approach. This has largely superceded the vice-county method for depicting distributions and is not complementary to it. The vice-county system suffers in that their boundaries do not always correspond to present county boundaries and this is a source of some ambiguity and confusion. Where counties are mentioned in the text, we have unambiguously indicated which administrative county it corresponds to. Those wishing to know the exact boundaries of the vice- counties and their number can consult the maps in Praeger (1901), Scannell and Synnott (1987). Webb (1980) re-describes the biological subdivision of the island in some detail. At the end of the textual account the British and European distributions of the species are given.

In an attempt to introduce consistency of treatment with respect to the documentation of threats to the British and Irish floras, we have chosen to loosely model the structure of our species accounts on that used in Perring and Farrell (1983). Differences in treatment between that Red Data Book and this arise not only from the inclusion of distributional data in this compilation but also from having to deal with two distinct administrative entities within the one geographical area.

At the end of each account, summary data for both the Republic of Ireland and Northern Ireland are given for the species past and present distribution, its conservation status and its Threat Number. These summary statistics are structured for ease of extraction for all those interested in the status of that species. They are especially arranged for those framing planning and conservation policy. All data are filed on computer at the Wildlife Service, Sidmonton Place, Bray, Co. Wicklow. The data are confidential except to bona fide workers, provided the release of the information does not potentially endanger the species in question.

The Distribution Maps[5]

Distribution maps, prepared by computer, for a range of selected species accompany some of the species accounts. All have been prepared by plotting each record on a 10km basis, using the Irish National Grid, with separate symbols indicating whether or not the species has been seen in a square since, but not including, 1970. Only those distributions which illustrate a particular feature or trend have been included.

Explanation of text

With respect to nomenclature, the scientific names of the vascular plants are according to Flora Europaea volumes 1-5 (Tutin, T.G. *et alia* 1964–1980). The common names of the species follow those recommended by Dony, Jury and Perring (1986)[6].

[5] These are omitted from this version as they are out dated.
[6] The latest BSBI list of common-names is used in this version.

The species accounts are arranged into five groups on the basis of habitat type, namely coastal, grassland, wetland, woodland and artificial. These are further subdivided into finer categories or minor habitats and the species accounts are arranged appropriately within them. Few species are confined to any one habitat and in all cases the species are given under the habitat which they are apparently found most commonly in. They may, for example, like the Bee Orchid, *Ophrys apifera*, which occurs in coastal and grassland habitats, occur commonly in two habitats. In that case they are arranged under the most appropriate heading. Exact habitat ranges can be checked in any of the standard floras. The habitats indicated are those in which the species is found in Ireland and not elsewhere throughout its range. Each major habitat group is introduced by a short account of the types and range of habitats within it together with an indication of the types of threats facing it. Each minor category is introduced in a similar manner and more specific details of the habitat are given.

It seemed preferable to arrange the species by habitat rather than in alphabetical or taxonomically systematic fashion as the text is more read- able, discursive and hopefully more interesting to the casual reader. In addition, this arrangement sets each species within an ecological framework from which general trends in species decline can be more easily assessed, From a practical standpoint, we feel that the conservation of threatened plants is best approached from a habitat stance rather than a species one and thus structuring the accounts in this way promotes that view.

Each individual account is headed by the scientific name of the species followed by its common name[7]. If the species is protected in the Irish Republic and/or scheduled in Northern Ireland then this is indicated between the species name and its account. The IUCN category then follows and consists of two values the first being the Country Category (Ireland) with respect to Extinct, Endangered, Vulnerable, Rare, Indeterminate or 'nt' status[8]. The European category follows[9] if the species has been so designated by the Council of Europe in its List of Rare, Threatened and Endemic Plants in Europe (Council of Europe 1983), subject to the modifications that we have proposed in the section on Ireland in a European Context. Each species account contains a brief description of the species, a summary of its status and its present distribution in Ireland, followed by a summary of its range in Britain, if any and in Europe. These data are based on Clapham, Tutin and Warburg (1981) and on Tutin *et alia* (1964–1980), respectively. Bracketed species accounts indicate species which are not threatened or rare in Ireland or Europe but which are included, for the sake of completeness as they were previously protected in the Republic of Ireland or are presently scheduled for protection in Northern Ireland.[10] They have been assigned an IUCN Country Category of 'nt'.

At the end of each species account, summary statistics are given. The first row of values contains data for the Republic of Ireland and the second those for Northern Ireland, Entries for Column 1 – Number of Squares and Column 5 – Threat Number are given for every account but entries for Columns 2-4 will depend on whether data are applicable for those columns, for the particular species. All entries are as accurate as possible, given our state of knowledge in mid-1987. They will require revision as

[7] In this version the Irish and Family names have also been added.
[8] These have been updated as follows: Endangered to CR, Vulnerable to EN, Rare to VU, the old valuie is bracketed.
[9] In this version the current UK Red Data List coding is used instead.
[10] In this version the brackets are omitted, and the code (nt) indicates that it was bracketed in the original version of the book.

boundaries of Areas of Scientific Interest change and as further Nature Reserves and National Parks are declared.

List of Contractions used in the Species Accounts

Column 1:

RI = In the Republic of Ireland, the number of 10 km squares the species has been seen in since 1970, followed by the total number of 10 km squares the species has been recorded from.

NI = In Northern Ireland, the number of 10 km squares the species has been seen in since 1970, followed by the total number of squares the species has been recorded from. In many cases species have been seen in only half the total number of squares which they have been recorded from. We consider that such levels indicate under-recording rather than a true decline given that there are no grounds for assuming the species to have gone from most of its sites.

b = 25 squares or greater.

Column 2:

NR = In the Republic of Ireland, the number of Nature Reserves that the species has been noted in since 1970.

NNR/FNNR = In Northern Ireland, the number of National Nature Reserves and/or Forest National Nature Reserves the species has been noted in since 1970.

since 1970. ASSI's are at present being designated by the Department of the Environment (NI).

Column 3:

NP = In the Republic of Ireland, the number of National Parks that the species has been noted in since 1970.

NT/UTNC = In Northern Ireland, the number of National Trust or Ulster Trust for Nature Conservation properties in which the species has been noted since 1970.

Column 4:

ASI = In the Republic of Ireland, the number of Areas of Scientific Interest that the species has been noted in since 1970. A complete list of ASI's has been complied and delimited on maps by the Wildlife Service and includes and updates the list complied by An Foras Forbartha in 1981.

ASI/ASSI = In Northern Ireland, the number of Areas of Scientific Interest or Areas of Special Scientific Interest in which the species has been noted

Column 5:

TN = The Threat Number for the species for the whole island calculated as already indicated in the section on Compiling the Irish Red Data Book.

EXTINCT = The species is considered extinct on the island.

INDETERMINATE = The status of the species on the island is uncertain and cannot accurately be determined at this time.

nt = The species is not rare or threatened as it now occurs in more than 10, 10 km squares or it has not shown a significant decline since 1970. All 'nt' species are bracketed in the text as at present they are not considered true Red List species.

COASTAL HABITAT GROUP

Coastal ecosystems can be divided into five major habitats, namely estuaries, sand-dunes, salt-marsh, sea-cliffs and shingle beaches. Ireland is particularly rich in these habitats as the total length of the coastline, including offshore islands is approximately 6,000 kms. Sand dunes are the most threatened habitat of this group due to heavy human pressure on them Twenty-six species occur in this group with 3 species probably Extinct, 1 Endangered and 6 Vulnerable. Many species, though occurring inland elsewhere throughout their range, have coastal distributions in Ireland, as their requirements for light, sandy, well-drained soils which heat quickly are only met there. Such conditions are found mainly along the east and south-east coasts and so species having such requirements are virtually restricted in distribution to such regions. Consequently species such as *Salvia verbenaca*, which is widespread inland in Britain, is in Ireland a restricted, coastal species.

Habitat 1: Estuaries

Six major estuary areas are found on the island namely, the Barrow, Lee, Shannon, Foyle, Bann and Boyne. Three species are found in this habitat which is under direct influence of salt-water and is consequently brackish. Salt marshes often occur in association with estuaries. The one extinction recorded has probably occurred due to reclamation, which poses a threat to this habitat. The Cord Grass, *Spartina* x *townsendii* has invaded large stretches of mud flat which also poses some threat to these areas.

Carex divisa Hudson — CYPERACEAE
Divided Sedge — Cíb ghabhlach
IUCN: CR (EX) UK:**VU**
Status: **PROTECTED**

This creeping sedge of damp pastures or marshy ground usually in brackish conditions was known from Dublin, along the Liffey estuary, and in County Wexford along the Barrow estuary. However, despite a number of searches this plant has not been seen at any of its five sites, except on the Kilkenny/Wexford border, since 1930. It was considered extinct in Ireland until 1990. Iit is probably now extinct in Ireland, as its Dublin sites have been long built over and its Wexford habitats have suffered extensive drainage and disturbance due to dyking and embankment of the estuary edge to prevent flooding[11].

Distribution: This species is recorded from the greater part of coastal England and Wales, but is rare in Scotland. Occurs in western and southern Europe, mainly along the coast.

RI 0/4 — **EXTINCT**

Eleocharis parvula (Roemer & Schultes) Link ex Bluff — CYPERACEAE
Dwarf Spike-rush — Spícíneach bheag
IUCN: EN (V) UK:**LC**
Status: NI Scheduled Species

In Ireland this small, (2-7 cms in ht) slender perennial of wet, muddy estuarine shores has been recorded from only three counties. In the Republic of Ireland this species was confined to two sites, one in Kerry and one in Wicklow. In Kerry it occurred in the tidal portion of the river Cashen near Ballybunnion, where it was once abundant for some five kms. In Wicklow it grew at the river mouth in Arklow and nearby at Kynoch's canal. Despite assiduous

[11] Rediscoverd in 1990 in salt-marshes on the Kilkenny/Wexford border.

searching over a number of years to refind this Spike-Rush in Wicklow and Kerry, it has not been re-located. It still occurs at a single site in Northern Ireland in Co. Derry. It seems possible that this species is extinct in the Republic of Ireland due to river drainage, reclamation and development of its estuarine habitat. However, it is a species that can be easily overlooked and some suitable habitats do still exist for it at its previously recorded sites.

Distribution: A British Red List species. In Britain only known from 5 counties in southern England and Wales. Occurs in most of Europe but local.

RI 0/2 **TN=10**

Schoenoplectus triqueter (L.) Palla CYPERACEAE
Triangular Club-rush Bogshifín tríchúinneach
(*Scirpus triqueter*)
IUCN: EN (V) UK:**CR**
Status: **PROTECTED** (1987)

This creeping perennial of muds bordering tidal rivers has been recorded from the Shannon estuary, in the vicinity of Limerick City and along its tributaries on the Clare-Limerick borders, where it still occurs. Outside that area it was also found by Scully on the Cashen river in Co. Kerry, by whom a flower head was collected but which remained unidentified for a number of years. Despite subsequent searches by Praeger and a number of others, the species was never refound at that site. Apparently stable and locally abundant in some sites near Limerick.

Distribution: A British Red List Species. In Britain, now only known to occur on the River Tamar on the borders of Cornwall and Devon, extinct at the former sites along the Thames apparently due to embanking. Occurs in south, west and central Europe.

RI 1/5 **TN=10**

Habitat 2: Sand-dunes

Sand dunes in Ireland fall into two major types; those on the north and west coasts form flat, level surfaces of dune grassland, whereas elsewhere they consist of hills, sometimes well-formed. Heavy recreational pressure along the north and east coasts are causing a major contraction in the area of intact dune and several species sites have been lost as a result. Along the west coast, the fencing of dune grassland and overgrazing are causing major changes in the ecology of the dunes there.

Asparagus officinalis subsp. prostratus (Dumort.) Corbière LILIACEAE
Wild Asparagus Lus súgach
IUCN: VU (R) UK:**EN**
Status: **PROTECTED** (1987) (1980)

This creeping, herbaceous perennial occurs in fixed dune on sandhills on the south-east coast of Ireland. It has been recorded from a total of 11 sites from Wicklow to Waterford (Map 1). The Dublin record is of a garden escape of the typical sub-species which is grown as a vegetable. Recently ssp prostratus has been seen in only 8 sites and is apparently declining. Its habitat is under threat from increasing amenity, agricultural and development pressures to sand dune systems along the east coast, and in at least two of its sites it has become extinct due to these factors.

Distribution: A British Red List species. In Great Britain this sub-species is now only known from Cornwall, Pembroke and two of the Channel Islands. Found in most coastal areas of western Europe from Spain northwards.

RI 4/7 **NR 2** **ASI 2** **TN=8**
NR 2

Astragalus danicus Retz. LEGUMINOSAE
Purple Milk-vetch Bleachtphiseán
IUCN: VU (R) UK:**EN**
Status: **PROTECTED** (1987) (1980)

This hairy, blue-purple flowered, herbaceous perennial grows in short turf on calcareous soils and dunes. In Ireland it is confined to Inishmore and Inishmaan on the Aran Islands in Co. Galway. There it has been recorded from a total of 3,10 km squares where it is found on machair grassland, limestone heath and in sandy places by the sea. On the islands it has been recorded from 4 sites in all of which it has been seen recently. The populations are apparently stable. (Plate la).

Distribution: In Britain it is found mainly in the eastern half where it is locally abundant in suitable habitats from southern England to Scotland. Occurs in north-western and central Europe. There is no explanation to account for its anomalous distribution in Ireland.

RI 3/3 **ASI 2** **TN=6**

Centaurium littorale (Turner ex Smith) Gilmour GENTIANACEAE
Seaside Centaury Dréimire trá
IUCN: EN (V) UK:**LC**
Status: NI Scheduled Species

This erect, pink-flowered annual with a basal rosette and narrow, parallel-sided stem leaves, occurs on dunes and other sandy places, usually near the sea. In Ireland it is confined to one site in Co. Derry from where, in 1986, a large population was reported from a low, grazed, grassy sward on dunes.

Distribution: A local species in Britain almost confined to the coasts of Wales, northern England and Scotland. In northern and central Europe.

RI 0/0 **TN=10**

Centaurium pulchellum (Sw.) Druce GENTIANACEAE
Lesser Centaury Dréimire beag
IUCN: EN (V) UK:**LC**
Status: **PROTECTED** (1987)

This small, pink-flowered annual without a basal rosette is found on sandhills and sandy places usually near the coast. It is recorded from 5 counties from Cork to Dublin. Recently it has been seen in 4 sites; 3 in Wexford and 1 in Dublin (Map 2). Apparently declining, though it may be under-recorded due to confusion with Centaurium erythraea Rafn,

Distribution: Common near the sea in southern and central England, decreasing as you move northwards in Britain. Occurs in most of Europe.

RI 4/14 **NR 2** **ASI 1** **TN=9**
NR 2

Epipactis phyllanthes G.E. Smith ORCHIDACEAE

Green-flowered Helleborine Cuaichín glas

IUCN: EN (V) UK:**LC**

Status: (1980) NI Scheduled Species

A taxonomically critical species, this pale-flowered orchid occurs in sand dunes and open woodland. In Northern Ireland var. pendula has been recorded from woodland at single sites in Derry and Fermanagh, whilst in its other sites in Wicklow, Wexford and Dublin it is found in dune slacks. Recently the taxon has been seen in all of its sites but that at Brittas Bay, Wicklow. The habitat of this orchid is under threat from expanding amenity use of the dunes and slacks in which it is found. However the taxonomic status of the Wexford plants is in some doubt and they may not be referable to E.phyllanthes. Consequently until the status of the species is clear we include it only as a provisional entry on the threatened list. It was formerly protected in the Republic of Ireland.

Distribution: Varieties of this taxonomically difficult aggregate are recorded from southern England to north Wales. Occurs in north-west and central Europe.

RI 2/3 **NR 1** **ASI 2** **TN=9**

NR 1

Hyoscyamus niger L. SOLANACEAE

Henbane Gafann

IUCN: VU (R) UK:**VU**

Status:

This coarse biennial or annual with purple-yellow, funnel-shaped flowers grows in sandhills, sandy open areas and waste ground. In the past it has been recorded from 26 Irish counties. This species has undergone a dramatic decline and within the island of Ireland is now extant only in Wicklow, Wexford, Dublin, Louth, Kilkenny, Galway and Down. It is known from a total of 8 sites within these counties. The dramatic decline is attributed to more efficient agricultural methods and development pressures on its habitat. The decline may also be accentuated by this species tendency to appear ephemerally.

Distribution: Widely scattered throughout Britain but declining. Occurs throughout Europe.

RI 7/$ **NR 1** **ASI 1** **TN=8**

NR 1 **NNR 1**

Hypochaeris glabra L. ASTERACEAE

Smooth Cat's-ear Cluas chait mhín

IUCN: DD (IN) UK:**VU**

Status: NI Scheduled Species

This bright, yellow-flowered annual composite is confined in Ireland to sand-dunes on the Ulster coast. There it has been recorded from 4 sites in Co. Derry and one in Antrim. It differs from the Common Cat's Ear in being annual with usually glabrous leaves. However it has not been seen recently in any of its sites and it may be extinct.

Distribution: In Britain it occurs northwards to Moray and Inverness. It is found in most of Europe.

RI 0/0 **INDETERMINATE**

NNR 1 **NT 1**

Lathyrus japonicus subsp. maritimus (L.) P. Ball LEGUMINOSAE

Sea Pea Peasairín trá

(*Lathyrus japonicus*)

IUCN: DD (IN) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This glabrous, glaucous perennial with purple to blue flowers grows on maritime sands, shingles and more rarely on the shores of the larger lakes. In Ireland this plant is recorded from 4 sites, all on the coast; 2 in south Kerry, 1 in west Mayo and 1 in west Donegal. Up to 1981 this species was only known from Kerry but the site at Inch has not been seen recently. The newly discovered site in west Mayo, on Achill Island, is no longer extant as it was washed away by a storm in 1985. The present status of the Donegal population is also unknown. For these reasons the species is ranked as Indeterminate, as a Threat Number does not reflect its true status which urgently needs investigation.

Distribution: In Britain occurs from Cornwall and Dorset to northern Scotland; very local. Occurs in north-west Europe.

RI 3/3? **ASI 1** **INDETERMINATE**

Matthiola sinuata (L.) R. Br. in W.T. Aiton BRASSICACEAE
Sea Stock Tonóg chladaigh
IUCN: EX (EX) UK:**VU**
Status:

This erect, hoary biennial crucifer with pale-purple flowers can reach a height of 60 cms and grows on sandhills and sea cliffs. Formerly known from 9 Irish sites; 2 in Kerry, 2 in Clare, 1 in Galway and 4 in Wexford. It has not been seen recently in any of these localities and seems likely to be extinct (Map 3). The reason for its decline are unknown but as the species is on the edge of its range in Ireland, it may be liable to fluctuating population numbers. Its sites were not especially threatened. (Plate lb).

Distribution: A British Red List species. Declining in Great Britain and now only known from Devon, Glamorgan and the Channel Islands. In Europe the species occurs on the south and west coasts.

RI 0/8 **EXTINCT**

Ophrys apifera Hudson ORCHIDACEAE
Bee Orchid Magairlín na mbeach
IUCN: nt (nt) UK:**LC**
Status: NI Scheduled Species

This orchid with its bee-like labellum grows in dune pasture, on dry banks, and in pastures on limestone soils. It occurs locally in suitable habitats throughout most of Ireland. It is however a rare species in Northern Ireland and it is only known from a total of 11 sites in Fermanagh, Armagh, Down, Derry and Antrim. Recently it has been seen in all of these sites.

Distribution: In Britain occurs locally throughout England and Wales, northwards to Scotland. Occurs in south, west and central Europe.

RI $/$ **TN=5**

NNR 4

Polygonum maritimum L. POLYGONACEAE
Sea Knotgrass Glúineach mhara
IUCN: VU (R) UK:**VU**
Status: (1987) (1980)

In Ireland this perennial knotgrass is confined to one site, where it was first found in 1973, on a beach just above high tide level, in Co. Waterford. The population here is apparently static, though there is a potential threat due to heavy amenity pressure on the beach

Distribution: A British Red List species. In Great Britain, since 1966 only known from Cornwall and Herm in the Channel Islands. It was previously known as a native from the Scilly Isles, Devon, Somerset and Hampshire. Occurs in southern and western Europe.

RI 1/1 **ASI 1** **TN=6**

Salvia verbenaca L. LAMIACEAE
Wild Clary Tormán
IUCN: VU (R) UK:**LC**
Status: (1980)

This wild sage is an aromatic perennial herb of dry sandy banks, pastures and waste places near the coast. In Ireland it has been recorded from 24 sites on or near the coast, from Louth to Galway (excepting Kerry). Since 1970 it has been reported from 11 sites; 3 in Cork (one since destroyed), 1 in Waterford, 1 in Galway, 2 in Wexford, 3 in Dublin (I since extinct) and 1 in Meath (Map 4). Through formerly protected in the Irish Republic, due to an apparent decline, research has revealed that the species is commoner than has been supposed. In addition, many of the sites that it was first recorded from have not been visited since the species was first found there and there is no reason to assume that it may be gone from many of these. Consequently the species may be even more common than the recent records suggest. On an all island scale it is not a threatened species but the sites for this species are often areas of high amenity usage, for example, golf links, so that the potential threats to the species habitats require close monitoring.

Distribution: In Britain it occurs in southern England, occasional in Wales and northern England, and rare in Scotland. Occurs in south-west Europe.

RI 8/17 **ASI 4** **TN=7**

Taraxacum gotlandicum (Dahlst.) Dahlst. ASTERACEAE
Dandelion Caisearbhán
IUCN: VU (R) UK:**?**
Status: (1980)

In Ireland this dandelion of the T. Erythrosperma group is restricted to one site on sandhills near Fanore in Clare. Here it occurs occasionally and the population is apparently stable. The taxon was formerly protected in the Republic of Ireland. It is a biotype of a larger apomictic group and we do not consider it merits inclusion as a Red List species, for the reasons which have already been outlined in the section on Species Covered.

Distribution: In Britain this taxon has been reported from E. Scotland. In Europe reported from Norway and the Baltic region.

RI 1/1 **ASI 1** **TN=6**

Habitat 3: Salt-Marsh

Salt-Marshes are locally distributed around the Irish coast though extensive stretches are confined to the vicinity of the larger estuaries. This category includes only two species. There is little threat to this habitat. However, reclamation and the spread of Cord Grass *Spartina* x *townsendii*, which is in invasive species, have decreased the area available to species in some salt-marshes.

Sarcocornia perennis (Miller) A.J. Scott CHENOPODIACEAE
Perennial Glasswort Lus gloine buan
(*Arthrocnemum perenne*)
IUCN: EN (V) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This fleshy, slightly woody perennial grows up to 30 cms tall and often extends to form tussocks up to 1 metre in diameter. It occurs in salt-pans in salt marshes and on tidal muds. In Ireland its distribution is restricted to the south-east coast where it is found in salt-pans. It has been recorded from a total of three sites, all in Co. Wexford, in only one of which is it known to be extant. It is possibly extinct in at least one of the other two sites due to the aggressive spread of *Spartina* x *townsendii*.

Distribution: In Britain this species is confined to southern England. In Europe it occurs along the south and west coasts.

RI 1/2 **ASI 1** **TN=9**

Puccinellia fasciculata (Torrey) E. Bickn. POACEAE
Borrer's Saltmarsh-grass Féar muirisce triopallach
IUCN: VU (R) UK:**VU**
Status: **PROTECTED** (1987)

This tufted perennial grass of salt-marshes, muddy inlets and estuaries is restricted to southern and eastern Ireland, where it has been recorded from Cork, Waterford, Wexford and Dublin. The only recent records are from the vicinity of Wexford Harbour and at Booterstown in Dublin. Apparently declining for reasons unknown.

Distribution: Very local in Britain, coasts of southern England and Angus in Scotland. Occurs in suitable brackish places in western Europe.

RI 2/6 **ASI 2** **TN=8**

Habitat 4 : Maritime cliffs and rocks

This habitat is a common one around Irish coasts and there are many spectacular cliff sites on the north and west coasts. However there are few species in this category and discounting the three Sea Lavenders, only one species is apparently declining. There is little threat to this habitat as for the most part it is inaccessible.

Ligusticum scoticum L. APIACEAE
Scots Lovage Sunais
IUCN: VU (R) UK:**LC**
Status:

The habitat of this dark, green perennial is maritime cliffs and rocky shores in the north-west of the island. It is recorded from 5 counties. Within the Republic of Ireland it has not been seen recently in any of its sites. However, since 1970 it has been seen in a number of its Northern Irish sites in Antrim and Derry. The remote and often inaccessible habitat of this species may make it difficult to locate and consequently this may be responsible for its apparent decline.

Distribution: In Britain the species occurs locally in Scotland. It may be extinct in Northumberland. The species is particularly susceptible to sheep grazing and that may account for its decline in some parts of northern Europe, which is the range of the species.

RI 0/10 **ASI 1** **TN=7**

Limonium binervosum agg. PLUMBAGINACEAE
Rock Sea-lavender Lus liath aille
(*Limonium binervosum*)
IUCN: nt (nt) UK:**LC**
Status: NI Scheduled Species

This Sea Lavender of rocky shores, shingle and maritime cliffs occurs frequently on the east and south-east coasts of Ireland, extending to Kerry, Clare, Mayo and Donegal on the west coast. It is very rare in Northern Ireland where it is confined to one site in Down.

Distribution: Common in Britain northwards to southern Scotland and Lincoln. It is widespread along suitable coasts in western Europe.

RI $/$ **TN=4**

Limonium recurvum subsp. humile (Girard) Ingrouille PLUMBAGINACEAE
Rock Sea-lavender Lus liath Albanach
(*Limonium paradoxum*)
IUCN: IN () UK:**0**
Status:

This Sea Lavender was considered to be endemic to Britain and Ireland but is most likely a minor segregate of L.binervosum. It was recorded from one site on maritime cliffs in county Donegal. We no longer consider this taxon to merit designation as an endemic Irish species. It was formerly protected in the Irish Republic because of its previously presumed endemic status.

Distribution: A British Red List species. It has been recorded in Britain from one site at St. David's Head, Pembrokeshire.

RI 1/1 **TN=5**

Limonium recurvum subsp. pseudotranswallianum Ingr. PLUMBAGINACEAE
Western Sea-lavender Lus liath na Boirne
(*Limonium transwallianum*)
IUCN: DD (nt) UK:**--**
Status: (1980)

Like L. paradoxum, this taxon was once considered endemic to Britain and Ireland but is most likely a minor segregate of L. binervosum. Consequently we believe that it should no longer be designated as an endemic species[12]. It was previously protected in the Irish Republic for that reason. It had been recorded from a total of 6 sites in the Burren region of Clare and on the Aran Islands.

Distribution: A British Red List species. In Britain the taxon has been recorded from two localities in Pembroke.

RI 5/6 **TN=6**

Habitat 5 : Shingle beaches

Few in number and usually remotely situated, true shingle beaches have only come under threat sporadically in Ireland. However, widespread illegal removal of shingle in Donegal,

[12] This microspecies is now considered to be endemic to Ireland.

Wicklow and Wexford has certainly led to a loss in habitat for those species found in such situations. Included in this category are the more widespread and frequent stone and boulder beaches, and the shingle foreshores to many sand-dune systems. In this group there are four species of which one is probably extinct. A feature of species found in shingle sites is their fleeting appearances as once quite abundant populations can be destroyed during a storm and may not re- appear for some time. Consequently it is difficult to gauge whether a species has become extinct or may re-appear in the future.

Crambe maritima L. BRASSICACEAE
Sea-kale Praiseach thrá
IUCN: nt (nt) UK:**LC**
Status: (1980)

This fleshy, herbaceous perennial of coastal sands, shingle, rocks and boulder beaches has been recorded from a total of 33 sites within the Republic of Ireland. In Northern Ireland it has been noted from a number of sites in counties Down and Antrim but it has not been seen in any of these recently. Since 1970, it has been seen in a total of 17 sites in Kerry, Cork, Waterford, Galway, Dublin and Louth. Though noted in the older floras as a rare and decreasing species, it is recovering from a decline perhaps as a result of it being no longer collected as a vegetable. It is now so widespread so as to rank as a non-threatened species (Map 5). It was formerly protected in the Irish Republic.

Distribution: Occurs widely in Britain from Islay and the Firth of Forth southwards. Recorded from most of Europe.

RI 16/$ **ASI 8** **TN=5**

Euphorbia peplis L. EUPHORBIACEAE
Purple Spurge Spuirse dhearg
IUCN: EX (EX) UK:**EX**
Status:

This annual spurge of sandy and shingle beaches formerly occurred at only one site in Ireland. It was first found at Garrais Cove, Waterford by Trench in 1839. The species has not been seen since although it has been searched for on several occasions. It is probably extinct and Hart stated that it had probably been destroyed by the great storm of 1881.

Distribution: A British Red List species. Formerly known from a number of stations in southern Britain where it is now extinct. It is now known only from the Channel Islands. On suitable beaches in south-west Europe.

RI 0/1 **EXTINCT**

Mertensia maritima (L.) Gray BORAGINACEAE
Oysterplant Lus na sceallaí
IUCN: VU (R) UK:**NT**
Status: **PROTECTED** (1987)

This prostrate, pink to blue-flowered perennial of gravelly seashores and shingle beaches, on the north and east coasts, has been recorded from 8 counties. It has undergone a gradual decrease in range over the last century and recently it has been seen in only one site in Donegal and in 2 sites in Down and 3 in Antrim (Map 6). Climatic factors are usually given as the reason for its decline as the species is on the edge of its north-western range in Ireland. (Plate lc).

Distribution: Very rare in the south of Britain, local in the north but decreasing. Occurs widely in northern Europe.

RI 1/12 **ASI 1** **TN=8**
ASI 5

Otanthus maritimus (L.) Hoffsgg. & Link ASTERACEAE
Cottonweed Cluasach mhara
IUCN: CR (EN) UK:**EX**
Status: **PROTECTED** (1987) (1980)

This woolly, perennial herb is restricted to sandy seashores and stable shingle on the south-east coast of Ireland. Formerly recorded from six sites; 2 in Wexford, 2 in Waterford, 1 in Wicklow and 1 in Kerry. The species is now only known from two adjacent sites in Wexford, one of which was discovered in the 1970s. Here, though small, the populations are stable but there is some threat from human disturbance. The populations therefore need close monitoring. (Plate Id).

Distribution: A British Red List species. Extinct in Britain. Occurs in south and west Europe.

RI 1/5 **ASI 2** **TN=12**

GRASSLAND HABITAT GROUP

Grassland ecosystems can be divided arbitrarily into five major categories covering pastures, meadows, heaths including open, annual plant-dominated areas, eskers and mountains including cliffs. The bulk of the land area of the island is occupied by this habitat, albeit in a much modified and controlled form in most areas. Meadows and esker grasslands are highly threatened whilst the least threat to any habitat is seen in the case of mountains and their cliffs. Overgrazing may become a problem on mountains in future. There are 49 species in this group of which 14 are threatened.

Habitat 1: Pastures

Twelve species are found in this habitat which contains all the rough grazing areas from limestone pavement heaths and grasslands, to upland areas fringing bog and heath. Both pastures over acid and basic soils are included here. There has been one probable extinction in this group and two species are neither rare nor threatened, one of which, the Cowslip, *Primula veris* is included here due to its protected status in Northern Ireland. It would seem to be on the increase in the Republic of Ireland.

Ajuga pyramidalis L. LAMIACEAE
Pyramidal Bugle Glasair bheannach
IUCN: VU (R) UK:**VU**
Status: (1980) NI Scheduled Species

A perennial herb of crevices in rocky, basic ground and often in shallow pockets of peat soil, this softly hairy, pale-blue flowered herb grows up to 15 cms high and has been recorded from a total of twelve sites in Ireland. It has recently been found, for the first time in Northern Ireland, in County Antrim. There it occurs in one area where at least 175 plants have been recorded. Its nine western sites are confined to coastal areas around Galway Bay. Since 1970 it has been seen in 8 of these 9 sites, 5 in Clare and 3 in Galway. The populations are apparently stable with large numbers occurring in some areas. Recently it has been discovered

in a number of new localities near its already known sites in Connemara, Galway. The species is increasing and it may await discovery in further sites.

Distribution: In Britain it occurs locally in north-west England and Scotland. Occurs in most of Europe.

RI 4/4 **ASI 4** **TN=5**

NNR 1 **ASI 1**

Arenaria norvegica subsp. norvegica Gunnerus CARYOPHYLLACEAE
Arctic Sandwort Gaineamhlus Artach
(*Arenaria norvegica*)
IUCN: EX (EX) UK:**VU**
Status:

This species was reported as having being found on limestone pavements on Gleninagh mountain in the Burren area of Co. Clare in 1961. Despite frequent searches since that time, it has never been refound and is probably extinct. It may have been recorded in error.

Distribution: A British Red List species. A rare and local plant in Britain, found only in Scotland. Occurs in north-west Europe.

RI 0/1 **INDETERMINATE**

Dryas octopetala L. ROSACEAE
Mountain Avens Leaithín
IUCN: nt (nt) UK:**LC**
Status: NI Scheduled Species

This evergreen, prostrate, arctic-alpine undershrub forms extensive mats over limestone pavements, calcareous gravels and mountain cliffs. The Mountain Avens is locally abundant in the Burren region of Clare and occurs occasionally on limestone northwards to Fermanagh. It is found more rarely as a mountain plant, extending to Antrim and Derry. A rare species in Northern Ireland where it is only known from 4 stations in 3 of which it has been seen recently. The populations are apparently stable. However the abundance of this species in certain areas of the Republic would indicate that it is a non-threatened species on the island as a whole.

Distribution: Local in montane Britain and descends to sea level in Scotland. Occurs in montane Europe and at sea level in the north.

RI 19/19 **NR 2** **ASI 11** **TN=8**

NR 2 **NNR 1** **ASI 1**

Filipendula vulgaris Moench ROSACEAE
Dropwort Lus braonach
IUCN: VU (R) UK:**LC**
Status:

In Ireland this perennial of rocky, limestone heaths is virtually confined to the district surrounding Gort in south Galway-north Clare. It is locally frequent in this region with large numbers of plants occurring in some areas. The populations are apparently stable. Outside the Gort district old records exist for Black Head in Clare and at Lough Derg on the Galway-Tipperary border. In neither of these sites has the species been refound.

Distribution: In Britain, widespread but local in England extending to Wales and Scotland. Occurs in most of Europe.

RI 4/6 **NR 1** **ASI 2** **TN=7**
NR 1

Helianthemum oelandicum subsp. piloselloides (Lapeyr.)Greuter & Burdet
CISTACEAE
Hoary rock-rose Grianrós liath
(*Helianthemum canum*)
IUCN: VU (R) UK:**NT**
Status: (1980)

Confined in Ireland to Clare and Galway, this small, woody perennial occurs over limestone rocks and pastures. It is recorded from 7 sites in Clare, six of which are extant and 8 in Galway, 7 of which are extant with one destroyed by development. In the Burren (including the Aran Islands), this species is often locally abundant. However, in some areas of the Aran Islands it is subject to overgrazing. The populations are apparently stable.

Distribution: Very local in Britain, confined to northern England and north Wales. Occurs in southern and central Europe.

RI 9/10 **ASI 5** **TN=7**

Helianthemum nummularium (L.) Miller CISTACEAE
Common Rock-rose Grianrós
IUCN: VU (R) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This rockrose is confined to one site in Ireland. It occurs on limestone near Ballintra in Donegal. Recently refound, the population consists of two small colonies 16 metres apart. In total there are approximately 100 plants. The population is apparently stable. Possible threats to the colony include expansion of nearby quarrying activities and close monitoring of the site is therefore necessary. (Plate 2a).

Distribution: Common in suitable habitats over most of Britain. Occurs in most of Europe.

RI 1/1 **ASI 1** **TN=7**

Anacamptis morio (L.) Chase et al. ORCHIDACEAE
Green-winged Orchid Magairlín féitheach
(*Orchis morio*)
IUCN: EN (V) UK:**NT**
Status: (1987)

The Green-Winged Orchid occurs in meadows, pastures and sandhills. It has been recorded from 19 Irish counties and it once occurred in local abundance in central and eastern Ireland. However, it apparently has suffered a catastrophic decline in numbers and only 7 sites have been reported since 1970 3 in Galway, and 1 each in Dublin, Offaly, Monaghan and Down. The reasons for this decline are apparently due to land reclamation and especially fertilizing of the old pasture sites in which it occurred.

Distribution: In Britain occurs throughout England and Wales, becoming rarer in the north. Occurs throughout Europe.

RI 6/$ **NR 1** **ASI 2** **TN=10**
NR 1

Primula veris L. PRIMULACEAE

Cowslip Bainne bó bleachtáin

IUCN: nt (nt) UK:**LC**

Status: NI Scheduled Species

The cowslip occurs frequently in meadows and pastures in central Ireland, becoming less common as you move outside this area. It is a rare species in Northern Ireland where it occurs in only 6 sites in Armagh and Fermanagh. It is under threat there from modern agricultural methods and from casual collection by gardeners. It is apparently increasing in eastern Ireland and is now abundant in many sites where it was once absent or rare.

Distribution: Locally frequent, almost throughout Britain but decreasing. Occurs in most of Europe but absent from the Mediterranean and the extreme north.

RI $/$ **TN=8**

NT 1

Pseudorchis albida (L.) Á. Löve & D. Löve ORCHIDACEAE

Small-white Orchid Magairlín bán

IUCN: EN (V) UK:**VU**

Status: **PROTECTED** (1987)

This white-flowered orchid of upland pastures and heaths has previously been recorded from 23 Irish counties. However there are only 7 post-1970 records; 1 in Donegal, 2 in Antrim and 4 in Fermanagh. The decline of this species mirrors that of Orchis morio. The increased pressure on hill pastures from overgrazing, reclamation and the associated application of artificial fertilizers seem likely to have led to its decline.

Distribution: In Britain, very rare in southern England, locally frequent northwards to Yorkshire. Occurs in most of Europe.

RI 1/$ **ASI 1** **TN=10**

ASI 1

Sanguisorba officinalis L. ROSACEAE

Great Burnet Lus an uille mór

IUCN: EN (V) UK:**LC**

Status: **PROTECTED** (1987)

This erect perennial of lake shores and dry banks has been recorded in the past from four Irish counties. In western Ireland it is confined to the shores of Lough Conn and Lough Cullin, where it is still known to occur, at the lake margins and over cut-away bog. In Northern Ireland it has been recorded from single stations in Down and Derry and from two sites in Antrim. Since 1970 it has been seen at a single station each in Antrim and Down.

Distribution: In Britain occurs northwards to southern Scotland. Occurs in most of Europe.

RI 3/5 **ASI 1** **TN=10**

Saxifraga granulata L. SAXIFRAGACEAE

Meadow Saxifrage Mórán léana

IUCN: CR (EN) UK:**LC**

Status: **PROTECTED** (1987)

This downy perennial herb, with white flowers, of pastures and sandhills near the coast, has been recorded from 21 sites in 9 counties. In 13 sites in the vicinity of counties Kildare, Meath, Dublin and Wicklow it is native but outside these counties the plant is thought to be introduced. Only two sites are known to be extant, one north of Arklow town and one near

Dublin city. Apparently declining due to amenity, agriculture and development pressures on the coastal habitat of the species, notably the high amenity sand-dune areas within easy reach of Dublin.

Distribution: Local and with an eastern tendency in Britain. Occurs in north-west and central Europe.

RI 2/12 **ASI 2** **TN=12**

Viola hirta L. VIOLACEAE
Hairy Violet Sailchuach ghiobach
IUCN: EN (V) UK:**LC**
Status: **PROTECTED** (1987)

This softly-hairy perennial occurs on dry banks, rocky ground and scrub on limestone soils in the southern half of Ireland. It has been recorded in the past from Limerick (5 sites), Clare (3 sites), Galway (3 sites), Wexford (I site), Laois (I site), Kildare (I site) and Dublin (15 sites). Recently it has only been seen in the Askeaton/Foynes area of Limerick and on Inishmaan and Inishmore of the Aran Islands (Map 7). Apparently decreasing, possibly due to quarrying and overgrazing of its limestone grassland sites.

Distribution: In Britain, occurs in England and Wales to east Scotland, widespread and rather common on suitable soils. Occurs in most of Europe.

RI 4/17 **ASI 2** **TN=10**

Habitat 2: Meadows

Two species are found in this group. Meadows on basic soils are fast disappearing due to fertilizing and silage making but acid meadows are still a feature of farms in the north-west of the island and in upland areas. One species is threatened.

Bromus racemosus L. POACEAE
Smooth Brome Brómas mín
IUCN: VU (R) UK:**LC**
Status:

This erect annual or biennial grass has been recorded from a total of 9 Irish counties. It occurs in water meadows, hay fields and on arable and waste land. In the Republic of Ireland this species was last seen in Galway as an arable weed in 1987. In Northern Ireland it has been seen recently in a number of sites. Apparently declining in the Republic of Ireland, but the possibility of confusion with B. commutatus may be a contributory factor.

Distribution: Scattered throughout Britain but uncommon. Occurs in most of Europe.

RI 1/23 **ASI 1** **TN=8**

Hordeum secalinum Schreber POACEAE
Meadow Barley Eorna mhóinéir
IUCN: EN (V) UK:**LC**
Status: **PROTECTED** (1987)

This tufted, perennial grass of lowland coastal and inland meadows and pastures, mostly on damp heavy soils has been recorded in the past from 15 Irish counties. The majority of these sites were meadows bordering estuaries. The only recent records are from Kilkenny, Wexford

and Dublin. Apparently declining due to reclamation and embankment of lands fringing estuaries.

Distribution: England and Wales; locally abundant in the south becoming rarer in the north. Occurs in most of Europe.

RI 3/20 **ASI 1** **TN=9**

Habitat 3: Heaths

In this group are included the heather-dominated areas of heaths, the gorse and bracken heaths and sandy, open areas which contain communities of annual species. These open areas are frequently occupied by species of the Grass and Pea families which are indicative of the early stages of heath development and find their best development on sheltered, south-facing slopes on the east coast of the island. There are 13 species in this group of which 5 are closed heath species, while the remainder prefer the more open conditions of the early heath stages. Heath is threatened in some areas along the coast, where it is being reclaimed for agriculture. In upland areas fertilizer spreading had decreased its area in favour of grasses. Eight species are not threatened in this group and there have been no extinctions.

Erica vagans L. ERICACEAE
Cornish Heath Fraoch gallda
IUCN: EN (V) UK:**LC**
Status: NI Scheduled Species

In Ireland this small shrub is confined to a single heath in Fermanagh where approximately 500 plants occur. There it grows in a nutrient-rich flush, in an area (30m x 45m) over sandstone. This population is apparently stable. There is also an old record of the species from cliffs at Islandicane, west ofTramore, Co. Waterford from where Burkitt reported the species in the 1850s. Despite repeated searches it has never been refound there.

Distribution: A British Red List species this heather is found only on heaths in Cornwall. Occurs in western Europe.

RI 0/1 **TN=10**

ASSI I

Filago minima (Smith) Pers. ASTERACEAE
Small Cudweed Cáithluibh bheag
(*Logfia minima*)
IUCN: VU (R) UK:**LC**
Status: **PROTECTED** (1987)

This small annual of sandy or gravelly places is recorded from a total of 16 counties, mainly in the south and east. Recently it has only been seen in the following number of sites; 1 in Kerry, 2 in Galway, 1 in Carlow, 4 in Derry and 1 in Tyrone. Apparently dramatically declining, possibly due to reclamation of its habitat.

Distribution: Locally common throughout Britain, but rare in the north. Occurs in most of Europe.

RI 4/$ **ASI 2** **TN=7**

Lotus subbiflorus Lagasca LEGUMINOSAE
Hairy Bird's-foot-trefoil Crobh éin mosach

IUCN: VU (R) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This hairy annual or perennial with yellow flowers, is usually found in dry, grassy, often rocky places near the sea. In Ireland it is restricted to 2 offshore islands in west Cork and one mainland locality nearby. On the islands the species occurs in some abundance and the populations are stable. However it has not been seen at its mainland site recently. (Plate 2b).

Distribution: In Great Britain it occurs in southern coastal counties and in the Channel Islands. Occurs in western Europe.

RI 2/3 **ASI 3** **TN=8**

Gnaphalium sylvaticum L. ASTERACEAE
Heath Cudweed Gnamhlus móna
(*Omalotheca sylvatica*)
IUCN: VU (R) UK:**EN**
Status: **PROTECTED** (1987)

This woolly, perennial herb of upland pastures and damp sandy places was once recorded from all but 5 Irish counties. Recently it has been recorded from only 8 sites; 1 in Carlow, 1 in Donegal, 1 in Tyrone, 1 in Down and 4 in Derry. The cause for the dramatic decline of this species is unknown, but as it occurred in fallow ground, the area of which has decreased considerably in recent years, this may account for its population fall (Map 8).

Distribution: Locally common in pastures, dry open woods and heaths throughout Britain. Occurs in most of Europe.

RI 2/$ **ASI 1** **TN=8**

Ornithopus perpusillus L. LEGUMINOSAE
Bird's-foot Crúba éin
IUCN: VU (R) UK:**LC**
Status: (1987)

This delicate, pinnately-leaved annual of dry sandy and gravelly places occurs on the south and east coasts of Ireland. It has been recorded from 14 sites in total from the following counties; Cork, Wicklow, Wexford, Dublin, Carlow and Down. In only five sites is it still extant, 2 in Wicklow, 1 in Carlow, 1 in Cork and 1 in Wexford. Apparently declining, but somewhat fleeting in its appearances and it may therefore yet be refound at some of its former sites.

Distribution: Generally distributed throughout Britain becoming rarer as you move northwards. Occurs in north-west and central Europe.

RI 5/9 **ASI 4** **TN=8**

Orobanche rapum-genistae Thuill. OROBANCHACEAE
Greater Broomrape Múchóg chapaill
IUCN: VU (R) UK:**NT**
Status: (1980)

This parasite on the roots of shrubby Leguminosae (chiefly Gorse or Broom) is restricted to south-east Ireland. In the past it has been recorded from a total of 33 sites, occurring in Wicklow, Cork, Waterford, Tipperary and Wexford, the bulk of which were in Wicklow. It has been seen in only seven sites since 1970; 2 in Cork (one since destroyed by hedgerow removal), 1 in Waterford, 1 in Tipperary, 1 in Wexford and 2 in Wicklow. Apparently declining. The habitat of this species is under threat from land clearance and reclamation of

gorse-dominated heath. Though the species was formerly protected in the Irish Republic, the still wide ranging distribution of its host species and the probable under-recording of this Broomrape make it likely to be more widespread than recent records suggest. Consequently until its status has been further investigated we do not consider it a candidate for protection.

Distribution: Throughout England, Wales and south Scotland. Found in western Europe.

RI 6/23 **NR 1** **ASI 3** **TN=7**

NR 1

Pyrola media Sw. PYROLACEAE

Intermediate Wintergreen Glasluibh bheag

IUCN: VU (R) UK:**VU**

Status:

This perennial of heaths, rocky places, woods, and glens in northern and western Ireland has been recorded from 11 Irish counties. On the island it has been found in Clare and Westmeath and from Mayo to Donegal to Down. Since 1970 it has been seen in the following number of sites; 1 in Westmeath, 1 in the Burren region of Co. Clare; 5 in Antrim, 1 in Fermanagh, 1 in Tyrone and 2 in Derry. Apparently declining, however this species is easily overlooked and seldom searched for. It therefore seems likely to be refound at many of its old sites of which the majority are in the Fanad peninsula, Donegal.

Distribution: In Britain occurs locally in England and Scotland. Occurs in north and central Europe, and in mountains in the south.

RI 2/19 **ASI 2** **TN=6**

Simethis planifolia (L.) Gren. in Gren. & Godron LILIACEAE

Kerry Lily Lile Fhíonáin

IUCN: EN (V) UK:**--**

Status: **PROTECTED** (1987) (1980)

This white-flowered lily is confined to one area in Ireland - a maritime dry heath near Derrynane in Kerry. It is recorded from a 20 kilometre square area of rocky terrain, over most of which it has been seen recently. The population is apparently stable but is under some threat from fire and housing development, particularly in the vicinity of Lamb's Head, It has recently been reported from the Beara peninsula but the record has not yet been confirmed.

Distribution: In Britain, introduced with Pinus pinaster near Bournemouth in Dorset. Naturalised in Hampshire. Occurs in southwest Europe.

RI 1/2 **NP 1** **ASI 1** **TN=10**

Trifolium glomeratum L. LEGUMINOSAE

Clustered Clover Seamair chlibíneach

IUCN: EN (V) UK:**LC**

Status: **PROTECTED** (1987) (1980)

This clover is confined to sandy ground near the sea in south-east Ireland. It has been recorded from a total of six sites, 3 in Wicklow, 1 in Waterford and 2 in Wexford. Since 1970 it has only been seen at its Waterford site near Dunmore East and across the Barrow estuary in Wexford. Apparently declining but erratic in its appearances. The former sites in Wicklow have been damaged by road widening and reclamation.

Distribution: In Britain occurs in south and east England. Occurs in south and west Europe.

RI 2/5 **ASI 1** **TN=9**

Trifolium subterraneum L. LEGUMINOSAE
Subterranean Clover Seamair faoi thalamh
IUCN: EN (V) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This species is confined in Ireland to 3 sites in County Wicklow, all near Wicklow town, in one of which it occurred fleetingly. The plant has been seen recently at two of these sites, but not in the third. At one of the extant sites the clover occurs along a 30 metre stretch of sandy bank. The second extant site for the species is a nearby rocky hillock. The populations at both sites undergo wide annual fluctuations with numbers at the first site ranging from 140 in 1973 to 41 in 1984. 15 plants were recorded at the second site in 1984.

Distribution: In Britain occurs from southern England to Cheshire and Lincolnshire. Occurs in south-west Europe.

RI 1/1 **ASI 1** **TN=10**

Tuberaria guttata (L.) Fourr. CISTACEAE
Spotted Rock-rose Grianrós breac
IUCN: VU (R) UK:**NT**
Status:

This small, yellow, annual rock-rose, found on islands and on heaths near the west and south-west coast, is confined in Ireland to Cork, Galway and Mayo. The Irish plants are often attributed to subspecies breweri - a presumed endemic of Britain and Ireland. It occurs on rocky, maritime. heathland, usually on higher ground and often where burning has occurred the previous year. It has been seen recently in all of its sites in Galway, but Inishark, and at Sheep's Head, Cork (Map 9). Only at Carraroe has it been seen in the quantities suggested by previous reports. Apparently declining, but the populations are prone to wide annual fluctuations in numbers, and as it is annual, it may require periodic burning of its heath habitat to maintain the open conditions in which it thrives.

Distribution: A British Red List species. Occurs in 5 sites in north-west Wales. The typical species is found in southern and western Europe.

RI 4/8 **ASI 6** **TN=7**

Vicia lathyroides L. LEGUMINOSAE
Spring Vetch Peasair earraigh
IUCN: VU (R) UK:**LC**
Status:

This small, spreading, downy annual of sandy ground near the sea has been recorded from seven Irish counties. It has been seen recently in the following number of sites; 1 in Waterford, 3 in Wicklow (1 destroyed in 1977), 2 in Dublin, 2 in Down and 1 in Derry. In its sand-dune habitats the species is under slight threat from amenity and agricultural pressures but otherwise the species is stable.

Distribution: Scattered throughout Britain. Occurs in most of Europe.

RI 6/10 **ASI 6** **TN=8**

Viola lactea Smith in Sowerby VIOLACEAE
Pale Dog-violet Sailchuach liath
IUCN: EN (V) UK:**VU**
Status: **PROTECTED** (1987)

This grey to blue-flowered violet of heathy ground in southern and western Ireland has been recorded in the past from 6 counties. Recently it has only been seen at one site in Waterford and one in Galway. Apparently declining, possibly due to heathland reclamation (Map 10).

Distribution: In Britain, occurs in scattered localities from the Isle of Man southwards, very local, commonest in south-west England. Occurs in western Europe.

RI 2/11 **ASI 1** **TN=10**

Habitat 4: Eskers

Intact eskers were once widely distributed in the centre of Ireland but most have been much modified. This habitat is highly threatened in Ireland and many of the sand and gravel ridges of the midlands have been denuded of woodland, dug away for gravel or reclaimed for agriculture. Where esker grassland is still found it is usually burned and overgrazed. There are 4 species in this group of which 3 are threatened.

Clinopodium acinos (L.) Kuntze LAMIACEAE
Basil Thyme Lus mhic rhí Breatan
(*Acinos arvensis*)
IUCN: EN (V) UK:**VU**
Status: **PROTECTED** (1987)

This downy annual, up to 20 cm in height and with violet flowers has been recorded from a total of 11 counties in central and south-eastern Ireland. In the past it occurred occasionally on exposed esker ridges, in arable fields, on gravel, and on sandy soils. It has a preference for calcareous soils. Since 1970, the species has been seen only at four sites, one in each of the counties Wexford, Laois, Westmeath and Monaghan (Map 11). The species is apparently declining as a result of modern methods of weed control and exploitation of its esker habitat for gravel extraction.

Distribution: In Britain a local species centred in the south. In most of Europe.

RI 4/$ **ASI 1** **TN=9**

Cardamine impatiens L. BRASSICACEAE
Narrow-leaved Bitter-cress Searbh-bhiolar caol
IUCN: VU (R) UK:**NT**
Status: **PROTECTED** (1987)

This biennial or annual, pinnately-leaved herb with inconspicuous white flowers has recently been recorded from an esker in County Westmeath where it is probably native. There it is found along a 200 metre stretch of woodland floor which has been disturbed through trampling. It had previously been noted as a casual from Clare, Dublin and Antrim. It is still known as a casual at Ballyvaughan, Co Clare. The population in Westmeath is under threat from possible woodland clearance.

Distribution: This species occurs locally in western Britain in shady ash woods and on moist limestone rocks. Occurs throughout Europe.

RI 1/1 **TN=7**

Erigeron acer L. ASTERACEAE
Blue Fleabane Lus gorm na ndreancaidí
IUCN: EN (V) UK:**LC**
Status: NI Scheduled Species

A slender annual or biennial herb, with pale-purple and yellow flowers this species reaches 40 cms in ht and is covered in rough hairs. It has been recorded from 26 of the 32 Irish counties. It occurs on eskers, in dry grassland, sandy pastures and on walls - especially on calcium-rich substrates. It is now apparently a rare and local species, confined mostly to central and south-eastern Ireland. From the number of squares in which it has been found in the Irish Republic since 1970, the species appears threatened. However we believe that it is under-recorded and consequently not yet a candidate for protection. Its status requires urgent investigation. In Northern Ireland it is confined to one dune system in County Down where it is common.

Distribution: In Britain common in England and Wales though rarer in Scotland. Throughout most of Europe.

RI 5/$ **ASI 4** **TN=9**

NNR 1

Galeopsis angustifolia Ehrh. ex Hoffm. LAMIACEAE
Red Hemp-nettle Ga corcra
IUCN: EN (V) UK:**CR**
Status: **PROTECTED** (1987)

In distribution this red-flowered, downy annual is restricted to south-east Ireland. A Labiate, it is found in eskers, arable fields and waste places and has been recorded from 10 Irish counties. Since 1970 it has been seen only in Carlow, Wicklow, Dublin and Westmeath in a total of 7 sites. It is apparently declining due to cleaner crop husbandry and exploitation of its sandpit and esker habitats due to extraction of sands and gravels.

Distribution: In Britain, this species occurs in arable land in England but it is rare in the north. Occurs in south-west Europe.

RI 5/$ **ASI 3** **TN=9**

Habitat 5: Mountains

Mountain ranges are mainly coastal in distribution in Ireland and no peak exceeds 1,041 metres in height. Most of the flora in this group is arctic - alpine and relictual containing some of the rarest of Irish species. They are found mostly on north-facing cliffs, which are the areas least accessible to man and consequently less modified than other habitats. There are 18 species in this group none of which are threatened. Sheep grazing has caused some damage to cliff-faces due to trampling and overgrazing. This is likely to increase rather than decrease in the next few years as farmers change from cattle to sheep production. There has been a lack of recent investigation of many mountain sites and most of the plant records date from the last century when they were being systematically explored by botanists, notably Hart. Therefore many of the old records need confirmation. There seems no reason to assume that most species have declined in this habitat and so many of the older records should be confirmed if a more thorough search is undertaken in the Irish mountains.

Alchemilla alpina L. ROSACEAE
Alpine Lady's-mantle Bratóg Mhuire
IUCN: VU (R) UK:**LC**
Status:

This 15-20 cms tall alpine with palmate leaves, silky-white beneath and clustered yellow-green flowers is only known in Ireland from mountain cliffs in Kerry and Wicklow. Of the species 3 sites it has been seen in 2 of these since 1970, one in southern Kerry, on the

Brandon mountain range in the Dingle peninsula (Plate 2c) and one in County Wicklow near Lough Ouler. The populations are apparently stable.

Distribution: In Britain occurs from north-west England northwards, and often locally abundant. Occurs in north-west and central Europe.

RI 3/4 **ASI 3** **TN=4**

Arenaria ciliata L. CARYOPHYLLACEAE
Fringed Sandwort Gaineamhlus gaelach
IUCN: VU (R) UK:--
Status: **PROTECTED** (1987) (1980)

This tufted, montane, white-flowered perennial was once considered to constitute an endemic sub-species of the *A .ciliata* complex (ssp *hibemica*). It is confined to one part of the Ben Bulben range in Co. Sligo where it is quite frequent. It occurs in open mountain grassland, on basic soil and on limestone cliffs between 400 and 600 metres in height. The population is apparently stable along this mountain range.

Distribution: Other forms of the *A.ciliata* complex occur in Britain. *A.ciliata* occurs widely in montane Europe.

RI 1/1 **ASI 1** **TN=6**

Asplenium septentrionale (L.) Hoffm. ASPLENIACEAE
Forked Spleenwort Fionncha ladhrach
IUCN: VU (R) UK:**NT**
Status: **PROTECTED** (1987) (1980)

This fern of siliceous and volcanic rocks is confined to one site near Roundstone in west-Galway where it occurs in clefts of hornblende-gneissic rocks unaccompanied by other vegetation.. It has also been recorded from Co. Down, where it is introduced. The small population near Roundstone (c.l2 plants) is apparently stable and was last surveyed in 1985.

Distribution: In Britain it occurs in south-west England, Wales, Lake District and as a rare and local species in Scotland. Occurs throughout Europe on suitable rock types.

RI 1/1 **ASI 1** **TN=5**

Arabis petraea (L.) Lam. BRASSICACEAE
Northern Rock-cress Gas caillí Artach
(*Cardaminopsis petraea*)
IUCN: VU (R) UK:**VU**
Status: **PROTECTED** (1987) (1980)

In Ireland this white-flowered, montane species is confined to two mountain areas. It is restricted to a small area of mountain cliff in Leitrim and to the Galtee mountains in Tipperary where it rarely flowers. At Glenade, much of the population is on a vertical cliff and is inaccessible. It has been seen recently in both sites and the populations are apparently stable and not threatened.

Distribution: In Britain it occurs locally on mountain rocks in Wales and Scotland. Occurs in montane Europe.

RI 2/2 **ASI 2** **TN=5**

Cryptogramma crispa (L.) R. Br. ex Hook. ADIANTACEAE
Parsley Fern Raithneach chas

IUCN: VU (R) UK:**LC**
Status: **PROTECTED** (1987)

This montane fern of screes, rocky and stony places on calcium-free, siliceous soils occurs on mountains in the north, east and west of Ireland. It has been recorded from a total of 9 counties. Recently it has been seen at 1 site in Galway, 3 in Down and 2 in Antrim. A partial explanation for this species decline may be attributed to its tendency to appear fleetingly.

Distribution: Locally abundant in some montane areas in northern England, Wales and Scotland. Occurs in montane Europe.

RI 1/8 **ASI 1** **TN=6**

ASI 1

Draba incana L. BRASSICACEAE
Hoary Whitlowgrass Araflasach
IUCN: VU (R) UK:**LC**
Status:

This small hoary, biennial or perennial, white-flowered herb occurs on screes, cliffs and sandhills. Its distribution is predominantly in the north-west. It is recorded from a total of 8 counties and recently it has been found only in 9 sites; 3 in Kerry, 2 in Sligo, 1 in Leitrim and 3 in Donegal. It has not been reported from Northern Ireland recently. Apparently declining but as most of its sites are in mountains this may just reflect the lack of recording in remote areas.

Distribution: In Britain this species occurs locally northwards from Caernarvon, and central England. Occurs in montane Europe.

RI 7/18 **ASI 6** **TN=7**

Epilobium alsinifolium Villars ONAGRACEAE
Chickweed Willowherb Saileachán sléibhe
IUCN: VU (R) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This species is a slender arctic-alpine willowherb of mountain streams and spring margins. In Ireland this species is restricted to one locality in Co. Leitrim where it is found in two adjacent sites. In the first, 100 plants are found on a wet cliff in an area of 25 metres square. In the second site, 70 plants are found along a 30 metre stretch of a small stream. The populations are apparently stable.

Distribution: In montane Britain, Wales and northwards to Scotland, the Hebrides and Shetlands. Occurs in montane Europe.

RI 1/1 **ASI 1** **TN=5**

Minuartia recurva (All.) Schinz & Thell. CARYOPHYLLACEAE
Recurved Sandwort Gaineamhlus cuar
IUCN: VU (R) UK:**--**
Status: **PROTECTED** (1987) (1980)

A tufted, southern-montane perennial of bare, siliceous soils this sandwort is confined in Ireland to one area in the south-west. It occurs on exposed rocks in the Caha mountain range on the Cork and Kerry border, where 2 sites are known. The populations are apparently stable, with approximately 100 plants having been recorded by the BSBI in September 1985. (Plate 3b).

Distribution: Absent from Britain. It occurs in the mountains of southern and south-central Europe.

RI 1/1 **ASI 1** **TN=5**

Poa alpina L. POACEAE
Alpine Meadow-grass Cuisce Alpach
IUCN: VU (R) UK:**LC**
Status: (1980)

This usually viviparous, perennial, montane grass occurs on mountain cliffs and in exposed mountain grasslands. In Ireland it is restricted to 3 sites; 2 on the Ben Bulben range in Sligo and 1 on the Dingle peninsula in Kerry. Recently it has only been seen at its Sligo sites on the Ben Bulben range where it is frequent along several stretches of cliff. Its apparent decline in Kerry may only reflect the lack of recent investigation in this remote, and often difficult to work habitat. The species was previously protected in the Irish Republic but there seems to be no cause for concern about its status at present.

Distribution: In Britain occurs in Wales, north-west Yorkshire, Lake District and the Scottish Highlands. Occurs in montane Europe.

RI 2/3 **ASI 1** **TN=6**

Persicaria vivipara (L.) Ronse Decraene POLYGONACEAE
Alpine Bistort Glúineach shléibhe
(*Polygonum viviparum*)
IUCN: DD (IN) UK:**LC**
Status: **PROTECTED** (1987)

This montane perennial occurs on wet alpine rocks, consolidated screes and mountain grasslands. It has been recorded from mountain areas in Kerry (Brandon), Sligo/Leitrim (Ben Bulben, Ben Whisken and Glenade) and in Donegal (Bulbin mountain and Slieve League). The Alpine Bistort has not been recorded since 1970 in any of these sites. However the last record was from Slieve League in 1969. As most mountain plants are under-recorded, we believe that this species is still extant in some of its sites. However its status needs urgent investigation. One of the Donegal populations is vulnerable to reclamation. (Plate 3a).

Distribution: In Britain common in mountain districts of Wales, Northern England and Scotland. Occurs in montane of this species habitat contributes to it Europe.

RI 0/5 **INDETERMINATE**

Polystichum lonchitis (L.) Roth ASPIDIACEAE
Holly-fern Ibheag dheilgneach
IUCN: VU (R) UK:**VU**
Status: NI Scheduled Species

This montane fern occurs in crevices of basic rocks on mountain cliffs in western Ireland, where it has been recorded from 7 counties. Recently it has been seen in 9 sites; 4 in Kerry, 2 in Galway; 1 in Leitrim; 1 in Donegal and 1 in Fermanagh - its most easterly site. As is the case with other mountain plants, the species is apparently declining but has most likely been under-recorded. Its status in Northern Ireland is such that it merits protection there, as only one plant has been seen there recently.

Distribution: In Britain in northern England, Scotland and Wales. In most of Europe.

RI 8/18 **ASI 4** **TN=4**

Salix phylicifolia L. SALICACEAE
Tea-leaved Willow Saileacha ghaelach
IUCN: VU (R) UK:**LC**
Status: (1980)

This montane shrub of wet mountain cliffs and streamsides is confined to the west and north of Ireland. In western Ireland it has been found in the following number of sites 2 in Sligo, one of which was found in 1977, and 1 in Leitrim. It has been seen recently in these sites where the populations are stable. However, the inaccessibility of this species habitat contributes to it being rarely reported. The Mayo and Donegal records of Hart may be errors and in Northern Ireland the species may also have been recorded in error from near Derry and in Antrim. The precise taxonomic and distributional status of the species in Ireland is still not fully known and needs further research.

Distribution: In Britain locally abundant on suitable ground from Lancashire and Yorkshire north to the Orkneys. Occurs in northern Europe.

RI 3/3 **ASI 1** **TN=4**

Saussurea alpina (L.) DC. ASTERACEAE
Alpine Saw-wort Sábhlus sléibhe
IUCN: VU (R) UK:**LC**
Status: (1980) NI Scheduled Species

This montane herb of mountain cliffs and ledges above 300 metres has been recorded from 26 sites within the island of Ireland. These sites are broken down as follows; 6 in Kerry, 1 in Tipperary, 2 in Galway, 1 in Wicklow, 4 in Mayo, 1 in Sligo, 10 in Donegal, and 1 in Down. The species has been seen in 10 of these sites since 1970 3 in Kerry, 2 in Galway and 1 each in Wicklow, Mayo, Sligo, Donegal and Down. Apparently declining but in recent times there has been a minimum of botanical investigation in Irish mountains, and the species is probably under-recorded. No apparent threats to its sites have arisen since it was first reported from them.

Distribution: In Britain this species occurs from 50 metres to 1,900 metres in Scotland, North Wales and the Lake District. Throughout Europe in the mountains but at low altitudes in the north.

RI 7/20 **NP 1** **ASI 4** **TN=4**

Saxifraga aizoides L. SAXIFRAGACEAE
Yellow Saxifrage Mórán buí
IUCN: VU (R) UK:**LC**
Status: NI Scheduled Species

This arctic-alpine, yellow-flowered saxifrage of damp rocky places is virtually confined in Ireland to mountains in the north-west. It has been recorded from 15 sites from Sligo to Donegal with an outlying station in Antrim. Recently it has been seen in 3 sites in Sligo, 2 in Leitrim and 1 each in Donegal, Antrim and Fermanagh (Map 12). Apparently declining but this montane species is probably under-recorded and in all of the sites that it has been seen in recently it is locally abundant.

Distribution: In Britain this species occurs in Wales, northern England and Scotland locally common. Occurs in arctic and sub-arctic Europe and on mountains throughout.

RI 4/9 **ASI 3** **TN=5**

Saxifraga hartii D. Webb SAXIFRAGACEAE

Hart's saxifrage Mórán creige

IUCN: VU (R) UK:--

Status: **PROTECTED** (1987) (1980)

This saxifrage is apparently endemic to Ireland, although some doubt exists to its exact taxonomic status and it has been suggested that it is probably best given sub-specific status under S.rosacea Moench. It occurs only on sea cliffs on an island off Donegal. The population here is apparently stable and approximately 50 plants are known to occur on the maritime cliffs. S. rosacea is found on cliffs and rocks in western Ireland.

Distribution: A former British Red List species, S.rosacea is extinct in Britain. In Europe the species is found in northern, western and central areas.

RI 1/1 **ASI 1** **TN=5**

Saxifraga nivalis L. SAXIFRAGACEAE

Alpine Saxifrage Mórán an tsneachta

IUCN: VU (R) UK:**LC**

Status: **PROTECTED** (1987) (1980)

This arctic-alpine saxifrage of mountain cliffs and damp rocks is restricted to one site in Ireland. A small population is confined to a limited area of cliffs on the Ben Bulben range in Sligo. A recent investigation located only 10 plants on the cliff face, though more may probably occur as the cliffs on which they grow are treacherous and difficult to work. Therefore many suitable areas remain unexplored.

Distribution: In Britain this arctic-alpine occurs in north Wales, northern England and Scotland. Occurs in arctic and sub-arctic Europe and locally in the mountains elsewhere

RI 1/1 **ASI 1** **TN=5**

Saxifraga oppositifolia L. SAXIFRAGACEAE

Purple Saxifrage Mórán sléibhe

IUCN: VU (R) UK:**LC**

Status: NI Scheduled Species

This loosely matted or tufted, purple-flowered, arctic-alpine, saxifrage has been recorded on mountains in 7 counties from Galway to Derry. This species is under no threat in the Republic of Ireland in which it has recently been seen in half of its sites. As with other mountain species, it is under-recorded. However it is confined to one station in Northern Ireland in County Derry. Here it still occurs on north-west facing cliffs of basalt.

Distribution: In Britain this arctic-alpine saxifrage occurs in Wales, northern England and Scotland. In arctic and sub-arctic Europe and on mountains elsewhere in Europe.

RI 8/17 **NP 2** **ASI 6** **TN=4**

NNR 1

Silene acaulis (L.) Jacq. CARYOPHYLLACEAE

Moss Campion Coireán caonaigh

IUCN: VU (R) UK:**LC**

Status: NI Scheduled Species

This densely-tufted, pink-flowered, arctic-alpine perennial is confined to north-west Ireland where it has been recorded from Mayo, Sligo, Leitrim, Donegal and Derry. In these areas it is found on mountain slopes and cliffs. The only recent records known to date are from Clare Island, the Ben Bulben range and on Benevenagh in Derry. It occurs in all these sites in some

abundance and it seems likely to be still extant in its remaining sites as little threat to these have been noted.

Distribution: Scattered, but local, in the mountain districts of Britain, predominantly in the north. Occurs in arctic Europe and on mountains in the west and centre.

RI 3/5 **ASI 2** **TN=6**

NNR 1

WETLAND HABITAT GROUP

Wetland ecosystems can be arranged, arbitrarily into five major divisions namely rivers and lakes, marsh/fen, bogs, ponds and streams and marginal wetland habitats such as lake shore, riversides and damp places. By far the most threatened habitat is bog with only 8% of raised bog of conservation interest now remaining intact. The greatest number of species in any major habitat category is found in wetlands but this does not necessarily imply that they are more threatened than species in other groups. Ireland it particularly rich in rivers, lakes and other aquatic habitats and consequently the wetland flora is very well represented. There are 56 species in this group of which 2 are Extinct and 14 are threatened. Seven species are rated as Vulnerable in Europe with the Bog Orchid, *Hammarbya paludoso* and the Pillwort, *Pilularia globulifera* being the most threatened European species in Ireland and consequently candidates for listing on Appendix I of the Bern Convention (see Ireland in a European Context).

Habitat 1: Bogs

Raised, lowland and mountain-blanket bogs are highly threatened with most of the midland, raised bogs having been cut away or milled for peat production. Afforestation, both state and more recently state-aided private afforestation is also a major cause of loss of virgin peatland, most notably blanket bog. Turbary and overgrazing are also having their effects on blanket bogs. There are 13 in this group of which 1 is probably Extinct, 2 are Endangered and 3 are vulnerable.

Andromeda polifolia L. ERICACEAE
Bog-rosemary Lus na móinte
IUCN: nt (nt) UK:**LC**
Status: NI Scheduled Species

This trailing semi-erect, pink-flowered, heather species occurs frequently on raised bog in central Ireland and on blanket bog in the eastern counties. However it is a rare species in Northern Ireland where it was found only in single sites in Antrim, Armagh and Derry. It has now disappeared from the last due to afforestation but it is widespread in its other two bog sites.

Distribution: Local and decreasing in Britain. Northern and north-central Europe and on mountains in the south.

RI $/$ **TN=6**

NNR 1

Carex magellanica Lam. CYPERACEAE
Tall Bog-sedge Cíb bhocht
IUCN: VU (R) UK:**LC**

Status: NI Scheduled Species

This sedge is confined in Ireland to two sites in Northern Ireland. It is a plant of upland bogs, often occurring on cliff ledges. Until recently this plant was only known from a small area of Co. Antrim, but its distribution has since been extended to include one site in Tyrone. It was found in the latter county in 1981 among Sphagnum moss at the margin of a number of small pools in an area of upland blanket bog. In Antrim, the plant occurs on a blanket-bog, covered plateau at approximately 300 metres above sea level. Here the plant grows with Sphagnum moss and other sedge species, often at pool margins and is found at 3 of the known 4 sites throughout the plateau, one site having been lost due to afforestation.

Distribution: In Britain this species is scattered from the Lake district to north-western Scotland. Occurs in north and central Europe.

RI 0/0 **TN=7**

NNR 1

Carex pauciflora Light. CYPERACEAE
Few-flowered Sedge Cíb scáinte
IUCN: EN (V) UK:**LC**
Status: NI Scheduled Species

A species of oligotrophic bogs, this plant is confined to a small area of mountain in Co. Antrim. There it occurs relatively frequently throughout a stretch of upland bog over 3, 10km squares. Since 1970 it has been seen in 2 of the 3 squares. The population is apparently stable.

Distribution: In Britain this species is frequent throughout the highlands of West Scotland, very rare and local elsewhere. Occurs in north and central Europe.

RI 0/0 **TN=9**

Deschampsia setacea (Hudson) Hackel POACEAE
Bog Hair-grass Móinfhéar seascainn
IUCN: EN (R(V)) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This tufted, slender perennial grass of wet bogs and lake sides is confined in Ireland to west Galway (Map 13). Here it has been recorded from a total of 16 sites. Recently it has been seen in 9 of these. Despite its very low Threat Number the habitat of the species is threatened by small and large-scale peatland reclamation and development, principally afforestation. This species is rated as Vulnerable in Europe.

Distribution: A British Red List species and much threatened in the south of England through drainage. Known in 15 counties from Dorset to the Outer Hebrides and Shetland. A western European species.

RI 8/8 **ASI 2** **TN=3**

Erica ciliaris L. ERICACEAE
Dorset Heath Fraoch frainseach
IUCN: EN (V) UK:**LC**
Status: (1987) (1980)

This heather is confined in Ireland to one site near Roundstone in west Galway where it occurs close to a road margin which suggests that it may have been planted there. Here approximately 5 plants, apparently of the one clone occur, and whose numbers are stable. The population does not set seed. The vulnerable position of this colony makes it liable to threats such as turbary, road widening, dumping and rock extraction from a nearby quarry.

Distribution: A British Red List species. In Britain this heather occurs abundantly on heaths in Cornwall, Devon and Dorset but it has declined sharply there due to habitat destruction and hybridization with Erica tetralix L. In Europe a western species.

RI 1/1 **ASI 1** **TN=9**

Erica mackaiana Bab. in Mackay ERICACEAE
Mackay's Heath Fraoch Mhic Aoidh
IUCN: VU (R) UK:--
Status:

This compact, bushy heather is confined to two Irish counties. It remains locally abundant on blanket bog surrounding a lake near Gweedore in Donegal, despite the feared impact of a local hydroelectric scheme on its habitat. It also occurs frequently over a track of bog from south-east of Clifden to the lower slopes of Errisbeg mountain in west Galway. Another small colony is to be found near Carna in west Galway. The populations do not set seed but hybrids with E.tetralix are apparently common. The difficulty in easily distinguishing this heath from E.tetralix suggests that its range may yet be extended further. The populations are apparently stable.

Distribution: Only known elsewhere from northern Spain.

RI 4/4 **ASI 2** **TN=5**

Eriophorum gracile Koch ex Roth CYPERACEAE
Slender Cottongrass Ceannbhán caol
IUCN: EN (R(V)) UK:**NT**
Status: **PROTECTED** (1987) (1980)

Since it was first recorded in Ireland from Connemara in 1966, this bog cotton has been recorded from a further 13 sites. This slender perennial grows in wet acid bogs and by lake margins. The centre of its Irish distribution is in Connemara in west Galway in which it has been seen in 8 of the sites that it was previously reported from (Map 14), Outside this area, it is found in 2 sites in Kerry and 1 in Westmeath, all of which are extant. It is possible that the distribution of this species may yet be extended further in Ireland. However, its habitat is under threat from bogland drainage and afforestation. Rated as a Vulnerable European species.

Distribution: A British Red List species. Formerly known from 9 English and Welsh counties, but now only known in 5 sites due to habitat drainage. Occurs in most of Europe where it is threatened throughout.

RI 9/10 **ASI 6** **TN=6**

Hammarbya paludosa (L.) Kuntze ORCHIDACEAE
Bog Orchid Magairlín na móna
IUCN: EN (R(V)) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This small orchid grows in wet, acid spongy bogs, usually in tufts of Sphagnum moss. It has been recorded, in the past, from over 50 sites throughout the island. Recently it has been seen only in single sites in counties Carlow, Galway, Mayo, Dublin, Louth and Antrim (Map 16). This species is easily overlooked and is seldom seen in the same site subsequently. This may partially explain its dramatic decline but the rapid destruction of Irish peatlands is undoubtedly a major factor in the loss of its habitat. We recommend its inclusion in Appendix I of the Bern Convention.

Distribution: A British Red List species. It occurs in north and west Britain. In Europe, the species occurs throughout the north and centre where it is also threatened.

RI 5/$ **NP 1** **ASI 1** **TN=8**

Lycopodiella inundata (L.) Holub LYCOPODIACEAE
Marsh Clubmoss Garbhógach chorraigh
(*Lepidotis inundata*)
IUCN: VU (R) UK:**EN**
Status: **PROTECTED**

This Clubmoss of lake margins and wet bogs has been recorded from 8 Irish counties, from a total of 22 sites mainly in the south and west. Since 1970 it has been seen in 8 sites in west Galway, 1 in Offaly, 1 in west Mayo, 1 in west Donegal and 1 in Armagh, where it has survived the drainage of its lake habitat. Though this species is vulnerable to the effects of the increasingly rapid exploitation and destruction of midland and western bogs, it has increased in range since 1970 (Map 15). It is not threatened at present though its status requires monitoring in its peatland sites.

Distribution: Occurs locally in Britain from Orkney southwards, very rare in Scotland, north-east England and Wales. Occurs in most of Europe except in the Mediterranean region.

RI 9/17 **NR 1/1** **ASI 6** **TN=4**
NR 1/1 **NNR 1**

Orthilia secunda (L.) House PYROLACEAE
Serrated Wintergreen Glasluibh fhiaclach
IUCN: CR (EN) UK:**LC**
Status: NI Scheduled Species

This greenish-white flowered perennial of bogs and wet mountain ledges has been recorded from 4 Irish counties. Formerly known from Offaly, Derry, Fermanagh and Antrim, it is now only known to be extant around one area of moorland in County Fermanagh. The habitat of this species is under threat from peatland exploitation and reclamation. The only site for this species in the Republic of Ireland, at Pollagh Bog in County Offaly, was utilised by Bord na Mona for peat extraction in the 1950s and the site was destroyed.

Distribution: In Britain occurs in Scotland and northern England and in south Wales. Occurs in most of Europe but rarely in the Mediterranean.

RI 0/1 **TN=12**

Rubus chamaemorus L. ROSACEAE
Cloudberry Eithreog shléibhe
IUCN: EN (V) UK:**LC**
Status: NI Scheduled Species

The cloudberry occurs in montane moorland and in Ireland is confined to one area. This alpine species is restricted to one locality in the Sperrin mountains in Tyrone, where the population, though small, is apparently stable. The population occurs as a small colony and grows in a stunted, apparently non-flowering condition.

Distribution: Locally abundant in upland Britain, from north Wales to Scotland, though absent from the islands. A northern European species.

RI 0/0 **TN=9**

Saxifraga hirculus L. SAXIFRAGACEAE
Marsh Saxifrage Mórán réisc
IUCN: CR (EN) UK:**VU**
Status: **PROTECTED** (1987) (1980)

This yellow-flowered saxifrage occurs in wet bogs in the north and west of Ireland. It has been recorded from a total of 8 sites on the island; from 2 sites in Mayo, from 2 in Antrim and from one each in Tipperary, Laois, Offaly and Westmeath. Since 1970 it has been seen only in a single site each in Mayo and Antrim. The decline of this species is due to the drainage and exploitation of its peatland habitat. The site at which this saxifrage occurs in County Mayo is surrounded by exploited peatland and the mineral flush in which the species grows is believed to be drying out as a result of workings in the area.

Distribution: A British Red List species. Formerly known from about 20 localities but now known only from 8 counties in northern England and Scotland as it has declined due to drainage. Occurs in north and central and eastern Europe.

RI 1/6 **ASI 1** **TN=12**

Scheuchzeria palustris L. SCHEUCHZERIACEAE
Rannoch-rush Luachair an Phollaigh
IUCN: EX (EX) UK:**LC**
Status:

This perennial herb of very wet Sphagnum bogs was confined to one site in Ireland. The plant was discovered on Pollagh Bog, County Offaly in 1951. This raised bog was subsequently utilized by Bord na Mona for peat production and the site destroyed. However before work on the bog was begun, efforts were made in 1959 to transplant the species to two other bogs in County Offaly - Raheenmore and Lough Roe. It was subsequently refound on the latter bog in 1960 but has not been subsequently recorded on Raheenmore. It has not been refound on either peatland site recently and seems likely to be extinct in Ireland.

Distribution: A British Red List species. In Britain, now thought to be confined only to 2, 10 km squares near Perth though previously known from 5 other counties. The decline is due to drainage, peat-cutting and afforestation. Occurs in north, central and eastern Europe.

RI 0/1 **EXTINCT**

Habitat 2: Marsh and Fen

Eleven species are found in this habitat which has suffered from drainage and in the case of fens also from peat cutting. Marsh and fen differ from each other in that the former is found over mineral soil whilst fen has a peat soil which is usually lime-rich. Both habitats are frequently found alongside each other. Eight species found in this group are particularly conspicuous and attractive. Three species do not occur in Britain, *Inula salicina*, *Hypericum canadense* and *Sisyrinchium bermudiana*. Three species are rated in Europe – ssp *maritima* of *Pyrola rotundifolia*, Irish Lady's Tresses, *Spiranthes romanzoffiana* and Irish St. John's Wort, *Hypericum canadense*.

Carex elongata L. CYPERACEAE
Elongated Sedge Cíb ard
IUCN: nt (nt) UK:**LC**
Status:

This tufted sedge of damp soils in wet meadows, on lake shores, ditch margins and swamp woodland was formerly recorded from one county in the Republic of Ireland and from around Lough Neagh in Northern Ireland. The distribution has recently been extended from Cavan to include Leitrim, Roscommon and Monaghan. In Northern Ireland its distribution has been extended to the upper Lough Erne region.

Distribution: Very local and rare in Britain and occurring in northern and central Europe.

RI 4/4 **ASI 2** **TN=3**

FNNR 1 **ASI 1**

Dactylorhiza traunsteineri (Sauter ex Reichb.) Soó ORCHIDACEAE
Narrow-leaved Marsh-orchid Magairlín caol
IUCN: nt (nt) UK:**Park**
Status: NI Scheduled Species

This dactylorchid has a wide distribution in the island as it has been increasingly recognised from fens and calcareous marshes, particularly in western Ireland. In the Republic of Ireland, recent research has increased the number of pre-1970, 10km squares to 26 and since 1970 it has been reported from 16 of these, principally in the west and centre. It is a rare species in Northern Ireland and it has been seen in 4 sites, 3 in Antrim and 1 in Fermanagh.

Distribution: More widespread in Britain than the published records from Wales and southern England show. It has recently been recognised from Scotland. A northern and central European orchid.

RI 16/$ **TN=7**

Epipactis palustris (L.) Crantz ORCHIDACEAE
Marsh Helleborine Cuaichín corraigh
IUCN: nt (nt) UK:**LC**
Status: NI Scheduled Species

The Marsh Helleborine occurs in marshes, fens, lake shores and wet sandy pastures. It occurs with relative frequency in suitable habitats in central Ireland. It is however a rare species in Northern Ireland where it has been recorded from Armagh, Derry, Fermanagh and Tyrone. Recently it has been seen in 4 sites there, with thousands of plants occurring in one dune slack system in Derry. Its habitats in Northern Ireland are threatened by drainage and reclamation.

Distribution: In Britain the species is locally frequent throughout England and Wales and northwards to Perth and the Inner Hebrides. In Europe throughout except in the Mediterranean and the extreme north.

RI $/$ **TN=5**

NNR 2 **UTNC 1**

Hypericum canadense L. HYPERICACEAE
Irish St John's-wort Beathnua gaelach
IUCN: VU (R(R)) UK:**--**
Status: **PROTECTED** (1987) (1980)

This annual, sometimes perennial herb with small yellow flowers occurs in wet, boggy areas on lake margins and on heaths. In Ireland it is confined to two districts; near Lough Mask in County Mayo and to the Glengarriff area of County Cork. At Lough Mask it has been reported from 5 sites. It has been seen recently at 4 of the Lough Mask sites and in its one locality in west Cork. Its populations are apparently stable.

Distribution: Not known from Britain and occurs only in Holland in western Europe. It is found widely in North America.

RI 3/3 **ASI 2** **TN=6**

Inula salicina L. ASTERACEAE
Irish Fleabane Lus gréine gaelach
IUCN: EN (V) UK:--
Status: **PROTECTED** (1987) (1980)

Confined in Ireland to the shores of Lough Derg on the river Shannon, this species does not occur in Britain (Map 17). It is an erect perennial with golden-yellow flowers which is found on the limestone shores of the lake in a zone flooded during the winter. In the past it has been recorded from a total of 6 sites but it has only been seen in two of these recently. There appears to have been a definite decline in its range along the lake shore and it may possibly be due to the changes in lake level which the area has undergone since the construction of the Shannon hydroelectric scheme in 1927. In particular, the marked fluctuations in lake level during the period 1939-45, when demands for water from the lake was at its greatest, may have been the major factor in affecting the populations. (Plate 3c).

Distribution: Though absent from Britain, the species occurs throughout most of Europe.

RI 1/4 **ASI 1** **TN=11**

Juncus compressus Jacq. JUNCACEAE
Round-fruited Rush Luachair chruinn
IUCN: VU (R) UK:**NT**
Status:

This rush, which is similar in appearance to J.gerardii, was discovered in alluvial meadows by the Boyne river in Co. Meath in 1968. It has since been found at a second site nearby and also along the banks of the river Shannon, above Lough Ree in counties Roscommon and Longford. Apparently increasing.

Distribution: In Britain it occurs northwards to Ross but is uncommon. Occurs throughout most of Europe.

RI 2/2 **ASI 1** **TN=6**

Lathyrus palustris L. LEGUMINOSAE
Marsh Pea Peasairín corraigh
IUCN: nt (nt) UK:**NT**
Status: (1980) NI Scheduled Species

This climbing, perennial pea grows on river callows, in fens and in damp grassy places. The Marsh Pea has been recorded from 22 sites in the Republic of Ireland and from over 25 sites in Northern Ireland. Its main area of distribution is in the centre and north with 2 outlying stations on the east coast at Wicklow (Map 18). It has been seen in 12 of these sites recently in the Republic of Ireland. In Northern Ireland it has not been seen recently in its sites in Tyrone, Armagh and Down but it still occurs around the Antrim shores of Lough Neagh and abundantly in the Upper Lough Erne region of Fermanagh where over 20 sites occur. It is apparently increasing, despite its habitats being threatened due to drainage and reclamation as it would seem to benefit from the drier conditions resulting from such operations. The species was formerly protected in the Republic of Ireland but on its present status it cannot be considered threatened.

Distribution: Previously listed as a British Red List species but now discarded as it is now found in more than 15, 10 km squares. Scattered locally in England and Wales. Occurs in most of Europe.

RI 8/13 **ASI 8** **TN=7**

NNR 1 **ASI 4**

Pyrola rotundifolia L. PYROLACEAE
Round-leaved Wintergreen Glasluibh chruinn
IUCN: EN (V) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This perennial herb grows in wet bogs, damp hollows in dunes, in fens, woods and on damp rock ledges. It has been recorded from 12 sites in Ireland; 8 in Westmeath and one each in Wexford, Offaly, Kildare and Meath. Most of the records for this species have been made since 1970 and it has been noted from 10 sites since that time (Map 19). It is increasing in range and is consequently not threatened at present. However its habitats are vulnerable to threat from land reclamation and drainage and so its status needs regular monitoring. The ssp maritima, which is protected in the Republic of Ireland, is known from one site in County Wexford where the population is increasing. (Plate 3d).

Distribution: In Britain the species occurs from southern England to Orkney though it has a distinct eastern tendency and is locally distributed. The species is widespread in north and central Europe, but the subspecies maritima is threatened in Europe.

RI 7/8 **NR 1** **ASI 5** **TN=6 (species), TN=8 (ssp maritima)**

NR 1

Sisyrinchium bermudiana L. IRIDACEAE
Blue-eyed-grass Feilistrín gorm
IUCN: nt (nt) UK:**--**
Status: NI Scheduled Species

This blue-flowered member of the Iris family grows to a height of 30 cms and is found in damp meadows, in ditches and by lake shores. In Ireland it has been recorded from 11 counties in the west and north-west of the island and from Antrim in the north-east. In the Kerry/west Cork regions it occurs frequently in suitable habitats but elsewhere it is found very locally and is restricted to a few sites in each county. In Northern Ireland this is especially so. There it is now known only from Lough Erne in County Fermanagh where the populations are apparently stable. It has not been seen recently in the Antrim site on the shores of Lough Neagh where it is thought to have been introduced.

Distribution: Introduced in Britain and Europe. A native of eastern North America and Ireland.

RI 18/18 **TN=5**

NT 1

Spiranthes romanzoffiana Cham. ORCHIDACEAE
Irish Lady's-tresses Cúilín gaelach
IUCN: EN (R(R)) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This orchid occurs in damp meadows, on lake shores, in seasonally flooded pastures and on valley bogs. In Ireland it is confined to the west and north (Map 20). In the west of the island

it has been recorded from 15 localities in south Kerry and west Cork and it is known from 6 sites around the shores of Lough Corrib in west Galway. Since 1970 the species has been seen in only 5 of these sites. In Northern Ireland the species is found around the shores of Lough Neagh where it has been recorded from the counties which border the lake. It is also found in Fermanagh. Since 1970 the species has been seen in 7 sites in Northern Ireland. Apparently declining, but the populations of this species are prone to wide annual fluctuations in numbers with spectacular flowering in some years followed by a dramatic decrease or absence in others. There is a possible link between abundant flowering and dry climatic conditions.

Distribution: A British Red List species. In Britain the species is found in Scotland and the Inner and Outer Hebrides. There is an old record for Devon. Not known from continental Europe but widespread in North America.

RI 5/17 **ASI 3** **TN=7**

Viola persicifolia Schreber VIOLACEAE
Fen Violet Sailchuach uisce
IUCN: VU (R) UK:**EN**
Status: NI Scheduled Species

This perennial violet with underground stolons is found in damp grassland subject to periodic inundation. It has been recorded from 7 counties. Its centre of distribution in Ireland is in the north Clare/south-east Galway region around Gort. Here it occurs in abundance in several turloughs. It has also been recorded from several counties fringing the river Shannon and from the Lough Erne region of Fermanagh. Recently, it has only been seen in the latter area and in Clare and Galway. Though its habitat is especially vulnerable to damage through drainage and reclamation, its apparent decline is most likely due to lack of investigation of the Shannon sites rather than to disturbance.

Distribution: A British Red List species. Occurs as a fen species in Britain where it has become extinct in 18 of its sites. Now found only in Cambridgeshire. Occurs throughout most of Europe except in the Mediterranean.

RI 3/9 **NR 1** **ASI 2** **TN=7**
NR 1 **ASI 1**

Habitat 3: Rivers and Lakes (including canals)

Five species are found in this habitat including two species threatened in Europe. Rivers and lakes have been much affected by drainage and pollution though no extinctions have yet been recorded.

Groenlandia densa (L.) Fourr. POTAMOGETONACEAE
Opposite-leaved Pondweed Líobhógach dlúth
IUCN: EN (V) UK:**VU**
Status: **PROTECTED** (1987) (1980)

This herbaceous, aquatic perennial occurs in ditches, streams, ponds and canals and on marginal muds in estuaries. In the Republic of Ireland it has been recorded from a total of 32 sites, mostly in the southern half of the island. Recently it has been seen in only 3 sites in the Republic, in Limerick, Laois and Dublin. In Northern Ireland it has been recorded from Antrim and Derry but it is now confined to one site, in County Antrim. This species is declining and this can probably be attributed to drainage and pollution of its habitat, particularly the effects of infilling and peat run-off into the canals.

Distribution: In Britain the species is widespread in the lowlands extending northwards to Ross but it is decreasing throughout. Occurs widely in Europe.

RI 3/$ **ASI 2** **TN=10**

Hydrilla verticillata (L.f.) Royle HYDROCHARITACEAE
Hydrilla Ilphéistein fáinneach
IUCN: EN (V) UK:**VU**
Status: **PROTECTED** (1987) (1980)

This slender, aquatic perennial is confined in Ireland to one lake in Connemara in west Galway. It was discovered here in 1935 by W.H. Pearsall in a small lake which is separated from the sea by a narrow shingle bar. The population here is apparently stable but is vulnerable to run-off from nearby development and so requires careful monitoring.

Distribution: The species is extinct at what was its only British site at Esthwaite Water, Cumbria. In Europe it is found from Prussia to Poland and Russia. A common species throughout the tropics particularly as a weed of rice fields.

RI 1/1 **ASI 1** **TN=9**

Najas flexilis (Willd.) Rostkov & W. Schmidt NAJADACEAE
Slender Naiad Síofróg uisce
IUCN: EN (R(V)) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This slender, brittle annual is found in lacustrine, deep water and is usually recorded as fragments washed ashore. It has been recorded from 30 sites in the west of Ireland and in west Galway, west Donegal, Kerry, west Mayo and Leitrim (Map 21). It has been seen recently in 19 sites and it has apparently increased in the last 10 years. Extensive underwater surveys of lakes in the west of the island have led to many further sites being found. The species is not threatened in the Republic of Ireland through it is rated as a Vulnerable species in Europe.

Distribution: A British Red List species. In Britain it occurs in northern England and Scotland including the Hebrides. Found in northern and central Europe and threatened there.

RI 16/21 **NP 1** **ASI 10** **TN=2**

Pilularia globulifera L. MARSILEACEAE
Pillwort Lus an phiollaire
IUCN: EN (R(V)) UK:**NT**
Status: **PROTECTED** (1987) (1980)

This creeping, easily overlooked pteridophyte occurs in shallow water at the margins of acid lakes and rivers. In Ireland it has been recorded from 23 sites mainly on the west coast, with 4 sites in Northern Ireland at Lough Neagh and the river Bann (Map 22). Recently it has been seen in 11 of these in Kerry, Galway, Mayo and Donegal but in none of its sites in Northern Ireland. The habitat of this species is threatened from drainage, pollution and reclamation. Despite its low Threat Number it is apparently declining but the precise reasons are unknown. A threatened European species. We recommend its inclusion in Appendix I of the Bern Convention.

Distribution: A British Red List species once known from about 70 sites. Now extinct in 40 of the 69 counties in which it occurred. Declining also in Europe where its habitat in the west of the continent is being threatened due to drainage.

RI 10/15 **NP 1** **ASI 8** **TN=6**

Ranunculus fluitans Lam. RANUNCULACEAE
River Water-crowfoot Néal uisce abhann
IUCN: VU (R) UK:**LC**
Status: NI Scheduled Species

This aquatic, white-flowered Ranunculus which lacks floating leaves, and has a glabrous receptacle, is confined to one river in Ireland. It is found in one locality in County Antrim where it was first found by S.A. Stewart in 1865. It occurs frequently for some miles along the course of the river.

Distribution: In Britain it is scattered through the south and east, rare elsewhere and it is absent from the extreme north. In Europe, local in western and central areas.

RI 0/0 **TN=8**

Habitat 4: Ponds and Streams

A small group of five species are included here whose habitat is not as highly threatened as the previous but drainage of such small areas is easily effected.

Callitriche truncata Guss. CALLITRICHACEAE
Short-leaved Water-starwort Réiltín scoite
IUCN: VU (R) UK:**LC**
Status: **PROTECTED**

This small aquatic herb is confined in Ireland to 1 site near Enniscorthy in Co. Wexford where it was first recorded in 1897. It was last seen there in 1973 at which time the population was apparently stable. This critical taxon is not easily separable from C.hermaphroditica L. and may prove to be more widespread in Ireland as it becomes increasingly recognised.

Distribution: In Great Britain this species occurs locally in England and on one of the Channel Islands. This taxon occurs in south-west Europe.

RI 1/1 **ASI 1** **TN=7**

Elatine hydropiper L. ELATINACEAE
Eight-stamened Waterwort Bosán te
IUCN: VU (R) UK:**LC**
Status: NI Scheduled Species

This slender, small (2.5-10 cms in ht), usually submerged annual occurs in shallow lakes and rivers. In Ireland this species is confined to the north-east. Here, as Praeger noted, it had been reported from Lough Briclan, Lough Shark and Lough Neagh until the development of the canal system. Subsequently, the species then spread along the Lagan canal to Belfast and down the Newry canal to Newry. This species has been seen recently in counties Antrim, Armagh, Derry and Tyrone in a total of 5 sites and is especially abundant in a lake near Lough Neagh.

Distribution: A British Red List species. In Britain, though there has been some site losses in southern England due to alteration of water levels in its habitat, it has been refound in a number of sites and has been extended in range since 1968. Population numbers apparently fluctuate widely with changes in water level.

RI 0/0 **ASI 3** **TN=8**

Hottonia palustris L. PRIMULACEAE

Water-violet Cleiteán uisce

IUCN: VU (R) UK:**LC**

Status: NI Scheduled Species

This lilac-flowered, floating perennial grows in ponds, ditches and marshes. An attractive water plant, the species was introduced in the past as an ornamental species to ponds and lakes and in the Republic of Ireland it is considered an introduction in its sites in Tipperary and Meath. However in Northern Ireland it has been reported from Down and Fermanagh where it is considered to be native. Recently it has been seen only in two sites in Down.

Distribution: Widely distributed in England and Wales but local and rather rare except in the east and rare in Scotland. Most of Europe.

RI 2/2 **TN=7**

NNR 1

Limosella aquatica L. SCROPHULARIACEAE

Mudwort Lus lathaí

IUCN: VU (R) UK:**LC**

Status: **PROTECTED**

This ephemeral annual of river, lake, reservoir and turlough margins occurs in Clare, Cork, Galway and Fermanagh. In the Burren the species distribution is centred in the Gort region, where it appears annually in relatively large colonies in some turloughs. It has been recently reported from two other sites in the Burren where it occurs on river margins and in limestone solution hollows. Outside this area, it has recently being found to occur in large swards on the exposed bed of a reservoir near Macroom in County Cork. Here the Mudwort is the dominant species in a pre- dominantly annual vegetation over several square kilometres of reservoir bed. The species has not been seen recently in Fermanagh.

Distribution: Local and decreasing in England and Wales, and uncommon in Scotland. Occurs in most of Europe.

RI 6/7 **NR 1** **ASI 3** **TN=5**

NR 1

Ranunculus tripartitus DC. RANUNCULACEAE

Three-lobed Crowfoot Néal uisce na dtrí chluas

IUCN: VU (R) UK:**EN**

Status: (1987) (1980)

This white-flowered buttercup is a semi-terrestrial herb of temporary pools, ponds and ditches in nutrient-poor conditions. In Ireland it has been recorded from five localities, all in the south-west of the island. Two sites are known from west Cork and three from south Kerry. Two of the Kerry sites are in small streams near Sneem and are still extant. The other recently discovered site, lies west of Killarney. In neither of the Cork sites has the species been seen since 1970. Despite the ephemeral habitat of this species, this plant may be more widespread than records suggest, as it is easily overlooked and flowers early in the season.

Distribution: In Britain, occurs in south and west England and Wales. Occurs in western Europe.

RI 3/5 **TN=7**

Habitat 5 Marginal Wetland Habitats

A heterogenous category covering all areas alongside rivers and lakes which are flooded, including turloughs, flooded pavement, ditches and damp places. This by far the largest group of rare and threatened species, numbering 22, of which 6 are threatened and one is Extinct.

Allium schoenoprasum L. LILIACEAE
Chives Síobhas
IUCN: VU (R) UK:**LC**
Status: **PROTECTED** (1987)

This bulbous perennial occurs on open limestone pavement on the karstic margin of Lough Mask in east Mayo, where we consider it indigenous. There it is found in solution hollows with shallow humus which are periodically flooded in the winter. There is a recent unconfirmed record from a similar habitat in the Burren area of County Clare. The Mayo population, first found by E. S. Marshall in 1895, is apparently stable.

Distribution: A British Red List species now discarded as occurring in more than 15, 10km squares. In Britain it occurs in rocky pastures, usually on limestone, from south-western to northern England and in Wales. Occurs in most of Europe.

RI 3/3 **ASI 1** **TN=6**

Calamagrostis epigejos (L.) Roth POACEAE
Wood Small-reed Giolc
IUCN: VU (R) UK:**LC**
Status: **PROTECTED** (1987)

This perennial grass of damp rocky places occurs in western Connaught and Northern Ireland. It has been recorded from a total of 12 sites; 2 in Clare, 7 in Galway - the majority of which are on the Aran Islands - 1 in Mayo and 2 in Derry. Since 1970 it has been seen only at its Aran Island sites on Inishmore and Inishmaan and at one site in the Slieve Aughty mountains in Clare. It is apparently declining but the causes are unknown.

Distribution: Widely distributed in England but local in the rest of Britain. Occurs throughout Europe.

RI 4/7 **ASI 3** **TN=8**

Calamagrostis stricta (Timm) Koeler POACEAE
Narrow Small-reed Giolc beag
IUCN: EN (V) UK:**VU**
Status: NI Scheduled Species

A slender erect perennial grass which grows in bogs and marshes. In Ireland it is confined to the shores and islands of Lough Neagh and the adjoining Lough Beg. It once occurred in all of the counties that surround Lough Neagh. It is however decreasing, due to the effects of drainage, and it has become extinct at a number of its former sites and it is now known from only 3 sites in Antrim and Derry. The Irish plant is said to be referable to var. hookeri Syme.

Distribution: In Britain this rare and decreasing species occurs locally in England and Scotland. Var. hookeri is confined to Norfolk. In north and central Europe.

RI 0/0 **ASI 2** **TN=9**

Campanula trachelium L. CAMPANULACEAE
Nettle-leaved Bellflower Scornlus
IUCN: EN (V) UK:**LC**

Status: (1987)

This blue-flowered perennial grows up to 1 metre tall and occurs in woods, hedgebanks and shady roadsides. In Ireland this species is virtually confined to the river valleys of the Nore and the Barrow in the south of the country, where it is found alongside the edges of these rivers and in swamp woodland. Once relatively frequent in this area it has been seen recently in three sites in Kilkenny, 1 in Carlow and 1 in Westmeath. Apparently declining due to amenity pressures on the riverbanks along which it occurs.

Distribution: Scattered throughout Britain. Occurs in most of Europe.

RI 4/17 **TN=10**

Cardamine amara L. BRASSICACEAE
Large Bitter-cress Seilín cuaiche
IUCN: VU (R) UK:**LC**
Status:

In Ireland this white-flowered, weak-stemmed perennial, up to 60 cms in ht, is confined to Ulster. It grows in wet meadows and on riversides. Recorded from seven counties, it has only been seen recently in Northern Ireland in all counties, except Fermanagh, in 11 sites. Its single sites, in east Donegal and Cavan have not been seen since 1970. Its apparent decline and possible extinction in the Republic of Ireland may be an artifact of the lack of recent field investigation in this region.

Distribution: In Britain this species occurs locally from Aberdeen south-wards. In most of Europe.

RI 0/2 **TN=5**

NNR 1 **NT 1** **ASI 4**

Cirsium heterophyllum (L.) Hill ASTERACEAE
Melancholy Thistle Cluasán fia
(*Cirsium helenioides*)
IUCN: VU (R) UK:**LC**
Status: NI Scheduled Species

Similar to C. dissectum but larger in all its parts (reaching up to 120 cms in ht). This thistle occurs only in wet grasslands in north-west Ireland, There it is confined to one area in County Fermanagh where the populations are apparently stable but it was not refound when the site was visited in 1985.

Distribution: In Britain from Scotland southwards to Derby and including the Hebrides. In northern Europe extending to the mountains in the south.

RI 0/0 **TN=8**

Colchicum autumnale L. LILIACEAE
Meadow Saffron Cróch an fhómhair
IUCN: CR (EN) UK:**NT**
Status: **PROTECTED** (1987)

This autumn-flowering crocus was once locally common in the Nore valley in south-east Ireland. Here it occurred in old damp meadows and on river banks. Outside the Nore valley its only other known Irish sites are in County Limerick (Map 23). Recently it has been seen only in Limerick, in an old, alternate meadow near Ballingarry. Apparently declining. Intensive agricultural practices and drainage seem likely to have led to its decline.

Distribution: In Britain occurring as far north as Cumbria. In Europe in the south, west and centre.

RI 1/10 **TN=12**

Equisetum pratense Ehrh. EQUISETACEAE
Shade Horsetail Scuab eich mhóinéir
IUCN: VU (R) UK:**LC**
Status:

This northern-montane horsetail of stream banks, mountain glens and moorland is confined in Ireland to Ulster. In the Republic of Ireland it has been recorded from a number of sites in Donegal where it has not been …..

RI 0/7 **TN=4**

NNR 1

Frangula alnus Miller RHAMNACEAE
Alder Buckthorn Draighean fearna
IUCN: VU (R) UK:**LC**
Status: NI Scheduled Species

Hierochloe odorata (L.) P. Beauv. POACEAE
Holy-grass Féar Muire
IUCN: VU (R) UK:**LC**
Status: NI Scheduled Species

Mentha pulegium L. LAMIACEAE
Pennyroyal Borógach
IUCN: EN (V) UK:**EN**
Status: **PROTECTED** (1987) (1980)

Oenanthe pimpinelloides L. APIACEAE
Corky-fruited Water-dropwort Dathabha ainíse
IUCN: VU (R) UK:**LC**
Status: (1987)

Poa palustris L. POACEAE
Swamp Meadow-grass Cuise réisc
IUCN: VU (R) UK:**--**
Status:

……County Monaghan. The species has not been seen recently at either of these sites, although a detailed search may yet reveal that it is still extant there. In Northern Ireland it is also recorded from the Ulster Canal, in County Fermanagh, in a number of sites on Lough Neagh and one near Larne, in County Antrim. Since 1970 it has been seen in all of these sites.

Distribution: In Britain, native in a few fens in East Anglia, very local. Occurs in most of Europe.

RI 0/2 **ASI 1** **TN=6**

Potentilla fruticosa L. ROSACEAE
Shrubby Cinquefoil Tor cúigmhéarach
IUCN: VU (R) UK:**NT**
Status:

This perennial shrub of rocky places subject to flooding is restricted to north Clare and the shores of Lough Corrib in Galway and Mayo. It remains locally frequent in north Clare, notably around turloughs and lake margins. It is also still known from the north-east shore and islands of Lough Corrib, where it is still extant but is no longer known from the west shore where it was found in a single site. Turlough drainage and land clearance have been responsible for some loss in the range of the species in Clare. It is asserted in the British Red Data Book that it has suffered from over collecting in England and Ireland. We have no evidence that this has been the case in its Irish sites.

Distribution: A British Red List species. In Britain, 17 populations are known from northern England. In Europe the species has a discontinuous distribution and it ranges from the Baltic to the Pyrenees and Maritime Alps.

RI 6/7 **ASI 5** **TN=6**

Rorippa islandica (Oeder ex Murray) Borbás BRASSICACEAE
Northern Yellow-cress Biolar buí na Boirne
IUCN: VU (R) UK:**LC**
Status: (1980)

This taxonomically critical species is restricted in Ireland to Galway and Clare. There it occurs in moist, often poached areas, especially where water stands only in winter -most notably in turlough bottoms. It has been recorded from 7 sites, 5 in Galway and 2 in Clare. Recently it has been seen in all of these sites but one, the Renvyle site in west Galway which has been destroyed by dumping. Recently distinguished from R. palustris by Jonsell in 1968 the distribution of this critical species may yet be extended further. Previously protected in the Irish Republic but its taxonomic status is still far from clear.

Distribution: The distribution of this species is incompletely known in Britain. Occurs throughout mainland Europe.

RI 4/5 **NR 1** **ASI 2** **TN=5**
NR 1

Rumex maritimus L. POLYGONACEAE
Golden Dock Copóg bhuí
IUCN: VU (R) UK:**LC**
Status:

This dock occurs at pool and lake margins and in wet hollows, often in areas with fluctuating water levels. The Golden Dock has been recorded from 10 sites in 8 Irish counties. Since 1970 this plant has been seen in 4 sites; at Kilcolman marsh in Cork, Lady's Island in Wexford, Lough Gur in Limerick and on the Sligo shoreline of Lough Gara. Apparently declining but its occurrences are often fleeting as it depends on low water levels to provide the right conditions and stimulus for seed germination.

Distribution: A rare and decreasing species in Great Britain, occurring from southern England to Yorkshire and in the Channel Islands. Occurs in most of Europe.

RI 4/10 **ASI 4** **TN=7**

Scrophularia umbrosa Dumort. SCROPHULARIACEAE

Green Figwort Donnlus glas

IUCN: EN (V) UK:**LC**

Status:

This erect perennial of river banks and lake shores has been recorded from 5 Irish counties. Within the island of Ireland it has been recorded from one site in Limerick, in 6 sites along a stretch of the river Liffey on the Kildare-Dublin border, 1 site in Derry and 1 in Fermanagh. Recently it has only been noted from Derry. Apparently declining but probably under-recorded as it is difficult to separate from S. auriculata L.

Distribution: Rare in Britain, occurring in damp shady places in England and southern Scotland. Occurring in most of Europe but rare in the west.

RI 0/5 **TN=9**

Serratula tinctoria L. ASTERACEAE

Saw-wort Sábhlus

IUCN: EX (EX) UK:**LC**

Status:

This glabrous perennial was recorded in Ireland only from the banks of the river Barrow above New Ross in County Wexford. It was first found here in 1925 by R. A. Phillips who reported "a goodly colony of over forty strong plants". However the species has not been seen since the 1950s despite assiduous searching. The possibility exists that the plant is now extinct, perhaps destroyed by the building of a manna along the stretch of river where it occurred.

Distribution: In Britain, local throughout England and Wales and in south- west Scotland. Occurs in most of Europe.

RI 0/1 **EXTINCT**

Sibthorpia europaea L. SCROPHULARIACEAE

Cornish Moneywort Pinguin Dhuibhneach

IUCN: VU (R) UK:**LC**

Status:

This delicate, slightly hairy, creeping perennial is virtually confined in Ireland to the Dingle peninsula in County Kerry. In this area of south-west Ireland it occurs in damp grassy places and along streamsides. Recently it has been seen only in the Conor Pass area, and near Castlegregory but it is probable that it occurs more extensively than recent reports have indicated. However it is under threat from competition in its habitat from the aggressive spread of the alien Epilobium nerterioides A.Cunn. Apparently declining.

Distribution: A very local species in Britain, occurring in southern England and in the Outer Hebrides. Occurs in western Europe.

RI 3/9 **ASI 1** **TN=5**

Teesdalia nudicaulis (L.) R. Br. in W.T. Aiton BRASSICACEAE

Shepherd's Cress Lus an bhuachalla

IUCN: VU (R) UK:**NT**

Status: NI Scheduled Species

This delicate, glabrous annual of sandy lake shores has been recorded from south-western and Northern Ireland. In the past it has been recorded from the shores of Lough Neagh in County Tyrone, near Coleraine in Derry, Glenmore in Antrim and in a number of sites in Down. In the south-west of the island it has been noted from the sandy shores of the Lower Lake in

Killarney, County Kerry. A specimen also exists in DBN, collected during the fieldwork (1958) for the Atlas of the British Flora. It was collected in the Longford area but no exact details of the site exists. Recently this small crucifer has been seen in 2 sites in Derry, 1 in Down and there are now no known extant sites for the species in the Republic. Apparently declining but the reasons are unknown.

Distribution: Scattered throughout Britain and locally common, though becoming rarer as you move northwards. Occurs in north-west and central Europe.

RI 0/2 **TN=7**

NNR 1

Trichomanes speciosum Willd. HYMENOPHYLLACEAE
Killarney Fern Raithneach Chill Airne
IUCN: EN (R(V)) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This small fern occurs near waterfalls, on damp rocks, in crevices and beneath overhanging rocks - in general, in dark, sheltered situations with a humid atmosphere. It ascends in altitude as far as 500 metres. The species has been recorded from 43 sites scattered throughout the island of Ireland, with the highest concentration in Kerry and Cork. Recently it has been seen in 10 of these; 3 in Kerry, 3 in Cork, 1 in Limerick/Tipperary, 1 in Carlow, 1 in Sligo and 1 in Antrim (Map 24). In the past this species was frequent in the south-west of Ireland but the populations were reduced dramatically through the activities of plant collectors who sold large quantities to gardeners and tourists during the late 19th century.

Distribution: A British Red List species. In Britain, it is now recorded from only a few localities in England, Wales and Scotland. Occurs in the extreme west of Europe and considered an Atlantic species. A vulnerable European species.

RI 8/$ **NP 1** **ASI 2** **TN=8**

Trollius europaeus L. RANUNCULACEAE
Globeflower Leolach
IUCN: EN (V) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This yellow-flowered herb occurs on lake shores and river banks, in wet pastures, scrub and woodland. In Ireland it has been recorded from Leitrim, Donegal and Fermanagh. Recently it has been seen in only 4 of its former 8 sites, 2 extant sites being in Donegal and 2 in Fermanagh. Apparently declining. The species is under threat from drainage and land reclamation but some of its Donegal sites have been destroyed by flash floods. (Plate 4b).

Distribution: In Britain it occurs in mountain districts northwards from south Wales. Occurs in most of Europe but only on mountains in the south.

RI 2/5 **ASI 1** **TN=9**

WOODLAND HABITAT GROUP

Woodland habitats can be divided into several categories ranging from dry woods to swamp woodland. Here, three divisions are recognised namely woods mostly on acid soils of which Oak is the principal tree in deciduous woods, woods on limestone of which Ash-Elm-Hazel are the principal native components and the third category is scrub comprising open, fragmented woods and hedgerow. There are 16 species in this category of which 9 are Vulnerable. But there have been no extinctions. The woodland flora in general is at present the least threatened group but extensive scrub clearance is a feature of large parts of the west

of the island and it is expected that several species will move into the threatened category, as a result, in the near future. Most of our woods are of recent origin as they were extensively cleared in the past, and especially during the last century. As a consequence the flora of Irish woodlands is depauperate, compared with that on the European mainland, and it lacks many specialised wood- land species. Many of the rarer European species are lacking which would account for the absence of species threatened on a European scale from this category.

Habitat 1: Woods on Acid Soils

This group is widely distributed in the east, north and south-west of the country where extensive stretches of secondary woodland are found. Woods over these soil types are dominated by Oak though in upland areas there may be several co-dominants such as Birch and Holly. In general this habitat is not under threat though grazing in some areas is affecting the ground flora. There are 5 species in this group, 3 of which are threatened.

Cephalanthera longifolia (L.) Fritsch — ORCHIDACEAE
Narrow-leaved Helleborine — Cuaichín caol
IUCN: EN (V) UK:**VU**
Status: **PROTECTED**

In the past this white-flowered orchid of damp woods and scrub was recorded from 15 Irish counties. Since 1970 it has been seen in seven sites; 3 in Westmeath, and one each in Clare, Galway, Roscommon and Mayo. Apparently declining due to woodland disturbance and overgrazing. However, under-recording is clearly a factor and many sites merely await re-investigation. In addition like most orchids, this species may occur abundantly in some years and rarely or even not at all in others.

Distribution: Local and rare in Britain. Occurs throughout most of Europe.

RI 5/$ **NR 1** **ASI 2** **TN=9**
NR 1

Gymnocarpium dryopteris (L.) Newman — ATHYRIACEAE
Oak Fern — Raithneach dharach
IUCN: EN (V) UK:**LC**
Status:

In Ireland this fern has only been reliably recorded from Clare, Wicklow, Sligo, Leitrim and Antrim (Map 25). The map for the species in Jenny et alia (1978) is inaccurate. It has not been seen in the Republic of Ireland since the last century. It occurs in shaded, rocky areas in mountains. Recently it is only known from Antrim in Northern Ireland where only one clump survives. The decline and apparent extinction of this species in the Republic of Ireland may be an artifact of its remoteness and the inaccessibility of its habitat. It therefore may possibly be refound in some of its former sites but it has probably become extinct in its Wicklow site due to over-collection. It is however clearly more threatened than its Threat Number suggests.

Distribution: Occurs in northern montane Britain. Occurs throughout Europe, but rare in the south.

RI 0/5 **TN=9**

Melampyrum sylvaticum L. — SCROPHULARIACEAE
Small Cow-wheat — Lus sagairt beag
IUCN: EN (V) UK:**EN**

Status:

This deep golden to yellow-flowered annual grows up to 35 cms in height and occurs in upland woodlands. In Ireland it is confined to the north-east where it has been recorded from a number of sites in Antrim and Derry. There is also an unconfirmed record by Corry in 1882 from Lough Eske in Donegal, which may have been an error. Recently, it has only been seen at a single site in Antrim.

Distribution: Occurs very locally in Britain, in Teesdale and the Scottish highlands. Discarded from the British Red List as commoner than had previously been thought. In Europe mostly in the north.

RI 0/1? **TN=10**

Monotropa hypopitys L. PYROLACEAE
Yellow Bird's-nest Buían sailí
IUCN: VU (R) UK:**EN**
Status:

This yellow Bird's Nest is a low growing, perennial saprophyte, lacking chlorophyll, with yellow stems and scale-like leaves and tubular flowers. It grows in woods, notably of beech or pine. It occurs locally in the western half of the island. Recorded from 13 Irish counties, it has been reported from only 3 sites in the Republic since 1970; 2 in Galway and 1 in Wexford. However it is clearly under-recorded due to its inconspicuousness. In Northern Ireland, it is confined to 4 localities and since 1970 it has been seen in 3 of these, all in County Fermanagh. In its Wexford site it occurs in a Pine plantation and was probably introduced with the trees. It is abundant there.

Distribution: Local in England, rare in Wales, very rare in Scotland. Most of Europe except in the extreme south.

RI 3/13 **NR 2** **ASI 1** **TN=5**
NR 2

Prunus padus L. ROSACEAE
Bird Cherry Donnroisc
IUCN: nt (nt) UK:**LC**
Status:

This shrub or small tree of woods and damp rocky places has been recorded from a total of 28 counties though it may be introduced in some of them. It is known to range from Kerry and Cork northwards to Donegal and from Galway to Wicklow. In the Republic this species has been seen recently in the following number of sites; 1 in Cork; 1 in Meath; 2 in Roscommon and 1 each in Sligo and Donegal. Apparently declining in the Republic of Ireland but probably more widespread than recent records suggest, though there may have been some contraction in range due to woodland clearance and grazing. In Northern Ireland it is widespread in Armagh, Antrim, Derry and Fermanagh and on its present status there it would seem that most of its records in the Republic merely await confirmation.

Distribution: Scattered throughout Britain but locally frequent in some areas. Occurs in most of Europe except in the south.

RI 6/$ **ASI 3** **TN=6**
FNNR 1 **NT 1**

Habitat 2: Woodlands on Limestone Soils

These woods consist mostly of Ash-Elm-Hazel but on eskers in the mid- lands, Oak may be an important component. In the pavement areas of western Ireland, much of the woodland cover of this type is being cleared for agriculture. Esker woodland has also been cleared for the same purpose as well as for gravel extraction. There are five species in this group of which 1 is threatened. Well-developed woodland over limestone is uncommon in Ireland.

Carex depauperata Curtis ex With. CYPERACEAE
Starved Wood-sedge Cíb choille bhocht
IUCN: VU (R) UK:**EN**
Status: **PROTECTED** (1987)

This calcicole sedge of dry woods and hedgebanks has recently been discovered in Ireland. It was first noted in a small limestone wood in Cork in 1973. Twenty clumps of the sedge were observed by the finder during the period 1976-1980. The population had declined to five clumps by August 1983. The reasons for the decline are unknown and the population needs close monitoring.

Distribution: In Britain this species is restricted to one site in Somerset where the population is made up of only eight plants. A British Red List species. Occurs in western and southern Hurope.

RI 1/1 **ASI 1** **TN=8**

Hordelymus europaeus (L.) Jessen in Harz POACEAE
Wood Barley Eorna choille
IUCN: DD (IN) UK:**LC**
Status:

This stout, perennial grass with broad leaves up to 1 cm wide, grows to a height of over 1 metre and is found in woods and shaded hedgebanks. In Ireland, this species was confined to one area in County Antrim. There it occurred on shaded river banks in the Glens of Antrim. However it has not been seen since 1949 and the area in which it formerly occurred needs investigation to establish its true status there.

Distribution: In Britain it is abundant in England. In northern and central Europe.

RI 0/0 **INDETERMINATE**

Hypericum hirsutum L. HYPERICACEAE
Hairy St John's-wort Lus an fhógra
IUCN: EN (V) UK:**LC**
Status: **PROTECTED** (1987)

This downy-leaved perennial of river banks and shady places has been recorded from 5 counties in eastern Ireland, concentrated in the river Liffey valley. There is one record from near Cave Hill in County Antrim. Recently it has only been seen in two sites; 1 in Kildare and 1 in Dublin, where it is locally abundant along a short stretch of the River Liffey, west of Dublin. Apparently declining but as the species has not been searched for in many of its sites, this may not be the case.

Distribution: Scattered throughout Great Britain. Occurs in most of Europe.

RI 2/5 **TN=11**

Lamiastrum galeobdolon (L.) Ehrend. & Polatschek LAMIACEAE
Yellow Archangel Neantóg Mhuire

IUCN: VU (R) UK:**LC**
Status:

This slightly hairy perennial herb with whorls of yellow flowers is found in hedges and woods in the south-east of Ireland, with an outlying site in Westmeath. It has been recorded from a total of 5 counties. There are recent records from Dublin at 2 sites, from Carlow at 3 sites and from Wicklow where it has been seen at 2 sites. There are no recent records for Westmeath and Wexford. In some sites it is locally abundant where it spreads aggressively by means of runners. Some of its Dublin sites in hedgebanks have been destroyed through building development and road widening.

Distribution: Common in England and Wales but rare in Scotland. Occurs in most of Europe.

RI 5/14 **ASI 3** **TN=7**

Neottia nidus-avis (L.) Rich. ORCHIDACEAE
Bird's-nest Orchid Magairlín neide éin
IUCN: nt (nt) UK:**NT**
Status:

This saprophytic orchid, without chlorophyll, has been recorded from 30 Irish counties. The Bird's Nest orchid occurs in shady woods notably on humus-rich, calcareous soils. It is widely but sparingly distributed throughout the island of Ireland. In Northern Ireland it is found in Antrim, Down, Fermanagh and Derry where it is locally common. This species is of fleeting occurrence but there is no evidence to suggest that it may be declining.

Distribution: Throughout Britain, northwards to Moray. Occurs throughout Europe.

RI $/$ **ASI 1** **TN=5**

NNR 3 / FNNR 2

Habitat 3: Scrub

A heterogenous category to contain patches and strips of woodland, hedgerows and mixtures of scrub, grassland and heath. This division contains 6 species of which 5 are Vulnerable. Hedgerow is being cleared in many parts of the island to create larger fields for agriculture. Scrub on drift and even over pavement is being cleared to make fields for pasture.

Adoxa moschatellina L. ADOXACEAE
Moschatel Moscadal
IUCN: EN (V) UK:**LC**
Status:

This delicate, glabrous, rhizomatous perennial has small, light green flowers and grows up to 10 cms in height. It occurs in woods and among mountain rocks on fairly rich substrata. In Ireland it is confined to one site near Belfast where it was once more widespread. It has been seen there since 1970.

Distribution: In Britain widespread but local and occurs from Sutherland southwards. Throughout Europe but on mountains only in the south.

RI 0/0 **TN=9**

Geranium sylvaticum L. GERANIACEAE
Wood Crane's-bill Crobh coille
IUCN: EN (V) UK:**LC**

Status:

A downy perennial with stout rhizome that occurs in scrub, meadows, damp woods and on mountain rock-ledges. In Ireland this species is confined as a native to the glens in County Antrim. Here it once occurred relatively frequently, but has lately become less common for reasons unknown. It has been seen recently in three localities, in one of which there are only 3-4 plants under an oak canopy. The other sites occur in hazel scrub and meadows respectively.

Distribution: Occurs locally in northern Britain. Throughout Europe but on mountains in the south.

RI 0/0 **TN=9**

UTNC 1

Gymnocarpium robertianum (Hoffm.) Newman ATHYRIACEAE
Limestone Fern Raithneach aolchloiche
IUCN: EN (V) UK:**LC**
Status: **PROTECTED** (1987) (1980)

This fern of limestone rocks and screes is restricted to one site in Ireland to a limestone knoll in eastern Mayo. The habitat of this species has been threatened in the past due to land reclamation. The species is reported to have been seen since 1970. However the site has been visited twice during fieldwork for the present report with no success in locating the Limestone Fern. The present status of this species at its Mayo site is therefore in need of further investigation.

Distribution: In Britain this species occurs locally in suitable habitats from southern England to northern England. Very rare in Scotland. In Europe, wide ranging though absent from large areas. .

RI 1/1 **ASI 1** **TN=9**

Orobanche hederae Duby OROBANCHACEAE
Ivy Broomrape Múchóg mhór
IUCN: nt (nt) UK:**LC**
Status:

This broomrape grows parasitically on Ivy and has a slender purple stem, swollen at the base. Its flowers are dull purple in colour, having yellow stigma lobes, and are arranged in a long, but lax, spike. It occurs occasionally in the southern half of the island, becoming scarcer, northwards. It is a rare species in Northern Ireland where it is only known from two sites in County Fermanagh, where it has not been seen recently.

Distribution: A local plant of southern England and Wales. In Europe it is found in the west and south.

RI $/$ **TN=5**

Stachys officinalis (L.) Trev. St. Léon LAMIACEAE
Betony Lus beatha
IUCN: EN (V) UK:**LC**
Status: **PROTECTED** (1987)

This erect, sparingly-hairy perennial with whorls of reddish-purple flowers, is found in open woods, hedges and grasslands. It has been recorded from 14 Irish counties. It has been noted from Kerry to Meath and further into the midlands in Westmeath and Longford. In the north of the country, it has in the past, been noted us a local species occurring from Donegal to

Antrim. It has been seen recently at two sites near Killarney and one near Woodford in Galway. In Northern Ireland though recorded from 4 counties it has not been seen in any of its sites recently. It may not be declining as dramatically as the figures suggest, but there has been some contraction in range due to the effects of modern agricultural practices on some of its pasture sites. (Plate 4c).

Distribution: In Britain a common species in England and Wales, local in Scotland. Occurs in most of Europe.

RI 2/27 **ASI 2** **TN=9**

Vicia orobus DC. LEGUMINOSAE
Wood Bitter-vetch Peasair shearbh
IUCN: EN (V) UK:**NT**
Status: **PROTECTED** (1987)

This bushy perennial of thickets and rocky places has been recorded from 10 sites in 5 Irish counties (Map 26). Recently it has been seen only in the Derry hills in Laois, on a limestone knoll near Headford (Mayo) and near Lame in County Antrim. The habitat of this species is under serious threat from land reclamation and the species is apparently declining in Ireland.

Distribution: Scattered throughout Britain but very local. Occurs in western Europe.

RI 2/8 **ASI 2** **TN=11**

ARTIFICIAL HABITAT GROUP

This arbitrary category can be divided into many sections to accommodate man-made or man associated habitats. These range from walls and road- sides to farmland and waste places. Two are appropriate here, namely walls and arable farmland. This category contains 12 species of which 1 is Endangered, 5 are Vulnerable and 5 are Extinct.

Habitat 1: Walls

Three species are found in this group occurring on walls and associated roadside habitats.

Asplenium obovatum subsp. lanceolatum (Fiori) Pinto da Silva ASPLENIACEAE
Lanceolate Spleenwort Fionncha lansach
(*Asplenium billotii*)
IUCN: EN (V) UK:**NT**
Status: **PROTECTED** (1987) (1980)

This densely-tufted fern grows inland on walls and banks, and on rocks near the sea. It has been recorded from 12 sites in Ireland on the south and east coasts from Kerry to Wicklow and inland to Carlow (Map 27). Recently it has only been seen in 3 sites; 2 in Wicklow and 1 in Carlow. Apparently declining, possibly due to habitat destruction of the old walls and hedgebanks in which it is frequently found.

Distribution: This sub-atlantic species occurs locally in coastal south and west Britain. Confined to western Europe.

RI 3/12 **ASI 1** **TN=10**

Geranium purpureum Villars in L. GERANIACEAE
Little-Robin Eireaball rí

IUCN: EN (V) UK:**LC**
Status: (1980)

This erect annual or biennial herb is closely related to Herb Robert, Geranium robertianum and occurs in open sunny areas, on old walls and roadsides, usually near the sea. A total of eleven sites have been recorded in Ireland, all from Munster. Ten of these sites are in Cork City and one in Waterford. The Cork sites have all been seen since 1970, but four of these have since been destroyed by building development and road widening. The plant has not been seen recently at Dungarvan, Waterford, This species is declining due to habitat destruction and was previously protected in the Irish Republic. However its taxonomic status is uncertain enough to war- rant its exclusion at present, and it may at best be a sub-species of G.robertianum. It is difficult to separate from that species.

Distribution: A British Red List species. In Great Britain this taxon is decreasing as it is now only known from three English counties and the Channel Islands. However large populations occur in Cornwall. It occurs in south-west Europe.

RI 2/3 **TN=9**

Geranium rotundifolium L. GERANIACEAE
Round-leaved Crane's-bill Crobh cruinn
IUCN: EN (V) UK:**LC**
Status:

This much branched annual herb is found by roadsides, on walls and in hedges. It has been recorded from 7 counties, with the distribution centering on Cork. However the species is taxonomically critical and its distribution is still uncertain in Ireland. Recently there have been definite records from 2 sites in Wexford and one in Dublin. In the last it has been noted as being particularly abundant on wasteland near the city. It is clearly an opportunistic casual in most of its sites in Ireland as it has persisted in few of those that it had originally been recorded from.

Distribution: In Britain a local species in England becoming casual as one moves northwards. Occurs in most of Europe.

RI 3/13 **TN=10**

Habitat 2: Arable Farmland:

Nine species are found in this category of which 5 are Extinct and the remainder are highly threatened. All of the species are weeds which have declined dramatically throughout Europe due to better seed cleaning methods and to the use of herbicides. Two of the species Kickxia elatine and Misopates orontium are associated with root crops whilst the remainder are cereal-associated species.

Agrostemma githago L. CARYOPHYLLACEAE
Corncockle Cogal
IUCN: EX (EX) UK:**Wait**
Status:

This annual, arable weed was once widespread in cornfields throughout Ireland. A reddish-purple flowered herb it grows to a height of 1 metre and has been recorded from most counties except those of the west and centre. However it has not been seen recently in Ireland and seems likely to be extinct. The decline of the Corn Cockle is attributed to improved seed cleaning methods and modern methods of weed control and a decline of the area under tillage. (Plate 4d).

Distribution: A British Red List species. Once widespread in Britain, where a dramatic decline for the species has also been noted and it is now known only certainly as an arable weed from Moray in Scotland. Occurs throughout Europe, probably native in the Mediterranean, and naturalised as a weed in most temperate regions.

RI 0/$ **EXTINCT**

Anthemis arvensis L. ASTERACEAE
Corn Chamomile Fíogadán goirt
IUCN: EX (EX) UK:**EN**
Status:

This annual, aromatic herb has been recorded from a total of 8 counties, in scattered localities in Cork, the east and mid-west of Ireland. A calcicolous weed, with white spreading ray florets and yellow disk florets, it grew in arable land and waste places. It has not been seen in any of the 8 counties since 1930 and seems likely to be extinct. The decline of this species is attributed to modern methods of weed control and increased efficiency in agricultural methods and a decrease in the area now under tillage.

Distribution: A locally common plant throughout Britain. Occurs in most of Europe.

RI 0/10 **EXTINCT**

Carduus nutans L. ASTERACEAE
Musk Thistle Feochadán crom
IUCN: IN (IN) UK:**LC**
Status:

This biennial thistle was formerly recorded in 11 counties from pastures, waysides, arable fields and waste places. Since 1970 it has been seen in 2 sites in Dublin and one each in Meath and Down. Both Dublin sites were destroyed in 1980 by development and the species has not been reported from Meath since 1971. In the site in Down the species was accidentally introduced with seed in 1985. It was revisited in 1986 but the species was not refound. Throughout the island its decline is possibly attributed to the decrease in suitable arable areas and the effects of seed cleaning as well as development of its wasteland habitat.

Distribution: Locally common throughout Britain, through becoming sparse in the north. Decreasing. Occurs in west and central Europe.

RI 3/22 **INDETERMINATE**

Centaurea cyanus L. ASTERACEAE
Cornflower Gormán
IUCN: EN (V) UK:**LC**
Status:

This slender blue-flowered annual weed of corn and flax fields, grows up to a height of 60 cms and with flower heads reaching 4 cms in width. An arable weed, it was formerly recorded from 23 counties. The cornflower has not been seen recently in any of its sites and may be extinct. Its decline is attributed to more effective methods of seed cleaning, weed control and a decline in tillage, (Note added in Press: Two of the arable weed species considered extinct, Cornflower Centaurea cyanus and Darnel, Lolium temulentum were found recently on the Aran Islands, County Galway. Only two plants of the former were recorded but the latter proved to be a very widespread weed of cultivation. Their accounts consequently need amending in the light of this information.).

Distribution: This species was formerly common in Britain, now on the decline. Occurs throughout Europe.

RI 0/$ **EXTINCT**

Kickxia elatine (L.) Dumort. SCROPHULARIACEAE
Sharp-leaved Fluellen Buaflíon Breatnach
IUCN: EN (V) UK:**LC**
Status: (1987)

This hairy annual has been recorded from arable fields of root crops and from roadsides near the coast in south and west Ireland. It was noted from 6 counties on the coast from Cork to Wexford and from Limerick to southern Galway. It has been seen recently in 3 sites in Cork, 1 site in Clare and 3 sites in Wexford. The decline of this species can be attributed to increased agricultural efficiency in weed control.

Distribution: Local in Britain, extending north to Yorkshire. Occurs in south, west and central Europe.

RI 7/$ **TN=9**

Lolium temulentum L. POACEAE
Darnel Roille
IUCN: EN (V) UK:**CR**
Status:

This stout, erect, annual grass of cultivated fields and waste ground has in the past been recorded in all but one of the 32 Irish counties and was once so common as to be recorded in the older floras without comment. There are no known recent records of this species in Ireland. This decline is too dramatic to be attributed solely to its casual nature. It seems more likely that it has suffered from increasingly advanced agricultural practices such as seed cleaning and herbicide application. Apparently extinct (Note added in Press: Two of the arable weed species considered extinct, Cornflower Centaurea cyanus and Darnel, Lolium temulentum were found recently on the Aran Islands, County Galway. Only two plants of the former were recorded but the latter proved to be a very widespread weed of cultivation. Their accounts consequently need amending in the light of this information.).

Distribution: Scattered throughout Britain as a casual, but decreasing. Occurs in north and central Europe but native only in the Mediterranean region.

RI 0/$ **EXTINCT**

Misopates orontium (L.) Raf. SCROPHULARIACEAE
Weasel's-snout Srubh lao beag
IUCN: EN (V) UK:**VU**
Status: **PROTECTED** (1987)

In the past this erect, pink to purple-flowered annual has been recorded from cultivated land in Cork, Carlow, Dublin and Wexford with 14 of a total of 20 sites being in the Cork region. Since 1970, it has been noted from only two sites; one in Cork and the other from a sugar beet field in Wexford. Modern methods of weed control seem likely to be contributing to the decline of this species as well as the changes in recent agricultural practices.

Distribution: Occurs locally in Britain in southern England. Found in south, west and central Europe.

RI 2/16 **TN=11**

Papaver hybridum L. PAPAVERACEAE
Rough Poppy Bláth na mbodach
IUCN: CR (EN) UK:**LC**
Status: **PROTECTED** (1987)

This poppy of sandy and gravelly places has been recorded in the past from a total of 11 Irish counties. It was thought to be extinct in Ireland until it was found in a neglected barley field in north county Dublin in 1985 (Map 28). The decline of this poppy is attributed to improved methods of seed cleaning and weed control and a decline in tillage.

Distribution: In Great Britain a rare weed of arable fields and waste places, occurring in southern England and decreasing. The Channel Islands. Occurs throughout Europe.

RI 1/$ **TN=12**

Scandix pecten-veneris L. APIACEAE
Shepherd's-needle Gob an ghoirt
IUCN: EX (EX) UK:**CR**
Status:

This slightly hairy annual of tilled fields has been recorded in the past from all of the Irish counties. In none of these counties is it known to be extant. The decline of this species is attributed to increased agricultural efficiency including modern methods of seed cleaning and the use of herbicides and a decline in the area under tillage. Apparently extinct.

Distribution: Generally distributed throughout Britain, declining. Occurs in south, west and central Europe.

RI 0/$ **EXTINCT**

FINAL SYNTHESIS

This section of the Red Data Book summarises the threats to species survival and their habitats and suggests causes of decline for certain categories of species. The section has been arranged on the basis of the IUCN category of the taxa and deals only with extinct and threatened, i.e. Endangered and Vulnerable, taxa. It omits Rare and Indeterminate species as by definition, though the former are very restricted in distribution, they are not necessarily threatened, whilst the status of the latter are still uncertain. What follows is a condensed form of that which has already been outlined in the Species Accounts section with the addition of some analysis of the numbers of threatened species and the causal factors. We believe that in a work of this kind, a final synthesis is useful in highlighting the major factors causing a decline in our flora.

Extinct Species

Ten species of the 159 (6 per cent) recorded in this Red Data Book are thought to be extinct. This represents 0.7 per cent of the total flora of vascular plants recorded from the island of Ireland. Five of the extinct species come from Artificial habitats, three from Coastal, and two from Wetland. The majority of these extinctions have been caused by the activities of man. Of the 12 species that make up the Artificial habitat group, the 5 species which are now extinct are all plants of arable land which have declined dramatically and eventually died out as a result of more efficient agricultural methods. These include better screening methods, increased use of herbicides and most importantly the decline in area under tillage in favour of pasture and silage making. A similar decline of arable weeds has been noted in Britain with just 10 per cent of the weed flora having been recorded as extinct by Perring and Farrell (1983). Of the remaining 7 extant species in the Artificial habitat group, 1 is nearing extinction and 1, *Carduus nutans*, though given Indeterminate status may already be extinct.

With respect to Coastal habitats, 3 species are now extinct or 11 per cent of that group. *Carex divisa* has declined and become extinct due to habitat destruction principally through the reclamation of estuaries and salt-marshes in which it occurred. However, suitable habitats do still exist for the species and there is some chance that it will be found in a previously unknown locality. The decline and subsequent extinction of the other two Coastal species, *Matthiola sinuata* and *Euphorbia peplis*, is most likely due to natural causes – probably climatic. Both were clearly on the edges of their ranges in Ireland.

The two recorded extinctions in the Wetland group are *Scheuchzeria palustris* and *Serratula tinctoria*. The former occurred at one bog site, from which it was transplanted to two other sites, but it has not been seen recently. The latter occurred at what is now a site of a small marina. However overall the number of extinctions recorded in the Wetland group is small which is surprising considering the widespread reclamation of aquatic habitats which has been in progress since the 1970s. Clearly the pressures have not been as acute in Ireland as elsewhere in order to cause species extinctions.

Endangered Species

Six species are in danger of extinction and their survival is unlikely if the causal factors continue to operate; that is 4 per cent of the species included in the Irish Red Data Book. If these figures are combined with the number of extinctions, then just over 1 per cent of the total vascular flora is extinct or in danger of extinction. Three Endangered species are from the Wetland group, that is 5 per cent of that group. Two species are from bogs, *Saxifraga hirculus* and *Orthilia secunda*, which have declined as a result of the destruction of their peatland habitat. *Orthilia secunda* is already extinct in the Irish Republic for that reason. The remaining wetland species is *Colchicum autumnale*, whose decline seems attributable to loss of habitat due to the intensive farming use of the seasonally wet, old meadows in which the species occurred.

Otanthus maritimus is the single Endangered coastal species and its decline may be due to climatic reasons. The centre of distribution of this species is in the Mediterranean and it reaches its northern limit in Ireland. There is however, human pressure on its habitat which increases the species naturally vulnerable position in its few coastal sites. *Papaver hybridum*, the Endangered arable weed species, was thought to be extinct until it was re-found in north county Dublin in 1985. The reasons for its decline are the same as those already given for the other arable species. The remaining Endangered species, Saxifraga granulata, is declining for a number of reasons, highest among these being the pressures caused by modem agriculture and amenity on its habitats.

Vulnerable Species

Forty-four species are believed likely to move into the Endangered category in the near future if the causal factors continue operating. This category comprises 27 per cent of the taxa in the Red Data Book and over 3 per cent of our total vascular plant flora. They can be divided by habitat group as follows: – 13 Grassland species, 11 Wetland, 9 Woodland, 6 Coastal and 5 Artificial.

The 13 grassland species make up 26 per cent of that group with 5 species from heaths, 4 from pastures, 3 from esker and 1 from meadows. All of the heath species have declined – some dramatically – the cause for their decline is not certain but pressures from agriculture and in particular the end of the practice of leaving land fallow in upland areas. The majority of pasture species are victims of habitat loss due to reclamation and fertilising. Most notable in this category are the two orchids, *Pseudorchis albida* and *Orchis morio*. Both have undergone dramatic declines from occurring in over 60, 10 kilometre squares to under 10 squares. The exact percentage decline is made more difficult to estimate due to the known tendency of orchids to appear abundantly in some years and rarely in others. The exact cause of such a dramatic decline is an example of a problem which the Red Data Book seeks to highlight and encourage research on.

Three of the four grassland species in the esker group, fall into the Vulnerable category. This habitat is under increasing threat from excavation for gravel and from reclamation of esker pasture to permanent, fertilised pasture. The single meadow species, *Hordeum secalinum*, which occurs in coastal meadows, has decreased due to reclamation and disturbance of its habitat.

The 11 wetland species comprise 20 per cent of that group and can be divided by habitat as follows:– 5 marginal wetland, 3 bog, 2 in rivers and lakes and 1 marsh/fen.

In marginal wetland areas, drainage and reclamation are the major cause of decline. *Scrophularia umbrosa*, which has not been seen since 1970 in the Republic of Ireland, is probably under-recorded. *Oenanthe pimpinelloides* was thought to be extinct until it was found in a new site in County Clare. It too may be under-recorded. The threats to bogs have already been emphasised in the text. The 3 Vulnerable bog species are effectively single site species and therefore especially susceptible to threats. *Erica ciliaris* is the species most likely to be threatened by collectors than any other in this Red Data Book. Despite it being an obvious threat, collection of flora has not been responsible for any decline or extinction as far as we can determine. The two river/lake species, *Hydrilla verticillata* and *Groenlandia densa* are both under threat as the habitat of the first is being threatened due to development and possible pollution whilst the latter has suffered from the drying out, reclamation and pollution of its canal habitat. *Inula salicina* seems set to move into the Endangered category if the decline in its populations continues. This may be linked to the long-term effects of the Shannon hydro-electric scheme combined with a build up of silt in the lake. Peat run-off from the peat workings along the Shannon river, north of Lough Derg is depositing large quantities of powder peat into the river course. However, the exact causes for the species decline need to be investigated urgently.

The 9 woodland species make up 56 per cent of that small group and can be divided by habitat as follows:– 3 acid woodland species, 1 species from limestone woods and 5 from scrub. Acid woodland is in general a less threatened habitat than scrub and many Nature Reserves have now been designated in the Republic to conserve formations of this type. The Oak Fern, *Gymnocarpium dryopteris* is however clearly more threatened than its Threat Number of 9 suggests and with only one clump known to be extant, it clearly should be considered an Endangered species. The rare species of limestone woodland, *Hypericum hirsutum*, is Vulnerable but not directly threatened at present. With regard to scrub, species of open woodland and true scrub are included here. Such areas are prone to reclamation and in particular the Burren region of Clare is undergoing large scale clearance of ash/hazel scrub. The most notable decline in this group is shown by *Stachys officinalis* which has dropped from a total of 32 squares to only 2. The status of this species needs urgent investigation.

Six species or 23 per cent of the Coastal group are rated as Vulnerable. Three occur in sand-dunes, 2 in estuaries and 1 in salt-marshes. Sand-dunes are prone to agricultural pressures on the west coast where commonage is being divided resulting in more intensive grazing and fertilising. Along the east coast most dune systems are under heavy pressure for amenity purposes and *Centaurium pulchellum*, which shows the most striking reduction in range of this group, may have declined for this reason and/or under- recording. Of the two species found in estuaries, *Eleocharis parvala* is already extinct in the Republic whilst the other, *Scirpus triquetris* confined to one region of the Shannon mouth. A certain number of salt-marshes are threatened by proposals to reclaim them but a major threat to species such as *Arthrocnemum perenne* is from the aggressive spread of *Spartina* x *townsendii* – the Cord Grass.

There are 5 Vulnerable species in the Artificial habitat group, 3 being species of walls and 2 being arable weed species. The wall and roadside habitat of *Asplenium billotii*. *Geranium purpureum* and *G. rotundifolium* is vulnerable to road-widening and re-development of property and consequently the species are often fleeting in their appearance. The 2 species of *Geranium* are taxonomically uncertain and more research on their precise status needs to be carried out.

Conservation and the Future

Table 2 is an attempt to compare habitat data on species decline and extinction for Ireland with that from Britain. The British data were obtained by extraction from the *British Red Data Book* (Perring & Farrell, 1983). It was necessary to amalgamate some of the British habitat categories to make the comparison.

Table 2: Comparison of Irish data on extinction and threat by habitat with similar data for Britain

Habitat	Ireland			Britain (after Perring and Ffarrel, 1983)		
	No. of species	% Extinct per habitat	% threatened per habitat	No. Species	% Extinct per habitat	% threatened per habitat
Coastal	26	1.8	4.4	29	0.9	3.7
Woodland	16	0.0	5.6	33	0.3	6.3
Wetland	56	1.2	8.8	56	1.8	8.2
Artificial	12	3.1	3.7	48	1.8	9.4
Grassland	49	0.0	8.8	151	0.9	17.6
TOTALS	159	6.0	31.0	317	6.0	45.0

Though Britain's Red list flora is twice the number of Ireland's, the percentage of species extinct and threatened, for both geographical areas are strikingly similar for Coastal, Wetland and Woodland habitats. Artificial habitats contain the highest number of extinctions in Ireland whilst in Britain all habitat groups have recorded extinctions of around 1 per cent. However there is a higher proportion of species of Artificial habitats threatened in Britain than in Ireland with the most threatened species being those of grasslands. In Ireland the highest percentage of threatened species are those of wetlands and grasslands, the latter at half the British value. Overall 6 per cent of the Red List vascular flora has become extinct in both Britain and Ireland whilst 45 per cent of Britain's Red List flora is threatened as against 31 per cent for Ireland.

Though there are broadly similar trends in the decline of the British and Irish floras, the conservation of the latter is still in its infancy in that the Republic and Northern Ireland are only beginning to formulate a policy of rare species conservation. In the former, there is as yet little environmental awareness and little interest in conservation of rare and threatened species and their habitats. In addition there is little funding available, in these economically stringent times, to purchase or indeed manage areas for rare and threatened species conservation. The existing measures of the Flora Protection Order (1987) in the Republic and the Wildlife (NI) Order 1985 in Northern Ireland, go some way towards giving limited protection to the threatened flora. In the latter, ASSI designation conveys a further level of protection. The expansion of a Nature Reserve and National Park network assists species conservation but the process is a slow one and is not adequate to keep pace with the rapidly increasing threats to the flora – especially from agriculture. Given this situation what are our realistic expectations of conserving the important genetic resource represented by our threatened flora? One option would be that outside specially designated areas, management agreements with landowners are the most sensible options as outright purchase of small areas, solely for species conservation would be a costly and inefficient method. Clearly it places high demands on limited resources for

management purposes. The setting up of management agreements with farmers, to manage arable areas in the traditional manner, is a priority if we are to conserve our weed flora. Re-introduction will obviously be necessary in these cases. For those species threatened on a European scale funding may have to be sought in Europe for the purchase or management of sites in which these species occur.

However we do not see piecemeal acquisition or even management of sites as the only answer to rare and threatened species conservation. We would propose that, realistically, their conservation would be furthered by transplanting to other sites which are protected or to botanic gardens. However to conserve populations in situ, in the wild, another option is to consider the matter of regional conservation. The initiation of a system of regions of outstanding scientific value within which an integrated land-use policy is applied and in which strict environmental controls operate, according to conservation objectives, would assist species conservation alongside those of ecosystems and traditional management regimes. Each of the options we have outlined above will save our rare and threatened flora and one does not necessarily preclude the other. But in the long-term, the regional conservation approach makes for easier management. It also omits the necessity of formulating numerous, elaborate, short-term agreements with landowners, transplantation programmes and frequent monitoring of many sites. Our aim is to work towards a strategem of regional conservation within which species conservation is a major component rather than the only component.

We propose that this Red Data Book be revised at 7-yearly intervals. A major drive in educating people in conservation and in initiating practical measures to conserve our rare and threatened flora is necessary to avoid recording an increase in the loss and threats to our flora in the next edition.

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