



# PLANTLIFE

IDENTIFYING  
IMPORTANT  
PLANT AREAS:

**A Site Selection Manual for Europe, and a basis for  
developing guidelines for other regions of the world**

**IDENTIFYING IMPORTANT PLANT AREAS:**

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**landbouw, natuurbeheer  
en visserij**

**Planta Europa**

Planta Europa is the network of organisations (Government and Non Government) working for plant conservation in Europe. The ultimate mission of this network is to conserve European wild plants, both higher and lower, and their habitats. Plantlife hosts the Planta Europa secretariat. Planta Europa is the European Programme of Plantlife International. Website: <http://www.plantaeuropa.org>

Planta Europa

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<http://www.plantaeuropa.org> and <http://www.plantlife.org.uk>

**Plantlife**

Plantlife is Britain's only national membership charity dedicated exclusively to conserving all forms of plant life in their natural habitats. It has 12,000 members and owns 22 nature reserves with a total land holding of 3,900 acres. Plantlife is 'Lead Partner' for 77 species under the UK Government's Biodiversity Action Plan. Conservation of these is delivered through a recovery programme called *Back from the Brink*. Plantlife involves its members as volunteers (called Flora Guardians) in delivering many aspects of this work.

## Acknowledgements

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The views within this document are not necessarily those of the conference of the parties to the Convention on Biological Diversity.

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## 1: Introduction

### **Aims:**

The aim of the Important Plant Areas (IPAs) programme is to identify and protect a network of the best sites for plant conservation throughout Europe and the rest of the world, using consistent criteria.

### **Background:**

In their sixth meeting held in the Hague, Netherlands from 7 to 19 April 2002, the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) adopted the Global Strategy for Plant Conservation including 16 global targets for 2010. For the first time the aims of the CBD in preserving biodiversity can be measured against targets and the progress made in achieving them assessed.

The targets are grouped under 5 main objectives – Understanding & Documenting Plant Diversity; Conserving Plant Diversity; Using Plant Diversity Sustainably; Promoting Education & Awareness about Plant Diversity; and Building Capacity for the Conservation of Plant Diversity. Target 5 of this strategy calls for the protection of 50% of the most important areas for plant diversity by 2010. The IPA programme provides a framework for identifying those important areas for plants in order to protect them in Europe. This contributes to the global objectives to be implemented according to national priorities and capacities and taking into account differences in plant diversity between countries.

The European Plant Conservation Strategy was the product of a vast Pan-European consultation exercise in 2001 and is a regionally focussed strategy, which aims to halt the loss of plant biodiversity in Europe. It is a contribution to, and part of the Global Strategy for Plant Conservation. Targets 1.4, 1.5 and 2.14 of the European strategy are based on the identification, monitoring & management of IPAs.

The IPA project was conceived in Europe in response to the increasing rate of loss of the irreplaceable wealth of Europe's wild flowers and habitats through rapid economic development, urbanisation, and habitat destruction. The IPA programme is a means of identifying and protecting the most important sites for wild plant and habitats in Europe. In addition to the protection this will offer to threatened habitats and species (higher, lower plants and fungi), IPAs will also offer protection to a wide range of species including medicinal plants, relatives of crop plants, veteran trees and many common but declining species. Currently there is no central inventory of all the sites that contain Europe's most threatened plants and habitats or areas of exceptional plant and habitat richness, identified using consistent criteria.

### **Consensus:**

The success of the Important Bird Areas project inspired botanists to begin a similar project and in 1995 the urgent need to identify Europe's most important plant sites was proposed at the first Planta Europa Conference in Hyères, France. In the following years, after extensive consultation and several pilot studies, European botanists reached consensus about the criteria used to identify important plant areas, and the first IPA Guidelines were published in time for the 3<sup>rd</sup> Planta Europa Conference in the Czech Republic in 2001 (Palmer & Smart, 2001). The first phase of the programme is to identify the sites of Europe's most important plants areas, and the second phase is to ensure that they receive proper protection and management. The IPA project will also develop programmes and protocols for monitoring IPAs.

**What are IPAs?:**

IPAs are intended to be areas of great botanical importance for threatened species, habitats and plant diversity in general, that can be identified, protected and managed as sites. The WWF/IUCN Centres of Plant Diversity project (1994) identified large regions of botanical importance. However, the IPA programme is intended to build on this approach to identify areas that are appropriate for a site-based approach to conservation.

**Progress to date:**

IPA pilot projects have been carried out in Belarus, Czech Republic, Greece, Slovenia, Sweden, Turkey and the UK (see references). The Turkish IPA project carried out by Doğul Hayatı Koruma Derneği (DHKD), Fauna and Flora International (FFI) and the University of Istanbul was completed in 2001 and the results will be available in the near future.

**How to Use this Manual:**

This manual describes the aims and background of the IPA Programme, the role of IPAs in global and European conservation, and the organisational structure of the IPA Secretariat and the IPA national teams. It outlines the IPA criteria, the methodology for applying the criteria and the guiding principles for selecting sites. The data collection process is described and the information that should be recorded about each IPA is given in the IPA questionnaire. Appendices that record sources used for criterion A, EUNIS level 2 habitats and the Centres of Plant Diversity are included. The European list of Criterion A species and Criterion C habitats will be circulated to IPA national coordinators in a separate document.

This manual is a starting point for the IPA identification in Central and Eastern Europe. However, it is recognised that the practical experiences of carrying out this work and ongoing input and advice from IPA partners will add much valuable information that can be included in future versions of the site selection manual. This manual is focussed on European IPA identification. The general principles can be adapted and developed into criteria suitable for application in other regions of the world. A regional approach to the Global Strategy for Plant Conservation was recognised by the CBD (COP6, The Netherlands, April 2002) as a key implementation mechanism.

**Global and European Conservation:**

IPA identification provides the framework for governments throughout the world to achieve Target 5 in the CBD Global Strategy for Plant Conservation (GSPC) ([www.biodiv.org](http://www.biodiv.org)). IPA identification is also intended to provide specific plant data that can inform other existing European and global conservation legislation and programmes. In particular IPA identification will provide essential information for the Natura 2000 network of the EU Habitats Directive, the Emerald Network of the Bern Convention and the PEEN programme of PEBLDS. IPA identification will provide a base of solid data for the legislation and programmes detailed in the table below.

The IPA database will act as a focal point for collating data on the conservation status of higher and lower plants and fungi throughout Europe. These data can be used as a source of information for organisations preparing lists of species and habitats of conservation, such as the IUCN global/European Red list, and the Habitats Directive and Bern Convention Annexes.

**A list of IPA's which are eligible for SAC selection will be included in the Appendix of national IPA inventories.**

## IPA s in Existing European and Global Conservation Programmes

Legislation/Programme	IPA Target & Notes
<b>Global</b>	
CBD (Convention on Biological Diversity)	IPAs help to implement <b>Articles 6,7, 8</b> on biodiversity strategies and in situ conservation, and <b>Articles 12 &amp; 13</b> on national and international cooperation
CBD - Global Plant Conservation Strategy (GSPC)	Adopted at COP 6, The Hague April 2002 <b>Target 5</b> of the GSPC is for the protection of 50% of the world's most important areas for plant diversity by 2010
IUCN Species Survival Commission, Global Plant Conservation Programme	IPAs are a stated priority
IUCN Parks for Life Programme	In <b>Priority Project 6</b> the importance of IPAs is recognised in <b>Article 4.3.5</b> for higher plants, and in <b>Article 4.3.6</b> for lower plants
The Ramsar Convention on Wetlands of International Importance	IPAs will help to identify sites which qualify under the new group A and B criteria for threatened species and ecological communities
<b>European</b>	
EU Habitats and Species Directive (Natura 2000)	IPAs can contribute plant information for Natura 2000 sites, particularly Criteria A & C
Bern Convention (Emerald Network)	IPAs can contribute specific plant information for implementing the Emerald Network, particularly Criteria A & C
European Plant Conservation Strategy (EPCS) (Plantlife nominated lead partner on IPA targets)	<b>Target 1.4</b> – IPA inventory of Europe by 2007 <b>Target 1.5</b> research to assess effectiveness of IPAs <b>Target 2.14</b> Promotion of IPAs to underpin international protected area networks
PEBLDS through the implementation of PEEN (Pan-European Ecological Network)	IPAs can contribute to PEEN by providing plant data for the identification of a network of sites that reduce threats to and increase resilience of Europe's biological and landscape diversity, through coherent European programmes and public involvement in the process

## 2. The IPA Project in Central and Eastern Europe (CEE)

### **Background:**

The Ministry of Agriculture, Nature Management and Fisheries of the Netherlands has provided funding to carry out IPA inventories in 7 Central and Eastern European countries. Plantlife International will coordinate this project. An IPA Project Manager, based in London, and an IPA Regional Coordinator, based in CEE, will work full time on this project to assist the National IPA teams to produce the national IPA inventories. Each country will have a national IPA partner organisation(s) to coordinate the IPA project and a named individual as IPA Country Coordinator.

### **Outcomes:**

- Country Coordinators compile reports on national IPA inventories by the end of 2004
- The IPA Secretariat, in consultation with partners, will compile a Regional overview of plant conservation and IPAs in CEE by the end of 2004
- Data on IPAs will be entered into the IPA Database as a tool for monitoring the conservation status and lobbying for the protection of sites and species
- This project will provide practical experience for carrying out IPA projects in other countries in Europe and the rest of the world.

### **National IPA Partners:**

In each country there will be a lead organisation to coordinate IPA identification and selection by collating available data and applying IPA criteria. Each lead organisation will be responsible for convening the national IPA team of conservation stakeholders, such as specialists, NGOs, government agencies, and for promoting awareness of IPAs in their country to specialists and the public.

### **Training & Information:**

In each of the 7 countries there will be a national IPA workshop to provide information on the criteria, site selection and training on the IPA database. This will also provide a forum for airing national concerns and suggestions about the project. The IPA Project Manager and the IPA Regional Coordinator will provide continuing support and information. At the end of 2003 a regional workshop for the 7 participating countries will be held, to assess the progress and problems, the European coverage of the national IPA networks, and to agree on the future development of the IPA project in CEE.



### Organisation of Project:

	<b>Role</b>	<b>Contact Details</b>
<b>Plantlife International</b>	Coordination/Organisation	<a href="http://www.plantlife.org.uk">www.plantlife.org.uk</a>
<b>IPA Project Manager</b> (based at Plantlife International, London)	Coordination/ Administration / technical support & information for partners	seona.anderson@plantlife.org.uk Plantlife, 21 Elizabeth Street, London SW1W 9RP, UK, Tel: +44 (0) 20 7808 0122
<b>IPA Regional Coordinator (CEE)</b> (based in Slovak Republic)	Regional coordination, support & information for partners – analysis of regionally based conservation issues and regionally specific problems	:tomas.kusik@plantlife.sk Plantlife, Mlynske Nivy 41, SK-821 09, Bratislava 2, Slovak Republic Tel/Fax: +421 (0) 2 55 42 35 23

### 3. IPA Definitions & Methodology

#### Definition of an Important Plant Area:

An Important Plant Area (IPA) is a natural or semi-natural site exhibiting exceptional botanical richness and/or supporting an outstanding assemblage of rare, threatened and/or endemic plant species and/or vegetation of high botanic value.

#### Three Basic Principles of IPA Identification:

##### Criterion A

The site holds significant populations of one or more species that are of global or European conservation concern.

##### Criterion B

The site has an exceptionally rich flora in a European context in relation to its biogeographic zone.

##### Criterion C

The site is an outstanding example of a habitat type of global or European plant conservation and botanical importance.

#### General Principles & Definitions:

- The word plant encompasses algae, fungi, lichens, liverworts, mosses, and wild vascular plants.
- The selection of sites should be based as far as possible on sound data, quantifiable population and area thresholds and a transparent selection process.
- The biogeographical zones of the IPA project are the 11 zones defined in the Council of Europe's extended Pan-European map of the Natura 2000 project: Alpine, Anatolian, Arctic, Atlantic, Black Sea, Boreal, Continental, Macaronesia, Mediterranean, Pannonian and Steppic.
- The aim of the IPA project is to identify and protect a comprehensive European network of IPAs, however, the number, size and range of IPA sites within each country is a national decision based on the constrictions of the existing criteria and the knowledge, resources and experience of national IPA groups.

#### Qualification as an IPA :

- To qualify as an Important Plant Area, a site needs to satisfy one or more of the criteria, i.e. a site can qualify if it satisfies either criterion A or B or C or any combination of the criteria. The table of IPA criteria on page 14 describes the quantifiable thresholds and the acceptable sources of data for each criterion.

## Potential European Wide Databases for Use in IPA Projects

Below are a selection of some pan-European databases on species or habitats that potentially could be available for use in national IPA Projects.

IPA Participants wishing to find out more about these databases and how they could be used in the national IPA Project should contact the compilers and national coordinators directly or via the Secretariat.

Type	General Information	Contact Details
<b>Habitats</b>		
CORINE Land Cover	European land cover data from satellite imagery – 44 classifications, 250x250 m square minimum resolution	European Environment Agency data service <a href="http://dataservice.eea.eu.int/dataservice/available2.asp?type=findkeyword&amp;theme=NATLAN&amp;i=1">http://dataservice.eea.eu.int/dataservice/available2.asp?type=findkeyword&amp;theme=NATLAN&amp;i=1</a> – this web page also provides information on the following databases Corine Coastal Erosion; Corine Soil Erosion; Corine Biotopes; Corine Land Quality; Digital Map of European Ecological Regions (DMEER); Nationally Designated Areas
EUNIS	European Habitats Classification System used in Natura 2000 system – hierarchical system developed from CORINE/PALAEARCTIC – includes cross-references between Habitats Directive & Bern Convention habitats	<a href="http://mrw.wallonie.be/dgrne/sibw/EUNIS/home.html">http://mrw.wallonie.be/dgrne/sibw/EUNIS/home.html</a>
GLCC	Global Land Cover Characterisation also provides information on the global Forest Resources Assessment.	<a href="http://edcdaac.usgs.gov/glcc/glcc.html">http://edcdaac.usgs.gov/glcc/glcc.html</a> this page also provides information on the Global Forests Resources Assessment.
PEEN Map	Map of sites for the Pan-European Ecological Network	Coordinated by ECNC – European Centre for Nature Conservation <a href="http://www.ecnc.nl">http://www.ecnc.nl</a>
PELCOM	Pan European Land Cover and Monitoring Database, 1km land cover resolution for Europe	<a href="http://systemforschung.arcs.ac.at/SU/Projects/pelcom.htm">http://systemforschung.arcs.ac.at/SU/Projects/pelcom.htm</a>
SYNBIOSIS	Species, Plant community and habitat data for Holland & other European countries	Alterra, P.O. Box 47, 6700 AA, Wageningen, The Netherlands
WETLANDS INTERNATIONAL	Information on wetland habitats throughout Europe	<a href="http://www.wetlands.org/">http://www.wetlands.org/</a>
<b>Species</b>		
	Computerised records of	Secretariat of the Committee for Mapping the Flora of

Atlas Flora Europea	20% of the Flora of Europe – at a resolution of 50x50 km <sup>2</sup>	Europe <a href="http://www.fmnh.helsinki.fi/map/afe/E_afe.htm">http://www.fmnh.helsinki.fi/map/afe/E_afe.htm</a>
Bern Convention, appendix I & Resolution 16 of Working Group 4 on habitats	Text of Directive and updated versions of Appendix 1	Via <a href="http://www.ecnc.nl/doc/europe/legislat/bernconv.html">http://www.ecnc.nl/doc/europe/legislat/bernconv.html</a>
Habitats Directive Annexes IIb & IVb	Text of Directive and updated versions of Annexes I, IIb & IVb	<a href="http://europa.eu.int/comm/environment/nature/habdir.htm">http://europa.eu.int/comm/environment/nature/habdir.htm</a>
IUCN Global Red List/ UNEP-WCMC Threatened Plants database	Annually updated list of threatened species on the Global Red List	<a href="http://www.redlist.org">www.redlist.org</a> The majority of plants have not yet been assessed using the 1997 criteria for the IUCN red list so it is also necessary to search the UNEP-WCMC Threatened Plants database <a href="http://www.wcmc.org.uk/species/plants/red_list.htm">http://www.wcmc.org.uk/species/plants/red_list.htm</a> .
WorldMap	Computer Programme for assessing potential areas of species richness, diversity and rarity, also capable of assessment of complementarity of sites. Has been used in conjunction with Atlas Flora Europea	Worldmap@nhm.ac.uk
<b>Large CEE Projects</b>		
CEE Grasslands Project	Dutch funded project to map the natural and semi-natural grasslands in CEE – Participating countries, Bulgaria, Estonia, Hungary, Latvia, Lithuania, Romania, Slovakia, Slovenia	Coordinated by the Peter Veen, Royal Dutch Society for Nature Conservation, KNNV with national partner organisations (bureau@knnv.nl)
WWF Danube/Carpathian Project	EcoRegion Projects to define hotspots of biodiversity	<a href="http://www.carpathians.org">www.carpathians.org</a>

<b>Protected Sites Databases</b>		
Important Bird Areas (IBAs)	Database & details of IBAs in Europe & the rest of the World	BirdLife International <a href="http://www.birdlife.org">www.birdlife.org</a>
RAMSAR	Database of RAMSAR sites maintained by Wetlands International	<a href="http://www.wetlands.org/rdb.htm">http://www.wetlands.org/rdb.htm</a>
UNEP -WCMC	Protected Areas Database	<a href="http://www.unep-wcmc.org/">http://www.unep-wcmc.org/</a>
<b>General GIS Information</b>		
ESRI	Free GIS – Arcview programmes – also map library	<a href="http://www.esri.com/software/arcexplorer/">http://www.esri.com/software/arcexplorer/</a>
<b>General Conservation Information</b>		
CBD Clearing House	Information Search Engine for biodiversity issues related to the CBD	<a href="http://www.biodiv.org/chm/default.aspx">http://www.biodiv.org/chm/default.aspx</a>
European Environment Agency Clearing House	Information Search Engine for environment issues relating to Europe	<a href="http://www.biodiversity-chm.eea.eu.int/">www.biodiversity-chm.eea.eu.int/</a>

This list is not exhaustive and gives a sample of some European wide or multi-country projects. National projects have not been included in this list. Any further information about projects, databases or maps that partners feel would be helpful in the IPA Project can be disseminated through the Secretariat on request.

## IPA Selection Criteria

CRITERION	DESCRIPTION	THRESHOLD	NOTES
<b>A(i)</b> (threatened species)	Site contains <b>globally</b> threatened species	All sites known, though or inferred to contain 5% or more of the national population can be selected, or the 5 <sup>1</sup> 'best' sites, whichever is the most appropriate.	Species must be listed as <b>'threatened'</b> * on IUCN global red lists (see appendix 1)
<b>A(ii)</b> (threatened species)	Site contains regionally ( <b>European</b> ) threatened species	<sup>1</sup> (In exceptional cases, for example where there are less than 10 sites in the entire country or there are between 5-10 large populations of a species, up to 10 sites can be selected)	Species must be listed as <b>'threatened'</b> * on European IUCN red list; or Habitats Directive Annexes IIb & IVb; or Bern Convention Appendix I (see appendix 1)
<b>A(iii)</b> (threatened species)	Site contains <b>national endemic</b> species with demonstrable threat not covered by A(i) or A(ii)	(populations must be viable or there is a hope that they can be returned to viability through conservation measures)	Species must be listed as national endemic (on any recognised list or publication) and <b>'threatened'</b> * on national red lists
<b>A(iv)</b> (threatened species)	Site contains <b>near endemic/limited range</b> species with demonstrable threat not covered by A(i) or A(ii)		Species must be listed as near endemic/ limited range (on any recognised list or publication) and <b>'threatened'</b> * on national red lists
<b>B</b> (species richness)	Site contains high <b>number of species</b> within a range of <b>defined habitat types</b>	Up to 10% of the national resource (area) of level 2 EUNIS habitat types, or 5 best sites, whichever is the most appropriate.  <sup>2</sup> (In exceptional cases, for example there are between 5 and 10 exceptionally rich sites for a particular habitat, up to 10 sites can be selected for each level 2 habitat type)	<b>Species</b> richness based on nationally created list of indicator species developed for each habitat type and from the following types of species: <b>characteristic species</b> and/or <b>endemic species</b> and /or <b>nationally rare and scarce</b> species (where the endemic and rare and scarce species are numerous and/or are characteristic for the habitat) <b>Defined Habitat Type</b> taken as level 2 (generic) habitat types in EUNIS (e.g. D1 raised & blanket bogs; G1 broad-leaved deciduous forests; E1 dry grasslands)
<b>C(i)</b> Priority threatened habitats	Site contains threatened habitat	All sites known, thought or inferred to contain 5% or more of the national resource (area) of priority threatened habitats can be selected, or a total of 20-60% of the national resource, whichever is the most appropriate.	Priority threatened habitats are those listed as priority on Annex I of the Habitats Directive (and any corresponding habitat from the Bern Convention Res. 4)
<b>C(ii)</b> Threatened habitats	Site contains threatened habitat	All sites known, thought or inferred to contain 5% or more of the national resource (area) can be selected, or the 5 <sup>3</sup> 'best' sites, whichever is the most appropriate. <sup>3</sup> (In exceptional cases, for example where there are less than 10 sites in the whole country, or there are 5-10 exceptional sites, up to 10 sites can be selected)	Threatened habitats are those listed on Annex I of the Habitats Directive and the Bern Convention Resolution 4, not covered by C(i)

\* **Criterion A, threatened species must be listed as** Critically Endangered (CR), Endangered (EN) or Vulnerable (VU) **using the new IUCN criteria, or** Extinct/Endangered (Ex/E), Endangered (E) or Vulnerable (V) **using the original IUCN categories.**

## Criterion A: Threatened Species

IPAs are intended to identify and conserve populations of the most threatened plant species in Europe and the world.

### Criterion A Categories

There are 4 categories of Criterion A. The criteria diagram (p.13) and appendix 1 indicate the currently accepted sources for the European Criterion A list.

- A(i) Globally threatened plants
- A(ii) European threatened plants
- A(iii) Threatened endemics not covered by the accepted sources for A(i) or A(ii)
- A(iv) Threatened near endemic/limited range species not covered by the accepted sources A(i) or A(ii)

Many threatened endemic or near endemic/limited range species will be in category A(i) or A(ii), however some of these species are not included on existing global or European red or threatened lists but are included in national red lists. The rationale for keeping A(iii) and A(iv) separate from A(i) is to be able to track the protection status of these threatened endemic and near endemic/limited range species and to work towards their inclusion on global or European threatened lists.

### European list of IPA Criterion A species

The IPA Secretariat in collaboration with partners will produce a list of criterion A species for Europe. This list is generated from the sources in Appendix I and from A(iii) and A(iv) species nominated by the national partners. This list will also include information on the taxonomy, synonyms, reference floras, legal designation, and the country and biogeographic zones where the species occur. Subspecies is the lowest taxonomic level acceptable for taxa in Criterion A. The inclusion of variety level taxa in the Criterion A list can be discussed by national partners and the IPA Secretariat.

### Additions to the currently accepted sources for Criterion A species

The IPA Secretariat will take advice from Red listing authorities & expert groups on additions to the currently accepted list of sources for Criterion A species in Europe, including the following organisations:

- ECCB for Bryophytes
- ECCF for Fungi
- IAL for Lichens
- IUCN European red list groups and other IUCN specialist groups

The IPA Secretariat will take advice from IUCN SSC Re-introduction Specialist Group on the status of plant species in the IUCN benign re-introduction programme.

Threatened Species	IPA Category	Global Red List	Habs Dir. (IIb/IVb)	Bern (App I)	European Red List (will be used when available)	Threat. Endemic (not in A(i)/A(ii))	Threat. Near endemic (not in A(i)/A(ii))
Name	A(i)/A(ii)	x	x	x			
Name	A(ii)		x	x			
Name	A(iii)					x	
Name	A(iv)						X

## Thresholds for Criterion A

- All sites known, thought or inferred to contain 5% or more of the national population can be selected, or the 5\* 'best' sites, whichever is the most appropriate

\*(In exceptional cases where there are less than 10 sites in the entire country, or there are between 5 to 10 large populations, up to 10 sites can be selected)

### Example:

- For very threatened species with under 10 sites within a country, the IPA system should aim to select all of the sites with viable populations
- For species with up to 20 sites the largest populations (5% or more of the national population) can be selected
- For species with 20-100 or more sites the best 5-10 sites should be selected.

### Rationale:

The aim of the IPA project is to identify priority areas to target plant conservation at a site based level. For many species in Criterion A there will be very few sites, however for the more populous or dispersed species it is appropriate to make a selection of the best areas to target protection rather than identifying 50-100 sites for one species which may then disperse conservation efforts.

## Guiding Principles for Selecting Criterion A Sites

- The national IPA network should represent the full range of the national Criterion A species list.
- In Accession countries, consideration may be given to fast-tracking Annex IIb/IVb species to assist with selection of sites for Natura 2000
- For particularly dispersed species with no obvious population centres, separate IPAs should not be selected where it is possible to include them on IPAs selected primarily for other species.
- Where data are available, sites that contain a significant percentage of the European population (>1%) of a species should be included in the IPA network.
- The degree of threat to the population and the need for protection should be taken into account, but IPAs should be selected only for populations which are viable or for which there is hope that ameliorative measures can be taken to ensure a return to viability.
- Populations at the core and edge of the European range should be included in the IPA network
- The genetic composition of the population should be taken into account, where there is reason to believe that this is necessary to conserve biodiversity.



## Criterion B: Richness

IPAs are intended to identify and conserve areas of exceptional botanical richness. Existing European legislation targets a limited range of threatened species and habitats with no direct provision for conserving areas of outstanding botanical richness, important for the biodiversity of plants and other organisms.

### METHODOLOGY

#### Unit of Comparison

The unit of comparison for assessing species richness is EUNIS Level 2 Habitat level (see appendix 2)<sup>4</sup>. For example, all coastal sand dunes (B1) are compared for species richness and all temperate shrub heathland (F4) is compared for species richness. The reason for comparing species richness at this level is to ensure that species poor environments are not compared with species rich environments, for example peat bogs are not compared with limestone grasslands. Thus rich examples from across a wide spectrum of habitat types can be identified and conserved.

#### Indicator Species checklists

For each EUNIS level 2 habitat type present in their country, the national IPA team will create a check-list of indicator species for richness from across the range of sub-habitats within each level 2 habitat. For example G1 (broad-leaved deciduous woodland) will have many sub-habitats, whereas D1 (raised and blanket bog) will have fewer sub-habitats.

The check-list for each habitat can also include niche habitats such as disturbed ground or succession species as well as climax vegetation species. The check-list of indicator species for each habitat type can be as long or as short as is deemed appropriate by the national team.

The check-list of indicator species for each habitat type can include species from different taxonomic groups, as deemed appropriate by the national IPA team. Thus a combination of, for example, vascular plants, fungi and lichens might be used in woodland, or vascular plants and charophytes might be used in aquatic habitats.

The check-list should include examples from one or more of the following groups:

- Species characteristic to a particular habitat (a species that is wholly or largely restricted to a particular habitat type)
- Endemic species (where these are numerous and/or characteristic to the habitat type)
- Nationally scarce or rare species (where these are characteristic of the habitat type)

For example, the list of indicator species for B1 (coastal sand dunes) in Turkey was made up of a tightly defined list of 41 nationally rare and scarce species that were

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<sup>4</sup> (EUNIS level 2 habitats FA (Hedgerows), FB (Shrub plantations), I1 (Market gardens) & I2 (Cultivated areas of gardens and parks), do not fall entirely into the definition of IPAs as natural or semi-natural sites and are not priority habitats for assessment of richness.)

largely or wholly confined to this habitat type. The best sites supported between 15 to 20 of these species and were selected as IPAs using the criterion B thresholds.

In the UK an assessment of rich freshwater habitats was made using a list of indicator species comprising all characteristic aquatic species, common or rare (including charophytes).

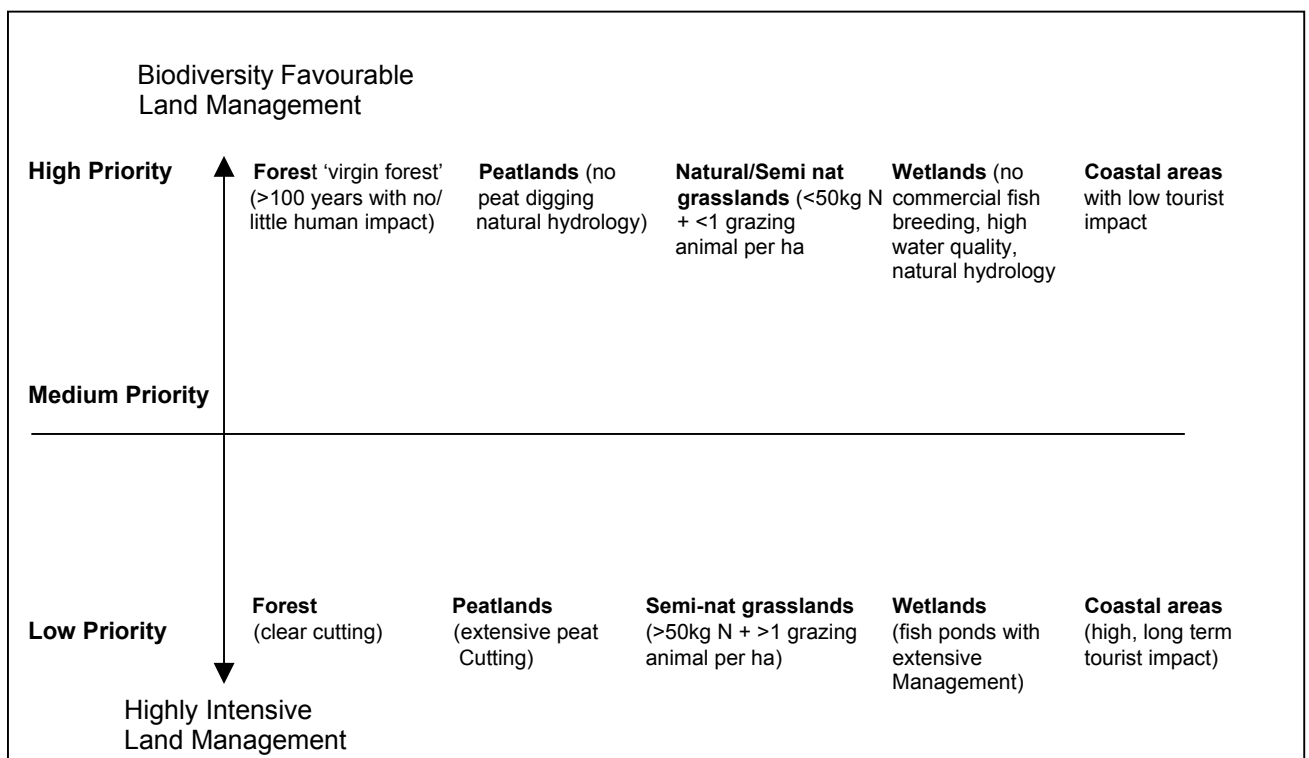
The rationale for using indicator check-lists is to ensure that the species used to assess richness are truly indicative of a rich example of the habitat and do not include species that are not particularly characteristic for the habitat. Thus a checklist for bogs should not include any of the ruderals growing around the edge or any invasive species. The data availability in each country will also affect the choice of check-list (see Data Flow, p. 27), thus if the data are held mainly for rare or endemic species these are more likely to be used as indicator species.

The check-lists of indicator species used in assessments should be published in the national IPA report. Later these lists may be used to create European check-lists for level 2 EUNIS habitats.

### Targeting Areas for Richness Assessment

When making the initial assessment for areas to target research into species richness priority should be given to those areas with the highest potential 'quality', i.e. those areas that have been in continuous, favourable land management for a long period. The diagram below indicates some ways in which a simple prioritisation within some habitat types could be made. It does not include suggestions for all habitat types.

The targeting of potentially biodiversity rich areas does not exclude more intensively managed habitats from being selected as IPAs. It is merely a practical suggestion of ways to prioritise the research into species rich areas and to ensure that existing biodiversity rich areas are included in the IPA network in the first phase of identification.



### Site Selection & Mosaic Habitats

The unit of richness comparison is the EUNIS level 2 habitat type. However, certain habitat types are more isolated and distinct than others. Thus, coastal sand dunes are a relatively distinct habitat type, whereas mountainous areas contain a combination of different types of forest, grasslands, screes, rivers, etc. In the case of mountainous areas, for example, it is possible to identify certain areas as particularly rich examples of a level 2 habitat type (e.g. broad-leaved forest) or alpine grassland, using indicator checklists, however the IPA may contain many other habitats within its boundaries.

For example:

- The New Forest in England might qualify as an IPA because of the particularly rich woodland, however the site is a mosaic of wood pasture, enclosed woodland, open heath acid grassland and valley mire, all contained within the same management area. The IPA would include the mosaic of habitats which make up the whole ecological entity, as conservation measures should aim to preserve the integrity of the whole site.
- A particular lake might qualify as an IPA because of a high number of freshwater aquatic indicator species. Within the boundary of the lake there may be several islands and these would be included within the IPA boundary.
- A particular part of a mountain range might qualify as an IPA because of an area of particularly rich deciduous woodland, which also includes a river, coniferous forest and scree. The IPA would include all of these areas as they form part of the ecological integrity of the site.

### Thresholds

Up to 10% of the national area of level 2 EUNIS Habitats, or 5\* 'best' sites, whichever is the most appropriate.

\*(In exceptional cases, such as when there are between 5 –10 exceptionally rich sites, for a particular habitat, up to 10 sites can be selected for any criterion B level 2 habitat)

The threshold for criterion B is based on both percentages of national area and sites, since both are appropriate at different times. For example, in Turkey there are only 5 bog sites. One site might contain 20% of the national area, hence the site threshold is appropriate here. In Ireland the national area of bogs is large and the percentage approach is preferable.

### Guiding Principles:

- **Complementarity:** The principle of complementarity is based on selecting a range of sites that contains the greatest number of different species, rather than selecting, 5 rich sites that contain basically the same range of species. Thus if 10% of the deciduous woodland of the UK was selected for richness it should include sites that contain species from across the range of deciduous woodland types, based on the national indicator list for deciduous woodland.
- Sites selected for richness will be open to review for their European representativeness.

## Criterion C – Threatened Habitats

IPAs will identify sites of threatened habitat types. For the IPA Project in Europe, threatened habitats are taken to be those listed on Annex I of the Habitats Directive and on Resolution 4 of the Bern Standing Committee 16. A combined list of threatened habitats from both of these documents has been created for use in the IPA project in Europe, based on information in the EUNIS habitats system (see page 44 for details). This document will be distributed to IPA national partners or can be obtained from the Secretariat (see contacts, p.50). This criterion is split into two parts:

- C(i) Priority Threatened Habitats is based on the priority habitats of Annex I of the Habitats Directive and any corresponding Bern Convention Habitats
- C(ii) Threatened Habitats is based on the threatened habitats contained in Annex I of the Habitats Directive and the Bern Convention not covered by C(i)

C(ii) habitats are equally important as C(i) habitats. Creating two categories is a way of tracking the progress of site identification for processes such as the Natura 2000 programme.

To apply this criterion each national IPA team needs to produce a list of the threatened habitats present in their country based on the combined Habitats Directive and Bern list.

It is understood that there are varying degrees of information available about the locations and extents of habitats in each country. The IPA project can only use the best available data in each country at the present time. The IPA project is dynamic and as more data becomes available it can be incorporated into the system. The IPA project can help to identify the major gaps of missing data about habitat types and to target future research projects towards these habitats.

For data collection issues see page 27. The Interpretation Manual of European Union Habitats for use in the Natura 2000 process is available on the web (<http://europa.eu.int/comm/environment/nature/hab-en.htm>)

### Thresholds

C(i) all sites known, thought or inferred to contain 5% or more of the national area of a priority threatened habitats can be selected as IPAs, or a total of 20-60% of the national resource, whichever is the most appropriate

C(ii) all sites known, thought, or inferred to contain 5% or more of the national area of a threatened habitat can be selected or the 5\* 'best' sites, whichever is the most appropriate

\*(In exceptional cases, for example where there are only between 5-10 sites of a particular habitat in a country, or there are between 5-10 exceptional sites, up to 10 sites can be selected)

The rationale for selecting sites with 5% or more of the national area is to ensure that all the largest remaining examples of a particularly threatened habitat are included in the IPA system. However, the selection of the 'best' sites can also be influenced by 'quality' factors such as favourable land management and diversity of species. As discussed in Criterion B for Turkish and Irish peat bog sites, percentage and site thresholds are appropriate in different situations.

In C(i), the 20-60% threshold is based on the Habitats Directive working threshold for habitat coverage at the Biogeographical zone level. However, the first phase of IPA identification will be carried out at the national level and hence the threshold is given at the national level.

In C(ii) for habitats where there are large numbers of small potential IPAs that do not cover 5% or more of the national resource, the 5-10 site threshold is intended to prioritise action towards the best sites where there are many potential sites.

### **Guiding Principles:**

- The national IPA network should represent the full range of the national Criterion C habitat list.
- In Accession countries, consideration may be given to fast-tracking Annex I habitats to assist with selection of sites for Natura 2000.
- The threshold for selecting IPAs is based on area in order to preserve the largest continuous extents of each habitat, however factors such as land management history, species diversity can also be considered in site selection.
- Where checklists of indicator species are available for threatened habitats, these could be used to assess the 'best' examples of habitats using a similar method described in Criterion B for assessing species richness.
- The degree of threat to the habitat and the need for protection should be taken into account.

## Endemic and Near Endemic/ Limited Range Species

### General Principles:

- For the purposes of the IPA project an endemic is defined as a species that occurs entirely within one national state. It is recognised that this is a political rather than a biological definition but that most of the data are held at the level of politically defined states.
- A near endemic or limited range species is one which is found within a very limited range within Europe. For practical purposes this may be defined as a species that has more than 50% of its range within one country and occurs in no more than 2-3 countries in total, or that occurs only within one geographical unit, such as the Carpathians.
- All countries that contain a near-endemic/limited range species can include this species in their national IPA list, not only the country that contains 50% or more of the species population.
- Threatened endemics and near endemic/limited range species are covered by the criterion A.
- Less threatened endemics and limited range species can be included in the IPA system as indicators of exceptionally rich botanical areas in criterion B
- The Centres of Plant Diversity (WWF & IUCN, 1994) indicates regions of particular richness, including areas of endemic plant species throughout the world. These regions can be targeted for potential IPAs. A list of European Centres of Plant Diversity are included in Appendix 3.

## Algae, Fungi, Mosses, Liverworts, & Lichens

In the IPA Project, the definition of plant also includes lower plants and fungi. Lower plants and fungi are poorly represented in existing European conservation legislation. The IPA network is one means of ensuring that the sites important for these plants are identified, protected and properly managed.

- National IPA selection species should include lower plants and fungi from the recognised sources listed in appendix 1
- Species of lower plants and fungi can be included as indicator species for richness in Criterion B and indicators of habitat quality in Criterion C
- Where possible IPA site selection should be integrated for all plant types, higher, lower and fungi, however, in some cases it may be more appropriate to carry out IPA assessments for the different plant groups separately in the first phase of the project.

- The Secretariat and the IPA national partners will liaise with organisations such as the ECCF (European Committee for the Conservation of Fungi) and ECCB (European Committee for the Conservation of Bryophytes) and the IAL (International Association of Lichenologists) to collate data on the locations and status of lower plants and fungi in Europe.

#### 4. Selecting IPA Sites

The area selected for each IPA is ultimately a decision for each national IPA team, within the conditions of the IPA criteria. Potentially an IPA could be very small and designed to protect a single species or small area of a specific habitat, or it could incorporate a large area with many different IPA species, or habitats, or areas of richness and diversity. The following guidelines are intended to discuss important points on selection.

The variety of botanical, geographical, political, and practical factors in identifying what constitutes a site and outlining its boundaries make it impractical to provide definitive guidelines that would cover every situation in Europe. The size and boundaries of an individual IPA should be determined by selecting the area that can be conserved in practical terms without compromising the intrinsic value of the site.

#### IPA Composition & Boundaries

A site is defined so that, as far as possible:

- i) it is different in character or habitat or botanically significant from the surrounding area
- ii) exists as an actual or potential protected area or an area that could be managed for conservation
- There is no fixed minimum or maximum size for IPAs.
- There are no set rules for the treatment of small sites that lie close to each other. These sites may remain as individual IPAs or the smaller sites can be merged to create a single larger IPA. Where possible a mosaic of interlinked habitat types would confer many conservation benefits but practical factors at the local level and the conservation priorities of individual countries will influence these decisions
- Site boundaries. Obvious boundaries such as rivers or roads or distinct changes in land use can be used to mark the boundaries of sites. In larger regions where there are less obvious site boundaries or changes in habitat type, site boundaries can be delimited by geological features such as ridge-lines, or hilltops. Practical considerations such as ownership may need to be considered.

#### Representation of IPAs at the National, European & Biogeographic Zone Level

The IPA programme is intended to identify the most important sites for plants in Europe and the world, however the process of IPA identification is a national process carried out within the constraints of the IPA criteria.



### **National Representation**

The national IPA team is responsible for identifying IPAs using available data and experience. The IPA thresholds are set at the national level because of the nature of botanical data and also because many of the efforts to protect and manage sites will be carried out at the national level. There is no maximum or minimum number of IPAs that each country must identify, although the inventory should aim to include representatives of all the national IPA list of species and habitats. Each country should aim to have a spread of IPAs across the different biogeographic zones of that country.

Where a country has a well documented responsibility for a particular species or habitat at the Global or European level this can be reflected in the national IPA inventory. For example, the west coast of Scotland has particularly rich examples of Atlantic epiphytic woodland, and Central and Eastern Europe has particularly rich grasslands. These are the types of factors that could be considered by national teams when making the national IPA inventory.

### **European & Biogeographic Representation**

The representation of IPAs sites at the Biogeographic zone and the European level is an essential part of the process. It is intended to hold a workshop for all the individual country coordinators in CEE in late 2003 in order to facilitate decisions on the representativeness of national IPA networks and to reach consensus on any changes that would improve the European and global value of the IPA network. Throughout the project the Secretariat will also ensure that all national partners have access to information on IPAs in other partner countries, either through access to the IPA database or through regular reports, in order to facilitate decision making.

### **General Principles for selecting IPAs**

- The selection of IPA sites should be based as far as possible on sound data
- IPAs can be identified on land that is either private or protected
- The degree of threat and the need for protection should be considered
- Consideration should be given to identifying IPAs on sites that contain several features of the IPA national list of Criteria A, B, C species and habitats in one place, in order to focus conservation action.
- Consideration should be given to sites that constitute important areas of biodiversity value for plants and other organisms, or prevent the isolation of populations, i.e. continuous habitats or linked mosaics of different habitats.
- When selecting IPAs consideration should be given to natural or semi-natural areas that support sustainable wild plant harvesting, for food, medicine or other reasons, as this contributes to the aims of the Convention on Biological Diversity and emphasises the continuing importance of the relationships between wild plants and people.
- Where possible, large areas including buffer zones should be represented in the boundaries of an IPA

## 5. Management of IPA sites

### Protection & Management

The ultimate aim of the IPA programme is to ensure that the sites identified as being important for plants are adequately protected and managed to ensure the continued existence of those plants and habitats. Ultimately it is hoped that each IPA will have a clear management plan that will provide information to all interested parties on how to preserve the species and habitats at the site.

Many of the IPAs identified will already be protected and managed as National Parks, Reserves or through other protected areas systems. In the future, for the sites that are not protected in any form, the IPA national team and the IPA network can work with landowners, regional and national government to ensure that the site receives adequate protection through negotiation and lobbying.

Further information on site management practice can be obtained from the WCPA (World Commission on Protected Areas) website ([www.wcpa.iucn.org](http://www.wcpa.iucn.org)).

Target 2.14 of the European Plant Conservation Strategy is to initiate research into the effectiveness of IPA management for the protection of species and habitats from 2003.

### Government responsibility for IPA Sites

Target 5 of the Global Plant Conservation Strategy of the Convention on Biological Diversity requires national governments all over the world are required to ensure that 50% of the areas important for plants in their country are protected by 2010. The IPA programme offers a means of identifying those areas important for plants and assessing how many of them are already protected under existing systems such as national parks, reserves, Natura 2000 or Emerald sites, and how many need more protection.

### Information & Guidance on IPA Site Management

Where possible, IPA site accounts should include information on best management practices for preserving the species and habitats contained on the IPA site. This information should be targeted at helping land-owners with IPAs on their land, protected area managers or other interested parties, to manage the site. This information will be recorded in the IPA database (see pages 28-31). Where possible information on the best practice for managing species and sites should be disseminated through the IPA network.

For example:

- General Site management guidance at 'Chalk Grassland Reserve': this 90 acre site has prospered under a 50 year regime of grazing between 30-40 cows, predominantly summer grazing from July to December, with no fertilisers or pesticides, and with regular scrub clearance (annual or biannual)
- General Site Management guidance on 'Highland Peat Bog': old drainage ditches should be dammed and the number of deer grazing the site should be observed, which ideally should not exceed 40 animals.

- Managing sites important for fungi: maintain continuity of site by leaving veteran or ancient trees and dead wood, or continuing existing management system, avoid using fungicides avoid using artificial fertilisers particularly lime
- Managing the site for ground pine (*Ajuga chamaepitys*): formerly a common chalkland plant now threatened. Good management includes low density sheep grazing to disturb the ground and prevent scrub growth; maintaining a cultivated but uncropped and unsprayed margin round the edge of cultivated land.

### **Sustainable Plant Harvesting on IPAs**

Where wild plant harvesting has been shown to be an integral and sustainable feature of the site management this should continue to be part of site management practices. However, for wild plant use throughout the world there is an urgent need to establish red list type criteria to assess the resilience of habitats to plant collecting that are effective at the local, regional and global scales. Until such a system is developed the practise of recording and disseminating 'best practice' examples throughout countries and the IPA network should be initiated. For example, the new medicinal plant law in Bulgaria incorporates a voucher scheme for medicinal plant gatherers, which allows them to gather a specific amount of each plant at particular sites.

### **Threats to IPAs (see page 36)**

Threat should be recorded for the site as a whole, but with special emphasis on the qualifying features of the IPA. For example threats to the site as a whole may include, drainage and development, overgrazing or lack of grazing, but threats to individual species may be more specific in focus.

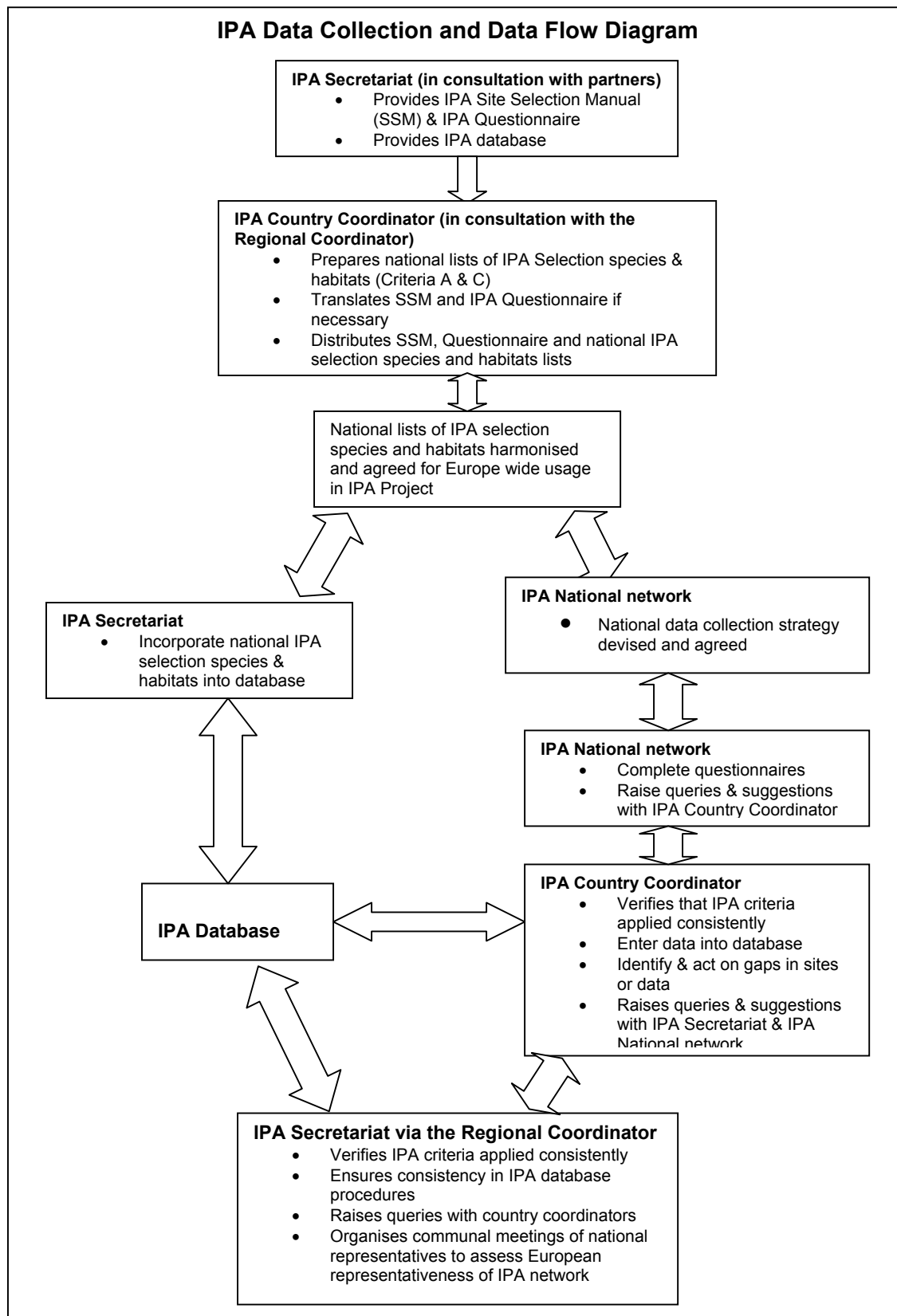
There may be situations where there is direct conflict between the requirements of different species and habitats at the site. In the case where there is a conflict of site management practice the solution should consider the survival of the IPA qualifying feature.

### **Monitoring at IPA sites**

Target 1.5 of the European Strategy requires the production of an IPA Evaluation and Monitoring Manual. Plantlife will liaise with the member organisations of the European Biodiversity Monitoring and Indicator Framework (EBMI-F) to ensure that this manual is produced.

## 6. Data Collection & Data Flow

The IPA programme will collate the wealth of dispersed information on the conservation of plants and sites throughout Europe. The following section explains the main expected channels of data flow in the IPA project.



### **National Species & Habitat Lists**

The first stage of the data flow process is for the National IPA team to identify the national list of Criterion A species and Criterion C habitats from the harmonised list provided by the Secretariat. In the case of Criterion A any additions for A(iii) or A(iv), threatened endemic or near endemic/limited range species not covered by A(i) or A(ii) should be added to the national list and sent to the Secretariat to be included in the European list. For Criterion B the national team should identify which of the EUNIS level 2 habitat types occur in their country and when the indicator species list are prepared for the different habitat types these should be sent to the Secretariat.

### **Site Selection Manual & Questionnaire**

The Site Selection Manual and questionnaire should be translated into the national language if necessary and distributed to the national IPA team and relevant conservation stakeholders.

### **Data Collection Strategy**

The data on the locations of species and habitats is held at different levels in different countries.

For species data there are three main data collection units

- Grid reference/spot location
- Grid square (e.g. 10km<sup>2</sup> or 5km<sup>2</sup>)
- Orographical unit (e.g. a large geographical unit such as an area of a mountain range, or a particular elevation of a mountain range, a delta area)

Habitat location within different country will be available in more diverse forms and will be different for different habitat types.

- European mapping projects such as CORINE land types or CORINE biotopes
- National mapping projects such as grasslands or forests
- Expert knowledge about the locations and range of habitats

At the start of the project the national IPA team should define the units of data collection available. For countries with very well mapped species data the grid reference or grid square may be the most effective unit of data collection and assessment. For countries with more diverse data units, the orographical unit may be the basic unit of data collection with more specific grid reference or grid square data included within the orographical unit. These data collection units can be used to assess and compare the locations of IPA species and habitats.

Orographical units were used as the basic unit of data collection in the Carpathian project to identify hotspots of plant diversity and then expert knowledge was used to identify sites within the orographical units. For more details of this approach see <http://www.carpathians.org>.

### **IPA Database**

The IPA database will be the main tool for collecting, analysing and disseminating data about the project. Data will be entered into the database by the country coordinators on the basis of data collected from questionnaires sent out to experts or

entered directly by the coordinator. The questionnaire mirrors the type of data that will be entered onto the database. The data will be entered into the database in English. The Secretariat will provide training for country coordinators in the use of the IPA database.

- The main types of data include individual site descriptions, the IPA species and habitats present, the land use and threats to each site, and the degree of existing protection.
- In order to save time in data entry, to prevent typing errors and to avoid duplication of entries, many fields will be pre-entered into the data, such as species names (including authorities and synonyms) and habitat types, the range of threats and land uses, protected area designations etc and these can be chosen from pull down lists on the database.
- Each IPA country coordinator enters and edits their own national IPA inventory and they will also be able to view the national inventories of other partners
- The IPA Questionnaire is intended to be circulated to relevant national experts and returned to the Country coordinator.

#### **Data Access Policy**

- The general principle of the data access policy is that IPA data should be used in all ways possible to protect the plants and habitats of Europe.
- More detailed points of data access will be agreed between the Secretariat and IPA National Partners within a data sharing agreement.
- All sites will be included in the database for web publication with responsibility for users to document and credit sources, unless there is a specific written request for site confidentiality.

#### **Site Maps**

It is essential that maps outlining the boundaries of sites at the appropriate scale are included with site reports as these will form the basis of efforts to protect the contents of IPAs. The Country Coordinator should ensure that the Secretariat has a copy of the maps in the final report.

- At present it is envisaged that the IPA database will be used to create a simple dot maps of the central point of each IPA to illustrate the distribution of IPAs across each country and across Europe
- Detailed GIS information about each site, including digitised boundaries, and interactive layers of information are desirable for each IPA. However, given the timescale, cost and expertise needed to carry this out, it is envisaged that this will form a second phase of IPA description and monitoring.

#### **Compilers of IPA Site Reports**

The names of the compilers of individual site reports will be recorded in the IPA database and should be credited in publications wherever possible and appropriate.

## **End Products**

- National Inventories compiled by IPA Country Coordinators should include a brief overview of the main conservation threats in that country, an overview of the national IPA methodology, the IPA selection species and habitats covered in the national network, the degree of protection and impacts, and the site reports and locations of national IPAs, as well as any proposed solutions to conservation problems.
- National Inventories will include a list of IPAs that are eligible for SAC selection.
- The published National IPA Inventory should be in the national language and there is no obligation to publish this in English. Site descriptions held in the database will be in English.
- A Regional Overview compiled by Secretariat in consultation with partners will provide an analysis of the main threats to plants and habitats in CEE using IPA data and any proposed solutions to the threats.
- The IPA database will be regularly updated with information about IPAs in Europe.

## 7. Proposing & Confirming IPA Sites

There are several stages in the proposal and identification of IPAs. The first stage is the collation of the best available data about the locations of threatened species and habitats, along with estimates of the percentage of the national population or area, and of data about areas of botanical richness. Additional fieldwork may be carried out where appropriate within the time and logistical constraints of the present project. These locations are proposed IPA sites. The national IPA team will assess which of these proposed sites will be confirmed as IPAs and the final list will be discussed with the Secretariat.

### Data on Proposed and Confirmed IPA Sites

- All of the criteria require a broad national overview of the locations of threatened species and habitats and of areas of botanical richness and diversity. This can only be done with the best data available and will highlight the major gap areas in research and data.
- Confirming sites as IPAs is a national decision. The Secretariat can query sites that do not appear to satisfy any of the criteria, in order to achieve agreement with the country coordinators about the status of individual sites. The European network of IPA sites should also be open to review within the IPA network of National Coordinators and the Secretariat in order to reach consensus on the best network of sites across Europe.
- The data from proposed sites will not be lost. These data can be held in the IPA database as proposed IPAs and will be available for further analysis on conservation issues. Proposed IPAs may be confirmed in future, as and when more supporting data is provided.
- This project is at the start of large scale IPA identification in Europe and the IPA process will be dynamic. When new data on threatened species and habitats becomes available these can be incorporated into the IPA system.



## Filling in the Questionnaire

The questionnaire is intended to keep a degree of consistency in the recording, description and assessment of IPAs in different countries. The questionnaire is intended to be distributed to national experts, and mirrors the information that will be entered into the database. If the site report is compiled by the National Coordinator the data can be entered directly into the IPA database. The choices of entries for land use, threats to site, ownership etc, have also been matched as far as possible with the IBA categories, in order to allow for easy comparison between the protection status and threats to IBAs and IPAs. Where it is possible to select from the list of choices rather than choosing 'other', this will greatly aid the comparative and analytical power of the database.

Also in order to be able to target the needs of future research into IPAs please indicate the quality of the data used for assessment. The following table gives more detailed explanations on the type of information required.

Questionnaire	Information needed	Notes
<b>Site Details</b>		
Country	Country where IPA is located	Indicate if site is transboundary
Biogeographic Region	Biogeographic region(s) where the site is located, choose from the 11 zones of Europe (see p. 10)	
Compiler(s)	Name(s) of site report compiler(s)	
Administrative Region(s)	Region(s) where site is located	
Administrative District	District(s) where site is located	
Site Coordinates	The central point of the site in minutes and degrees	For simple GIS mapping
Approximate area	Area of the IPA in hectares	
Area accuracy	Estimate of the accuracy of area	
Altitude Range	Minimum & maximum altitude of site in meters	
Confidential site	Tick if the location and details of the site are to be kept confidential	
<b>Ownership</b>		
What type of ownership	Choose type of ownership from list	
<b>Protected Areas</b>		
Name/Designation	Name & Designation (eg National Park, IBA, MAB site etc) the Database will contain the WCMC standard lists of protected areas types to choose from	
Area	Area of Protected area	
National/International	Tick either national or international	
Relationship to IPA	State how the IPA is related to the existing protected area – choose <b>one</b> of following – contains IPA, contained by IPA, adjacent to IPA, overlaps with IPA or unknown	
<b>Land use</b>		
Types & extents of land use on site	Choose <b>one</b> from either <b>major</b> , <b>minor</b> , an estimate of the <b>% cover</b> of a type of land use on the site or <b>unknown</b> extent – please enter for <b>every land use</b> that applies on the site	If %s are used they can add up to more than 100%, as land use types can overlap
<b>Threats to site</b>		
Types & degree of threat to the site	Put an estimate of the degree of threat to the site from the choice of threats – <b>high</b> , <b>medium</b> , <b>low</b> or <b>unknown*</b> (for guidelines on how to rank threat see below); please enter for every threat that applies on the	Threats that affect the site as a whole and IPA qualifying features specifically should be recorded.

	site	
General Habitat	Enter the EUNIS 1 or 2 habitat types. If more detailed habitat descriptions are used please enter the system used and the authority	This is for a general habitat description of the site –more detailed habitat information relating to Criteria B & C can be entered later
Habitat Level 1	Enter the name or the code for EUNIS Level 1 Habitats and <b>one</b> of either <b>major</b> , <b>minor</b> , <b>% cover</b> or <b>unknown</b> ; please enter for each Level 1 Habitat Type present on the site	If %s are used they must add up to 100%
Habitat Level 2	Enter the name or code of all EUNIS level 2 habitat types present on the site – no estimate of area necessary	
Further habitat information	If necessary enter further habitat details. Classification systems other than EUNIS may be used to describe more detailed habitat classifications, although the system and the authority must be made clear	This further level is optional for the general habitat description of the site
<b>Site Summary Account</b>		
Brief account of the main feature of the site	Enter details of the main geological features, climate, conservation issues and any species features of the site.	Please limit this description to c500 words to provide concise information for the database and the national inventory
<b>Criterion A – threatened species</b>		
Name	Name of species from the national IPA selection species list	
Abundance	Where information is present on abundance please enter <b>one</b> from the list of choices – dominant, abundant, frequent, occasional, rare, no. of individuals, or % cover (using the Braun-Blanquet % intervals for the site, <1%, 1-5%, 6-25%, 51-75%, 76-100%), unknown	
Trend	Where information is available enter <b>one</b> from the list of choices: decreasing (continuing), decreasing (past), decreasing (future), stable, increasing, fluctuating, large increase, small increase, small decrease, large decrease, unknown	
% of National Population	Where information is available enter <b>one</b> from the list of choices: major, minor, %, or unknown	
Data Quality	Enter one from list to indicate the quality of the data used to make assessments of the species at the site – <b>high</b> , <b>medium</b> , <b>low</b> or <b>unknown</b>	
Post 1990 Data available	Tick box if the data used to assess the site includes data later than 1990, either literature or fieldwork	
<b>Criterion B</b>		
Habitat Level 2	Criterion B is assessed by comparing the number of species on different sites of a particular habitat type	
No of species	Enter the number of species found in the particular level 2 habitat type	It would be difficult to include the name of every possible species in Europe in the IPA database, so at present only the number can be recorded. The indicator checklists will be published in the

		national reports and the regional overview and in the future it is hoped to include them in the IPA database
Trend (in number of species at the site)	Where information is available enter <b>one</b> from the list: decreasing (continuing), decreasing (past), decreasing (future), stable, increasing, fluctuating, large increase, small increase, small decrease, large decrease, unknown	
Data Quality	Select one from the list to indicate the quality of data used: <b>high, medium, low or unknown</b>	
Post 1990 Data	Tick if available	
<b>Criterion C</b>		
IPA Selection Habitat	Enter name or code from national list of IPA selection habitats	
Area	Indicate the area of the IPA selection habitat	
Area accuracy	Indicate the accuracy of the area assessment; select one from good, medium, poor or unknown	
Trend (in the condition of the habitat)	Choose <b>one</b> from decreasing (continuing), decreasing (past), decreasing (future), stable, increasing, fluctuating, large increase, small increase, small decrease, large decrease, unknown	
Data Quality	Select one from the list to indicate the quality of data used: <b>high, medium, low or unknown</b>	
Post 1990 data	Tick if available	
<b>Main Data Sources</b>		
References/Fieldwork Reports used to assess IPA	List the main literature sources or fieldwork reports used to assess the site	
Additional notes	List any other information about the site, such as associated fauna, research projects, etc	
Management Notes	Record any management practices that would help to conserve the site as a whole or conserve IPA qualifying species or habitats. This information should be aimed at landowners or site managers	

## Threat Assessments

To assess the degree of threat to the site or the IPA qualifying species or habitat, as high, medium or low, the following scale can be used. The score for each of the three sections (I,II & III) is added. A total score of 3,4 or 5 is a low degree of threat; a total of 6 or 7 is a medium degree of threat; a total score of 8 or 9 is a high degree of threat.

<b>I – Effect of Threat on Site or IPA species or habitats</b>	<b>Score</b>	<b>II – Spatial Scale of threat</b>	<b>Score</b>	<b>III – Realization of Threat</b>	<b>Score</b>	<b>Total Score</b>
Destruction/Extinction	3	Affects the IPA/species population/IPA habitat as a whole	3	Threat already exists	3	
Rapid deterioration	2	Affects a large part of the IPA/species population/IPA habitat, but does not threaten all parts of the site or IPA qualifying species population or habitat	2	Threat is planned with realization expected in short term	2	
Slow deterioration	1	Affects a relatively small part of the IPA/species population/IPA habitat, but is not critical for the survival of the site or the IPA qualifying species population or habitat	1	Threat is planned with realization expected in long term	1	
Total	Sum of this column		Sum of column		Sum of column	<b>Total score</b> (add column scores)

## IPA SITE QUESTIONNAIRE (SAMPLE)

Country: Country X

Biogeographic Region: Continental

Date Site Report Completed: July 2000

A Kovacs

Misty Moor

Regions A and B

Districts x, y and z

150-350 m

yes

	1,500		x	Contains IPA
	800	x		Contained by IPA
	1,000		x	Adjacent to IPA

						50%

	unknown		
			low

## IPA Site Questionnaire (Sample)

General Habitat Description of Site using EUNIS Habitat System (General only, see Criteria B & C below)

**Habitat Level 1:** (Choose from Marine (A); Coastal (B); Inland Surface Water (C); Mire bog & Fen (D); Grassland & Tall Forb (E); Heathland, Scrub & Tundra (F); Woodland & Forest (G); Inland unvegetated or sparsely vegetated (H); Regularly or recently cultivated agricultural, horticultural & domestic (I); Constructed, Industrial & other artificial habitats (J))

**Level 1 Habitat Type**

C	D				
---	---	--	--	--	--

**Cover** (please choose one from major, minor, % or unknown)

	70%				
--	-----	--	--	--	--

**Level 2 Habitats** present on site (see Level 2 Habitats sheet) (use name or code, eg C1 Surface standing waters, D1 raised & blanket bogs)

C – C1 Surface Standing water; C2 Surface Running Water

D – D1 Raised and blanket bog; D2 Valley Mires, Poor Fens & Transition mires; D4 – Base rich fens; D5 Sedge and reed beds

**Further habitat description (optional)**

**(If EUNIS classification used please indicate code – if other system than EUNIS used for more detailed habitat classification please indicate the system used and the authority)**

C1: C1.1 - Permanent oligotrophic lakes, ponds and pools

C2: C2.1- Springs, spring brooks & geysers

D1: D1. 1 Raised bogs – D1.11 Active, relatively undamaged bogs

D2: D2.3 – quaking mires – D2.38 Sphagnum and Eriophorum rafts

D4: D4.1 - Rich fens, including eutrophic tall-herb fens and calcareous flushes and soaks

D5: Sedge and Reed Beds – D5.3 Swamps and marshes dominated by [*Juncus effusus*] or other large [*Juncus*] spp.

## IPA Site Questionnaire

**Site Summary Account** (brief account of main geographical features, climate, conservation issues, special features etc, 500 words max.)

The site is one of the best preserved and largest areas of moorland in country X with a large, un-fragmented extent and a long history of biodiversity favourable management over most of the site. It contains a mosaic of different plant communities and habitat types from bog to rich fens and sedge beds and is host to variety of endangered and declining bird, mammal and invertebrate species.

**The Botanical Importance of the Site can be summarised as follows:**

The site is the largest example of continuous moorland in the country. It contains several IPA selection species, the endemics *Dactylorhiza bohemica* and *Pinguicula bohemica*, and the Bern convention species *Ligularia sibirica* is particularly abundant here. The site also contains 33 other species listed as threatened in national red lists.

**The Conservation Issues at the Site:**

A motorway is due to be built through most of the eastern quarter of the site, which contains the main population of the threatened endemic *Pinguicula bohemica*. Protests have been made and it is still hoped that the motorway may be rerouted.

Water extraction at the western and central edge of the site is a recurrent problem although recent legislation has helped to limit the effects

Peat extraction was formerly a major threat to the western edge of the site but the increased protection of the site has limited this threat.

There are plans to build a hotel and carting track on the southern edge of the site and it is still unclear how much the site will be affected by this development





**IPA Site Questionnaire continued**

.....	14	unknown	good	x
.....	28	unknown	good	x
.....	17	unknown	good	x
.....				

.....	500	good	stable	good	x
.....					
.....					
.....					

**Notes (especially on quality of habitat)**

This is a particularly well preserved example with a long history of good management and detailed research, although the threats to the site are increasing.

## IPA Site Questionnaire (Sample)

### Main Data Sources:, e.g. publications or fieldwork reports

Kovacs & Kovacs 1999 – Botanical Field survey report of Misty Moor. Institute of Botany X Field Reports  
Gellerman, 1992 – The fen flora of Misty Moor. Science Publishing House, X

### Additional Notes about site (such as any associated faunal interest at the site, any research projects associated with the site, etc)

The site is also extremely important for birds and there is a RAMSAR and an IBA site in the area. The site has been extensively studied by the Institute of Botany in X and is the subject of a current PHD thesis on vegetation history in the region. There is also a well documented range of butterfly and herpetological species at this site.

### Management Notes

The Northern part of the site has old drainage ditches, which need to be dammed and checked at regular intervals.

## FAQ's (Frequently Asked Questions)

**1. Do I need to apply all the criteria to select an IPA?**

No, an IPA can be selected if any one of the criteria applies to the site and all criteria have equal weight in selecting IPAs.

**2. Can I apply more than one criterion to an IPA site?**

Yes, and when it is possible to identify sites that include many IPA qualifying features this is a good method of focussing conservation and management efforts.

**3. Are algae, mosses, liverworts, lichens, (lower plants) and fungi included in the IPA project?**

Yes

**4. Will it be clear on what criterion/criteria an IPA has been selected?**

Yes, for each IPA the qualifying criteria will be published.

**5. How are endemic and near endemic/limited range species incorporated into the IPA system?**

Endemic or near endemic/limited range species with a recognised threat (global, European or national) can be selected using criterion A. Lower threat endemic or near endemic/limited range species can be incorporated as indicators of richness in criterion B

**6. Why are there thresholds for the criteria?**

The IPA project is intended to identify the most important areas for plants to focus conservation action, this leads to a need to have some form of threshold for identifying priority sites in order to focus conservation action.

**7. Why are the population thresholds for Criterion A based on national figures, the IBA criteria rely on global estimates?**

It is unlikely that there will be accurate data for global population estimates of plant populations for many species, and even national population estimates will be extremely difficult for many species. The data that are available, are generally held at the national level.

**8. Why is the threshold for Criterion C, threatened habitats, based on area?**

The reason that area was included as a primary selecting factor was to ensure that the largest examples of continuous habitat types are included in the IPA network. However, there is potential to use other factors such as quality of habitat and diversity in selecting IPAs under criterion C.

**9. Criterion B is only helpful for plant communities that are rich by nature?**

No, Criterion B compares richness at the habitat level, thus peat bogs are only compared with peat bogs, and broad leaved deciduous forests are only compared with broad leaved deciduous forests.

**10. Criterion C is a last resort for sites that do not qualify under criteria A or B?**

No, Criterion A & C are designed to include the very specific range of threatened species and habitats recognised at the Global and European level. Criterion B is designed to capture the important plants areas not

covered by this narrow range of recognised threat, such as diversity in more common plants and the inclusion of a wider range of habitats than recognised in existing legislation.

**11. What happens to areas not selected as IPAs?**

The IPA inventory list in 2004/5 is not intended to be a definitive or closed list. The IPA process is dynamic and will respond to new data on species and habitats as it becomes available. Data can be collected on proposed or potential IPAs and stored in the database at any time.

**12. What will the IPA data be used for?**

The IPA data will be used to support, inform and underpin existing conservation legislation and to inform and lobby for more general conservation policies such as agricultural schemes. Finally the IPA programme will help to identify new directions in conservation priorities at the national and European level through the process of identifying and protecting IPAs.

## Appendix 1: Sources for Criterion A

Category	Description	Accepted categories: vascular plants	Published lists: Vascular Plants	Accepted categories: lower plants & fungi	Published lists: lower plants & fungi
A (i)	<b>Globally threatened</b>	All plant species in IUCN global red lists in categories <b>CR, EN, VU</b> of the <b>new</b> IUCN criteria and <b>EX/E, E</b> or <b>V</b> in the <b>original</b> IUCN categories	<b>New IUCN categories:</b> <i>The World List of Threatened Trees</i> (Oldfield et al. 1998)  <b>Original IUCN categories:</b> <i>1997 IUCN Red List of Threatened Plants</i> (Walter & Gillett, 1998)	All species from a global list of IUCN new categories <b>CR, EN, V</b> or original IUCN categories <b>EX/E, E</b> or <b>V</b> .	Currently there are no known global lists for most lower plants or fungi  A global Red list for lichens is under construction by the IAL and SSC (IUCN)
A (ii)	<b>Regionally threatened (European)</b>	All plant species in recognised European red lists in IUCN new categories <b>CR, EN, VU</b> or <b>EX/E, E</b> or <b>V</b> in the <b>original</b> IUCN categories  All plants species on EU Habitat Directive Annexes IIb & IVb  All plant species on the Bern Convention Appendix I	European Red List (when an IUCN approved IUCN Red list is available for Europe this will be incorporated into the IPA system)  Published annexes (website 2002) (IIb & IVb) of Habitats Directive plus amendments from accession countries when they are added  Published appendix I (website 2002) of Bern Convention	All species of bryophytes, fungi, lichens or algae from recognised <b>European</b> lists in new IUCN categories <b>CR, EN, VU</b> or original categories <b>EX/E, E</b> or <b>V</b>  All bryophytes on Annex IIb of Habitats Directive  All bryophytes and algae on Appendix I of Bern Convention	<i>Red Data Book of European Bryophytes</i> (Schumaker & Martiny, 1995)  <i>'Datasheets of threatened mushrooms of Europe, candidates for listing on Appendix I of the Bern Convention'</i> (Koune, 2001 in ECCF & JEC, 2001) Document T-PVS (2001) 34  Published annex IIb (website 2002) of Habitats Directive (bryophyte species 29 + 2 for Macaronesia)  Published appendix I (website 2002) of Bern Convention (algae 12 species, all Mediterranean; bryophytes 22 species + 3 for Macaronesia)

Category	Description	Accepted categories: vascular plants	Published lists: Vascular Plants	Accepted categories: lower plants & fungi	Published lists: lower plants & fungi
A (ii) continued	<b>Regionally threatened (European) cont..</b>				Red list of European Macrolichens by Serusiaux 1989  Charophytes (Nick Stewart is currently initiating a European Charophyte red list project)
A (iii)	National <b>endemics</b> (endemics with their population range entirely within one country) <b>with demonstrable threat status</b> , not covered by A(i) or A(ii)	IUCN, new categories <b>CR, EN</b> , or <b>VU</b> , and original <b>EX/E, E</b> or <b>V</b> in the <b>original</b> IUCN categories recognised <b>national</b> red book lists	National red books for vascular plants exist in all the participating countries in CEE	New IUCN categories <b>CR, EN</b> , or <b>VU</b> , and original categories <b>Ex/E, E</b> or <b>V</b> in recognised <b>national</b> Red lists.	National red books for lower plants and fungi exist in some of the participating countries in CEE
A (iv)	<b>Near endemics</b> (ie range limited to 2/3 countries or where one country holds more than 50% of the global population) <b>with demonstrable threat status</b> , not covered by A(i) or A(ii)	New IUCN categories <b>CR, EN</b> , or <b>VU</b> , and original <b>EX/E, E</b> or <b>V</b> in the <b>original</b> IUCN categories recognised <b>national</b> red book lists	National red books for vascular plants exist in all the participating countries in CEE	New IUCN categories <b>CR, EN</b> , or <b>VU</b> , and original categories <b>Ex/E, E</b> or <b>V</b> in recognised <b>national</b> red book lists	National red books for lower plants and fungi exist in some of the participating countries in CEE

## Appendix 2: EUNIS Level 2 Habitat Types

EUNIS Level 1 (Habitat Description)		EUNIS Level 2 Habitat Description	EUNIS Level 1 (Habitat Description)		EUNIS Level 2 Habitat Description
<b>A : MARINE HABITATS</b>	<b>A1</b>	Littoral rock and other hard substrata	<b>F : HEATHLAND, SCRUB AND TUNDRA HABITATS</b>	<b>F1</b>	Tundra
	<b>A2</b>	Littoral sediments		<b>F2</b>	Arctic, alpine and subalpine scrub habitats
	<b>A3</b>	Sublittoral rock and other hard substrata		<b>F3</b>	Temperate and mediterraneo-montane scrub habitats
	<b>A4</b>	Sublittoral sediments		<b>F4</b>	Temperate shrub heathland
	<b>A5</b>	Deep-sea bed		<b>F5</b>	Maquis, matorral and thermo-Mediterranean brushes
	<b>A6</b>	Isolated oceanic features: seamounts, ridges and the submerged flanks of oceanic islands		<b>F6</b>	Garrigue
	<b>A7</b>	Pelagic water column		<b>F7</b>	Spiny Mediterranean heaths (phrygana, hedgehog-heaths and related coastal cliff vegetation)
	<b>A8</b>	Ice-associated marine habitats		<b>F8</b>	Thermo-Atlantic xerophytic habitats
<b>B : COASTAL HABITATS</b>	<b>B1</b>	Coastal dune and sand habitats	<b>F9</b>	Riverine and fen scrubs	
	<b>B2</b>	Coastal shingle habitats	<b>FA</b>	Hedgerows	
	<b>B3</b>	Rock cliffs, ledges and shores, including the supralittoral	<b>FB</b>	Shrub plantations	
<b>C : INLAND SURFACE WATER HABITATS</b>	<b>C1</b>	Surface standing waters	<b>G : WOODLAND AND FOREST HABITATS AND OTHER WOODLANDS</b>	<b>G1</b>	Broadleaved deciduous woodland
	<b>C2</b>	Surface running waters		<b>G2</b>	Broadleaved evergreen woodland
	<b>C3</b>	Littoral zone of inland surface water bodies		<b>G3</b>	Coniferous woodland
<b>D : MIRE, BOG &amp; FEN HABITATS</b>	<b>D1</b>	Raised and blanket bogs		<b>G4</b>	Mixed deciduous and coniferous woodland
	<b>D2</b>	Valley mires, poor fens and transition mires		<b>G5</b>	Lines of trees, small anthropogenic woodlands, recently felled woodland, early-stage woodland and coppice
	<b>D3</b>	Aapa, palsa and polygon mires	<b>H : INLAND UNVEGETATED OR SPARSELY VEGETATED HABITATS</b>	<b>H1</b>	Terrestrial underground caves, cave systems, passages and waterbodies
<b>D4</b>	Base-rich fens	<b>H2</b>		Screes	
<b>D5</b>	Sedge and reedbeds, normally without free-standing water	<b>H3</b>		Inland cliffs, rock pavements and outcrops	
<b>E : GRASSLAND AND TALL FORB HABITAT</b>	<b>E1</b>	Dry grasslands		<b>H4</b>	Snow or ice-dominated habitats
	<b>E2</b>	Mesic grasslands		<b>H5</b>	Miscellaneous inland habitats with very sparse or no vegetation
	<b>E3</b>	Seasonally wet and wet grasslands		<b>H6</b>	Recent volcanic features
	<b>E4</b>	Alpine and subalpine grasslands	<b>I : CULTIVATED, AGRICULTURAL DOMESTIC HABITATS</b>	<b>I1</b>	Arable land and market gardens
	<b>E5</b>	Woodland fringes and clearings and tall forb		<b>I2</b>	Cultivated areas of gardens and parks
	<b>E6</b>	Inland saline grass and herb-dominated habitats			
	<b>E7</b>	Sparsely wooded grasslands			

### Appendix 3: Centres of Plant Diversity in Europe

Centres of Plant Diversity & Endemism (by Country) (WWF/IUCN 1994, 48)

<b>ANDORRA</b>		<b>HUNGARY</b>		<b>RUSSIA</b>
Eu10. Pyrenees		Eu20 Carpathians		Eu21 South Crimea Mountains & Novorossia
<b>AUSTRIA</b>		<b>IRELAND</b>		<b>SERBIA</b>
Eu.11 Alps		Eu22 Burren		Eu14 Balkan & Rhodope Mountains
<b>BULGARIA</b>		<b>ITALY</b>		<b>SLOVENIA</b>
Eu14 Balkan & Rhodope Mountains		Eu11 Alps		Eu11 Alps
<b>BYELORUSSIA</b>		Eu12 Appennini & Alpe Apuane		<b>SPAIN</b>
Eu24 Białowieża Forest		Eu13 Tyrrhenian Islands: Sardinia, Sicily & offshore islands		Eu4 Baetic & Sub-Baetic Mountains (Spain)
<b>CYPRUS</b>		<b>LIECHTENSTEIN</b>		Eu 5Guadalquivir Estuary & Coto Donaña (Spain)
Eu18 Troodos		Eu11 Alps		Eu6 Sierra de Gredos & Sierra de Guadarrama (Spain)
<b>CZECH REPUBLIC &amp; SLOVAKIA</b>		<b>LITHUANIA</b>		Eu7 Massifs of Gudar & Javalambre (Spain)
Eu20 Carpathians		Eu24 Białowieża Forest		Eu8 Picos de Europa (Spain)
<b>FRANCE</b>		<b>POLAND</b>		Eu9 Islas Baleares (Spain)
Eu10 Pyrenees		Eu20 Carpathians		Eu10 Pyrenees
Eu11 Alps		Eu24 Białowieża Forest		<b>SWEDEN</b>
Eu13 Tyrrhenian Islands: Corsica		<b>PORTUGAL</b>		Eu23 Öland & Gotland
<b>GERMANY</b>		Eu1 Peneda-Gêres		<b>SWITZERLAND</b>
Eu11 Alps		Eu2 Serra da Estrêla		Eu11 Alps
<b>GREECE</b>		Eu3 Algarve		<b>UKRAINE</b>
Eu14 Balkan & Rhodope Mountains		<b>ROMANIA</b>		Eu20 Carpathians
Eu15 Mount Olympus (Thessalian Olympus)		Eu19 Danube Delta		Eu21 South Crimea Mountains & Novorossia
Eu16 Mountains of Southern & Central Greece		Eu20 Carpathians		



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**See also Appendix 1 for References to Threatened Plants and Habitats**

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