



**PRODUCTION OF THE LIST OF SPECIES AND HABITATS
CONSIDERED TO BE OF PRINCIPAL IMPORTANCE FOR
THE PURPOSE OF CONSERVATION OF BIODIVERSITY IN
SCOTLAND**

**(THE SCOTTISH BIODIVERSITY LIST)
EXECUTIVE SUMMARY**

November 2005



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1 EXECUTIVE SUMMARY

This report summarises how the list of species and habitats of principal importance for the conservation of biodiversity in Scotland (the Scottish Biodiversity List) has been produced, the species and habitats identified through the selection process, and how the List will be used.

1.1 Purpose and use of the Scottish Biodiversity List

The Scottish Biodiversity List has been developed to meet the requirements of Section 2 (4) of the Nature Conservation (Scotland) 2004 Act for the conservation of biodiversity. This legislation requires Scottish Ministers to publish lists of species of flora and fauna and habitats considered to be of principal importance for the purposes of biodiversity. The list must be published within one year of designation of the Scottish Biodiversity Strategy, which was designated on 1st January 2005.

The List will be used to guide decision-makers such as public bodies, including local authorities, in implementing their duty to further the conservation of biodiversity in Scotland, when carrying out their normal function. For example, the Scottish Executive will use the List in Land Management Contract work, Scottish Natural Heritage will use it in the development of Species Framework, it may be used as an assessment tool for Strategic Environmental Assessment.

1.2 Development of criteria

The first stage in the production of the Scottish Biodiversity List was the development of the set of criteria to identify species and habitats of 'principal importance' for the conservation of biodiversity. The Scottish Executive appointed a consultant, Scott Wilson, to undertake this task, under the direction of a Steering Group, comprising members of the Action Plan and Science Group (APSG) of the Scottish Biodiversity Forum (SBF).

It was agreed that the identification of species and habitats of principal importance for the conservation of biodiversity must be transparent, repeatable, and based on sound science, acknowledging that this may be influenced by social perception and practicalities of conservation. In accordance with this principle, a number of draft scientific and social criteria, as well as exclusion criteria to screen out unsuitable species and habitats, were developed. The draft criteria were modified slightly, following discussion with the APSG List sub group in April 2005 and the final list of agreed criteria (summarised in Table 1 below) was approved by Ministers in May 2005. These criteria have been used to generate the Scottish Biodiversity List contained within this report.

Scientific criteria have been grouped into three categories for the purposes of application – terrestrial and freshwater species, terrestrial and freshwater habitats, and marine species and habitats.



Table 1. Criteria for identification of species and habitats of principal importance.

Ref.	Criterion
Terrestrial and freshwater species	
S1	All UK priority species that are present in Scotland.
S2	Species for which Scotland, through the UK, has international obligations to safeguard.
S3	All species defined as nationally rare at a GB or UK level, which are present in Scotland.
S4	Species with populations present (resident, wintering or breeding) in five or fewer ten km squares or sites in Scotland.
S5	Species present in Scotland for which a decline of 25% or more in abundance or range (defined by number of sites where appropriate) has occurred in Scotland over the last 25 years or other appropriate time period.
S6a	All species that are endemic to Scotland.
S6b	Any sub-species or race that is widely recognised and accepted by the scientific (or other relevant community) and that is endemic to Scotland, if it also meets one of the other scientific criteria.
Terrestrial and freshwater habitats	
H1	All UK priority habitats that are present in Scotland.
H2	Natural and semi-natural habitats that are rare in Scotland (represented at less than ten sites or five ten km squares).
H3	Natural and semi-natural habitats that are known to be particularly important for supporting assemblages of plant or animal groups that are data deficient, such as fungi, bryophytes, lichens, algae, invertebrates.
H4	Natural and semi-natural habitats that are unique to Scotland within the UK.
Marine species and habitats	
M1	All marine habitats and species included on the priority list for the UK, and which are present in Scotland.
M2a	Species that are rare in Scottish waters, where rarity is assessed as species that occur in less than six (c. 1%) of the total number of ten km squares or less than three (c. 5%) of the ICES rectangles. A mobile species qualifies as nationally rare if the total population size is known, inferred or suspected to be fewer than 250 mature individuals. Vagrant species should not be included under this criterion.
M2b	Habitats that occur in six or fewer locations in Scottish waters.
M3	Habitats that are known to be particularly important for supporting marine plant and animal assemblages that are data deficient.
M4	An observed, estimated, inferred or suspected significant decline (exceeding expected or known natural fluctuations) in numbers, extent or quality of a marine habitat or species in Scotland (for species, quality relates to life history parameters). Significant decline should be assessed as 25% reduction of area or numbers, or other appropriate threshold (which must be stated and justified).
Social	
SO1	Non-domestic species, and habitats, identified as important by the Scottish public.

Ref.	Criterion
Exclusion	
E1	Escaped or introduced species that are not known historically to be naturally occurring in Scotland should be excluded from the list unless they are of recognised conservation value.
E2	Species, habitats and species groups should be excluded where data are insufficient to allow rigorous application of at least one of the scientific criteria. These data deficient groups, species and habitats will appear in an appendix.

1.3 Application of criteria

Specialist coordinators compiled the List (shorter) and the consultants were responsible for overall coordination, rationalising lists and addressing any groups of species or habitats not covered by the specialists.

The primary information sources used in this project were electronic databases and published data. The main sources were therefore the UK Biodiversity Action Plan (BAP), Scottish Natural Heritage reports, the National Biodiversity Network website, the Marine Life Information Network (Marlin) and the Marine Nature Conservation Review, species atlases and other published reference documents.

Data availability varied between groups. For example, high quality data were widely available for birds, vascular plants and lichens, whereas spiders, beetles and many freshwater invertebrates are considered to be under-recorded in Scotland. There were particular problems with data deficiencies for many marine species and habitats.

In applying the criteria, it was necessary to make certain assumptions for practical purposes. The criteria were applied only to species that are naturally occurring in Scotland. They were not applied to agricultural animals, domestic breeds or bacteria and viruses. At a general level, it was accepted that the criteria would be applied to each group only if sufficient data were available to ensure confidence in the robustness of the results. For example, many of the groups of terrestrial invertebrates and marine species are widely accepted to be under-recorded in Scotland, making it impossible to apply criteria relating to populations and declines with confidence. Where current best knowledge has been used to assess whether an under-recorded species would be considered to be rare enough to meet the criteria, this has been recorded.

The Exclusion criteria, E1 and E2, were applied to all species and habitats identified by the scientific and social criteria. Within the wording of E2, all species, habitats and groups can be assessed rigorously against criteria S1, H1 and M1 (whether it is a UK priority), making this criterion redundant. E2 was applied to the criteria on population size and declines, as well as the social criterion, but not to the presence on a UK list, or international obligations, i.e. no species on the UK list and present in Scotland was excluded, even if the population data were deficient.

A questionnaire was used to investigate the social criteria, SO1, and the top ten animals, plants and habitats were selected for inclusion on the List. The survey covered the full demographic range of Scotland across the whole of Scotland.

Habitats assessed under the scientific criteria were described using the National Vegetation Classification system.

1.4 Summary of the Scottish Biodiversity List

1,806 terrestrial and freshwater species (including 61 endemic species), 177 terrestrial and freshwater habitats, and 197 marine species and habitats were identified for inclusion on the Scottish Biodiversity List through the application of the criteria. This gives a combined total of 2,180 species and habitats. The species and habitats identified for inclusion on the List are summarised in Table 2, and Table 3 summarises the number of species and habitats selected under each criteria. It can be seen that many species and habitats qualified under more than one criteria.

Table 2. Summary of species and habitats identified for inclusion on the Scottish Biodiversity List.

Category	Group	Number
Terrestrial and freshwater species	Mammals	20
	Herpetofauna	3
	Birds	93
	Terrestrial Invertebrates	207
	Aquatic Invertebrates	82
	Fish	10
	Vascular Plants	236
	Bryophytes	208
	Charophytes	8
	Fungi	156
	Slime moulds	20
	Lichens	523
	Algae	240
Terrestrial and freshwater habitats	Not NVC*	9
	Woodland (W)	20
	Mires (M)	29
	Heaths (H)	16
	Upland grassland and montane (U)	15
	Calcareous grassland (CG)	7
	Mesotrophic grassland (MG)	7
	Swamp and Fen (S)	6
	Other (OV)	1
	Aquatic (A)	19
	Sand dune (SD)	19
	Saltmarsh (SM)	18
	Maritime (MC)	11
Marine species and habitats	Marine mammals	18
	Marine reptiles	4
	Marine fish	17
	Marine invertebrates	66
	Marine algae	4
	Marine habitats	88

*Several habitats that are not part of the National Vegetation Classification were included on the habitats list. Parks and playing fields and gardens were included under the social criterion, which consisted of general habitat categories. Other habitats are of importance for species on the list, or for their potential to

support species or groups that are under-recorded and are included on the data deficient list. The important habitats include, e.g. submerged tree roots and unvegetated substrates (which are important for a range of aquatic invertebrate species) and lichen heath.

Table 3. Summary of the number of species and habitats selected under each criteria.

Category	Criteria	No. species/ habitats qualifying solely on this criteria	Total number of species/ habitats qualifying under the criteria
Terrestrial and freshwater species	S1 – UK BAP	33	190
	S2 – International obligation	118	220
	S3 – Nationally Rare (UK)	300	1163
	S4 – Rare in Scotland	295	1170
	S5 – Decline	64	117
	S6a – Endemic species	9	61
	S6b – Endemic subspecies	0	9
	Social	11	45
Terrestrial and freshwater habitats	H1 – UK BAP	79	118
	H2 – International obligation	2	11
	H3 – Nationally Rare (UK)	41	88
	H4 – Rare in Scotland	0	17
	Social	2	(177)*
Marine species and habitats	M1 – UK BAP	84	107
	M2a – Rare species	64	73
	M2b – Rare habitats	0	5
	M3 – Important habitats	20	23
	M4 – Decline	2	12
	Social	0	106

*The social criterion habitats were broad and generic, in keeping with the expected level of knowledge of the respondents. All of the NVC communities that are listed on the Scottish Biodiversity List fall into the broad categories identified from the social survey.

The ‘top ten’ animals, plants and habitats identified through the social survey are summarised in Table 4 below. These 30 species and habitats have been incorporated into the List, some supported by scientific criteria, others not (see Table 3 above). It is notable that the types of animals and plants that were selected as most important are those that are often used to represent Scotland, such as deer, golden eagle, wild salmon, heather and thistle.

The statistical limits of the survey mean that if it were repeated, several other species, including capercaillie, wildcat, sea eagle and red grouse might move into the top ten, replacing, for example, robin, butterfly or otter.

Table 4. 'Top ten' socially important species and habitats.

No.	Top ten animals	Top ten plants	Top ten habitats
1	Red deer or roe deer	Heather	Hills and mountains
2	Red squirrel	Scots pine	Lochs
3	Golden eagle	Bluebell/harebell	Woodland
4	Dolphin, porpoise or whale	Oak	Beaches
5	Wild salmon	Thistle	Rivers and streams
6	Badger	Rowan	Parks and playing fields
7	Osprey	Scottish primrose	Coast
8	Otter	Poppy	Gardens
9	Butterfly	Ferns	Farmland
10	Robin	Orchid	Open sea

1.5 Publication of the Scottish Biodiversity List

The Scottish Biodiversity List will be published on the Biodiversity Scotland website, with links to the National Biodiversity Network (NBN). This will allow searching of the List by species, broad habitat categories and geographical location (place or local authority area). This presentation has been chosen to provide accessibility for a wide audience of specialists, public bodies, enthusiasts and others.

1.6 Discussion

Almost all contributors and consultees expressed the view than the timescales for the project were too short and they would have preferred longer for the project; to review species and habitats, to allow for even wider consultation, and for more discussion and interpretation of the results and the performance of the criteria.

Problems with lack of data were encountered for many groups of species and habitats. This was particularly an issue with assessing declines over 25 years, as many species simply do not have reliable records over this time period. The possible exception to this is the birds, where population trend data are widely published in the UK.

In addition to the Scottish Biodiversity List, lists of data deficient and extinct species were produced during the project. Some species that appear on the Scottish Biodiversity List by virtue of their UK BAP status are nonetheless data deficient in terms of population and declines in a Scottish context. The data deficient list could be a valuable tool for highlighting groups and species that require further research. The extinct list is for reference and would be considered against the criteria if the species were re-discovered. It is not clear at this stage whether the reintroduction of a species would qualify it for inclusion on the List, but the inclusion of a number of species that have been re-introduced such as red kite may set a precedent.

It is recommended that the Scottish Biodiversity List is reviewed on a five-yearly cycle, consistent with many Biodiversity Lists and Action Plans. In order to bring this review process in line with the reviews of the UK BAP, it is recommended that some updating is carried out in 2006/2007, to incorporate any changes due to the review of the UK BAP, which is due to be published in 2006. A full review of the Scottish List could be carried out at five-year intervals thereafter.