Fourth Quinquennial Review
of Schedules 5 and 8
of the Wildlife and Countryside Act, 1981

Report and Recommendations from the
Joint Nature Conservation Committee

September 2002

CONTENTS

Executive summary

1 This report by the Joint Nature Conservation Committee contains advice to Government following the Fourth Quinquennial Review of Schedules 5 and 8 of the Wildlife and Countryside Act, 1981, which list protected animals and plants respectively.

2 The report recommends increased protection for one species (Water Vole, to become fully protected), partial protection for one species (Roman Snail), and full protection for seven marine fish (two Seahorses and five elasmobranchs) and two Burnet moths (the Narrow-bordered Five-spot Burnet (or Talisker Burnet) and the Slender Scotch Burnet). The Roman Snail is collected for food, the Seahorses are collected for sale and display and the elasmobranchs are largely caught as bycatch (with a small fishery known for Common Skate). Evidence has recently been obtained that two rare Burnet moths in Scotland have been collected excessively for sale. The case for protecting species that have a commercial value is likely to affect those who currently exploit these animals.

3 The Joint Nature Conservation Committee does not recommend the removal of any species from either Schedule 5 or Schedule 8.

4 During the consultation for the Fourth Quinquennial Review, respondents also raised important general issues concerning the operation of species protection under Part I of the Wildlife and Countryside Act, 1981. These points will be followed up separately by the Head of Species Advice, Dr Ian McLean, but are not addressed in this report because they fall outside the remit of the Quinquennial Review process. Organisations consulted as part of the Quinquennial Review are listed on Appendix 1.

4 This is the first Quinquennial Review of Schedules 5 and 8 when the advice submitted by the Joint Nature Conservation Committee goes to devolved administrations as well as to DEFRA. Currently, Part I of the Wildlife and Countryside Act, 1981 applies to England, Scotland and Wales for the protection of endangered species, with new wildlife legislation planned for Scotland at the time this report was finalised.

5 It is anticipated that following previous practice, the Departments will consult widely in due course on the recommendations to amend Schedules 5 and 8. This would be prior to laying the necessary Orders before Parliaments, to make those changes that are approved by Ministers after these departmental consultations.

FOURTH QUINQUENNIAL REVIEW OF SCHEDULES 5 AND 8 OF THE WILDLIFE AND COUNTRYSIDE ACT, 1981

1. The statutory basis of Quinquennial Reviews

Schedules 5 and 8 of the Wildlife and Countryside Act, 1981 list animals (other than birds) and plants which are specially protected. Under Section 22 of the Act, the Secretary of State may, by order, add any animal (other than a bird) to Schedule 5 or any plant to Schedule 8 when one or both of the following circumstances apply:

i. in his opinion, the animal or plant is in danger of extinction in Great Britain or likely to become so endangered unless conservation measures are taken;

ii. for the purpose of complying with an international obligation.

Conversely, the Secretary of State may remove any animal from Schedule 5 or any plant from Schedule 8, if, in his opinion, it is no longer endangered or likely to become so.

1.2 The protection afforded by the Act to animals and plants listed on Schedules 5 and 8 extends throughout Great Britain unless otherwise specified, and to adjacent territorial waters, which currently extend 12 miles out to sea. The Secretary of State may apply all or only some of the relevant provisions of the Act to animals and plants listed on the Schedules and may limit the protection afforded to certain times of the year or to particular areas of Great Britain. The provisions relate to a range of activities as summarised in the following sections 1.1.3 to 1.1.6.

1.3 For animals the provisions under Section 9 of the Act are:

Section 9(1)

Killing, injuring or taking

Section 9(2)

Possession

Section 9(4)

a. damaging or destroying any structure or place used for shelter or protection, or obstructing access to this structure or place;

b. disturbing animals while they are occupying structures or places used for shelter or protection.

Section 9(5)

a. selling, offering or exposing for sale, possessing for the purpose of sale, or transporting for the purpose of sale;

b. publishing, or causing to be published, any advertisement offering to buy or sell.

1.4 For plants the provisions under Section 13 of the Act are:

Section 13(1)(a)

Picking, uprooting or destroying

Section 13(2)

a. selling, offering or exposing for sale, possessing for the purpose of sale, or transporting for the purpose of sale;

b. publishing, or causing to be published, any advertisement offering to buy or sell.

1.5 Activities under Sections 9(2), 9(5) and 13(2) apply to live individuals, dead specimens or derivatives. All wild plants are protected under Section 13(1)(b) of the Wildlife and Countryside Act against deliberate uprooting by unauthorised persons, but additional protection is afforded through scheduling.

1.6 Part of the protection conferred on species listed on Schedules 5 and 8 is a consequence of the legal requirement to avoid the unnecessary killing, injury, destruction etc of protected wild animals and plants by organisations or individuals undertaking or authorising activities which might have this result. Public authorities have to comply with this requirement in their administrative decisions e.g. planning decisions.

1.7 Under Section 24 of the Wildlife and Countryside Act the Nature Conservancy Council (NCC) was required, five years after the passing of the Act in 1981 and every five years thereafter, to review Schedules 5 and 8 and to advise the Secretary of State whether in its opinion any animal or plant should be added to or removed from the Schedules. The NCC was also empowered to make such recommendations at any time, outside the constraints of the five-yearly reviews. Recommendations were to be accompanied by a statement of the reasons which led to the advice. Under Section 133 of the Environmental Protection Act, 1990, the Joint Nature Conservation Committee (JNCC) became responsible for discharging these functions. Species currently included on the Schedules are listed on Appendix 2.

1.8 Following adoption of the EC Habitats and Species Directive, analogous protection was afforded to certain wild animals and plants through the Conservation (Natural Habitats etc) Regulations, 1994. The species receiving such protection are listed on Appendix 3.

2. Previous Quinquennial Reviews

2.1 In accordance with Section 24 of the Wildlife and Countryside Act 1981, the Nature Conservancy Council and, subsequently, the Joint Nature Conservation Committee have carried out successive reviews of Schedules 5 and 8. The first of these Reviews was submitted in October 1986, the second in October 1991, and the third in June 1996.

2.2 In total, these Reviews have together recommended additional protection for 83 animals and 121 plants, lichens and fungi, and have recommended reduced protection for 7 species.

2.3 The recommendations submitted during the first three Quinquennial Reviews have all been implemented through Orders made under Section 22 of the 1981 Act, except for the following:

i. the proposed deletion of the sandbowl snail *Catinella arenaria* from Schedule 5 was rejected as there were doubts whether it was extinct;

ii. the proposed addition of the wildcat/domestic cat hybrid was rejected;

iii. the proposed addition of the pool frog was rejected due to the extinction of the single native population of this species.

2.4 In addition, a further 5 plant species were added to Schedule 8 on the recommendation of the Department of the Environment, because, although not endangered in Great Britain, they were listed on Appendix 1 of the Bern Convention.

3. Statutory changes since the Third Quinquennial Review

3.1 By reason of Section 53 of the Scotland Act 1998, functions such as the making of Orders changing Schedules 5 and 8, as regards Scotland, are now exercisable by Scottish Ministers. In Wales, the National Assembly for Wales (Transfer of Functions) Order 1999 transferred such Order-making powers, as regards Wales, to the National Assembly for Wales.

3.2 Section 81 of the Countryside and Rights of Way Act 2000 amended Section 9 of the Wildlife and Countryside Act 1981, as regards England and Wales, by making it an offence for any person intentionally or recklessly to disturb a dolphin, whale or basking shark.

3.3 Section 81 of the Countryside and Rights of Way Act 2000 also changed the penalty provisions for offences committed under Sections 9 and 13 of the Wildlife and Countryside Act 1981, in England and Wales. A person guilty of an offence under these sections is now liable on summary conviction to imprisonment for a term not exceeding six months or to a fine not exceeding level 5 on the standard scale, or to both.

3.4 In addition, Section 74 of the Countryside and Rights of Way Act 2000 requires the Secretary of State, in England, and the National Assembly for Wales, in Wales, to publish a list of living organisms and types of habitat which in their opinion are of principal importance for the purpose of conserving biological diversity in accordance with the Convention on Biological Diversity. It is the duty of the listing authority to take, or promote with others to take, reasonably-practical action to further the conservation of listed organisms or habitats.

3.5 Notwithstanding the foregoing, the legislation requiring JNCC to undertake the Quinquennial Review of Schedules 5 and 8, and also the nature of that Review remains unchanged.

4. Criteria for the selection of species for Schedules 5 and 8 of the Wildlife and Countryside Act, 1981

4.1 Rationale underlying scheduling

In compliance with the purpose and provisions of the relevant Sections of the Wildlife and Countryside Act 1981, the statutory nature conservation agencies will pursue scheduling when:

i. there is an international obligation to afford to the species legal protection;

ii. an animal or plant is in danger of extinction in Great Britain, or is likely to become so endangered unless conservation measures are taken, and legal protection is likely to improve its chances of survival.

Scheduling is considered to be particularly appropriate where there is a need to:

iii. protect an animal or plant species from direct human pressure such as persecution, collection or trade;

iv. protect elements of habitat essential for the survival of an endangered species.

Scheduling also has the effect of raising awareness of the threats to species and thus the need for their protection.

4.2 Guidelines for recommending species for scheduling

Range of taxa under consideration

For Schedule 5 - vertebrates other than birds, invertebrates.

For Schedule 8 - vascular plants, bryophytes, lichens, fungi and algae.

All species of the groups listed above, including species at present on the schedules.

Taxa below species level under some circumstances (see 'Eligibility criteria').

Eligibility criteria

For a species to be recommended for scheduling one of the eligibility criteria in each of the Sections A to D below should be met:

A Generally, only native (including re-established) taxa are to be considered. Taxa introduced or thought to be introduced to Great Britain by man could be considered exceptionally, with the following provisos:

i. the organism is endangered or extinct in its native range, and

ii. preferably, the natural range reaches the north west coast of Europe (i.e. continental distribution extends to the Atlantic coast of France, Belgium, the Netherlands, Germany or Scandinavia; for marine taxa, the distribution includes the north west Atlantic area), and provided that

iii. information suggests that the organism is unlikely to have an adverse impact on important native species or ecosystems.

B The taxon must be either:

i. established in the wild in Great Britain
or
ii. occur as a vagrant in Great Britain and require international protection
or
iii. be believed extinct in Great Britain as a breeding species, but be in the process of re-establishment
or
iv. be believed extinct in Great Britain, but with the possibility that it could become re-established naturally.

C The taxonomic status of the organism must be well authenticated. Taxa below the species level could be considered, providing they are:

i. clearly recognisable (i.e. morphologically distinct), and

ii. geographically or ecologically distinct.

D The taxon must be endangered in Great Britain, or likely to become so unless conservation measures are taken, and/or be subject to an international obligation for protection.

One or more of the following may indicate that a taxon is or may become endangered:

i. it is included in a JNCC-approved British Red Data Book as *Extinct*, *Endangered* or *Vulnerable* (or, in Red Lists drawn up using the recently revised IUCN criteria, as *Extinct in the Wild*, *Critically Endangered*, *Endangered* or *Vulnerable*);

ii. it has been well searched for but is known from only a single locality;

iii. it is confined to a particularly threatened habitat. The extent or quality of the habitat is being significantly reduced or is likely to become significantly reduced, thus threatening the survival of the organism;

iv. it is rapidly declining in population, number of localities occupied or range. Indicative would be at least 50% decline observed, estimated inferred or suspected in the last 20 years, or a decline of at least 50% projected, inferred or suspected to be likely in the near future. The decline must transcend normal fluctuations;

v. it is endangered, or likely to become endangered through being targeted for exploitation or killing for commercial reasons and/or through being particularly attractive to collectors.

International obligations apply to a taxon which is:

vi. naturally resident and listed on Appendices I, II or III of the Bern Convention; Annexes II, IV or V of the EC Habitats and Species Directive; Appendix I of the Bonn Convention (unless derogations are in force);

and/or

vii. endemic to Great Britain and included in a JNCC-approved British Red List.

Decision criteria

An animal or plant taxon would be recommended for listing on the relevant Schedule only if scheduling has the potential to afford significant benefit to it, thus helping to arrest a decline or to facilitate an increase in population size, number of localities occupied or range. Potential benefits to be gained from scheduling are:

i. protection of animals at risk from persecution or other intentional killing or injuring;

ii. protection of animals or plants from collecting, where this is a problem or is likely to become one;

iii. protection of structures or places which animals use for shelter or protection (including breeding sites or other essential elements of the habitat);

iv. protection of animals from intentional or reckless disturbance;

v. protection of plants from intentional damage or destruction;

vi. protection of animals or plants from currently or potentially damaging trade, or other forms of exploitation.

5. Conduct of the Fourth Quinquennial Review

5.1 Internal process

5.1.1 The Joint Committee, at its September 2000 meeting, adopted a process for conducting the Fourth Quinquennial Review. A Fourth Quinquennial Review Working Group was established to assist JNCC to conduct the Review. The Working Group included staff from each of the three statutory nature conservation agencies and Prof. Crawley from the Joint Committee. It was able to call on taxonomic and conservation expertise from other individuals and organisations. During 2001, the Working Group:

i. endorsed the rationale, range of taxa, eligibility criteria and decision criteria set out in Section 5 above;

ii. applied these criteria to the species currently listed on Schedules 5 and 8;

iii. considered species of wild animals and plants not currently listed on Schedules 5 and 8; but where evidence indicated that they might meet the eligibility and decision criteria;

iv. considered whether any additional species might require protection in consequence of an international obligation;

v. considered the implications of the statutory changes brought in since the Third Quinquennial Review, if any.

5.1.2 The Working Group considered the needs of the priority species under the UK Biodiversity Action Plan, both in the context of the work being

undertaken to conserve those species through the Action Plan process, and also in the light of Section 74 of the Countryside and Rights of Way Act 2000. The Working Group considered these species within the framework of the eligibility and decision criteria set out in Section 4 above.

5.1.3 Following on from their work during 2001, the Working Group prepared a consultation document which explained the rationale behind the Fourth Quinquennial Review, listed the species already protected, the species to which international obligations apply and identified species which might be candidates for scheduling. The documents also set out a proforma to take information for candidate species, to facilitate consideration for scheduling.

5.2 External process

5.2.1 Between December 2001 and February 2002 the JNCC carried out an external consultation, inviting comments on the proposals set out in the consultation document, and also proposals for other species where change might be needed, in compliance with the eligibility and decision criteria. The consultation was sent to a range of relevant bodies and also published on the JNCC website.

5.2.2 The Working Group reviewed the comments and additional proposals received during February and March 2002 using the agreed criteria and presented its conclusions to the Joint Committee at their meeting on 20 March 2002. Some additional evidence and views were made available to the Working Group from specialist colleagues in the conservation agencies during this period and some comments were obtained from independent referees on the evidence received to support the cases for candidate species.

5.2.3 On 16 April 2002, prior to the submission of the Fourth Quinquennial Review advice to Government, evidence emerged of substantial collecting of large numbers of larvae of Burnet moths from the west coast of Scotland. Subsequent investigations revealed significant trade in some rare Burnet moths, which has resulted in two additional species being recommended for protection. At their meeting on 20 June 2002, the Joint Committee agreed to consider and determine their recommendations in relation to Burnet moths by postal action, and the recommendations were finalised by this process.

6. Recommendations

6.1 Species currently listed on Schedules 5 and 8

The JNCC has reviewed the species currently listed on the Schedules 5 and 8 against the eligibility and decision criteria and concluded that no species merit removal from the Schedules at this time.

6.2 Addition of species to Schedule 5

The JNCC recommends that the following species be added to Schedule 5:

Mammal:	Water Vole, *Arvicola terrestris* (increased from partial protection)
Marine fish:	Short Snouted Seahorse, *Hippocampus hippocampus* Spiny Seahorse, *Hippocampus guttulatus* Angel shark, *Squatina squatina* Common Skate, *Dipturus batis* Black Skate, *Dipturus nidarosiensis* Long-nose Skate, *Dipturus oxyrhinchus* White Skate, *Rostroraja alba*
Mollusc:	Roman Snail, *Helix pomatia*
Moths:	Narrow-bordered Five-spot Burnet (or Talisker Burnet), *Zygaena lonicerae* subspecies *jocelynae* Slender Scotch Burnet, *Zygaena loti* subspecies *scotica*

Table 1 List of species recommended for addition to Schedule 5

Species	Level of protection	Country presence	Summary reasons
Water Vole: *Arvicola terrestris*	Full protection	E, S, W.	Strong evidence of problems from all proponents; species will benefit from increased protection
Short Snouted Seahorse: *Hippocampus hippocampus*	Full protection	E.	Prevent commercial collecting; vulnerable to habitat disturbance
Spiny Seahorse: *Hippocampus guttulatus*	Full protection	E, S, W.	Prevent commercial collecting; vulnerable to habitat disturbance
Angel shark: *Squatina squatina*	Full protection	E, S, W.	Will prevent targeted fishing; will reduce bycatch problems
Common Skate: *Dipturus batis*	Full protection	E, S, W.	Will prevent targeted fishing; will reduce bycatch problems
Black Skate: *Dipturus nidarosiensis*	Full protection	E, S, W.	Will prevent targeted fishing; will reduce bycatch problems
Long-nose Skate: *Dipturus oxyrhinchus*	Full protection	E, S, W.	Will prevent targeted fishing; will reduce bycatch problems
White Skate: *Rostroraja alba*	Full protection	E, S, W.	Will prevent targeted fishing; will reduce bycatch problems
Roman Snail: *Helix pomatia*	Add to Schedule 5 for Section 9(1) killing, injuring & taking and Section 9(5) sale	E.	Will prevent collection and sale for food; captive bred stocks would need sale licensing
Narrow-bordered Five-spot Burnet (or Talisker Burnet): *Zygaena lonicerae* subspecies *jocelynae*	Full protection	S.	Will prevent collection and sale of adults and early stages
Slender Scotch Burnet: *Zygaena loti* subspecies *scotica*	Full protection	S.	Will prevent collection and sale of adults and early stages

6.3 Addition of species to Schedule 8

The JNCC recommends that no species be added to Schedule 8.

7. Statement of reasons for recommendations

7.1 A summary of the current status of the species which the Joint Nature Conservation Committee has recommended for additional listing on Schedule 5, or for increasing the protection of animals already listed on Schedule 5, is provided in Appendix 4, together with a statement of the reasons which led the Committee to arrive at their recommendations.

8. Acknowledgements

The members of the Fourth Quinquennial Review Working Group were:

John Bratton, Countryside Council for Wales
Prof. Mick Crawley, Joint Nature Conservation Committee, Independent Member
Andy Douse, Scottish Natural Heritage
Ian McLean, Joint Nature Conservation Committee, staff, Chair of Working Group
Roger Mitchell, English Nature

Members of the Working Group consulted with specialists in the statutory conservation agencies and elsewhere to obtain additional background information and to check factual statements in the proposals submitted for consideration; we are grateful for the time and expertise of all who helped in this way.

We are also pleased to acknowledge all those organisations and individuals who responded to the Fourth Quinquennial Review consultation, with candidate species for consideration to receive protection, with comments on the initial tranche of proposals, or with other comments on wildlife legislation and species protection.

Appendix 1 List of organisations consulted as part of the Fourth Quinquennial Review in December 2001

*Action for Invertebrates
*Amateur Entomologists' Society
Angler's Co-operative Association
Association for the Protection of Rural Scotland
Badenoch and Strathspey Conservation Group
*Balfour Browne Club
Bat Conservation Trust
*Bee Improvement and Bee Breeders' Association
*Bees, Wasps, and Ants Recording Society
*Biological Records Centre
Botanical Society of the British Isles (including BSBI Scotland)
British Arachnological Society
British Association of Nature Conservationists (including BANC Scotland)
British Association for Shooting and Conservation
British Bryological Society
British Deer Society
British Divers Marine Life Rescue
British Dragonfly Society
British Ecological Society
*British Entomological and Natural History Society
British Hedgehog Preservation Society
British Herpetological Society
British Horse Society
British Isles Bee Breeders Association
British Lichen Society
*British Myriapod and Isopoda Group
British Mycological Society
British Naturalists' Association
British Phycological Society
British Pteridological Society
British Trust for Conservation volunteers
*British Trust for Ornithology
Butterfly Conservation
Byways and Bridleways Trust
*CABI Bioscience UK Centre
Campaign for the Protection of Rural Wales
Care for the Wild
*Conchological Society of Great Britain & Ireland
Council for National Parks
Council for the Protection of Rural England
Countryside Council for Wales
Countryside Management Association
*Department for Environment, Food and Rural Affairs
*Dipterists' Forum
English Nature
*Environment Agency
Environmental Investigation Agency
Fauna and Flora Preservation Society

Field Studies Council
*Forestry Research, Alice Holt Lodge
*FreshwaterLife
Friends of the Earth (including FOE Cymru)
Friends of the Earth Scotland
*Froglife
Green Alliance
Greenpeace UK
Herpetological Conservation Trust
Institute of Biology
International Fund for Animal Welfare
International League for the Protection of Cetaceans
International Union for the Conservation of Nature (IUCN) Shark Specialist Group
International Wildlife Coalition
*Invertebrate Conservation Trust
Invertebrate Link (formerly Joint Committee for the Conservation of British Invertebrates)
John Muir Trust
Mammal Society
Marine Conservation Society (including MCS Scotland)
Mountaineering Council of Scotland
*National Assembly for Wales
National Federation of Badger Groups
National Federation for Biological Recording
National Trust (including NT for North and South Wales)
National Trust for Scotland
National Small Woods Association
*Natural History Museum
Open Spaces Society
Otter Trust
People's Trust for Endangered Species
Plantlife
Plantlife Link
*Pondlife
Ramblers' Association (including RA Scotland and RA Wales)
Reforesting Scotland
*Royal Entomological Society
*Royal Museum of Scotland
Royal Society for the Protection of Birds (including RSPB Wales and RSPB Scotland)
Royal Society for the Prevention of Cruelty to Animals
Scottish Conservation Projects Trust
Scottish Council for National Parks
Scottish Countryside Activities Council
Scottish Countryside Rangers Association
Scottish Environment Protection Agency
*Scottish Executive
Scottish Environmental Education Council
Scottish Field Studies Association
Scottish Natural Heritage
Scottish Ornithologists' Club
Scottish Scenic Trust
Scottish Trust for Underwater Archaeology
Scottish Wild Land Group

*Seahorse Trust
Sea Shepherd
*Shark Trust
Society of Antiquaries of Scotland
TRAFFIC International
Vincent Wildlife Trust
Welsh Historic Gardens Trust
Welsh Sports Association (Outdoor Pursuits Group)
Whale and Dolphin Conservation Society
Wildflower Society
Wildfowl and Wetlands Trust
Wildlife and Countryside Links
The Wildlife Trusts (including Scottish Wildlife Trust and Association of Welsh Wildlife Trusts)
Woodland Trust (including WT Scotland)
World Conservation Monitoring Centre
World Wide Fund for Nature - UK
Youth Hostels Association (including YHA Wales)
Young People's Trust for the Environment and Nature Conservation
Zoological Society of London

*Indicates added to the list of those consulted on the Third Quinquennial Review (including some organisations previously consulted via the former Joint Committee for the Conservation of British Invertebrates)

Appendix 2 Species other than birds specially protected under the Wildlife and Countryside Act, 1981

SCHEDULE 5 (ANIMALS)

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
Mammals			
Arvicola terrestris	Water vole	Damage/destruction of place of shelter/protection S.9(4)(a) and disturbance while in a place of shelter S.9(4)(b) only	1998
Cetacea	All dolphins, porpoises, whales		*Tursiops truncatus* & *Delphinus delphis* - 1981; rest - 1988
Felis silvestris	Wildcat		1988
Lutra lutra	Otter		1981
Martes martes	Pine marten		1988
Muscardinus avellanarius	Dormouse		1988
Odobenus rosmarus	Walrus		1988
Sciurus vulgaris	Red squirrel		1981
Vespertilionidae and Rhinolophidae	All bats		1981
Reptiles			
Anguis fragilis	Slow worm	Killing & injuring S.9(1) (part); sale S.9(5)	S.9(5) - 1981; S.9(1) - 1988
Cheloniidae and Dermochelyidae	All turtles		1988
Coronella austriaca	Smooth snake		1981
Lacerta agilis	Sand lizard		1981
Lacerta vivipara	Viviparous lizard	Killing & injuring S.9(1) (part); sale S.9(5)	S.9(5) - 1981; S.9(1) - 1988
Natrix natrix	Grass snake	Killing & injuring S.9(1) (part); sale S.9(5)	S.9(5) - 1981; S.9(1) - 1988
Vipera berus	Adder	Killing & injuring S.9(1) (part): sale S.9(5)	S.9(5) - 1981; S.9(1) - 1991
Amphibians			
Bufo bufo	Common toad	Sale only S.9(5)	1981
Bufo calamita	Natterjack toad		1981
Rana temporaria	Common frog	Sale only S.9(5)	1981
Triturus cristatus	Warty (great crested) newt		1981
Triturus helveticus	Palmate newt	Sale only S.9(5)	1981
Triturus vulgaris	Smooth newt	Sale only S.9(5)	1981

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
Fish			
Acipenser sturio	Sturgeon		1992
Alosa alosa	Allis shad	Killing, injuring & taking S.9(1), damage/destruction of place of shelter/protection (4)(a)	S.9(1) - 1991, S.9(4)(a) - 1998
Alosa fallax	Twaite shad	Damage/destruction of place of shelter/protection S.9(4)(a) only	1998
Cetorhinus maximus	Basking shark		1998
Coregonus albula	Vendace		1988
Coregonus lavaretus	Whitefish		1988
Gobius cobitis	Giant goby		1998
Gobius couchii	Couch's goby		1998
Lota lota	Burbot		1981
Butterflies			
Apatura iris	Purple emperor	Sale only S.9(5)	1989
Argynnis adippe	High brown fritillary		1992 (previously sale only)
Aricia artaxerxes	Northern brown argus	Sale only S.9(5)	1989
Boloria euphrosyne	Pearl-bordered fritillary	Sale only S.9(5)	1989
Carterocephalus palaemon	Chequered skipper	Sale only S.9(5)	1989
Coenonympha tullia	Large heath	Sale only S.9(5)	1989
Cupido minimus	Small blue	Sale only S.9(5)	1989
Erebia epiphron	Mountain ringlet	Sale only S.9(5)	1989
Eurodryas aurinia	Marsh fritillary	Sale only S.9(5) Full protection	S.9(5) - 1989 1998
Hamearis lucina	Duke of Burgundy	Sale only S.9(5)	1989
Hesperia comma	Silver-spotted	Sale only S.9(5)	1989
Leptidea sinapis	Wood white	Sale only S.9(5)	1989
Lycaena dispar	Large copper	Sale only S.9(5) Full protection	S.9(5) - 1989 1998
Lysandra bellargus	Adonis blue	Sale only S.9(5)	1989
Lysandra coridon	Chalkhill blue	Sale only S.9(5)	1989
Maculinea arion	Large blue		1981
Melitaea cinxia	Glanville fritillary	Sale only S.9(5)	1989
Mellicta athalia (*Melitaea athalia*)	Heath fritillary		1981
Nymphalis polychloros	Large tortoiseshell	Sale only S.9(5)	1989
Papilio machaon	Swallowtail		1981
Plebejus argus	Silver-studded blue	Sale only S.9(5)	1989
Strymonidia pruni	Black hairstreak	Sale only S.9(5)	1989
Strymonidia w-album	White-letter hairstreak	Sale only S.9(5)	1989
Thecla betulae	Brown hairstreak	Sale only S.9(5)	1989
Thymelicus acteon	Lulworth skipper	Sale only S.9(5)	1989

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
Moths			
Acosmetia caliginosa	Reddish buff		1981
Bembecia chrysidiformis	Fiery clearwing		1998
Gortyna borelii	Fisher's estuarine moth		1998
Hadena irregularis	Viper's bugloss		1988
		Removed, believed extinct	1998
Pareulype berberata	Barberry carpet		1981
Siona lineata	Black-veined		1981
Thalera fimbrialis	Sussex emerald		1992
Thetidia smaragdaria	Essex emerald		1981
Zygaena viciae	New Forest burnet		1981
Beetles			
Chrysolina cerealis	Rainbow leaf beetle		1981
Curimopsis nigrita	Mire pill beetle	Damage/destruction of place of shelter/protection S.9(4)(a) only	1992
Graphoderus zonatus	Water beetle		1992
Hydrochara caraboides	Lesser silver water beetle		1992
Hypebaeus flavipes	Beetle		1992
Limoniscus violaceus	Violet click beetle		1988
Lucanus cervus	Stag beetle	Sale only S.9(5)	1998
Paracymus aeneus	Water beetle		1992
Hemipteran bugs			
Cicadetta montana	New Forest cicada		1988
Crickets			
Decticus verrucivorus	Wart-biter		1981
Gryllotalpa gryllotalpa	Mole cricket		1981
Gryllus campestris	Field cricket		1981
Dragonflies			
Aeshna isosceles	Norfolk aeshna		1981
Coenagrion mercuriale	Southern damselfly		1998
Spiders			
Dolomedes plantarius	Fen raft spider		1981
Eresus niger (cinnaberinus)	Ladybird spider		1981
Crustaceans			
Austropotamobius pallipes	Atlantic stream (white-clawed) crayfish	Taking S.9(1) (part); sale S.9(5)	1988
Chirocephalus diaphanus	Fairy shrimp		1988
Gammarus insensibilis	Lagoon sand shrimp		1988
Triops cancriformis	Apus		1988

Scientific name	English name	Sections of Act cited where complete protection is not afforded	Year scheduled
Sea-mats			
Victorella pavida	Trembling sea-mat		1988
Molluscs			
Atrina fragilis	Fan mussel	Killing & injuring S.9(1); possession S9(2); sale S.9(5)	1998
Caecum armoricum	De Folin's lagoon snail		1992
Catinella arenaria	Sandbowl snail		1981
Margaritifera margaritifera	Pearl mussel	Killing & injuring S.9(1) (part)	S.9(1) - 1991
		Full protection	1998
Monacha cartusiana	Carthusian snail		1981
		Removed from Schedule 5	1988
Myxas glutinosa	Glutinous snail		1981
Paludinella littorina	Lagoon snail		1992
Tenellia adspersa	Lagoon sea slug		1992
Thyasira gouldi	Northern hatchet-shell		1992
Annelid worms			
Alkmaria romijni	Tentacled lagoon-worm		1992
Armandia cirrhosa	Lagoon sandworm		1988
Hirudo medicinalis	Medicinal leech		1988
Sea anemones and allies			
Clavopsella navis	Marine hydroid		1998
Edwardsia ivelli	Ivell's sea anemone		1988
Eunicella verrucosa	Pink sea-fan	Killing, injuring & taking S.9(1); possession S9(2); sale S.9(5)	1992
Nematostella vectensis	Starlet sea anemone		1988

SCHEDULE 8 (PLANTS)

Scientific name	English name	Year scheduled
Vascular plants		
Ajuga chamaepitys	Ground pine	1992
Alisma gramineum	Ribbon-leaved water-plantain	1981
Allium sphaerocephalon	Round-headed leek	1981
Althaea hirsuta	Rough marsh-mallow	1981
Alyssum alyssoides	Small alison	1981
Apium repens	Creeping marshwort	1988
Arabis alpina	Alpine rock-cress	1988
Arabis scabra (stricta)	Bristol rock-cress	1988
Arenaria norvegica	Norwegian sandwort	1981
Artemisia campestris	Field wormwood	1981
Atriplex pedunculata (*Halimione pedunculata)*	Stalked orache	1992
Bupleurum baldense	Small hare's-ear	1981
Bupleurum falcatum	Sickle-leaved hare's-ear	1981
Carex depauperata	Starved wood-sedge	1981
Centaurium tenuiflorum	Slender centaury	1992
Cephalanthera rubra	Red helleborine	1981
Chenopodium vulvaria	Stinking goosefoot	1988
Cicerbita alpina	Alpine sow-thistle	1981
Clinopodium menthifolium *(Calamintha sylvatica)*	Wood calamint	1981
Coincya wrightii *(Rhynchosinapis wrightii)*	Lundy cabbage	1988
Corrigiola litoralis	Strapwort	1988
Cotoneaster integerrimus *(Cotoneaster cambrica)*	Wild cotoneaster	1981
Crassula aquatica	Pigmyweed	1988
Crepis foetida	Stinking hawk's-beard	1988
Cynoglossum germanicum	Green hound's-tongue	1988
Cyperus fuscus	Brown galingale	1981
Cypripedium calceolus	Lady's-slipper	1981
Cystopteris dickieana	Dickie's bladder fern	1981
Dactylorhiza lapponica	Lapland marsh-orchid	1992
Damasonium alisma	Starfruit	1981
Dianthus armeria	Deptford pink	1998 England and Wales only
Dianthus gratianopolitanus	Cheddar pink	1981
Diapensia lapponica	Diapensia	1981
Eleocharis parvula	Dwarf spike-rush	1998
Epipactis youngiana	Young's helleborine	1988
Epipogium aphyllum	Ghost orchid	1981
Equisetum ramosissimum	Branched horsetail	1988
Erigeron borealis	Alpine fleabane	1988
Eriophorum gracile	Slender cottongrass	1988
Euphorbia peplis	Purple spurge	1981 Removed 1992
Eryngium campestre	Field eryngo	1981
Filago lutescens	Red-tipped cudweed	1988
Filago pyramidata	Broad-leaved cudweed	1992
Fumaria reuteri (martinii)	Martin's ramping-fumitory	1988
Gagea bohemica	Early star of Bethlehem	1988
Gentiana nivalis	Alpine gentian	1981
Gentiana verna	Spring gentian	1981
Scientific name	**English name**	**Year scheduled**

Gentianella anglica	Early gentian	1992
Gentianella ciliata	Fringed gentian	1988
Gentianella uliginosa	Dune gentian	1992
Gladiolus illyricus	Wild gladiolus	1981
Gnaphalium luteoalbum	Jersey cudweed	1981
Hieracium attenuatifolium	Weak-leaved hawkweed	1992
Hieracium northroense	Northroe hawkweed	1992
Hieracium zetlandicum	Shetland hawkweed	1992
Himantoglossum hircinum	Lizard orchid	1981
Homogyne alpina	Purple colt's-foot	1988
Hyacinthoides non-scripta	Bluebell	1998 S.13(2) sale only
Lactuca saligna	Least lettuce	1981
Leersia oryzoides	Cut-grass	1998
Limonium paradoxum	St. David's sea lavender	1981 Removed 1992
Limonium recervum	Recurved sea lavender	1981 Removed 1992
Limosella australis	Welsh mudwort	1992
Liparis loeselii	Fen orchid	1981
Lloydia serotina	Snowdon lily	1981
Luronium natans	Floating water-plantain	1992
Lychnis alpina	Alpine catchfly	1981
Lythrum hyssopifolia	Grass-poly	1988
Melampyrum arvense	Field cow-wheat	1981
Mentha pulegium	Pennyroyal	1988
Minuartia stricta	Teesdale sandwort	1981
Najas flexilis	Slender naiad	1992
Najas marina	Holly-leaved naiad	1988
Ononis reclinata	Small restharrow	1988
Ophioglossum lusitanicum	Least adder's-tongue	1988
Ophrys fuciflora	Late spider-orchid	1981
Ophrys sphegodes	Early spider-orchid	1981
Orchis militaris	Military orchid	1981
Orchis simia	Monkey orchid	1981
Orobanche artemisiae-campestris *(Orobanche loricata)* *(Orobanche picridis)*	Oxtongue broomrape	1981
Orobanche caryophyllacea	Bedstraw broomrape	1981
Orobanche reticulata	Thistle broomrape	1981
Petrorhagia nanteuilii	Childing pink	1981
Phyllodoce caerulea	Blue heath	1981
Phyteuma spicatum	Spiked rampion	1992
Polygonatum verticillatum	Whorled Solomon's-seal	1981
Polygonum maritimum	Sea knotgrass	1981
Potentilla rupestris	Rock cinquefoil	1981
Pulicaria vulgaris	Small fleabane	1988
Pyrus cordata	Plymouth pear	1981
Ranunculus ophioglossifolius	Adder's-tongue spearwort	1981
Rhinanthus serotinus	Greater yellow-rattle	1981
Romulea columnae	Sand crocus	1988
Rumex rupestris	Shore dock	1992
Salvia pratensis	Meadow clary	1992
Saxifraga cernua	Drooping saxifrage	1981
Saxifraga cespitosa	Tufted saxifrage	1981
Saxifraga hirculus	Yellow marsh-saxifrage	1992
Scirpus triqueter *(Scirpus triquetrus)*	Triangular club-rush	1981
Scleranthus perennis	Perennial knawel	1981

Scientific name	English name	Year scheduled
Scorzonera humilis	Viper's-grass	1988
Selinum carvifolia	Cambridge milk-parsley	1988
Senecio paludosus	Fen ragwort	1988
Stachys alpina	Limestone woundwort	1981
Stachys germanica	Downy woundwort	1981
Tephroseris integrifolia subspecies *maritima*	South Stack fleawort	1998
Teucrium botrys	Cut-leaved germander	1988
Teucrium scordium	Water germander	1981
Thlaspi perfoliatum	Perfoliate penny-cress	1992
Trichomanes speciosum	Killarney fern	1981
Veronica spicata	Spiked speedwell	1981
Veronica triphyllos	Fingered speedwell	1988
Viola persicifolia	Fen violet	1981
Woodsia alpina	Alpine woodsia	1981
Woodsia ilvensis	Oblong woodsia	1981

Mosses

Acaulon triquetrum	Triangular pygmy-moss	1992
Anomodon longifolius	Long-leaved anomodon	1998
Bartramia stricta	Rigid apple-moss	1992
Bryum mamillatum	Dune thread-moss	1992
Bryum neodamense	Long-leaved threadmoss	1998
Bryum schleicheri	Schleicher's thread-moss	1992
Buxbaumia viridis	Green shield-moss	1992
Cryphaea lamyana	Multi-fruited river-moss	1992
Cyclodictyon laetevirens	Bright-green cave-moss	1992
Desmatodon cernuus	Flamingo moss	1998
Didymodon cordatus (Barbula cordata)	Cordate beard-moss	1992
Didymodon glaucus (Barbula glauca)	Glaucous beard-moss	1992
Ditrichum cornubicum	Cornish path-moss	1992
Grimmia unicolor	Blunt-leaved grimmia	1992
Hamatocaulis (Drepanocladus) vernicosus	Slender green feather-moss	1992
Hygrohypnum polare	Polar feather-moss	1998
Hypnum vaucheri	Vaucher's feather-moss	1992
Micromitrium tenerum	Millimetre moss	1992
Mielichhoferia mielichhoferi	Alpine copper-moss	1992
Orthotrichum obtusifolium	Blunt-leaved bristle-moss	1992
Plagiothecium piliferum	Hair silk-moss	1992
Rhynchostegium rotundifolium	Round-leaved feather-moss	1992
Saelania glaucescens	Blue dew-moss	1992
Scorpidium turgescens	Large yellow feather-moss	1992
Sphagnum balticum	Baltic bog-moss	1992
Thamnobryum angustifolium	Derbyshire feather-moss	1992
Zygodon forsteri	Knothole moss	1992
Zygodon gracilis	Nowell's limestone-moss	1992

Liverworts

Scientific name	English name	Year scheduled
Adelanthus lindenbergianus	Lindenberg's leafy liverwort	1992
Geocalyx graveolens	Turpswort	1992
Gymnomitrion apiculatum	Pointed frostwort	1992
Jamesoniella undulifolia	Marsh earwort	1992
Lophozia (Leiocolea) rutheana	Norfolk flapwort	1992
Marsupella profunda	Western rustwort	1992
Petalophyllum ralfsii	Petalwort	1992
Riccia bifurca	Lizard crystalwort	1992
Southbya nigrella	Blackwort	1992

Fungi

Battarraea phalloides	Sandy stilt puffball	1998
Boletus regius	Royal bolete	1998
Buglossoporus pulvinus	Oak polypore	1998
Hericinum erinaceum	Hedgehog fungus	1998

Lichens

Alectoria ochroleuca	Alpine sulphur-tresses	1998
Bryoria furcellata	Forked hair-lichen	1992
Buellia asterella	Starry breck-lichen	1992
Caloplaca luteoalba	Orange-fruited elm-lichen	1992
Caloplaca nivalis	Snow caloplaca	1992
Catapyrenium psoromoides	Tree catapyrenium	1992
Catillaria laureri	Laurer's catillaria	1992
Catolechia wahlenbergii	Goblin lights	1998
Cladonia convoluta	Convoluted Cladonia	1998
Cladonia stricta	Upright mountain-cladonia	1992
Collema dichotomum	River jelly-lichen	1992
Enterographa elaborata	New Forest beech-lichen	1998
Gyalecta ulmi	Elm gyalecta	1992
Heterodermia leucomelos	Ciliate strap-lichen	1992
Heterodermia propagulifera	Coralloid rosette-lichen	1992
Lecanactis hemisphaerica	Churchyard lecanactis	1992
Lecanora achariana	Tarn lecanora	1992
Lecidea inops	Copper lecidea	1992
Nephroma arcticum	Arctic kidney-lichen	1992
Pannaria ignobilis	Caledonian pannaria	1992
Parmelia minarum	New Forest parmelia	1992
Parmentaria chilensis	Oil-stain parmentaria	1992
Peltigera lepidophora	Ear-lobed dog-lichen	1992
Pertusaria bryontha	Alpine moss-pertusaria	1992
Physcia tribacioides	Southern grey physcia	1992
Pseudocyphellaria lacerata	Ragged pseudocyphellaria	1992
Psora rubiformis	Rusty alpine psora	1992
Solenopsora liparina	Serpentine solenopsora	1992
Squamarina lentigera	Scaly breck-lichen	1992
Teloschistes flavicans	Golden hair-lichen	1992

Stoneworts

Chara canescens	Bearded stonewort	1992
Lamprothamnium papulosum	Foxtail stonewort	1988

Appendix 3 Species protected by the Conservation (Natural Habitats, etc.) Regulations, 1994

SCHEDULE 2 **Regulation 38**
EUROPEAN PROTECTED SPECIES OF ANIMALS

Common name	**Scientific name**
Bats, Horseshoe (all species)	Rhinolophidae
Bats, Typical (all species)	Vespertilionidae
Butterfly, Large Blue	*Maculinea arion*
Cat, Wild	*Felix silvestris*
Dolphins, Porpoises and Whales (all species)	Cetacea
Dormouse	*Muscardinus avellanarius*
Lizard, Sand	*Lacerta agilis*
Newt, Great Crested (or Warty)	*Triturus cristatus*
Otter, Common	*Lutra lutra*
Snake, Smooth	*Coronella austriaca*
Sturgeon	*Acipenser sturio*
Toad, Natterjack	*Bufo calamita*
Turtles, Marine	*Caretta caretta*
	Chelonia mydas
	Lepidochelys kempii
	Eretmochelys imbricata
	Dermochelys coriacea

SCHEDULE 4 **Regulation 42**
EUROPEAN PROTECTED SPECIES OF PLANTS

Common name	**Scientific name**
Dock, Shore	*Rumex rupestris*
Fern, Killarney	*Trichomanes speciosum*
Gentian, Early	*Gentianella anglica*
Lady's-slipper	*Cypripedium calceolus*
Marshwort, Creeping	*Apium repens*
Naiad, Slender	*Najas flexilis*
Orchid, Fen	*Liparis loeselii*
Plantain, Floating-leaved Water	*Luronium natans*
Saxifrage, Yellow Marsh	*Saxifraga hirculus*

Appendix 4 Data sheets for the 11 species proposed for addition, or increased protection, to Schedule 5 of the Wildlife and Countryside Act, 1981 under the Fourth Quinquennial Review

These data sheets have been compiled from the submissions made as part of the Fourth Quinquennial Review process and use a standard set of headings to organise the information.

Recommendation for amendment to Schedule 5 of the Wildlife and Countryside Act, 1981

Type of animal: Mammal

Scientific name: *Arvicola terrestris*

English name: Water Vole

Distribution in Great Britain

Throughout England, Scotland and Wales except most Scottish islands. Now patchily distributed and sparse or absent from many areas. For example, the species is now only found at 7.1% of sites in Yorkshire, where it was once considered common, and 1.9% of sites in the south-west. In the Anglian region, the traditional stronghold of the species, voles occurred at 72.4% of sites in 1989-90 but only 29.8% in 1996-98.

Distribution elsewhere

A Palaearctic species ranging from Great Britain to the Lena Basin in Siberia. Extends from the Arctic Circle to Lake Baikal, north of the Aral Sea, northern Iran and Near East.

Status in Britain

Long term decline since 1900. This accelerated during the 1980s and 1990s. A national survey in 1989-90 failed to find signs of water vole in 67% of the sites where they had been previously recorded. By 1996-98 the loss of known occupied sites had reached 89%. Populations are now fragmented due to habitat loss or mismanagement, leading to isolation of small populations. Mink predation is considered to further compound the problem.

Habitat

Largely confined to riparian habitats. More common in slow-flowing lowland rivers with extensive emergent vegetation, than upland areas. Also inhabits ponds and reedbeds.

Threats

Loss of suitable habitat is probably the underlying cause of the slow decline that has been continuing since the early part of the 20th century. This has been greatly exacerbated in the last 20-25 years by the spread of the introduced American mink, a predator against which the water vole has little defence.

Recommendation

The water vole is currently on Schedule 5 in respect of Section 9(4) only. We recommend that protection is extended to the whole of Section 9. This would protect the voles against intentional killing, injuring or taking as well as protecting places used for shelter or protection from intentional or reckless damage or destruction.

Justification for recommendation

The evidence shows that partial protection of the water vole is not enough to save the species from further decline.

1. The current legal status of the water vole, with partial protection under Section 9, has caused a great deal of confusion amongst those whose activities may affect them. In particular, many have found it difficult to understand the logic behind protecting the burrows of water voles whilst failing to protect the animals themselves. This apparent ambivalence in the legislation has weakened the message from the conservation agencies about the importance of conserving this species and preventing its complete extinction from some areas. Giving the water vole complete protection under Section 9 would considerably simplify the legal position and emphasise the commitment of the government to the conservation of this priority species. In practical terms, extending legal protection will encourage the major groups whose activities affect water voles, most notably developers and river engineers, to develop policies and working practices designed to avoid causing damage to water vole populations.

2. The most recent national survey for the water vole has confirmed that the rapid decline is continuing and that the situation is perhaps more serious than was previously thought. Extending legal protection, even marginally, sends a clear message to the wider community about the importance of preventing the extinction of this species. Full protection would place the water vole on the same legal footing as other threatened mammals, such as the red squirrel, common dormouse and bats. The fact that the water vole does not have the legal 'status' of species such as bats or dormice means that its needs are often not taken into consideration or neglected through ignorance during routine maintenance or development.

3. While direct persecution has not been implicated as an important factor in the historical decline of this species, populations in many areas are now so low that any persecution could be of significant importance.

4. Deliberate persecution. Evidence for this comes from reports where the general public (usually youngsters) have shot water voles with air rifles, often seriously threatening local populations. This has been reported from at least five areas (Derbyshire, Northumberland, Nottinghamshire, Staffordshire and Yorkshire). There is also evidence of deliberate persecution from trapping and killing of water voles at fisheries, to prevent or reduce damage to banks. Even in cases where the police have intervened, persecution has continued as no prosecutions have been possible. There is also evidence of persecution at some water gardens and nurseries, fish farms and game fisheries, where there have been reports of shot or poisoned water voles in recent years, presumably to prevent or reduce the damage that resident water vole populations do to the banks of watercourses and holding ponds etc. In one case, approximately 100 water voles were killed on a single site in a single summer. In another case, an aquatic nursery dealt with a water vole “problem” by trapping the population and releasing them elsewhere.

5. Accidental persecution. Because awareness of the water vole is generally low, there is considerable potential for accidental persecution. This is likely to be a fairly widespread phenomenon as water voles are either shot or poisoned where they are mistaken for rats,

or occupy the same areas. Cases have been reported for example from Cambridgeshire, Sussex, Dorset, County Durham and Kent. Evidence for this comes from cases of poisoning for rat control, where poison has been spread indiscriminately killing water voles. In one case, poisoning has led to the extinction of an entire population. Accidental trapping has also occurred; several cases are known where water voles have been accidentally trapped during underwater live-trapping operations targeted at other species. In most of those cases one or two water voles drowned in crayfish traps.

6. Other relevant issues. There have many cases where water vole populations have been lost because developers have circumvented the current legislation. Examples of this are developers translocating populations to unsuitable habitat with little or no monitoring and subsequent death of individuals, and destruction of the original site.

Benefits which would accrue from acceptance of the recommendation

1. A greatly simplified legal position, thus clarifying the presentation of the legal position to those whose activities may affect water vole populations.

2. An enhanced status for this species, which is still in decline.

3. The law would become very clear in terms of protection afforded to the water vole. Developers, landowners etc would take their responsibilities much more seriously as they do with other species such as dormice or great crested newts, for example. This means that they would carry out the proper environmental assessment and any consequent mitigations and enhancements etc, rather than cutting corners or ignoring advice – both of which usually end in damage to or loss of water vole populations. The Crown Prosecution Service are more likely to take a case to court in the event of deliberate or reckless damage if the water vole has fully protected status.

4. Deliberate persecution would be minimised through awareness raising of the legal protection, and prosecutions could be taken where necessary.

5. Rat control and water vole conservation guidelines would help reduce accidental persecution consistently across the country, thus saving entire populations from potential extinction.

6. Full protection for the water vole would assist greatly with ensuring better routine ditch management by Internal Drainage Boards, encouraging habitat restoration on farmland and increasing the status of water voles amongst planners and developers. Full protection for the water vole would also clarify current confusion over licensing, particularly for trapping. This would help to regulate trapping which is a growing activity by both researchers and conservation groups.

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Recommendation for amendment to Schedule 5 of the Wildlife and Countryside Act, 1981

Type of animal: Fish

Scientific name: *Hippocampus hippocampus*

English name: Short Snouted Seahorse.

Distribution in Great Britain

From the eastern most point of Kent along the South coast, up along the North Cornwall and Devon coastline. Around the Isles of Scilly and Channel Islands. Some historic sightings off the coast of Norfolk and up the River Thames.

Distribution elsewhere

Along the continental coastline of France down into the Bay of Biscay. Along the Northern coast of Spain and Portugal, into and around the whole of the Mediterranean, east as far as the Aegean Sea and into the Black Sea. This species is thought to possibly change throughout its distribution in size and base colouration. There is possibly a population down the Atlantic seaboard side of Africa.

Status in Britain

Not fully known, but thought to be uncommon. They are a very secretive animal blending in well with rocky and weedy habitats. As a result of the British Seahorse Survey run by The Seahorse Trust since 1994 the Short Snouted Seahorse is not thought to be common. Sightings are usually of individual animals and these sightings are infrequent. It was originally thought to be a transient species to our waters due to this infrequency of sightings but work done by the survey has shown they are in fact indigenous being found all year around. There have been animals of all ages found during the period of the survey from young juveniles to mature adults, including on a couple of occasions a small shoal of new born fry during the late Summer near Jersey in the Channel Islands.

Habitat

Mixed habitats of macro algae and rocky areas during the Spring, Summer and early Autumn. During the winter they are known to migrate to deeper waters to over winter in the relative stability of these deeper waters. These deep water areas tend to be of rock and silt, with little or no plant life.

They are quite often brought up from deeper water by crab and lobster fishermen where it is thought that they are attracted to the pots by the small Crustacea that feed on bait laid down in the pots by fishermen.

Threats

Seahorses in general are targeted around the world for the Traditional Medicine Trade, which takes in excess of 30 million animals per year (Vincent 1995). There are more than 65 countries taking part in this trade and new locations are being sort all the time. It will not be long before the British Isles becomes a target for this trade.

The second biggest trade threat to Seahorses around the world is for the live use in aquaria, (public and private). It has been suggested that a figure of up to one million animals a year (the vast majority of which never reach the destination they were bound for due to death in transit) are gathered for this trade around the world and very few survive any period of time as they are notoriously difficult to sustain in captivity. The British Isles is now being targeted for collection for the aquarium trade, with a small but significant number of animals being taken in Weymouth Bay in Dorset commercially (price reported as £65 per fish) and a handful of animals being taken by divers and fishermen particularly around the Channel Islands of Jersey and Guernsey. As stocks diminish in other countries and as more unusual species of Seahorse are sort, then this lucrative trade is bound to increase in our waters, leading to a larger scale fishery. As the exact population status is not understood within our waters any removal of animals from the National population could have disastrous effects.

Recommendation

Full legal protection by addition of the Short Snouted Seahorse (*Hippocampus hippocampus*) to Schedule 5, with respect to all parts of Section 9 is appropriate to prevent : taking and killing (Section 9 (1); damage or destruction of a place of shelter, or disturbance (Section 9 (4); sale (Section 9 (5)).

Justification for recommendation

Because very little is known about our native Seahorses, a precautionary approach is justified for their conservation. We need to follow the lead set by other countries and organisations and give full protection, as early as possible. Once Seahorses have been identified as a potential large scale fishery then it may be too late to conserve the national stocks of these fish.

They are already listed as vulnerable by the IUCN (2000 list). In the TRAFFIC (June 1996) report compiled by Amanda Vincent they are the subject of major concern because of their use in the Traditional Medicine and Curio trades.

Seahorses can suffer badly at the hands of individuals and organisations that attempt to keep them in aquaria, so by reducing the number of animals taken from the wild (except possibly under licence for captive breeding purposes under approved breeding programmes) collectors will be forced to acquire captive bred animals only.

Benefits which would accrue from acceptance of the recommendation

Listing the Short Snouted Seahorse on Schedule 5 would prevent the potential loss of this species from around the British Isles before its biology and ecology is fully understood. It is also found in Eel Grass beds and so is vulnerable to disturbance. Measures should be

considered to conserve these areas particularly during the Spring Summer and Autumn, this would not only benefit the Short Snouted Seahorse but as the area is also a nursery for many fish species it would accord overall protection for them which in turn would increase fish yields for many species.

Seahorses can suffer badly at the hands of individuals and organisations that attempt to keep them in aquaria so by reducing the number of animals taken from the wild (except possibly under licence for captive breeding purposes under approved programmes) collectors will be able to acquire captive bred animals only.

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Recommendation for amendment to Schedule 5 of the Wildlife and Countryside Act, 1981

Type of animal: Fish

Scientific name: *Hippocampus guttulatus* (formerly *ramulosus*)

English name: Spiny Seahorse (also known as Long Snouted Seahorse, Many Branched Seahorse).

Distribution in Great Britain

From the Eastern most point of Kent along the South coast, to Lands End up the west Coast of England, Wales and Scotland as far as the Shetland Isles and all around the coast of Northern Ireland and the Irish Republic.

Distribution elsewhere

Along the continental coastline of France down into the Bay of Biscay. Along the Northern coast of Spain and Portugal, into and around the whole of the Mediterranean, east as far as the Aegean Sea and into the Black Sea. This species is thought possibly to change in size and base coloration across its distribution. Whether these are subspecies or just area changes is not yet known. Further work will need to be done to determine the status of these colour forms.

Status in Britain

Not fully known, but they are thought to be uncommon. They are a very secretive fish, made inconspicuous by their camouflage ability of growing weed-like appendages on their bodies.

As a result of the British Seahorse Survey, run by The Seahorse Trust since 1994, the Spiny Seahorse is not thought to be common. Sightings are usually of individual animals and these sightings are infrequent. It was originally thought to be a transient species in our waters due to this infrequency of sightings, but work done by the survey has shown they are in fact indigenous and are found all through the year. There have been animals of all ages found during the period of the survey, from young juveniles to mature adults.

Habitat

Predominantly Eel Grass beds during the Spring, Summer and early Autumn. During the winter they are known to migrate to deeper waters to over winter in the relative stability of these deeper waters. The deep water areas tend to be of rock and silt, with little or no plant life.

They are quite often brought up from deeper water by crab and lobster fishermen where it is thought that they are attracted to the pots by the small Crustacea that feed on bait laid down in the pots by fishermen.

Threats

Habitat disturbance and loss is a primary cause of concern particularly the Eel Grass beds in which they breed in during the Spring, Summer and early Winter. This habitat is lost due to a number of factors, including silt deposits from land run off and fishing practices such as scalloping through the Eel Grass beds. Marina building and other developments are also damaging, and a naturally occurring wasting disease also results in additional mortality.

Seahorses in general are targeted around the world for the Traditional Medicine Trade, which takes in excess of 30 million animals per year (Vincent 1995). There are more than 65 countries taking part in this trade and new locations are being sort all the time. It will not be long before the British Isles becomes a target for this trade.

The second biggest trade threat to Seahorses around the world is for keeping in aquaria, (public and private). It has been suggested that a figure of up to one million animals a year (the vast majority of which never reach the destination they were bound for due to death in transit) are gathered for this trade around the world and very few survive any period of time as they are notoriously difficult to sustain in captivity. The British Isles is now being targeted for collection for the aquarium trade, with a small but significant number of animals being taken in Weymouth Bay in Dorset commercially (price reported as £65 per fish) and a handful of animals are taken by divers and fishermen elsewhere. As stocks diminish in other countries and as more unusual species of Seahorse are collected, then this lucrative trade is bound to increase in our waters, leading to a larger scale fishery. As the exact population status is not understood within our waters any removal of animals from the national population could have disastrous effects.

Recommendation

Full legal protection by addition of the Spiny Seahorse (*Hippocampus guttulatus*) to Schedule 5, with respect to all parts of Section 9 is appropriate to prevent : taking and killing (Section 9 (1); damage or destruction of a place of shelter, or disturbance (Section 9 (4); sale (Section 9 (5)).

Justification for recommendation

Because very little is known about our native Seahorses, a precautionary approach is justified for their conservation. We need to follow the lead set by other countries and organisations and give full protection, as early as possible. Once Seahorses have been identified as a potential large scale fishery then it may be too late to conserve the national stocks of these fish.

They are already listed as vulnerable by the IUCN (2000 list). In the TRAFFIC (June 1996) report compiled by Amanda Vincent they are the subject of major concern because of their use in the Traditional Medicine and Curio trades.

Seahorses can suffer badly at the hands of individuals and organisations that attempt to keep them in aquaria, so by reducing the number of animals taken from the wild (except possibly under licence for captive breeding purposes under approved breeding programmes) collectors will be forced to acquire captive bred animals only.

Benefits which would accrue from acceptance of the recommendation

Listing the Spiny Seahorse on Schedule 5 would prevent the potential loss of this species from around the British Isles before its biology and ecology is fully understood. Its habitat (Eel Grass beds) is also vulnerable to disturbance, so measures should be considered to conserve these areas particularly during the Spring Summer and Autumn. This would not only benefit the Spiny Seahorse but because the habitat is also a nursery for many other fish species it would increase fish yields for many species.

Seahorses can suffer badly at the hands of individuals and organisations that attempt to keep them in aquaria, so by reducing the number of animals taken from the wild (except possibly under licence for captive breeding purposes under approved breeding programmes) collectors will be forced to acquire captive bred animals only.

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Recommendation for amendment to Schedule 5 of the Wildlife and Countryside Act, 1981

Type of animal: Elasmobranch fish

Scientific name: *Squatina squatina*

English name: Angel shark

Distribution in Great Britain

Formerly common, the Angel Shark is now extremely rare in UK waters (Ellis 2001). CEFAS caught one small specimen in the Irish Sea a few years ago (Jim Ellis pers. comm.) and one specimen taken there by a fisherman, also several years ago, was transferred to the Anglesey Sea Zoo as a rarity. Three other specimens are held in captivity in aquaria elsewhere. Very occasional records are made in other regions.

Distribution elsewhere

The distribution of the Angel Shark extends from the UK and southern North Sea as far south as coastal waters of north Africa and the Canary Islands.

Status in Britain

The Angel Shark was formerly common in British waters, the decline of this species is documented by Rogers and Ellis (2000) and Ellis (2001).

Habitat

A marine fish, with larger individuals occurring in deeper water.

Threats

Once taken in directed fisheries, until stocks collapsed, or were utilised bycatch in multi-species fisheries. Now threatened as a result of bycatch in benthic fisheries. Several elasmobranch species were reportedly formerly common, widespread and landed in large numbers by targeted and bycatch fisheries, but have been seriously depleted (some possibly to extinction) by unregulated fisheries. This pattern of depletion by fisheries is the result of the heavily 'K-selected' life history characteristics which they share. All are slow growing, mature at a large size and produce only a few large young each year. Under current fishing pressures, very few of these large young survive long enough to reach maturity and breed, which ultimately leads to declining populations. Angel Sharks would benefit from strict legal protection because they are large, robust, easily recognisable animals, lacking internal gas bladders, and may therefore be expected to survive release from fishing gear relatively well.

Given the current high levels of mortality on British elasmobranchs greater than 70 cm in length due to fisheries exploitation it is unlikely that any of these species will recover in the absence of legal protection. Current mortality of skates in the Irish Sea is between 0.57-0.71, meaning that between 43-51% of all individuals are killed each year, and 0.59-0.72 in the

North Sea. These estimated mortality rates are in excess of that calculated (0.45) to have driven the Barndoor Skate to near extinction on NW Atlantic shelves. They have resulted in the documented extirpation of the Common Skate from the North Sea and the Irish Sea. Given the similar life histories of these British skates to the Barndoor Skate, current fishing mortality on these skates is sufficient to drive them to extinction. The future for the Angel Shark is similarly bleak.

Recommendation

Full protection, by addition to Schedule 5 of the Wildlife and Countryside Act, 1981.

Justification for recommendation

The world population of the Angel Shark was listed as **Vulnerable** in 2000. The appearance of the Angel Shark is extremely distinctive. This will minimise any ambiguity or conflict in enforcement of the legislation when these animals are taken as bycatch.

The Angel Shark can reach a maximum length of at least 183 cm and perhaps as much as 244 cm (although not a skate, it has a similar large, flat-bodied shape and bottom-dwelling character and is, therefore, similarly vulnerable to capture in fisheries, particularly bottom trawls). Female Angel Sharks mature at 126-167 cm long and give birth to 9-20 live young (the number of young in a litter is in proportion to the age and size of the mother).

This fecundity appears high compared to mammals and birds, but angel sharks and skates are arguably among the most threatened of all elasmobranchs. Fecundity in fishes generally has little bearing on population dynamics, demography and vulnerability, and generally contributes only 10% to population growth rate in similarly long-lived animals (Heppell *et al*. 1999). So, the relatively high numbers of eggs laid or pups born is not an indicator that these species are resilient. In contrast, survival to the age of maturity appears to be the critical life stage determining population growth rate and vulnerability.

Benefits which would accrue from acceptance of the recommendation

Listing under Schedule 5 of the WCA would not only prevent targeted fisheries for this threatened species, but also result in the release, unharmed, of listed elasmobranchs caught as bycatch.

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Recommendation for amendment to Schedule 5 of the Wildlife and Countryside Act, 1981

Type of animal: Elasmobranch fish

Scientific name: *Dipturus batis*

English name: Common Skate

Distribution in Great Britain

The Common Skate has virtually disappeared from the North Sea (sporadic catches are still reported in the north). The extirpation of the Common Skate from the Irish Sea has been described by Brander (1981) (although vagrants may still occasionally be reported).

Distribution elsewhere

The Common Skate is restricted to the north-eastern Atlantic and Mediterranean.

This species is thought to be threatened in the Mediterranean. The recent Medits 1998 benthic trawl survey of the Mediterranean failed to record any specimens of Common Skates, although this species was caught during a similar survey in 1948 (Jukic-Peladic *et al*. 2001).

Status in Britain

The Common Skate was formerly common around the British Isles. The decline was well documented by Brander (1981), Walker & Hislop (1998), Dulvy *et al*. (2000) and the UK Biodiversity Action Plan for this species.

Detailed studies have been undertaken of skate and ray populations in the North Sea, utilising long-term data sets (Walker & Heessen 1996, Walker & Hislop 1998). These concluded that the Common Skate has virtually disappeared from the North Sea (sporadic catches are still reported in the north). While skates over 100 cm long used to be common, those larger than 80 cm are now very scarce. All or most reproducing females of the larger species have now been lost as a result of intensive fishing effort, which imposes a total mortality on skate and ray populations well above replacement mortality for all species except for the smallest (only one ray species is within safe biological limits).

Habitat

A marine fish, which is a predator on bottom-dwelling animals.

Threats

Once taken in directed fisheries, until stocks collapsed, or were utilised bycatch in multi-species fisheries. Now threatened as a result of bycatch in benthic fisheries. Several elasmobranch species were reportedly formerly common, widespread and landed in large numbers by targeted and bycatch fisheries, but have been seriously depleted (some possibly to extinction) by unregulated fisheries. This pattern of depletion by fisheries is the result of

the heavily 'K-selected' life history characteristics which they share. All are slow growing, mature at a large size and produce only a few large young each year. Under current fishing pressures, very few of these large young survive long enough to reach maturity and breed, which ultimately leads to declining populations. All would benefit from strict legal protection because they are large, robust, easily recognisable animals, lacking internal gas bladders, and may therefore be expected to survive release from fishing gear relatively well.

Given the current high levels of mortality on British elasmobranchs greater than 70 cm in length due to fisheries exploitation it is unlikely that any of these species will recover in the absence of legal protection. Current mortality of skates in the Irish Sea is between 0.57-0.71, meaning that between 43-51% of all individuals are killed each year, and 0.59-0.72 in the North Sea. These estimated mortality rates are in excess of that calculated (0.45) to have driven the Barndoor skate to near extinction on NW Atlantic shelves. They have resulted in the documented extirpation of the Common Skate from the North Sea and the Irish Sea. Given the similar life histories of these three British skates to the Barndoor Skate, current fishing mortality on these skates is sufficient to drive them to extinction.

Recommendation

Full protection, by addition to Schedule 5 of the Wildlife and Countryside Act, 1981.

Justification for recommendation

Common Skate populations of shelf waters of the NE Atlantic were listed as **Critically Endangered** on the 2000 IUCN Red List, with their world population **Endangered**.

Body size is known to be a good predictor of vulnerability to exploitation and extinction risk. To date, all flat-bodied elasmobranchs over 120 cm have disappeared from the Irish Sea (a very few individuals, presumably vagrants, are still occasionally caught). The Angel Shark can reach a maximum length of at least 183 cm and perhaps as much as 244 cm (although not a skate, it has a similar large, flat-bodied shape and bottom-dwelling character and is, therefore, similarly vulnerable to capture in fisheries, particularly bottom trawls). The Long-nose Skate reaches a maximum size of 156 cm long, the Black Skate (a poorly known deepwater species) 200 cm long, White Skate 230 cm long and the Common Skate 285 cm. Remaining skate species greater than 70 cm long are also declining rapidly in abundance, and it is only the smallest species of skates that are increasing under the current fishing regime.

Body size is a good predictor of extinction vulnerability because it is closely linked to key life history parameters, such as age at maturity and reproductive output, which directly determine the population dynamics, demography, resilience and vulnerability to exploitation of species (Charnov 1993; Jennings *et al*. 1998; Dulvy *et al*. 1999; Dulvy & Reynolds 2002; Reynolds *et al*. 2001). It should be noted that the largest skate species on the US and Canadian west Atlantic shelf, the Barndoor Skate (*Dipturus laevis*), is nearly extinct (Casey & Myers 1998) and may qualify as **Critically Endangered** under the 2001 IUCN Red List Criteria. The four British species of long-nosed skates (Common, Long-nose, Black and White) skates are larger than the Barndoor Skate and may, therefore, be regarded as being more vulnerable to extinction than the nearly extinct Barndoor Skate.

Male Common Skate mature at an age of over 10 years old (125 cm long). Females are probably larger and older than this before they mature and begin to produce an estimated maximum of 40 large (14-25 cm long) eggs a year, from which young hatch at a length of 21-22 cm (Du Buit 1977). Little is known of the life history of the other three species of skate, but it is likely that they attain maturity at between 8-10 years of age and lay approximately 50 large eggs per year.

This fecundity appears high compared to mammals and birds, but angel sharks and skates are arguably among the most threatened of all elasmobranchs. Fecundity in fishes generally has little bearing on population dynamics, demography and vulnerability, and generally contributes only 10% to population growth rate in similarly long-lived animals (Heppell *et al*. 1999). So, the relatively high numbers of eggs laid or pups born is not an indicator that these species are resilient. In contrast, survival to the age of maturity appears to be the critical life stage determining population growth rate and vulnerability.

The threatened status of the Common Skate is fully recognised by its UK Species Action Plan (UK Biodiversity Group 1999). The Action Plan Objectives for this species include legal protection for the species in at least five key centres of abundance (within 5 years, *i.e.* by 2002) and, in the longer term, facilitating the migration of skate from refuge populations to areas where they are scarce or have been fished out. Proposed action for achieving these objectives includes seeking protection for the species in UK waters under appropriate fisheries legislation, and protection in refuge areas under appropriate site-based legislation. Following publication of this Plan, it has not been possible to identify more than one centre of abundance – a single refuge population on the west coast of Scotland. It is increasingly apparent that, for this and other similarly threatened species, it will be necessary to use all legislative tools available (including protection under the Wildlife and Countryside Act) if populations of this and other similarly threatened species are to be stabilised and past declines reversed.

All skates are difficult to identify to species level accurately, especially in the field. Because all of the large 'long nosed' species of skate which occur in UK waters are proposed for protection under this Quinquennial Review, misidentification of this group is unlikely to be a problem, even for those juveniles which have not yet attained lengths of 1 m (large size is a diagnostic for adults). This will minimise any ambiguity or conflict in enforcement of the legislation when these animals are taken as bycatch.

Benefits which would accrue from acceptance of the recommendation

Listing under Schedule 5 of the WCA would not only prevent targeted fisheries for this threatened species, but also result in the release, unharmed, of listed elasmobranchs caught as bycatch.

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Recommendation for amendment to Schedule 5 of the Wildlife and Countryside Act, 1981

Type of animal: Elasmobranch fish

Scientific name: *Dipturus nidarosiensis*

English name: Black Skate

Distribution in Great Britain

The Black Skate is restricted to deep water in the North East Atlantic, where its distribution and occurrence are poorly known. It is extremely scarce in British coastal waters.

Distribution elsewhere

The Black Skate is restricted to deep water in the North East Atlantic.

Status in Britain

The status of the Black Skate is poorly known in British waters, although it shares the same life history and reproductive features of the other skates and is similarly threatened by mortality from bycatch.

Detailed studies have been undertaken of skate and ray populations in the North Sea, utilising long-term data sets (Walker & Heessen 1996, Walker & Hislop 1998). These concluded that the Common Skate has virtually disappeared from the North Sea (sporadic catches are still reported in the north). While skates over 100 cm long used to be common, those larger than 80 cm are now very scarce. All or most reproducing females of the larger species have now been lost as a result of intensive fishing effort, which imposes a total mortality on skate and ray populations well above replacement mortality for all species except for the smallest (only one ray species is within safe biological limits).

Habitat

A deep water marine fish, which is a predator on bottom-dwelling animals.

Threats

Threatened as a result of bycatch in benthic fisheries. Several elasmobranch species were reportedly formerly common, widespread and landed in large numbers by targeted and bycatch fisheries, but have been seriously depleted (some possibly to extinction) by unregulated fisheries. This pattern of depletion by fisheries is the result of the heavily 'K-selected' life history characteristics which they share. All are slow growing, mature at a large size and produce only a few large young each year. Under current fishing pressures, very few of these large young survive long enough to reach maturity and breed, which ultimately leads to declining populations. All would benefit from strict legal protection because they are large, robust, easily recognisable animals, lacking internal gas bladders, and may therefore be expected to survive release from fishing gear relatively well.

Given the current high levels of mortality on British elasmobranchs greater than 70 cm in length due to fisheries exploitation it is unlikely that any of these species will recover in the absence of legal protection. Current mortality of skates in the Irish Sea is between 0.57-0.71, meaning that between 43-51% of all individuals are killed each year, and 0.59-0.72 in the North Sea. These estimated mortality rates are in excess of that calculated (0.45) to have driven the Barndoor skate to near extinction on NW Atlantic shelves. They have resulted in the documented extirpation of the Common Skate from the North Sea and the Irish Sea. Given the similar life histories of these three British skates to the Barndoor Skate, current fishing mortality on these skates is sufficient to drive them to extinction.

Recommendation

Full protection, by addition to Schedule 5 of the Wildlife and Countryside Act, 1981.

Justification for recommendation

The deep water Black Skate is poorly known, but proposed for protection as a precautionary measure (because of the vulnerable life history characteristics it shares with the other species) and to minimise identification problems that might occur if it were necessary to differentiate between listed and unlisted long-nosed skate species.

Body size is known to be a good predictor of vulnerability to exploitation and extinction risk. To date, all flat-bodied elasmobranchs over 120 cm have disappeared from the Irish Sea (a very few individuals, presumably vagrants, are still occasionally caught). The Angel Shark can reach a maximum length of at least 183 cm and perhaps as much as 244 cm (although not a skate, it has a similar large, flat-bodied shape and bottom-dwelling character and is, therefore, similarly vulnerable to capture in fisheries, particularly bottom trawls). The Long-nose Skate reaches a maximum size of 156 cm long, the Black Skate (a poorly known deep water species) 200 cm long, White Skate 230 cm long and the Common Skate 285 cm. Remaining skate species greater than 70 cm long are also declining rapidly in abundance, and it is only the smallest species of skates that are increasing under the current fishing regime.

Body size is a good predictor of extinction vulnerability because it is closely linked to key life history parameters, such as age at maturity and reproductive output, which directly determine the population dynamics, demography, resilience and vulnerability to exploitation of species (Charnov 1993; Jennings *et al*. 1998; Dulvy *et al*. 1999; Dulvy & Reynolds 2002; Reynolds *et al*. 2001). It should be noted that the largest skate species on the US and Canadian west Atlantic shelf, the Barndoor Skate (*Dipturus laevis*), is nearly extinct (Casey & Myers 1998) and may qualify as **Critically Endangered** under the 2001 IUCN Red List Criteria. The four British species of long-nosed skates (Common, Long-nose, Black and White) skates are larger than the Barndoor Skate and may, therefore, be regarded as being more vulnerable to extinction than the nearly extinct Barndoor Skate.

Little is known of the life history of the Black Skate, but it is likely that they attain maturity at between 8-10 years of age and lay approximately 50 large eggs per year. This fecundity appears high compared to mammals and birds, but angel sharks and skates are arguably among the most threatened of all elasmobranchs. Fecundity in fishes generally has little bearing on population dynamics, demography and vulnerability, and generally contributes

only 10% to population growth rate in similarly long-lived animals (Heppell *et al*. 1999). So, the relatively high numbers of eggs laid or pups born is not an indicator that these species are resilient. In contrast, survival to the age of maturity appears to be the critical life stage determining population growth rate and vulnerability.

All skates are difficult to identify to species level accurately, especially in the field. Because all of the large 'long nosed' species of skate which occur in UK waters are proposed for protection under this Quinquennial Review, misidentification of this group is unlikely to be a problem, even for those juveniles which have not yet attained lengths of 1 m (large size is a diagnostic for adults). The appearance of the Angel Shark is also extremely distinctive. This will minimise any ambiguity or conflict in enforcement of the legislation when these animals are taken as bycatch.

Benefits which would accrue from acceptance of the recommendation

Listing under Schedule 5 of the WCA would not only prevent targeted fisheries for this threatened species, but also result in the release, unharmed, of listed elasmobranchs caught as bycatch.

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Recommendation for amendment to Schedule 5 of the Wildlife and Countryside Act, 1981

Type of animal: Elasmobranch fish

Scientific name: *Dipturus oxyrhynchus*

English name: Long-nose Skate

Distribution in Great Britain

The Long-nose Skate is extremely scarce in UK coastal waters. A search of the historical literature confirmed that a long-line fishery existed on the Isle of Man targeting both Long-nose and White Skates during the 1880s (Dulvy *et al*. 2000). Informal questionnaires of older fish processors in Fleetwood have also confirmed that a long-nosed skate species (presumably *D. oxyrhinchus*), distinct from the common skate (*Dipturus batis*), was present in the Irish Sea, albeit in excess of 20-30 years ago. There have been no captures of Long-nose Skate in government (Centre for Fisheries and Aquaculture Science, DEFRA formerly MAFF) trawl surveys between 1988 – 1997, in either the autumn or spring surveys of the Irish Sea (Dulvy *et al*. 2000). By inference it has been concluded that the Long-nose Skate is now extirpated from in the Irish Sea (although vagrants may still occasionally be reported).

Distribution elsewhere

The Long-nose Skate is restricted to NW European waters of the eastern Atlantic and the western Mediterranean.

Long-nose Skate were caught in a survey in the Mediterranean in 1948 (Jukic-Peladic *et al*. 2001), and was also reported in 1998, although the number of records is not indicated by the authors.

Status in Britain

Records of Long-nose Skate are very infrequent. Detailed studies have been undertaken of skate and ray populations in the North Sea, utilising long-term data sets (Walker & Heessen 1996, Walker & Hislop 1998). While skates over 100 cm long used to be common, those larger than 80 cm are now very scarce. All or most reproducing females of the larger species have now been lost as a result of intensive fishing effort, which imposes a total mortality on skate and ray populations well above replacement mortality for all species except for the smallest (only one ray species is within safe biological limits).

Habitat

A marine fish, which is a predator on bottom-dwelling animals.

Threats

Once taken in directed fisheries, until stocks collapsed, or were utilised bycatch in multi-species fisheries. Now threatened as a result of bycatch in benthic fisheries. Several elasmobranch species were reportedly formerly common, widespread and landed in large numbers by targeted and bycatch fisheries, but have been seriously depleted (some possibly to extinction) by unregulated fisheries. This pattern of depletion by fisheries is the result of the heavily 'K-selected' life history characteristics which they share. All are slow growing, mature at a large size and produce only a few large young each year. Under current fishing pressures, very few of these large young survive long enough to reach maturity and breed, which ultimately leads to declining populations. All would benefit from strict legal protection because they are large, robust, easily recognisable animals, lacking internal gas bladders, and may therefore be expected to survive release from fishing gear relatively well.

Given the current high levels of mortality on British elasmobranchs greater than 70 cm in length due to fisheries exploitation it is unlikely that any of these species will recover in the absence of legal protection. Current mortality of skates in the Irish Sea is between 0.57-0.71, meaning that between 43-51% of all individuals are killed each year, and 0.59-0.72 in the North Sea. These estimated mortality rates are in excess of that calculated (0.45) to have driven the Barndoor skate to near extinction on NW Atlantic shelves. They have resulted in the documented extirpation of the Common Skate from the North Sea and the Irish Sea. Given the similar life histories of these three British skates to the Barndoor Skate, current fishing mortality on these skates is sufficient to drive them to extinction.

Recommendation

Full protection, by addition to Schedule 5 of the Wildlife and Countryside Act, 1981.

Justification for recommendation

The two shallow water skates, the Long-nose skate and the White Skate, have yet to be assessed under IUCN Red List Criteria, but it is expected that they will be assessed at least as **Vulnerable**, if not **Endangered**, due to their extirpation from the Irish Sea, continued absence from the North Sea, and likely poor status in the Mediterranean.

Body size is known to be a good predictor of vulnerability to exploitation and extinction risk. To date, all flat-bodied elasmobranchs over 120 cm have disappeared from the Irish Sea (a very few individuals, presumably vagrants, are still occasionally caught). The Angel Shark can reach a maximum length of at least 183 cm and perhaps as much as 244 cm (although not a skate, it has a similar large, flat-bodied shape and bottom-dwelling character and is, therefore, similarly vulnerable to capture in fisheries, particularly bottom trawls). The Long-nose Skate reaches a maximum size of 156 cm long, the Black Skate (a poorly known deepwater species) 200 cm long, White Skate 230 cm long and the Common Skate 285 cm. Remaining skate species greater than 70 cm long are also declining rapidly in abundance, and it is only the smallest species of skates that are increasing under the current fishing regime.

Body size is a good predictor of extinction vulnerability because it is closely linked to key life history parameters, such as age at maturity and reproductive output, which directly determine the population dynamics, demography, resilience and vulnerability to exploitation of species (Charnov 1993; Jennings *et al*. 1998; Dulvy *et al*. 1999; Dulvy & Reynolds 2002; Reynolds *et al*. 2001). It should be noted that the largest skate species on the US and Canadian west Atlantic shelf, the Barndoor Skate (*Dipturus laevis*), is nearly extinct (Casey & Myers 1998) and may qualify as **Critically Endangered** under the 2001 IUCN Red List Criteria. The four British species of long-nosed skates (Common, Long-nose, Black and White) skates are larger than the Barndoor Skate and may, therefore, be regarded as being more vulnerable to extinction than the nearly extinct Barndoor Skate.

Little is known of the life history of the Long-nose Skate, but it is likely that they attain maturity at between 8-10 years of age and lay approximately 50 large eggs per year. This fecundity appears high compared to mammals and birds, but angel sharks and skates are arguably among the most threatened of all elasmobranchs. Fecundity in fishes generally has little bearing on population dynamics, demography and vulnerability, and generally contributes only 10% to population growth rate in similarly long-lived animals (Heppell *et al*. 1999). So, the relatively high numbers of eggs laid or pups born is not an indicator that these species are resilient. In contrast, survival to the age of maturity appears to be the critical life stage determining population growth rate and vulnerability.

All skates are difficult to identify to species level accurately, especially in the field. Because all of the large 'long nosed' species of skate which occur in UK waters are proposed for protection under this Quinquennial Review, misidentification of this group is unlikely to be a problem, even for those juveniles which have not yet attained lengths of 1 m (large size is a diagnostic for adults). This will minimise any ambiguity or conflict in enforcement of the legislation when these animals are taken as bycatch.

Benefits which would accrue from acceptance of the recommendation

Listing under Schedule 5 of the WCA would not only prevent targeted fisheries for these threatened species, but also result in the release, unharmed, of listed elasmobranchs caught as bycatch.

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Brander, K. (1981) Disappearance of Common Skate *Raia batis* from Irish Sea. *Nature*, **290**, 48-49.

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Recommendation for amendment to Schedule 5 of the Wildlife and Countryside Act, 1981

Type of animal: Elasmobranch fish

Scientific name: *Rostroraja alba*

English name: White Skate

Distribution in Great Britain

Current distribution is uncertain, but considered very uncommon in British waters. A search of the historical literature has confirmed that a long-line fishery existed on the Isle of Man targeting both this species and Long-nosed Skate during the 1880s (Dulvy *et al*. 2000). Additionally, Day (1880-84) described the White Skate as occurring all around the UK and 'not uncommon'. There have been no captures of either skate species in government (Centre for Fisheries and Aquaculture Science, DEFRA formerly MAFF) trawl surveys between 1988 – 1997 in either the autumn or spring surveys of the Irish Sea (Dulvy *et al*. 2000). By inference it has been concluded that White Skate is now extirpated from in the Irish Sea (although vagrants may still occasionally be reported).

Distribution elsewhere

The White Skate occurs in the north-eastern Atlantic and south-west Indian Ocean. In European waters, the species has been recorded from southern Britain to the Mediterranean.

The species is thought to be threatened in the Mediterranean. The recent Medits 1998 benthic trawl survey of the Mediterranean failed to record any specimens of White Skate, although this species was caught during a similar survey in 1948 (Jukic-Peladic *et al*. 2001). The species is listed on Annex III of the Barcelona Convention for the Protection of the Mediterranean Sea and Annex III of the Bern Convention on the Conservation of European Wildlife and Natural Habitats.

Status in Britain

The White Skate was historically common in the British Isles but is now considered very uncommon. Detailed studies have been undertaken of skate and ray populations in the North Sea, utilising long-term data sets (Walker & Heessen 1996, Walker & Hislop 1998). These concluded that the Common Skate has virtually disappeared from the North Sea (sporadic catches are still reported in the north). While skates over 100 cm long used to be common, those larger than 80 cm are now very scarce. All or most reproducing females of the larger species have now been lost as a result of intensive fishing effort, which imposes a total mortality on skate and ray populations well above replacement mortality for all species except for the smallest (only one ray species is within safe biological limits).

Habitat

A marine fish, which is a predator on bottom-dwelling animals.

Threats

Once taken in directed fisheries, until stocks collapsed, or were utilised bycatch in multi-species fisheries. Now threatened as a result of bycatch in benthic fisheries. Several elasmobranch species were reportedly formerly common, widespread and landed in large numbers by targeted and bycatch fisheries, but have been seriously depleted (some possibly to extinction) by unregulated fisheries. This pattern of depletion by fisheries is the result of the heavily 'K-selected' life history characteristics which they share. All are slow growing, mature at a large size and produce only a few large young each year. Under current fishing pressures, very few of these large young survive long enough to reach maturity and breed, which ultimately leads to declining populations. All would benefit from strict legal protection because they are large, robust, easily recognisable animals, lacking internal gas bladders, and may therefore be expected to survive release from fishing gear relatively well.

Given the current high levels of mortality on British elasmobranchs greater than 70 cm in length due to fisheries exploitation it is unlikely that any of these species will recover in the absence of legal protection. Current mortality of skates in the Irish Sea is between 0.57-0.71, meaning that between 43-51% of all individuals are killed each year, and 0.59-0.72 in the North Sea. These estimated mortality rates are in excess of that calculated (0.45) to have driven the Barndoor skate to near extinction on NW Atlantic shelves. They have resulted in the documented extirpation of the Common Skate from the North Sea and the Irish Sea. Given the similar life histories of these three British skates to the Barndoor Skate, current fishing mortality on these skates is sufficient to drive them to extinction.

Recommendation

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Justification for recommendation

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Body size is known to be a good predictor of vulnerability to exploitation and extinction risk. To date, all flat-bodied elasmobranchs over 120 cm have disappeared from the Irish Sea (a very few individuals, presumably vagrants, are still occasionally caught). The Angel Shark can reach a maximum length of at least 183 cm and perhaps as much as 244 cm (although not a skate, it has a similar large, flat-bodied shape and bottom-dwelling character and is, therefore, similarly vulnerable to capture in fisheries, particularly bottom trawls). The Long-nose Skate reaches a maximum size of 156 cm long, the Black Skate (a poorly known deepwater species) 200 cm long, White Skate 230 cm long and the Common Skate 285 cm. Remaining skate species greater than 70 cm long are also declining rapidly in abundance, and it is only the smallest species of skates that are increasing under the current fishing regime.

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Little is known of the life history of the White Skate, but it is likely that they attain maturity at between 8-10 years of age and lay approximately 50 large eggs per year. This fecundity appears high compared to mammals and birds, but angel sharks and skates are arguably among the most threatened of all elasmobranchs. Fecundity in fishes generally has little bearing on population dynamics, demography and vulnerability, and generally contributes only 10% to population growth rate in similarly long-lived animals (Heppell *et al*. 1999). So, the relatively high numbers of eggs laid or pups born is not an indicator that these species are resilient. In contrast, survival to the age of maturity appears to be the critical life stage determining population growth rate and vulnerability.

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Recommendation for amendment to Schedule 5 of the Wildlife and Countryside Act, 1981

Type of animal: Mollusc

Scientific name: *Helix pomatia*

English name: The Roman snail (also known as the apple snail; edible snail; vine snail)

Distribution in Great Britain

It is distributed chiefly in a broad band of England, running eastwards from the Cotswolds to the Chilterns and also scattered along the North Downs of Surrey and Kent. Further isolated colonies in central and southern England are likely to be deliberate introductions. Its Post-glacial history is uncertain, but it is likely to be a well-established introduction. There is little to disprove the belief that the species was introduced by the Romans for food, probably about 2000 years ago.

Distribution elsewhere

Mainly central and south-east Europe, but extending westwards to France and England, and north to the coasts of the southern Baltic.

Status in Britain

Very locally distributed and occasionally quite common at sites where public access is restricted.

Habitat

A fairly catholic range of relatively undisturbed habitats on well-drained, calcareous soils. It may be found in hedges, hedge banks, rank grassland and open woodland and scrub. Unlike the *Helix aspersa* the garden snail, it is not associated with human habitations or gardens.

Threats

Habitat destruction and disturbance by intensive farming and developments are relatively minor threat. The main threats comes from commercial collection for use in restaurants, sale in delicatessens and market stalls and increasingly by amateur cooks and 'food for free' enthusiasts.

Recommendation

Add to Schedule 5 for Section 9(1) killing, injuring & taking and Section 9(5) sale.

Justification for recommendation

H. pomatia is a large snail, which is relatively easily found when the animal is active in the late spring and early summer. The adults are long-lived and recruitment of new adults to populations is slow. As a consequence of the ease of collection and slow recovery it is relatively easy for populations to be depleted or lost. Most U.K. populations are isolated from adjoining populations and so once lost from a site, natural recolonisation is unlikely. Throughout much of its European range the species is described as experiencing population declines due chiefly, as in England, to collection for human consumption.

Survey work in Gloucestershire has shown that colonies nearest to Bristol have become extinct and the National Trust has reported over-collecting and significant population declines elsewhere in the Cotswolds. There are also well-researched accounts of over-collecting leading to population declines on the North Downs in Surrey (e.g. Boxhill, Norbury Park and the Mickleham valley).

Wells & Chatfield (1992) place the snail in the threat category 'of special concern'; the species is listed on (1) Appendix III of the Bern Convention, (2) the IUCN Red List (IUCN 1990) and (3) EC Directive Annex Va. The collection of *H. pomatia* is subject to a wide range of regional and local controls in other European countries including Austria, Belgium, Bulgaria, Czechoslovakia, France, Germany, Hungary, Italy, Luxemborg, Netherlands, Poland, and Switzerland.

Although *H. pomatia* is probably an 'ancient introduction' to the British fauna (the likely pedigree extends back about 2000 years), it meets Schedule 5 criteria because:

- The organism is endangered in its native range (see paragraph above) giving the isolated UK populations particular significance;
- Information clearly demonstrates that the species does not have an adverse impact on important native species or ecosystems;
- The natural range of the species reaches the north-west coast of Europe (Atlantic coast of France).

Benefits which would accrue from acceptance of the recommendation

Addition of *H. pomatia* to Schedule 5 of the Act would considerably strengthen protection for the species in helping to prevent both casual and commercial collection, which is increasingly putting U.K populations at risk.

References

Wells, S.M. & Chatfield, J. E. 1992. Threatened non-marine molluscs of Europe, *Nature and Environment, No. 64.* Council of Europe Press, Strasbourg.

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Recommendation for amendment to Schedule 5 of the Wildlife and Countryside Act, 1981

Type of animal: Moth

Scientific name: *Zygaena lonicerae* (Scheven) subspecies *jocelynae* Tremewan

English name: The Narrow-bordered Five-spot Burnet (or Talisker Burnet)

Distribution in Great Britain

This subspecies is known from only four colonies on the Isle of Skye, Scotland. It was described as a new subspecies in 1962, but has not been found elsewhere in Scotland since.

Distribution elsewhere

This subspecies is not known from outside of the Isle of Skye, Scotland. It is represented by different subspecies elsewhere in the Palaearctic region.

Status in Britain

The Talisker Burnet, *Zygaena lonicerae* subspecies *jocelynae*, is regarded as of Red Data Book status in Scotland, although it was not included in the insect Red Data Book (Shirt, 1987). The other British subspecies of the Narrow-bordered Five-spot Burnet (*Zygaena lonicerae latomarginata*) is widely distributed and locally common in England and the east of South Wales, hence it is not threatened and is not proposed for legal protection.

Habitat

Ungrazed grassland on steep cliffs by the sea, maintained in suitable ecological conditions by regular landslips and erosion on at least one site. Larvae feed on Meadow-vetchling *Lathyrus pratensis* and adults fly in June-July.

Threats

Recent evidence has been obtained of commercial collecting of larvae, for sale as livestock, at such a large scale as to be a significant threat to this subspecies. Previously, there had been no indication of damaging collecting or trade in British Burnet moths.

Recommendation

Full protection, by addition to Schedule 5 of the Wildlife and Countryside Act, 1981.

Justification for recommendation

The small number of colonies, plus recent evidence of commercial collecting of this subspecies, indicates that the survival prospects of this subspecies will be improved by full legal protection.

Benefits which would accrue from acceptance of the recommendation

Collection of any life stage would only be allowed under licence, thus commercial collecting that threatens the small number of colonies of the Talisker Burnet would cease, allowing the populations to remain at the carrying capacity of their sites. The related New Forest Burnet (*Zygaena viciae argyllensis*), now only known from one site in western Scotland, is already a fully protected species.

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Shirt, D.B. (Ed.) 1987. British Red Data Books: 2. Insects. xliv+402 pp. Nature Conservancy Council, Peterborough.

Tremewan, W.G. (1985) Zygaenidae *in*: The Moths and Butterflies of Great Britain and Ireland 2. pp. 112-113. Harley Books, Colchester.

Recommendation for amendment to Schedule 5 of the Wildlife and Countryside Act, 1981

Type of animal: Moth

Scientific name: *Zygaena loti* (Denis & Schiffermüller) subspecies *scotica* Rowland-Brown

English name: The Slender Scotch Burnet

Distribution in Great Britain

This subspecies is known from only six or seven sites with inter-connected colonies, on the islands of Mull and Ulva, Scotland. It was described as a new subspecies in 1919, but has not been found elsewhere in Scotland since. The species does not occur elsewhere in Britain.

Distribution elsewhere

This subspecies is not known from outside of the islands of Mull and Ulva, Scotland. It is represented by different subspecies elsewhere in the Palaearctic region.

Status in Britain

The Slender Scotch Burnet, *Zygaena loti* subspecies *scotica*, is listed as Red Data Book 3 (Rare) in the insect Red Data Book (Shirt, 1987).

Habitat

Low cliffs and grassy banks by the coast, maintained in suitable ecological conditions by erosion causing regular rock and soil slides. Larvae feed on Bird's-foot Trefoil *Lotus corniculatus* and adults fly in June-July.

Threats

Recent evidence has been obtained of commercial collecting of larvae, for sale as livestock, at such a large scale as to be a significant threat to this subspecies. Previously, there had been no indication of damaging collecting or trade in British Burnet moths.

Recommendation

Full protection, by addition to Schedule 5 of the Wildlife and Countryside Act, 1981.

Justification for recommendation

The small number of colonies, plus recent evidence of commercial collecting of this subspecies, indicates that the survival prospects of this subspecies will be improved by full legal protection.

Benefits which would accrue from acceptance of the recommendation

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