Council of Europe
Conseil de l'Europe

Strasbourg, 13 May 1998 **T-PVS (98) 18**
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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Group of experts
on conservation of invertebrates

5th meeting
Strasbourg, 28-29 April 1998

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REPORT OF THE MEETING

Secretariat Memorandum
established by the
Directorate of Environment
and Local Authorities

The Group of Experts on the Conservation of Invertebrates held its 5th meeting in Strasbourg on 28-29 April 1998, in accordance with the terms of reference set up by the Standing Committee.

The Standing Committee is invited to:

1. Take note of the report of the meeting;

2. Take note, in particular, of the recommendation of the Group of Experts concerning the use of substances to control internal livestock parasites and its unwanted effects on other invertebrate fauna (Appendix 6 to this report);

3. Examine and, if appropriate, adopt the draft recommendation on the Conservation of *Maculinea* butterflies (Appendix 7 to this report).

4. When adopting the programme and budget for 1999 take into account the following three activities:

– Action plans for *Margaritifera margaritifera* and *Margaritifera auricularia*;

– Extension to Southern and Eastern Europe of the study on invertebrates that are potentially good candidates for Appendix II of the Convention;

– Review of existing initiatives concerning marine invertebrates conservation.

Other activities suggested for 2000 and onwards:

– Action plans for *Osmoderma eremita* and *Buprestis splendens*;
– Threatened Carabid Coleoptera for eventual listing in Appendix II;
– Seminar on ecological networks and invertebrates (Switzerland).

1. Opening of the meeting

The Chairman, Mr Anastasios Legakis (Greece), welcomed participants and opened the meeting.

A list of participants appears in Appendix 1 of this document.

2. Adoption of the agenda

The agenda was adopted as it figures in Appendix 2 to this document.

3. Secretariat report

The Secretariat informed the Group that Mrs Maguelonne Déjeant-Pons was now in charge of the Pan-European Biological and Landscape Diversity Strategy and that Mr Eladio Fernández-Galiano had been appointed acting Head of the Environment Conservation and Management Division. Miss Sandra Jen and Miss Liri Kopaçi were currently working for the convention. Miss Liri Kopaçi would be replaced by Mr Gianluca Silvestrini as of July 1998.

The Secretariat informed the Group that it had not been possible to hold the seminar on invertebrates and marine biodiversity because the Principality of Monaco had been unable to host it and also because of the staff changes in the Secretariat.

The Secretariat added that, at its 16th meeting, the Standing Committee had adopted Recommendations Nos. 50 (Recommendation on the conservation of *Margaritifera auricularia*), 51 (Recommendation on Action plans for invertebrate species in the Appendices of the Convention) and 52 (Recommendation on habitat conservation for invertebrate species).

In accordance with the wish expressed by the Group at its meeting in Killarney, the Standing Committee had decided to have a study conducted on the invertebrate species which might be included in Appendix II of the Bern Convention (T-PVS (98) 9).

On the subject of marine species, the Secretariat informed the Group that 13 marine invertebrate species found in the Mediterranean Sea had been added to Appendix II of the Convention.

The Secretariat informed the Group that the Bern Convention acted as co-ordinator for Action Theme 11 of the Pan-European Biological and Landscape Diversity Strategy. The Strategy had been approved by 54 States and was a contribution towards implementation in Europe of the Convention on Biological Diversity (Rio de Janeiro). Action Theme 11, on action for threatened species, was being implemented in accordance with the Euro-Species Programme, in which the various organisations and conventions concerned were involved along with non-governmental organisations active in wildlife conservation.

The Secretariat presented the following publications:

– Texts adopted by the Standing Committee of the Bern Convention 1982-96 (Nature and Environment Series No. 75); and

– Guidelines for Action plans for animal species: planning recovery (Nature and Environment Series No. 92).

The Group asked for more publicity to be given to the activities of the Bern Convention, especially those of the Group. A presentation on the Internet would be an ideal means of providing easy and regular access to information.

4. Progress in invertebrate conservation since the last meeting

The delegates of Belgium, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Lithuania, Luxembourg, the Netherlands, Norway, Slovakia, Spain, Switzerland, Turkey and the United Kingdom presented their national reports [1].

These national reports are presented in Appendix 3 to this document.

The Group welcomed in particular the information concerning *Margaritifera margaritifera* and *Margaritifera auricularia* in France and Spain. Those species were the subject of Recommendations of the Standing Committee Nos. 22 (adopted on 11 January 1991) and 50 (adopted on 6 December 1996).

It was generally felt that conservation of invertebrates in the different states called for:

– more action plans to be prepared;
– more red lists to be drawn up;
– scientific research to be carried out into these species.

Special emphasis was laid on the lack of knowledge about the correlation between species and microhabitats.

Studies should be conducted on the notions of corridors and landscape fragmentation and their impact on invertebrates.

It was vital to integrate invertebrate conservation requirements into sectoral policies such as agriculture or river and forestry management.

5. Action plan on *Maculinea spp.* (document T-PVS (98) 5)

The Secretariat presented the report and explained the limitations of time and finances for this activity.

Most delegates praised the quality and interest of the work and made the following comments:

– the report is not a proper action plan (not detailed enough) but a "framework action plan" or an information document that can be useful for the elaboration of national or regional action plans on the species;

[1] The national report of Tunisia was also submitted to the Secretariat during the Group meeting.

– more should be said about habitats of the *Maculinea* and habitat structure in particular;

– it would have been useful to include a section on management of habitats for *Maculinea* species;

– it would be interesting to foresee a review mechanism.

The experts agreed to send their comments in writing to the consultant.

The Group agreed that, as a first experience in an action plan for a group of butterflies for Europe, the experience had been interesting and should be continued with other species. In that respect, Recommendation No. 59 of the Standing Committee (on the drafting and implementation of Action Plans) should be taken into account.

The Group decided to propose the Standing Committee to adopt the draft recommendation included in Appendix 7 to this document and to follow up in future meetings the implementation of that recommendation by concerned Parties.

The report is to be circulated to experts and governments, revised by the expert and published.

6. Red Data Book of Butterflies (*Rhopalocera*) – Progress report (document T-PVS (98) 8)

The Secretariat and the representative of the United Kingdom presented the document which has been prepared by Mr van Swaay, Mr Warren and Mr Grill in co-operation with English Nature. The report is not finished, so the experts would welcome a feedback from the meeting.

Most of the delegates found the work very valuable, as it had also mobilised a lot of energy (and enthusiasm) in European Lepidopterologists. Some delegates made observations of detail on their own countries and were invited to send them in written form to the consultants.

It was suggested that it would have been appropriate for the consultants to work more closely with the European Lepidoptera Society and there was some concern that most of the species listed belonged to category "SPEC 3", that is, species which are non endemic to Europe but have threatened populations in Europe.

Some experts wished to see more information on the habitats of the species, so that species that live in threatened habitats or subject to important fluctuations could be properly considered.

7. European Red List of Invertebrates (document T-PVS (98) 9)

The consultant, Mr Haslett, insisted that he saw the work rather as list of possible species to be added to Appendix II (for some groups) than as a proper Red List. He explained that he was unable to use the new IUCN criteria as those are not applicable to invertebrates by lack of appropriate data.

The document was well appreciated by experts who understood the limitations of time and money in which the consultant had worked. All experts would have wished to see other groups being considered, and it was suggested that more information on habitats would have been useful. The main problem of the document seemed to be that it was somehow unbalanced geographically. Southern and Eastern Europe were underrepresented. Threat categories were also biassed or endemics of Northern Europe seemed to be less threatened than Northern species that reached also Central Europe. Iceland was perhaps not fully taken into account.

The Group decided that this was just a first step and that the study had to be completed. It was decided that the study would be circulated to governments and experts for comments, that it was to be extended for Eastern and Southern Europe and that the Group would examine an amended version at its next meeting.

8. Marine Invertebrates and habitats

At its previous meeting, the group had asked that the Bern Convention provide a focal point for activities aimed at the conservation of marine invertebrates and their habitats. For the present meeting, the group had six extra delegates, mostly from coastal states.

Mrs Bentata (France) outlined the situation facing marine invertebrates: the majority of marine invertebrates lived in littoral zones and suffered from:

- intensive harvesting;
- overfishing;
- habitat destruction;
- pollution;
- the introduction of non-native species.

The delay in the inclusion of the marine environment in European conservation initiatives had led to a shortage of knowledge in this area. Nevertheless, a good many projects were currently under way. The following were referred to: the classification of habitats for the British Isles and Ireland; the French classification for the Mediterranean, Atlantic and English Channel; work by the Helsinki Commission for the protection of the marine environment in the Baltic Sea area; the work of the Istanbul Commission under the aegis of the Convention on the Protection of the Black Sea against Pollution; the Mediterranean Action Plan (MAP) initiative of the OSPAR Convention, etc.

All of these activities would call for a certain degree of co-ordination. The European Environment Agency and the European Topic Centre on Nature Conservation might possibly act as focal points for co-ordinating the work on habitats.

Since, however, there was no overview of all of the initiatives in progress in this area, the Group called on the Secretariat to prepare an inventory of these initiatives.

9. Suggestions for invertebrate conservation activities within the framework of the Convention for 1999 and 2000

It was suggested that the Group could do further work on analysing the causes of the disappearing of main species in Europe, in particular fragmentation in agricultural areas. The Group decided to ask the Standing Committee or organise a seminar, in co-ordination with the meeting of the Group of Experts, to debate the ecological networks for invertebrates. Switzerland volunteer to host the seminar in Neuchâtel.

For the Programme of activities of 1999 and 2000 it was suggested to continue with action plans for *Margaritifera margaritifera*, *Margaritifera auricularia, Osmoderma eremita* and *Buprestis splendens*. The extension of the work on potential candidate species for Appendix II

should be extended to Eastern Europe and Southern Europe. A study on carabid beetles was also suggested.

The Group will also work to discuss on criteria for listing species into Appendix II and on high altitude invertebrates.

Other subjects for future work that were suggested were:

- invertebrates in wetlands;
- invertebrates in neglected agricultural landscapes;
- the importance for invertebrates of small water bodies.

10. Election of Chairman and Vice-Chairman

Mr Legakis (Greece) was reelected Chairman and Mr Gonseth (Switzerland) Vice-Chairman.

11. Other business

The Secretariat presented the document on the Emerald Network (document T-PVS (97) 30 rev. – draft resolution containing the list of species requiring specific habitat conservation measures).

The Group took note of this document.

Professor Jean-Pierre Lumaret made a statement on the use of endectocides and their effects on entomofauna. The group decided to adopt a recommendation on the use of endectocides (Appendix 6 to this document).

The next European Congress of Entomologists would take place in September 1999 in Thessaloniki and a workshop would focus on high-mountain invertebrates. The committee decided to consider this activity as an extension of its own work and hoped that the proceedings could be published in the same series as its other activities.

APPENDIX 1

LIST OF PARTICIPANTS / LISTE DES PARTICIPANTS

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I. CONTRACTING PARTIES / PARTIES CONTRACTANTES

AUSTRIA / AUTRICHE
Dr John R. HASLETT, Lecturer, Institute of Zoology, University of Salzburg, Hellbrunner Str. 34, A-5020 SALZBURG.
Tel: (43) 662 8044 5600. Fax: (43) 662 8044 5698. E-mail: john.haslett@sbq.ac.at E

BELGIUM / BELGIQUE
Mr Dirk MAES, Institute of Nature Conservation, Kliniekstraat 25, B-1070 BRUSSELS.
Tel: (32) 2 558 18 37. Fax: (32) 2 558 18 05. E-mail: dirk.maes@instnat.be. Homepage: http://www.instnat.be/ E/F

CYPRUS / CHYPRE

DENMARK / DANEMARK
Mr Hans Peter RAVN, National Forest and Nature Agency, Forskningscentret for Skov- og Landskab, Horsholm Kongevej 11, DK-2970 HORSHOLM.
Tel: (45) 45 76 32 00. Fax: (45) 45 76 32 33. E-mail: hpr@fsl.dk E
[Apologised for absence / Excusé]

ESTONIA / ESTONIE

FINLAND / FINLANDE
Mr Ilmari VALOVIRTA, Curator, Finnish Museum of Natural History, University of Helsinki, PO Box 17, FIN-00014 HELSINKI.
Tel: (358) 9 1917451. Fax: (358) 9 1917443. E-mail: Ilmari.valovirta@Helsinki.fi E

FRANCE / FRANCE

Mme Denise BELLAN SANTINI, Directeur de recherche CNRS, Centre d'Océanologie de Marseille, Station marine d'Endoume, Rue de la Batterie des Lions, F-13007 MARSEILLE.
Tel: (33) 4 91 04 16 33. Fax: (33) 4 91 04 16 35. E-mail: bellan@com.univ-mrs.fr F

Mr Robert GUILBOT, Office pour l'Information éco-entomologique - OPIE, B.P. 30, F-78041 GUYANCOURT Cedex.
Tel: (33) 1 30 44 13 43. Fax: (33) 1 30 83 36 58. F

Mr le professeur Jean-Pierre LUMARET, (Ministère Aménagement du Territoire et Environnement) Université Montpellier 3, Laboratoire de zoogéographie, B.P. 5043, F-34032 MONTPELLIER CEDEX 1. (route de Mende, 34199 Montpellier Cédex 5)
Tel: (33) 4 67 14 23 16. Fax: (33) 4 67 14 24 59. E-mail: lumaret@bred.univ-montp3.fr F

Mr Gilbert COCHET, Office pour l'Information éco-entomologique - OPIE, B.P. 30, F-78041 GUYANCOURT Cedex. [Le Village, F-07130 ST ROMAIN de LERPS]
Tel: (33) 1 30 44 13 43. Fax: (33) 1 30 83 36 58. F
[Tél.(33) (0)4 75 58 51 43 Fax (33) (0)4 75 58 53 37]

Mr Pascal DUPONT, Chargé de mission scientifique, Office pour l'Information éco-entomologique - OPIE, Cidex 116, 1286, rue de Belledonne, F-38920 CROLLES
Tel: (33) 4 76 92 19 75. Fax: (33) 4 76 82 19 75. F

GERMANY / ALLEMAGNE
Dr Horst GRUTTKE, Wiss. Rat., Bundesamt für Naturschutz, Konstantinstr. 110, D-53179 BONN
Tel: (49) (0)228 8491-105 Fax: (49) (0)228 8491-119/200 E

GREECE / GRÈCE
Mr Anastasios LEGAKIS, Zoological Museum, Dept. of Biology, University of Athens, Panepistimioupolis, GR-157 84 ATHENS.
Tel: (30) 1 728 43 72. Fax: (30) 1 728 46 04 E-mail: ALEGAKIS@ATLAS.UOA.GR E

HUNGARY / HONGRIE
Prof. Dr. Zoltán S. VARGA, Kossuth Lajos University, Department of Zoology and Evolution, Egyetem tér 1., H-4010 DEBRECEN.
Tel: (36) 52 316 666 Ext. 2331, 2333 Fax: (36) 52 316 666 Ext. 2331
E-mail: zvarga@tigris.kite.hu E (German; French: passive)

ICELAND / ISLANDE
Mr Ingi AGNARSSON, Biologist (Research on invertebrates), Icelandic Institute of Natural History, Hlemmur 3, P.O.Box 5320, ISL-125 REYKJAVIK, Iceland.
Tel: (354) 562 9822. Fax: (354) 562 0815. E-mail: ingia@nattfs.is E

IRELAND / IRLANDE
Dr Martin C.D. SPEIGHT, National Parks & Wildlife Service, 51 St Stephen's Green, IRL–DUBLIN 2.
Tel: (353) 1 661 31 11. Fax: (353) 1 662 02 83 E

LITHUANIA / LITUANIE
Mr Jonas AUGUSTAUSKAS, Head of Biological Diversity Division of the Landscape and Biological Diversity Department, Ministry of Environmental Protection, Juozapavi_iaus str. 9, LT-2600 VILNIUS.
Tel: (370) 2 722 808. Fax: (370) 2 722 080. E-mail: biolog.nt.gamta.lt E

LUXEMBOURG / LUXEMBOURG
Mr Marc MEYER, Conservateur, Musée national d'histoire naturelle, 25, rue Munster, L-2160 LUXEMBOURG.
Tel: (352) 462233 404. Fax: (352) 463848. E-mail mmeyer@mnhn.lu.
Web-site: http://www.mnhn.lu F

MONACO / MONACO
M^me^ Marie-Christine VAN KLAVEREN, Chef de Division du Patrimoine naturel, Département des Travaux publics et Affaires sociales, Service de l'Environnement, 3 avenue de Fontvieille, MC-98000 MONACO
Tel: (377) 93 15 89 63 / (377) 93 15 1 48. Fax: (377) 92 05 28 91. E-mail: pvk@mcn.mc
[Apologised for absence/Excusée] F

THE NETHERLANDS / PAYS-BAS
Mr Peter J. van HELSDINGEN, Consultant Ministry of Agriculture & Nature Management, National Museum of Natural History, Darwinweg 2, NL-2333 CR LEIDEN.
Tel: (31) 71 56 87 620. Fax: (31) 71 56 87 666. E-mail: helsdingen@nnm.nl E

NORWAY / NORVÈGE
Mr Kaare AAGAARD, Research scientist, Norwegian Institute for Nature Research (NINA), Tungasletta 2, N-7005 TRONDHEIM.

Tel: (47) 7380 1400. Fax: (47) 7380 1401. E

POLAND / POLOGNE
Prof. Maciej WOLOWICZ, (National Council of Nature Protection, Ministry of Environmental Protection) University of Gdansk, Institute of Oceanography, Al. Pitsudskiego 46, 81-378 GDYNIA.
Tel: (48) 58 620 21 01. Fax: (48) 58 620 21 65. E-mail: ocemco@univ.gda.pl E/F

SPAIN / ESPAGNE
Dr Maria de los Angeles RAMOS, Museo Nacional de Ciencias Naturales (CSIC), C/ José Gutierrez Abascal, 2, E-28006 MADRID.
Tel: (341) 411 13 28. Fax: (341) 564 50 78. E-mail: m.ramos@mncn.csic.es E

SWITZERLAND / SUISSE
Mr Yves GONSETH, Docteur en biologie, représentant l'Office fédéral de l'environnement (OFEFP, Directeur du Centre suisse de cartographie de la faune, CSCF, Musée d'histoire naturelle, Terreaux 14, CH-2000 NEUCHÂTEL, Suisse.
Tel: (41) 32 7257 257. Fax: (41) 32 717 79 69. E-mail: yves.gonseth@cscf.unine.ch F

TUNISIA / TUNISIE

TURKEY / TURQUIE
Mrs Serap KAYNAK, Biologist, Ministry of Environment, Eski_ehir Yolu 8 Km, TR-06530 ANKARA
Tel: (90) 312 287 99 63 / 24 08 Fax: (90) 312 286 22 71 E

UNITED KINGDOM / ROYAUME-UNI
Dr Ian FRANCIS Gilbert McLEAN, Head of Species Advice, Joint Nature Conservation Committee (JNCC), Monkstone House, City Road, GB PETERBOROUGH PE1 1UA
Tel: (44) (0)1733 816813. Fax: (44) (0)1733 555 948. E-mail: mclean_i@jncc.gov.uk E

II. OBSERVERS

Mr S. PATINY, expert en Melissologie et biogéographie des insectes *Apoidea*, Faculté des Sciences Agronomiques de Gembloux, Unité de Zoologie générale et appliquée, Passage des Déportés 2, B-5030 GEMBLOUX, Belgique.
Tel: (32) 0 81 62 22 86. Fax: (32) 0 81 62 33 12. E-mail: zoologie@fsagx.ac.be F

European Invertebrates Survey / Institut royal des sciences naturelles de Belgique, **Mr Richard Desmond KIME**, Expert, Institut royal des sciences naturelles de Belgique, 29, rue Vautier, B-1000 BRUXELLES, Belgique.
Tel: (32) 2 627 42 99. Fax: (32) 2 646 44 33. E/F

The World Conservation Union / L'Union mondiale pour la nature (IUCN/UICN)
Dr Mary SEDDON, Head of Mollusca, Biodiversity & Systematic Biology, National Museum of Wales, Cathays Park, CARDIFF, United Kingdom.
Tel: (44) 1222 573 343. Fax: (44) 1222 239 009. E-mail: Mary.Seddon@nmgw.ac.uk E
[Apologised for absence / Excusée]

Université du Maine
Mr le professeur Jacques LHONORE, (représentant Societas Europaea Lepidopterologica - SEL), Faculté des Sciences, Laboratoire de biosystématique des insectes, B.P. 535, Avenue Olivier Messiaen, F-72017 LE MANS Cédex.
Tel: (33) 2 43 83 32 51. Fax: (33) 2 43 83 39 33. E-mail: Lhonoré@univ-lemans.fr F/E

European Invertebrate Survey (EIS)

Dr Harald SCHREIBER, European Invertebrate Survey, Institute of Biogeography, University of the Saarland, P.O.B. 151150, D-66041 SAARBRÜCKEN, Allemagne
Tel: (49) (0)6897 798 - 104 Fax: (49) (0)6897 798 - 155 E-mail: h.schreiber@rz.uni-sb.de E

III. APOLOGISED FOR ABSENCE / EXCUSES

Bulgaria / Bulgarie

European Commission / Commission européenne

Liechtenstein/ Liechtenstein

Slovakia / Slovaquie

European Habitats Forum

Organisation for Economic Co-operation and Development (OECD) / Organisation de coopération et de développement économiques (OCDE)

United Nations Education, Scientific and Cultural Organisation (Unesco) / Organisation des Nations Unies pour l'éducation, la science et la culture (Unesco)

European Topic Centre on Nature Conservation (EEA) / Centre thématique européen pour la conservation de la nature (AEE)

IV. CONSULTANTS / EXPERTS

V. INTERPRETERS / INTERPRETES

Mr Cyrille de KLEMM, 21, rue de Dantzig, F-75015 PARIS.
Tel: 01 45 32 26 72. Fax: 01 45 33 48 84. E/F

M^me^ Ingrid CATTON-CONTY, La Petite Chênaie, Av. de Marnes, F-92430 MARNES-LA-COQUETTE.
Tel: 01 47 01 01 93. Fax: 01 47 01 02 03 E/F

M^me^ Starr PIROT, Chemin des Mollards, CH-1261 St. GEORGE, Suisse.
Tel: (41) 22 368 20 67 E/F

Mr William VALK, 2, rue des Jardins, Duntzenheim, F-67270 HOCHFELDEN.
Tel: (33) 3 88 70 59 02. Fax: (33) 3 88 70 50 98 E/F

VI. SECRETARIAT / SECRÉTARIAT

Council of Europe / Conseil de l'Europe
Directorate of Environment and Local Authorities / Direction de l'Environnement et des Pouvoirs Locaux, F-67075 STRASBOURG CEDEX, France
Tel : (33) 3 88 31 20 00 Fax : (33) 3 88 41 27 81 / 82 / 83

Mr Ferdinando ALBANESE, Director of Environment and Local Authorities / Directeur de l'Environnement et des Pouvoirs Locaux

Mr Eladio FERNÁNDEZ-GALIANO, Head a. i. of the Environment Conservation and Management Division / Chef a. i. de la Division de la Protection et de la Gestion de l'Environnement
Tel : (33) 3 88 41 22 59 Fax : (33) 3 88 41 37 51 / 27 84 E-mail : eladio.fernandez-galiano@coe.fr

Ms Sandra JEN, Environment Conservation and Management Division / Division de la Protection et de la Gestion de l'Environnement
Tel : (33) 3 88 41 22 56 Fax : (33) 3 88 41 37 51 / 27 84. E-mail : sandra.jen@coe.fr

Mr Gianluca SILVESTRINI, Environment Conservation and Management Division / Division de la Protection et de la Gestion de l'Environnement
Tel : (33) 3 88 41 35 59 Fax : (33) 3 88 41 37 51 / 27 84 E-mail: gianluca.silvestrini@coe.fr

APPENDIX 2

DRAFT AGENDA

1. Opening of the meeting by the Chairman

2. Adoption of the agenda

3. Secretariat report (Recommendations No. 50, 51 and 52)

4. Progress in invertebrate conservation since the last meeting (May 1996)
General comments (written summaries of national reports welcome)

5. Action plan on *Maculinea spp.* – Presentation of the report by the expert

6. Red Data Book of Butterflies (*Rhopalocera)* – Progress report

7. European Red List of Invertebrates – Presentation by the expert (document T-PVS (98) 9)

8. Marine Invertebrates and habitats

9. Suggestions for invertebrate conservation activities within the framework of the Convention for 1999 and 2000

10. Election of Chairman and Vice-Chairman

11. Other business (incl. Effects of worm control substances on entomofauna)

APPENDIX 3

REPORTS FROM THE NATIONAL DELEGATES

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3.1. Belgium / Belgique

3.2. Finland / Finlande

3.3. France / France

3.4. Germany / Allemagne

3.5. Greece / Grèce

3.6. Hungary / Hongrie

3.7. Iceland / Islande

3.8. Ireland / Irlande

3.8. *bis* *Austropotamobis pellipes* in Ireland

3.9. Lithuania / Lituanie

3.10. Luxembourg / Luxembourg

3.11. The Netherlands / Pays-Bas

3.12. Norway / Norvège

3.13. Slovakia / Slovaquie

3.14. Spain / Espagne

3.15. Switzerland / Suisse

3.16. Tunisia / Tunisie

3.17. Turkey / Turquie

3.18. United Kingdom / Royaume-Uni

3.1. Belgium / Belgique

Report on invertebrate research in Belgium (1996-1998)

I. FLANDERS (Mr Dirk Maes, Institute of Nature Conservation, Brussels)

1. Atlas projects

For two invertebrate groups atlases will probably be published in 1998: Butterflies (Lepidoptera: *Rhopalocera*) and Dragonflies (*Odonata*). The butterfly atlas will be limited to Flanders while the Dragonfly atlas will cover the whole of Belgium. Preparations are made for future Flemish atlases on Aquatic bugs (*Hemiptera*) and Aquatic beetles (*Coleoptera*) and a Belgian atlas on Grasshoppers (*Orthoptera*). Most atlas projects are done in close collaboration with amateur study groups.

2. Red List projects

Since 1995 three Flemish Red List on invertebrates are published: Carabid beetles (*Coleoptera: Cicindelidae, Carabidae*) in 1995, Butterflies *(Lepidoptera: Rhopalocera*) and Dragonflies (*Odonata*) both in 1996. For three families of flies (*Diptera: Syrphidae, Dolichopodidae, Empididae*) the Red List report is finished and they will soon be published as Red Data Books. A project for a Red List of Landsnails in Flanders (*Mollusca*) is currently running. In the near future projects for Red Lists of Grasshoppers (*Orthoptera*), Spiders (*Araneae*), Aquatic bugs (*Hemiptera*) and Aquatic beetles (*Coleoptera*) in Flanders will be started. The majority of the data with which the Flemish Red Lists are compiled are gathered by volunteers.

3. Monitoring projects

In Flanders a butterfly monitoring project started in 1991 and consists of weekly transect counts on about 40 sites. In 1998 a Dragonfly monitoring project will be tested. Both monitoring projects rely mainly on volunteers.

4. Species protection plans

In Flanders a species action plan has been proposed for *Maculinea alcon* that will probably get excepted.

II. WALLONIA (Mr Marc Dufrêne, La région Wallonne, Gembloux)

1. Surveillance and monitoring programs

Different research programs have been carried out by the Scientific Research Station of the regional government at Gembloux:

1.1. A specific inventory has been carried on during three years for Astacus astacus and exotic competiting crayfish species. The indigenous species is only present in more or less one hundred sites in Wallonia.

1.2. Since 1996, the actions supported by the administration for Insects are coordinated by the Observatory of the Fauna, the Flora and Habitats (OFFH) at the Scientific Research Station and realized by a naturalist network. In this frame, Butterflies (*Lepidoptera: Rhopalocera*) and Dragonflies (*Odonata*) beneficiate of large scale monitoring projects in the Walloon region. More than hundred sites are surveyed each year by a team of naturalists. A special interest is

reserved for species mentioned in international directives and conventions like the Bern one: populations are inventoried and site boundaries are mapped. Such information are provided in the case of incidence studies or when sites of great biological interest are threatened. All available data managing by OFFH are integrated in databases linked with information on species statute and ecology and site statute and inventory (GIS system). Some of the synthetic information on species (species list, maps, ecology, protection statutes, ...) and monitoring programs are available on a Internet server (web address in some weeks : biodiv.wallonie.be).

1.3. Since 1990, aquatic invertebrates data are also used in biotic indices (390 sites sampled all the three years). Since 1997, this inventory is coordinated by the Scientific Research Station at Gembloux. Nevertheless, main information are limited at present to genus or even families for all the groups.

Others research programs in Wallonia result from the dynamism of universities as the Mons-Hainaut University and the Agronomy Faculty of Gembloux on *Hymenoptera* and of naturalist groups (e.g. Grasshoppers: *Orthoptera*). Some information on Carabid beetles are also available at IRScNB (Bruxelles) and at the Catholic University at Louvain-la-Neuve.

2. Atlas projects

An atlas covering all the country will be published this year on Dragonflies (*Odonata*). Its completion is supported by the Walloon region in the frame of the regional species monitoring project. A Butterflies atlas is planned too but with no deadline. Another one is also in preparation for Crayfish species.

3. Red lists

Red lists for Butterflies (Lepidoptera: *Rhopalocera*), Dragonflies (*Odonata*) and Carabid beetles (Coleoptera: *Carabidae - Cicindelidae*) are available for the Walloon region.

4. Species protection plans or specific actions

With the help of the Catholic University of Louvain at Louvain-la-Neuve, a reintroduction plan of *Euphydryas aurinia* (Lepidoptera) has been carried on since 1995. All the walloon populations have been monitored and several introductions in suitable sites have been carried on. Some of them are at present successful. An emergency management action on one of the two main sites has been necessary to avoid a local extinction due to a partial destruction of suitable habitats. A similar program was also launched on *Melitaea cinxia* (Lepidoptera) but with no result at present. A specific inventory program of humid grasslands, fens and peatbogs with threatened butterflies (*Boloria aquilonaris*, *Proclossiana eunomia*, *Lycaena helle*, *Lycaena hippothoe*, ...) is carrying on in Ardenne.

Two new species will be added to the list of protected species: *Unio crassus* (Mollusca) and *Margaritifera margaritifera* (Mollusca). The complete protection of *Astacus astacus* (Crustacea) has been renewed for the next five years and some actions of reintroduction are initiated. Indigenous species lists for butterflies (Lepidoptera: *Rhopalocera*), Dragonflies (*Odonata*) and Grasshoppers (*Orthoptera*) have been legally decided to rule species introductions.

5. Other actions

This report is far to be exhaustive; other initiatives carried out by naturalist individuals and societies are surely launched on other biological groups, but the lack of time to write this

report prevents to have a global view. This report enhances mainly programs directly or indirectly supported by the administration.

BRUSSELS – No particular projects on invertebrates are taking place for the moment.

III. RAPPORT SUR L'ACTIVITÉ DE SURVEILLANCE DE LA FAUNE EN WALLONIE POUVANT S'INSCRIRE DANS LE CADRE DE LA CONVENTION DE BERNE (Mr S. Patiny, Unité de zoologie générale et appliquée, Université de Gembloux)

1. L'activité principale est le développement de la banque de données fauniques de Gembloux (FuSAGx) et Mons (UMH). Cette banque de plus de 30 ans, à l'initiative par le professeur J. Leclercq, s'enrichit en permanence. Elle étend son territoire géographique et les logiciels servant à sa gestion sont actualisés régulièrement en fonction des progrès informatiques. Ces logiciels sont développés et largement distribués (Allemagne, France, par exemple) par l'équipe du professeur P. Rasmont (UMH).

Les données reprises dans la banque proviennent de deux sources : les collections de différents musées, revues par nos spécialistes, et des collectes nouvelles pratiquées par divers groupes de recherches. Les données respectent en tous points les prescriptions de la FBDB (Fédération des banques de données biogéographiques).

La principale activité de recherche concerne les Hyménoptères Aculéates, les Symphytes et les Lépidoptères. Plusieurs autres groupes, étudiés lors d'une précédente liste rouge ou faisant l'objet de recherches particulières, sont également suivis.

2. La Banque de données fauniques a permis la publication de très nombreux travaux. L'un d'entre eux a été l'édition d'une première liste rouge voici quelques années ; son actualisation est prévue pour l'an 2000.

La mise en évidence d'une dérive faunique (*faunistical drift*) chez les bourdons (*Bombus*) a été possible, en partie grâce à l'existence de ce système de surveillance. En 1997, un colloque sur le thème «Etat de l'entomofaune à la veille de l'an 2000» s'est tenu à Gembloux (Belgique). Il a permis, grâce à l'abondance des données disponibles, d'étendre la notion de dérive faunique à plusieurs autres groupes (autres que les bourdons :*Andrenidae, Asilidae*, ...). Les actes de ce colloque seront prochainement publiés dans les «*Notes fauniques de Gembloux*».

3. La non-limitation de la BFGM au territoire belge a permis des études pertinentes sur la faune française (Aveyron, Lozère, Var ; Cerdagne) et l'apport d'un conseil pertinent de la part de nos experts : établissement des ZNIEFF en région PACA (Provence-Alpes-Côte d'Azur), par exemple, ainsi que la publication de plus de 2 000 cartes de distribution de nombreux invertébrés.

Des études menées dans différents pays : Maroc, Turquie et, prochainement, Sibérie, ainsi que la révision de très larges collections par nos experts, permettent de contribuer éventuellement à la connaissance de la répartition de très nombreux insectes de la région ouest-paléarctique (avec une grande facilité de cartographie).

Une partie des données disponibles sont, ou seront bientôt, accessibles sur différents sites Internet. Ceux-ci sont signalés sur les pages des Services de zoologie des universités de Mons (UMH) et Gembloux (FuSAGx).

3.2. Finland / Finlande

Progress in invertebrate conservation in Finland in 1996-1997

by Mr Ilmari Valovirta, Finnish Museum of Natural History

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1. Introduction

The main conservation methods can be classified in several groups: improving legislative controls, creation of conservation areas like Natura 2000 -network, environmental management like restoration of old habitats, artificial assistance in breeding and through increasing public awareness.

2. Red Data Books

In the first edition of the Red Data Book of Finland (1987) about 10,000 invertebrate species were checked. The proportion of threatened species was only 4 % (400 species) which was small in comparison to countries in Central Europe. In the group required monitoring were 256 invertebrate species. For the second edition of the Red Data Book (1992) about 12,000 invertebrate species were checked. In these about 6 % (733 species) were threatened. During the five years period 36 invertebrate species had been added to the list of which 512 species belonged to the group of required monitoring.

The third edition of the Red Data Book of Finland (will be published in 1999) is the most important recent progress in Invertebrate legislative conservation in Finland. In the earlier red data books there were four categories for threatened species: Extinct, Endangered, Vulnerable, and Required monitoring. For the third edition Finland will follow the new classification of threatened species compiled by IUCN. The criteria will change more international, which means that the result will also be different from the earlier Red Data Books.

3. Confiscation values

In 1995 the Ministry of Environment gave confiscation values for every protected animal and plant species in Finland. Confiscation values vary from that of sea eagle 44000 FIM (£6000) to the smallest values which is 100 FIM (£ 13). Using these valuations a court can order compensation to be paid in the event of violation. The confiscation value of a single *Margaritifera margaritifera* specimen in Finland is 3,500 FIM (about £ 500) and for *Unio crassus* (Philipsson) 300 FIM (£ 40). As a conservation method the confiscation value has had large effect in carrying conservation negotiations, and on the other hand, prohibitive effect on illegal mistakes.

4. Natura 2000 Network

The best method of restoring the threatened invertebrate species is the protection of the breeding population. In Finland only some of the threatened Invertebrate populations are inside some conservation areas, which means huge amounts of activities to protect the populations outside. Finland, who became as a member state of EU in 1995, has had only a few years to compile a list of conservation areas for Natura 2000 Network. We can say that *Margaritifera* represents a general cover of Natura 2000 Network on the threatened invertebrate species. Of the 50 known *Margaritifera* rivers 11 belong, at this moment, inside the Natura 2000 Network. However, it has also been possible to find and establish some new protected areas where freshwater pearl mussel occurs.

5. European Union Life / Nature Project

The European Union granted 360,000 ECU to start a Life Nature project of "Restoration of fluvial ecosystems containing pearl mussels" on three *Margaritifera* rivers in Central and South Finland. There are seven participating organisations like three Regional Environmental Centres, Rural Business District of Häme, Hämeenkyrö town, WWF-Finland and as the main co-ordinator the University of Helsinki. This is a study of *Margaritifera margaritifera* with a requirement to look at salmon as well. Rivers form a multifacial ecosystem with a great diversity of species. River-construction, especially log-floating, have caused the disparition of the majority of fluvial ecosystems in natural state in Finland. Many extensive projects have been realised to restore treated river-sections back to their natural state. The objective of these projects has been not only to restore the river-sites but also to improve possibilities of leisure fishing.

The rivers will be restored using the so called "soft restoration technique", a Finnish invention that consists in the reinstallation of boulders originally removed, in the opening of closed river-beds and in the creation of gravel beds for spawning. Although these measures will be accomplished mechanically, the needs of scenery and nature will continually be taken into consideration. The rivers will be protected against shortage of water due to its utilization and regulation by using embankments.

The populations of the endangered pearl mussel species will be revived by re-establishments and by cultivating local brown trout populations. The reproduction of the pearl mussels will be helped by assuring that the larva's fixation to brown trout acting, as hosts are solid, and by installing the fish in adequate emplacements in the river.

As a result of the project, there will be a varied entity of protected Natura 2000 -sites including different river-types. In those areas ecology and leisure-use will have been fitted together. The utility of the project will have two kinds of effects: on one hand it will have secured the maintenance of multisided nature on Natura 2000-sites concerned, on the other hand it will have created a basis for future restoration projects, and for the re-establishment of river nature to create an environment suitable for pearl mussels as well as for brown trouts.

6. Activities on Karelia District

During the last few years the activity on the co-operation between Finland and Russian Karelia has increased considerably. The main interest has been on inventorying the indicator and threatened species of the ancient forests. On the other hand, inventories of new and old conservation areas and National parks have also been carried out.

3.3. France / France

Examen des actions menées en France depuis 1996 pour la conservation des invertébrés inscrits à l'Annexe 2 de la Convention de Berne

par Mr R. Guilbot , avec la collaboration du Service du patrimoine naturel du MNHN, de M^me^ Bellan-Santini (1), MM. Deschamps-Cottin (2), G. Cochet (3), H. Descimon (4), J.L Dommanget (5)

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En application de la Convention relative à la conservation de la vie sauvage et du milieu naturel de l'Europe, des actions ont été organisées principalement sur l'entomofaune mais également sur les mollusques, particulièrement sur les Margaritiféridés dont le statut en France est précisé. La Direction de la nature et des paysages du ministère de l'Aménagement du territoire et de l'Environnement développe une politique de protection de la faune et de la flore marines par la mise en œuvre de plusieurs projets : réserves naturelles, parc marin et ZNIEFF mer. Dans ce cadre, la formidable diversité biologique que représentent les invertébrés est prise en compte.

Conformément à la Convention sur la diversité biologique, des actions d'une portée générale ont été développées sur la faune entomologique française.

1. ACTIONS DIRIGÉES VERS L'ENTOMOFAUNE

1.1. Les Inventaires

Le Service du patrimoine naturel (SPN) du Muséum national d'histoire naturelle constitue progressivement une banque de données à partir d'actions telles que les inventaires de la faune et de la flore. La collecte de toutes ces données dans le cadre du réseau Faune-Flore national permet de produire des bilans sous forme de cartes, de synthèses, de statistiques, etc., outils indispensables pour connaître et assurer la conservation de la richesse écologique de la France. Dans ce cadre, quatre actions spécifiques aux invertébrés ont été développées avec le soutien de la Direction de la protection de la nature et des paysages du ministère de l'Aménagement du territoire et de l'Environnement :

– Organisation à Limoges, en 1995, du second séminaire «Inventaire et cartographie des invertébrés comme contribution à la gestion des milieux naturels français» (Maurin H. *et al*, 1996). Il a connu une participation importante, avec un grand intérêt des «invertébristes» amateurs français (47 %) mais aussi des chercheurs (25 %) et des Conservatoires régionaux d'espaces protégés (17 %). Les communications se sont organisées autour des thèmes inventaires d'invertébrés et gestion des espaces naturels prenant en compte l'entomofaune. Plusieurs communications font référence à des espèces protégées au titre de la Convention de Berne (Lépidoptères).

– Edition d'une synthèse du statut de protection, degrés de menaces et statuts biologiques de la faune de France métropolitaine (Fiers V. *et al*, 1997) qui permet aux gestionnaires d'espaces protégés d'être informés des changements dans les domaines de la taxinomie et de la nomenclature, ainsi que les réglementations régionale, nationale et internationale en vigueur.

– Identification des *Scarabeides Laparosticti* endémiques de France qui montre que, sur l'ensemble des Laparosticti présents en France, 13,2 % des espèces ont un endémisme strict ou partagé (Lumaret J.P. *et al*, 1996).

– Développement d'un logiciel de base de données adapté à la collecte d'informations sur les invertébrés qui soit utilisable rapidement par les collecteurs de données. Cet ensemble

conçu en un seul programme est homogène et simple d'emploi.

Le logiciel de «Gestion informatisée des données écologiques» (GIDE) fera l'objet en 1998 de trois développements :

- convertir l'application GIDE en langage JAVA afin de permettre son utilisation multi-plateformes,
- développer un module cartographie,
- développer un module statistique.

Ce matériel sera confié gratuitement aux observateurs du réseau Faune-Flore animé par le Service du patrimoine naturel, qui souhaiteront collaborer.

– Inventaires d'espaces comportant, ou susceptibles de comporter, des données d'invertébrés (tous traités au S.P.N ce qui garantit une inter-compatibilité des données) :

- nouvelles générations des ZNIEFF (dite modernisation) (Maurin H. *et al*, 1997) ;
- fichier national des espaces protégés, complété et tenu à jour régulièrement portant sur une trentaine de types : parcs nationaux, parcs naturels régionaux et réserves naturelles en particulier ;
- inventaires des zones susceptibles d'être déclarées pour la France au titre de la Directive de l'Union européenne «Habitat Faune-Flore».

1.2. Recherches

Le plan national d'actions entomofaune mis en place par la Direction de la nature et des paysages a permis de réaliser plusieurs études finalisées à la conservation d'espèces inscrites à l'Annexe 2 de la Convention. D'une part, un projet de recherche sur l'état des populations d'*Euphydryas aurinia* et de *Euphydryas maturna.* Puis, d'autre part, développement des méthodes de suivi de populations de *Parnassius apollo* (Lépidoptère Papilonidae). Le réseau Inventaire et Cartographie des Odonates de France (INVOD) fonctionne depuis 1982. Il permet d'assurer le suivi les populations des espèces inscrites à cette annexe. Un travail particulier a été mené dans le département de l'Aveyron sur *Macromia splendens*.

1.2.1. *Mise au point sur l'état réel des populations de Mélitées (genres* Euphydryas *et* Melitaea*)* :

Cette étude qui concerne les populations des genres *Euphydryas* et *Melitaea* est menée par H. Descimon (Université de Provence, Laboratoire de systématique évolutive). L'état réel des populations a été effectué pour l'ensemble de la France. Par ailleurs, et en collaboration avec divers autres groupes, une approche écologique et génétique a été conduite sur celles de *E. aurinia*, *M. cinxia*, *M. didyma*.

Euphydryas aurinia : le rapport préliminaire montre une variation subspécifique très importante pour cette espèce ; il confirme l'importance des fluctuations d'effectifs annuels qui sont liées aux conditions climatiques printanières ainsi qu'à l'action des parasitoïdes. Ces conditions favorisent une «structure en métapopulation, avec une juxtaposition d'habitats vides et peuplées».

Le statut de l'espèce est très variable sur le territoire français ; le Nord et l'Ouest ont des populations en nette régression, dans l'Est, la Bourgogne, le Jura et Massif central les colonies sont nombreuses. Dans les autres régions (Sud-Est, Pyrénées,...) les populations se maintiennent.

Les causes de la régression sont principalement la disparition des habitats et la modification des modes d'exploitations (modifications des cultures, déprise agricole,...). Les observations effectuées par R. Mazel, dans le Sud-Ouest sur la *ssp. beckeri* montrent, si elles se confirmaient, que l'impact du changement climatique global pourrait avoir une incidence négative sur ces populations.

Euphydryas maturna : Cette étude a été réalisée par Dutreix Cl. (Muséum d'Autun). L'objectif du programme est de maintenir ou de rétablir dans un statut de conservation favorable les populations existantes, voire de favoriser la recolonisation des anciens habitats. Le programme sur 5 ans prévoit, entre autres, d'établir une carte de répartition actualisée ; de cartographier les zones potentielles, après avoir défini le type d'habitat ; de faire un suivi sur une durée de trois ans afin d'appréhender le cycle complet de l'espèce ; de décrire, d'inventorier et de situer les sites de l'espèce ainsi que de définir les sites prioritaires ; de proposer une méthode de suivi et de définir avec les organismes compétents des mesures de protection.

La problématique de la conservation de *E. maturna* est rendue difficile par la faible densité des populations et par leur grande dispersion. Comme l'espèce précédente, son abondance est cyclique. La période de vol est courte (de 15 à 21 jours). Ce papillon peut passer inaperçu ou sembler avoir disparu pendant plusieurs années et redevenir commun en quelques générations. Les conditions climatiques rendent les observations et le suivi délicats.

1.2.2. *Mise au point d'une méthodologie de suivi des populations de* Parnassius *sur l'arc alpin et formation d'un réseau de correspondant (1996 - 1997)*

Cette étude, financée par la Direction de la nature et des paysages, est une expérimentation grandeur nature d'un suivi à long terme des populations de cette espèce sensible. Ce travail s'articule autour de deux pôles : l'établissement d'un réseau de surveillance et l'approfondissement des connaissances de l'espèce. Les structures déjà en place comme les parcs ont été utilisées. Le travail a été réalisé avec des entomologistes bénévoles, les agents des parcs et des stagiaires. Les parcs sont très demandeurs de techniques de suivi pour la surveillance et la gestion de leurs ressources. Au cours de cette étude, plusieurs aspects ont été abordés :

- le choix du biotope qui semble être différent suivant les régions échantillonnées ;
- le bilan sous forme de cartographie des sites anciens et actuels ;
- la dynamique des populations d'Apollon montre des variations inter-annuelles ;
- l'étude des plantes nourricières.

Les premiers résultats ont permis : de préciser une méthode d'évaluation des populations pouvant être appliquée dans le temps ; de constituer un réseau d'observateurs ; d'évaluer les contraintes de son fonctionnement et d'améliorer nos connaissances sur cette espèce.

1.2.3. *Suivi des populations armoricaines de* Maculinea alcon

Depuis 1995, des populations de *Maculinea alcon* ont été suivies par J. Lhonoré (Université du Maine). En 1996 et 1997, de nouvelles stations ont été découvertes, hélas toutes aussi isolées que celles précédemment connues. Les effectifs sont réduits, mais il est difficile de conclure en raison des perturbations climatiques de ces deux dernières années.

1.2.4. *Réseau INVOD, étude sur* Macromia splendens

Le réseau Inventaire et Cartographie des Odonates de France mis en place par la Société odonatologique de France (Dommanget, 1994) fonctionne depuis 1982, il est mené en liaison avec le Service du patrimoine naturel et le ministère de l'Aménagement du territoire et de l'Environnement. Ce réseau assure un suivi qualitatif et quantitatif des différentes espèces d'Odonates françaises. Sur les 10 espèces concernées par la Convention de Berne, seule *Sympecma paedisca* n'a pas été retrouvée. Pour cette espèce, il faut toutefois préciser qu'elle n'a été citée auparavant avec certitude qu'une seule fois de la région de Grenoble dans les années 60. *Coenagrion mercuriale* et *Oxygastra curtisii* sont observés régulièrement en France sur une grande partie du territoire et présentent des populations assez stables, parfois importantes. Les autres espèces ont une répartition plus limitée (Gomphidae et Macromiidae) ou bien sont très disséminées et observées ponctuellement (Genre *Leucorrhinia*). Cependant, ces espèces ne paraissent pas actuellement en régression par rapport aux données antérieures.

Des études concernant *Gomphus graslinii*, *Oxygastra curtisi*i et *Macromia splendens* sont menées par la SFO dans le département de l'Aveyron sur la rivière Tarn. Les populations de ces trois Odonates sont relativement stables dans cette vallée et ne paraissent pas menacées actuellement. La présence de plusieurs retenues hydro-électriques semble favoriser le développement de *Macromia splendens* qui y présente parfois des populations particulièrement importantes. Toutefois, il faut noter que ces retenues et leur exploitation (marnage notamment) sont favorables au développement de nombreuses autres espèces d'Odonates.

1.3. Information-Formation

Depuis une vingtaine d'années, des associations nationales et régionales organisent des stages d'écologie, d'initiation à la découverte des insectes et d'autres arthropodes. La prise de conscience de la nécessité d'assurer la protection de la faune et de la flore fait actuellement l'objet de nombreux projets : protection des espaces et application d'une gestion adaptée (réserves naturelles,...) ; protection des espèces, projets d'inventaires de zones d'intérêts écologiques majeurs ; etc. L'organisation de stages de formation, la multiplication d'informations orientées vers le grand public, les décideurs ou les élus doivent faire prendre conscience de la nécessité d'application du concept de développement durable si l'on veut assurer la conservation de la diversité biologique.

Ces activités réalisées dans le cadre du plan d'actions sont soutenues par la Direction de la nature et des paysages et les Directions régionales de l'environnement (DIREN), services décentralisés du ministère de l'Aménagement du territoire et de l'Environnement

–Exemples de manifestations réalisées

- Organisation de stages entomologiques destinés aux personnels des réserves naturelles, aux agents de l'Office national des forêts, aux entomologistes amateurs, au grand public
- Organisation du 2e Festival international du film sur les insectes à Perpignan en 1997 à Montpellier
- Organisation du 2e séminaire «Inventaire et cartographie des Invertébrés» à Limoges en

1995.

2. LE STATUT DES MARGARITIFÉRIDÉS EN FRANCE

Les deux espèces de Margaritiféridés sont présentes historiquement en France : *Margaritifera margaritifera* et *Margaritifera* (*Pseudunio*) *auricularia* anciennement nommée *Unio sinuata*. Pour ces deux espèces, G. Cochet a tenté de cerner la répartition actuelle et de la comparer avec les données anciennes de la bibliographie et des collections pour établir l'évolution des populations.

2.1. *MARGARITIFERA Margaritifera* :

- Situation de *Margaritifera margaritifera* en France :

Pour cette espèce, au début des années 1980, seules des populations sont connues dans le Finistère et le Morvan (Bouchet, 1990). Au contraire, à la fin du siècle dernier, au moins 30 départements sont répertoriés avec des cours d'eau hébergeant l'espèce. Depuis 1993, nous avons prospecté une grande partie des rivières de France et, actuellement, grâce à ces recherches et celles de Ph. Quéré en Bretagne, nous avons pu montrer qu'au moins 26 départements sont encore occupés par l'espèce, présente sur au moins 74 cours d'eau. Plus précisément, ces 74 cours d'eau se répartissent de la façon suivante dans les grands massifs :

- Massif armoricain : 14
- Massif central et Morvan : 57
- Vosges : 1
- Pyrénées : 2

Les stations occupées par *M. margaritifera* se situent du niveau de la mer dans les Pyrénées et la Bretagne jusqu'à 1 153 m dans le Massif central.

Ainsi, la présence dans tous les massifs siliceux où l'espèce était anciennement signalée a été confirmée, par contre, les anciennes mentions, douteuses, sur les Alpes et le Jura, n'ont pas été retrouvées.

La plupart des grands bassins fluviaux restent occupés puisque *M. margaritifera* est toujours présente sur les bassins de l'Adour, la Garonne, la Charente, la Loire, la Seine et du Rhin, ainsi que dans les bassins mineurs des Pyrénées et du Massif armoricain.

Cette situation montre que l'absence de données récentes provenait uniquement d'une absence de prospection.

- Évolution des populations de *M. margaritifera* (carte 1) :

En comparant les données actuelles avec les nombreuses stations signalées au siècle dernier, une disparition d'au moins 30 à 50 % sur l'ensemble de la France est observée et, plus ponctuellement, la régression est plus forte puisqu'en Bretagne, sur plus de cinquante stations anciennes, seules 8 existent encore actuellement (Quéré, 1996) et, sur l'ouest du Massif armoricain, sur 10 cours d'eau anciennement cités, seuls 3 hébergent encore l'espèce avec des effectifs dérisoires (Cochet, inédit). Les plus fortes diminutions sont constatées pour les stations de basse altitude qui semblent souffrir de l'intensification agricole. Au contraire,

sur les têtes de bassin, la présence de pâturages et de forêts semblent avoir permis une meilleure préservation de la qualité des rivières, attestée par la pérennité des stations à *Margaritifera*.

Dans la quasi-totalité des stations, les effectifs sont dérisoires et beaucoup de cours d'eau n'hébergent que quelques dizaines à quelques centaines d'individus. Seuls de rares cours d'eau, notamment dans le Massif central, possèdent plusieurs milliers d'individus et une ou deux rivières hébergent probablement plusieurs dizaines de milliers d'individus.

Sur quelques cours d'eau présentant des données quantitatives anciennes, nous avons montré une diminution de près de 99 % !

Aucune preuve de reproduction n'a été obtenue dans le Massif armoricain, les Vosges et le Morvan. Par contre, dans la plupart des rivières du Massif central, même lorsque les effectifs sont très réduits, nous avons constaté la présence de jeunes individus et il en est de même d'un cours d'eau des Pyrénées.

Les causes de la diminution des effectifs sont multiples et méritent d'être hiérarchisées : en premier, l'eutrophisation semble toucher la quasi totalité des cours d'eau, même en montagne ; les ramassages intensifs ont précipité la disparition dans certains cas, surtout dans les Vosges, la Bretagne et une rivière du Massif central ; la réalisation de barrages, d'enrochements, de travaux d'entretien de rivières et de recalibrage affecte de façon quasi irréversible le biotope de l'espèce ; enfin, les pollutions diverses, même anciennes, expliquent souvent la disparition de stations répertoriées historiquement.

- Gestion et protection :

Grâce aux contacts étroits avec les gestionnaires de rivières, il a été possible d'intervenir pour limiter l'impact des campagnes d'entretien de rivières, les enrochements à but piscicole et la présence de l'espèce a même permis d'empêcher la réalisation de travaux (microcentrale dans le Massif central) et de proposer des Arrêtés de Protection de Biotope.

Margaritifera margaritifera a fait l'objet d'attention particulière dans le cadre du programme LIFE du haut bassin de l'Allier et dans l'application des mesures agri-environnementales sur le haut bassin de la Loire.

Dans le cadre de la mise en oeuvre de la directive Habitat, la plupart des cours hébergeant l'espèce ont été proposés dans les sites à retenir.

2.2. *PSEUDUNIO Auricularius* :

L'analyse bibliographique montre que la seconde espèce de Margaritiféridés, *Margaritifera auricularia*, était donnée, jusqu'au début de notre siècle, comme présente, et parfois abondante, sur la totalité des bassins fluviaux français. Ainsi, l'ensemble de ces données peut être résumé par la citation de Dupuys, en 1852 : «*Habite la plupart des fleuves et des rivières un peu considérables de France, le Rhin, la Meuse, la Seine, le Rhône, la Loire, la Garonne, la Charente, l'Adour, la Dordogne, le Tarn, etc.*».

Cette espèce semblait avoir totalement disparu de notre pays. Des coquilles subactuelles ont cependant été trouvées en 1989 par Nesemann et Nagel dans le bassin de la Loire. En 1996, et 1997, nous avons récolté les coquilles de 169 individus dans ce même bassin. Alors que beaucoup de ces coquilles sont probablement très anciennes, la fraîcheur de certaines est attestée par la présence de ligament, périostracum et nacre et, surtout, en 1997,

après une crue, nous avons pu récolter des coquilles avec des restes de chair fraîche et odorante !

Certaines de ces coquilles fraîches proviennent d'individus d'une dizaine d'années et indiquent une reproduction récente sans que l'on sache l'identité du poisson hôte puisque l'esturgeon (*Acipenser sturio*), pressenti comme candidat (Altaba, 1990) a disparu du bassin de la Loire vers 1940 (ROY, 1952, in Keith, Allardi, Mouton, 1992).

Ces données nouvelles autorisent l'espoir de retrouver des individus vivants lors d'une campagne de plongée programmée pour 1998.

2.3. Programme de recherche, acteurs et outils

Le programme de recherche sur les Margaritiféridés est financé par le ministère de l'Aménagement du territoire et de l'Environnement pour toute la France et les relais régionaux sont assurés, actuellement, par les DIREN de Rhône-Alpes, Auvergne, Limousin et Midi-Pyrénées ainsi que les Parcs naturels régionaux du Morvan, du Livradois-Forez et la région Rhône-Alpes.

L'ensemble de ce travail est effectué en collaboration scientifique avec le Muséum national d'Histoire naturelle et des chercheurs français et étrangers tels que P. Bouchet, J. Mouthon, G. Falkner, M.T. Von Proschmitz et Ian J. Killeen. Le Conseil supérieur de la pêche et le CEMAGREF sont aussi associés comme gestionnaires des cours d'eau.

3. ACTIONS MENÉES SUR LES INVERTÉBRÉS MARINS

Depuis le Colloque sur la conservation et le rétablissement des habitats des invertébrés qui s'est tenu à Killarney en 1996, le rapport «*Marine Invertebrates of the French coasts and their conservation*» (Dauvin *et al.*, 1996), fournissait dans ses conclusions un plan en sept points :

i. renforcer les travaux d'inventaires des invertébrés marins afin de fournir des outils nécessaires à l'estimation de l'évolution des populations, notamment des faunes et des bases de données ;

ii. effort d'inventaire, le long des côtes, des espèces sensibles, des communautés et des sites (réactualisation des ZNIEFF-mer) ;

iii. réduire des agressions et des pollutions du littoral ;

iv. surveiller et réduire la pêche dans les zones intertidales et action éducative envers les récolteurs amateurs ;

v. surveiller le bon usage des zones côtières pour les cultures marines ;

vi. surveiller les espèces introduites et, en particulier, *Crepidula fornicata* et *Caulerpa taxifolia* ;

vii. favoriser la création de parcs et réserves marines.

M[me] Bellan-Santini précise les actions de la France qui ont porté plus particulièrement sur trois points :

– Inventaires des invertébrés marins : le MNHN de Paris, d'une part, et le Réseau des stations marines, d'autre part, effectuent dans le cadre de l'Inventaire informatisé de la faune et de la flore, l'Inventaire des mollusques. Ce programme en cours a été présenté à l'appel d'offre 1998 du Réseau Diversité marine lancé par le PIR «Environnement, vie et sociétés». Ce programme participe aussi à une Action concertée de la CEE ;

– Inventaire des communautés et des sites. Le programme de réactualisation des ZNIEFF comprend un volet ZNIEFF-mer débuté en 1995 ; il se poursuit. En région PACA, la réactualisation des ZNIEFF des Bouches-du-Rhône devrait être achevée fin 1998 et celles du Var ont débuté ;

– Surveillance des espèces introduites. Les études sur le Programme *Caulerpa taxifolia* se poursuivent, organisation en mars 1997 d'un Séminaire international ministère de l'Environnement et Programme Environnement, Vie, Sociétés du CNRS «Dynamique d'espèces marines invasives : application à l'expansion de *Caulerpa taxifolia* en Méditerranée» (Les invertébrés sont fortement concernés dans l'habitat envahi ou créé dans l'état actuel, il paraît souhaitable, sans négliger les axes présentés en 1996, de poursuivre les efforts plus particulièrement dans quatre directions :

- inventaire des invertébrés marins avec constitution de banques de données comprenant: caratérisation spécifique, habitats, vulnérabilité, mesure de protection souhaitable ;

- inventaire des communautés et des sites : poursuite et intensification du Programme ZNIEFF-mer et reconnaissance des sites Natura 2000 dans le milieu marin ;

- surveillance des espèces introduites ;

- développement d'une politique de création de parcs et réserves en milieu marin.

4. DISCUSSION ET CONCLUSIONS

Plus d'une dizaine d'études ont été réalisées depuis l'application du Plan d'action pour la conservation de la biodiversité. L'expérience acquise au travers des différents programmes déjà engagés a permis de développer non seulement les projets d'inventaires et de cartographie mais aussi d'améliorer les connaissances sur la biologie, l'écologie et la répartition géographique de nombreuses espèces parmi les Lépidoptères, les Coléoptères et les Odonates inscrites à l'Annexe 2 de la Convention de Berne, et aussi d'évaluer les moyens méthodologiques à mettre en œuvre pour assurer un suivi de l'évolution de la faune.

Des actions de formation et d'information ont été soutenues et coordonnées. Plusieurs dizaines de milliers de personnes ont été informées de la nécessité, pour chacune d'elle, de contribuer à protéger un patrimoine national exceptionnel : celui de la diversité biologique que représente l'entomofaune. Ces programmes sont prioritaires.

La mise en œuvre du plan d'action est positive car elle engage une démarche à long terme qui permettra de suivre l'évolution de populations d'insectes, leur gestion et leur restauration si nécessaire, ainsi que celles des milieux naturels. Ces projets ont permis de juger de l'efficacité du fonctionnement des partenaires potentiels : ministères, organismes publics, universités, associations de naturalistes, autour de l'Institut d'écologie et de gestion de la

biodiversité (I.E.G.B) du Muséum national d'Histoire naturelle, et plus particulièrement du Service du patrimoine naturel (S.P.N).

Ces projets ont permis aussi de mettre en évidence la nécessité d'organiser une structure de coordination et de centralisation des données de type Observatoire national. Un effort doit être fait pour assurer une meilleure liaison entre les études entreprises et les possibilités d'application pour les gestionnaires du patrimoine naturel (espèces et espaces), très demandeurs actuellement. Il faut assurer un continuum efficace entre les recherches appliquées et la gestion des habitats pour permettre la conservation de la biodiversité.

Concernant le Groupe d'experts sur la protection des invertébrés de la Convention relative à la conservation de la vie sauvage et du milieu naturel de l'Europe, une réflexion pourrait être menée sur plusieurs points :

– la nécessaire prise en compte de l'environnement dans les politiques agricoles de l'espace européen afin de pouvoir assurer entre autres la préservation d'espèces d'invertébrés indispensables au fonctionnement de l'écosystème rural, et ce de même dans les politiques développées pour l'utilisation du milieu marin ;

– la nécessité de soutenir la recherche sur l'écoéthologie des invertébrés, domaine faiblement étudié face à son champ extrêmement vaste et fondamental pour la mise en œuvre d'une préservation adaptée à ces espèces ;

– la nécessité d'établir des listes rouges sur la base de critères scientifiques prédéfinis et correctement pris en compte pour les espèces considérées afin que ces listes reposent sur des bases rigoureuses et défendables à long terme ;

– mener une réflexion sur le positionnement des invertébrés marins qui devrait être abordée par un groupe d'experts spécifiques, ce qui n'exclurait pas des réunions communes sur des sujets spécifiques pouvant être discutés avec notre groupe ;

– de mettre en place une méthodologie commune lors de la mise en place de plans d'actions européens et définir une liste d'espèces prioritaires nécessitant la mise en œuvre de tels plans d'actions.

Un rappel doit être fait pour que tous les documents soient traduits dans les langues officielles du Conseil de l'Europe, pour une meilleure efficacité des travaux.

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(2) M. Deschamps-Cottin : Université de Provence - Laboratoire de systématique évolutive case 5- 3, place V. Hugo - 13331 Marseille Cédex 3
(3) G. Cochet : Le Village - 07130 St-Romain-de-Lerps
(4) H. Descimon : Université de Provence - Laboratoire de systématique évolutive case 5-3, place V. Hugo - 13331 Marseille Cédex 3
(5) J.L Dommanget : SFO - 7, rue Lamartine, F-78390 Bois-d'Arcy

ANNEXE

Statut de *Margaritifera margaritifera* en France

3.4. Germany / Allemagne

Progress in research and conservation of threatened invertebrates in Germany (1996-1998)

by Mr Horst Gruttke, Federal Agency for Nature Conservation
(Bundesamt für Naturschutz)

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1. Bern Convention Invertebrates in Germany

1.1. Red List status of Bern Convention Invertebrates (BCIs) in Germany 1998

The total number of invertebrate species listed in Appendices II and III of the Bern Convention (BCIs) occurring in Germany today or reported as having been indigenous in historical times is 36 (37) All of them except two (*Helix pomatia* : classified not threatened, however see FALATURI & KOENIES (1996); *Hirudo medicinalis*: not evaluated) are still regarded as threatened or extinct according to the new Red Data Book of Germany (see 2.; BINOT *et al*. 1998). For 13 species the Red List classification has been changed. In 1998, eight species (*Oxygastra curtisii, Dytiscus latissimus, Graphoderus bilineatus, Euphydryas aurinia, Coenonympha hero, Lopinga achine, Maculinea teleius* and *Hypodryas maturna*) are listed in categories reflecting a higher degree of threat than in 1984, four species (*Stylurus flavipes, Ophiogomphus cecilia, Proserpinus proserpina* and *Helix pomatia*) have been regarded as less threatened than before. *Margaritifera auricularia* is not included in the list any more (before it was listed as extinct).

1.2. Situation of *Hypodryas maturna*

Three populations of this species are known in Germany. Oviposition sites of the population in the southern part of "Steigerwald" (northern Bavaria) were surveyed in 1997 and are now guarded by a local NGO initiative. Since the application of Diflubenzuron (Dimilin) to control the pest species *Lymantria dispar* in 1994 (see report to the meeting in 1994) the population of *H. maturna* and other BCIs (*Eriogaster catax, Lopinga achine, Coenonympha hero*) seemed to be reduced in the "Steigerwald", however all species mentioned were still observed in the area in 1997.

1.3. Other species

To prevent the populations of *Parnassius apollo* spp. *vinningensis* in the Mosel area from being harmed by pesticide application in vineyards, an agreement has been concluded between an entomological association (Arbeitsgemeinschaft rheinisch-westfälischer Lepidopterologen), regional NGOs and winegrowers, by which pesticide use has been strongly restricted (no application of insecticides by helicopter) in and around known habitats of the butterfly species.

Supported by the regional conservation authorities (Untere Landschaftsbehörde Rhein-Sieg-Kreis), regional surveys on *Maculinea*-species have been continued in North Rhine-Westphalia. To improve habitat conditions for populations of both *Maculinea teleius* and *nausithous* in the protected wetland area "Feuchtgebiet Dreisel" (in North Rhine-Westphalia, Bergisches Land) additional sites will be integrated into the conservation and management programme. Populations seem to stabilise now.

Survey and research projects have been carried out for a number of other species (including BCIs) on regional level. A selection of new publications dealing with or containing information on BCIs is compiled in the references (see 6.).

2. New Red Data Book of Germany

The revision of the national Red Lists on animals – including many taxa invertebrates (last edition 1984) – was terminated in spring 1998. The new Red Data Book "*Rote Liste gefährdeter Tiere Deutschlands*" (BINOT et al. 1998) is in press now. For the first time all Red Lists in this book cover the whole territory of Germany, including the five new Federal States in the eastern part.

The new Red Data Book of Germany comprises various taxa of terrestrial, limnetic and marine animals. Several groups of invertebrates are included as well: various Diptera, Macrolepidoptera, Trichoptera, var. Hymenoptera, Coleoptera, Neuropteroidea, Rhynchota, Thysanoptera, Orthoptera, Plecoptera, Odonata, Ephemeroptera, var. Arachnida, var. Crustacea, Mollusca, Porifera, Cnidaria, Annelida, Echinodermata, Echiurioidea, Tunicata. The following taxa have been considered for the first time in national Red Data Book: *Pseudoscorpiones, Auchenorrhnchia, Syrphidae,* aquatic *Empididae* and *Dolichopodidae*. For the first time, the *Coleoptera* have been assessed completely.

The following categories of threat are used for the classification of the species. They have been adapted to the IUCN categories except in the case of categories G (= assumed to be endangered, but status unknown) and R (= very rare or geographically restricted species):

	German categories:		**Conform to latest IUCN-categories:**
0	Ausgestorben oder verschollen	**EW**	Extinct in the Wild
1	Vom Aussterben bedroht	**CR**	Critical
2	Stark gefährdet	**EN**	Endangered
3	Gefährdet	**VU**	Vulnerable
G	Gefährdung anzunehmen, aber Status unbekannt (assumed to be endangered, but status unknown)		-
R	Sehr seltene Arten bzw. Arten mit geographischer Restriktion (very rare or geographically restricted species)		-
V	Arten der Vorwarnliste	**nt**	Near Threatened
D	Daten defizitär	**dd**	Data Deficient

The status of more than 15,000 invertebrate species has been considered and reviewed for the Red Data Book, of which about 40 % have been classified as endangered according to categories 1, 2, 3, G and R, and 3 % of the species as near-threatened (V). For a similar percentage of animals, there has been insufficient knowledge (D).

The following list illustrates the status of threat for selected invertebrate groups:

Taxa	Total number of species in Germany	Extinct species	Endangered species
Macrolepidoptera	1,450	2 %	37 %
Syrphidae	428	2 %	38 %
Coleoptera	6,537	4 %	44 %
Apidae	547	5 %	47 %
Orthoptera	93	4 %	49 %
Odonata	80	3 %	58 %
Plecoptera	120	12 %	56 %
Ephemeroptera	102	4 %	42 %
var. Arachnida	1,046	2 %	50 %
terr./limn. Gastropoda/Bivalvia	333	2 %	47 %

The main factors responsible for threats and declines in the number of species have been identified, inter alia, as loss of original, mainly oligotrophic wetlands and dry habitats, the intensification of agricultural or forestry use, structural measures and the canalisation of rivers. Furthermore, the destruction of habitats caused by the loss of vegetation-rich woodland-borders, hedges, old and dead wood have been cited as factors.

Appended to the Red Data Book there is a table summarising reference to all the present Red Lists of animals of the 16 Bundesländer in Germany.

3. Relic population of *Carabus menetriesi* in the "Peenetal" (Mecklenburg-Vorpommern)

There is still no detailed information about the actual population size and exact distribution of the species in the "Peenetal" area, but the threat due to the construction of a motorway (A20) seems to be averted. According to the current planning the motorway will not cross the main known habitat of this species. The species seems to be confined to relics of relatively undisturbed (natural) areas of the Peene-valley.

Conservation activities in the "Peenetal" area are financially supported by the German Federal Government through a so-called "programme concerning riparian land" (Gewässerrandstreifenprogramm).

4. Other activities

4.1. Revision of the German "Species Protection Decree"

The "Decree on Species Protection" (Bundesartenschutzverordnung) which regulates the collection, possession, breeding and commercial trade of especially protected species has been revised in order to adjust this law to European (EC) legislation.

4.2. Assessment of the status of *Orthoptera* in Germany

The Federal Agency for Nature Conservation (Bundesamt für Naturschutz) has launched and will supervise a survey and research project which is intended to review and analyse population trends and current as well as historical distributions of all species of *Orthoptera* (93) in order to re-assess and evaluate their status of threat in more detail. The project will start in 1998 and shall be terminated in 2001.

5. Concluding remarks

Although considerable efforts in favour of invertebrates have been made, the situation of most endangered species has not or only locally improved. Infrastructural and economical developments are still leading to a loss of habitats and are thus responsible for the decline of many species which is documented in the new German Red Data Book of Animals (BINOT *et al*. 1998) by the great number of threatened invertebrate species (see also 1.1 and 2.).

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3.5. Greece / Grèce

Report on the progress towards the conservation of Bern Convention Invertebrates in Greece, 1996-1998

Anastasios Legakis, Zoological Museum, Dept. of Biology, Univ. of Athens,
Panepistimioupolis, GR-157 84 Athens, Greece

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1. Bern Convention Invertebrates and the Habitats Directive

A total of 296 sites were proposed by a group of experts for inclusion in the Natura 2000 network. For several of these sites, Special Environmental Studies, a legal procedure for the designation of protected areas, were initiated. All the Annex II invertebrates (12 in Greece) had to be taken into account (Lazaridou & Legakis 1996). This means that when these studies are finished, they must include specific proposals for their conservation.

2. Inventories

The data bank of the fauna of Greece managed by the Hellenic Zoological Society, is being continuously updated with new records from the literature, especially invertebrates.
Two new additions to the series Fauna Graeciae were published by the Hellenic Zoological Society: The Echinodermata of Greece (Pancucci-Papadopoulou 1996) and the Marine Bivalvia of Greece (Zenetos 1996). These publications include lists of species with synonyms and notes, detailed distribution records and distribution maps. One more publication, the Lepidoptera of Greece written by L. Gozmany, is in press.

3. Threatened species list

A new version (June 1997) of the list of threatened, protected and endemic animal species of Greece produced by the author in collaboration with a number of specialists from Greece and abroad, has been circulated (Legakis 1997). It includes more than 350 threatened and/or protected invertebrate species and 1474 invertebrate species endemic to Greece.

4. Legislation

Following the recent ratification of the Bonn and CITES Conventions by Greece and the embodiment of the Habitats Directive in the Greek legislation, the Greek Government is planning to review the law concerning the protection of flora and fauna.
The Ministry of Agriculture is preparing legislation concerning the protection of invertebrates that are commercially used as fishing baits.

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3.6. Hungary / Hongrie

Report on the progress towards the conservation of Bern Convention Invertebrates in Hungary, 1996-1998

by Mr Andras Ambrus, Hortobagy National Park, T.I.C.

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1. The Thematic Information Centre for Nature Conservation (T.I.C.) working within the framework of the Hortobagy National Park Directorate produced a standard software to handle and analyse data of different groups of invertebrates which may be processed by GIS softwares. The basic information (name, synonymies, area, distribution, conservation, etc.) and standard input data sheet/database are available for such groups as: *Odonata*, *Ephemeroptera*, *Trichoptera*, *Neuroptera, Macrolepidoptera, Orthoptera, Hymenoptera: Aculeata, Diptera: Syrphidae* and *Culicidae, Coleoptera: Carabidae, Cerambycidae, Buprestidae, Staphylionidae, Coccinellidae, Mollusca, Crustacea*, etc. *Hirudinoidae* are under process / regarding some taxonomic troubles.

T.I.C. is coordinating countrywide surveys and monitoring programmes on wetlands *Odonata, Ephemeroptera, Hirudinoidae*, etc. and makes efforts to support the work of specialists.

2. The National Biodiversity-monitoring Programme of Hungary issued standard data collecting methods for different invertebrate groups, such as: *Orthoptera, Crustacea, Lepidoptera, Coleoptera: Carabidae* and *Cerambycidae, Odonata* to survey and monitor them on species (population) or community levels.

3. Invertebrates are included in special local monitoring programmes e.g.: Szigetkoz (monitoring of effects of Gabcikovo on the Danube), and Kis-Balaton Reservoir (water quality improving project of the lake Balaton).

4. The EIS colloquium – Aspects of Biodiversity: Survey, Monitoring, Conservation – was held in Debrecen, 22-25 October 1997 organised by Professor Zoltan Varga. The Hungarian presentations covered Bern Convention and other threatened *Odonata* and *Lepidoptera* populations, surveys, monitoring and genetic variability. Posters were presented on specific groups of *Cerambycidea*, inhabits mainly grasslands, and the recent status and conservation demand of *Palingenia longicauda*.

(Some people from the Group of Experts were present; nomination of A Ambrus to join the EIS work was accepted.)

5. Special projects are launched in the field of conservational ecology, genetical diversity of *Parnasius mnemosyne, Maculinea genus, Coenonympha oedipus, Leucorrhinia pectoralis* and *L. caudalis, Gomphidae* etc. involving experts of the Natural History Museum of Hungary, University of Kossuth Lajos, T.I.C., and other local museums, universities, Nature Conservation Office, national park directorates, and other specialists.

NGO (=ECO) involvement is working well in the survey of *Crustacea: Decapoda*.

3.7. Iceland / Islande

Invertebrate research and conservation in Iceland 1996-1998

Mr Ingi Agnarsson, Icelandic Institute of Natural History

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1. None of the invertebrate species which are listed on the Bern Convention Appendix II are found in Iceland. Perhaps partly for this reason, the issue of invertebrate conservation has not caught much attention in Iceland. There is however at least one species on the "Suggested additions to the invertebrate species listed in Appendix II of the Bern Convention" (T-PVS (98) 9), the araneae *Pardosa sphagnicola*.

To date there are no invertebrate species protected by law.

2. Two large invertebrate research programmes are now in process. Firstly, Bioice which is a long term on marine invertebrates and has already lead to the discovery of very numerous new species to the Icelandic fauna and quite a few new to science. Secondly, in 1996, a similar project on land invertebrates was launched. These are mainly concerned with assessing the distribution and frequency of Icelandic invertebrate species.

3. A long term moth monitoring scheme began in Iceland in 1995. It is planned to publish the results of this work annually and in 1997 the first report was published, based on the results from the first year.

4. Very few recent atlases on invertebrate groups in Iceland exist. In 1996 one was published on spiders (Araneae) and last year the one on Lepidopterans mentioned before. In the next year of two it is planned to publish atlases on Syrphiidae, Chironomidae, Opiliones and Pseudoscorpions and some other groups.

5. To date a red data book on invertebrates has not been published in Iceland but one is scheduled in the immediate future.

3.8. Ireland / Irlande

Progress report in Ireland, 1996-1998

by Dr Martin C.D. SPEIGHT, National Parks & Wildlife Service

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1. ***Euphydryas aurinia*** **and** ***Scomalacus maculosus***

There is little to report on either of these species. Neither of them is threatened in Ireland and no new adverse influences have become apparent. There is some concern that perhaps *E. aurinia* exhibits a metapopulation structure increasingly difficult to maintain. But it is extremely unclear how available information on the species may be used to identify ways to increase landscape permeability for it, that would redress the situation.

2. ***Margaritifera margaritifera***

Since the last meeting of this group we have established that the *M. margaritifera* population in one of the rivers in SW Ireland is extremely large. Our initial estimation was of 2,000,000 reproductively mature specimens, but further survey suggests this is an under-estimate.

Examination of other rivers in the same part of the country has not located any similarly large populations, although it is apparent that such populations were probably widespread in the region 150-200 years ago.

Considerable damage done to *M. margaritifera* populations by both farming, forestry and peat extraction activities during this century have still not come to an end. Forestry, in particular, is probably a major cause of population decline, through causing siltation and acidification. These processes are active within the catchment of the 2 millions mussel river, unfortunately, and likely to intensify, because of recent speculative forestry initiatives being undertaken by private operators who have bought up large areas of the catchment.

There is no basis on which to justify acquisition of large areas of land in this catchment for conservation purposes, other than the presence of *M. margaritifera*, and it remains to be seen whether private forestry activities can be controlled adequatilly to protect the river channel and the quality of its water. During this year we hope to make progress towards production of a Conservation Management Landbook for *M. margaritifera* in Ireland, with a certain amount of help from our Finnish colleagues. Dr Valovirta visited Ireland during 1996 to provide advice on the 2-millions mussel river and we have maintained contact since.

3. ***Austropotamobius pallipes***

The prime danger of *A. pallipes* in Ireland remains intermittent outbreaks of crayfish plague, which, however, is not established due to a lack of appropriate non-native crayfish hosts. We have identified re-introduction as a key technique in maintaining *A. pallipes* populations in Ireland, because the species can be successfully re-established several months after being totally eradicated from a locality by plague. We are this year embarking on an experimental re-introduction programme at one carefully selected locality and this work is being undertaken as part of a draft action plan for the species, a copy of which is appended to this report. In parallel, we have produced the first part of a Conservation Management Manual for the species in Ireland. This document brings together information of use to river managers and protected site managers, in any attempt they may make to protect the crayfish. A copy of this Manual is also provided to accompany the present account. Part 2 of the Manual is to be produced once definitive results are available from the experimental re-introduction work.

4. Zebra mussel

This species has now arrived in Ireland, on the bottom of pleasure boats brought in on trailers from Britain. Since the pleasure boat use of Irish waterways continues to increase it is clear other aquatic invertebrates can and will arrive in the same way: we are expecting an expansion of aquatic invertebrate biodiversity !

3.8.*bis* **WHITE-CLAWED CRAYFISH,**
AUSTROPOTAMOBIUS PALLIPES

Species Action Plan
Dúchas, The Heritage Service National Parks and Wildlife (Ireland)

1. POLICY

It is the policy of the National Parks and Wildlife Service to implement the provisions of the Habitats Directive (92/43/EEC). Paragraph 10 of this Directive outlines the need:

"*to ensure the restoration or maintenance of natural habitats and species of Community interest at a favourable conservation status*".

It goes on to define, in Article 1.i, the conservation status of a species as:

"*the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations*"

and states that this status will be taken as "favourable" when:

"– *population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitat, and*

– *the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and*

– *there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis*".

The species of Community interest are listed in Annex II of the Habitats Directive, and *Austropotamobius pallipes* is one of these species. This Action Plan provides a brief summary of the available background information on the target species and details the actions and strategies that the National Parks and Wildlife Service have devised to maintain the favourable conservation status of this species in Ireland.

2. BACKGROUND

2.1. Historical Status

The white-clawed crayfish *Austropotamobius pallipes* is the only species of crayfish found in Ireland. *A. pallipes* is presumed to be native to Ireland, but its genetic similarity to French stocks is notable and dit may have been introduced by Normal colonists for its food value several hundred years ago. Whether native or introduced, the white-clawed crayfish is now an integral part of many Irish freshwaters.

2.2. Current Distribution

A. pallipes occupies a wide geographical range in Europe, from Dalmatia and Italy in the east, through Switzerland, France and Northern Spain to England, Wales and Ireland in the west. This species is widespread throughout the limestone lowlands of Ireland, but is absent from the granitic coastal uplands and from the sandstone areas of the south-west with the exception of the Awbeg tributary of the Munster Blackwater. Crayfish in the Westport River in Mayo probably comprise the most westerly population of this species in Europe. The crayfish is found in both lakes and streams in Ireland, elsewhere in Europe it is largely confined to streams.

A. pallipes is rare above 200 m altitude, perhaps because of low summer temperatures, but also because such areas in Ireland are associated with base poor bedrock. The crayfish has been recorded from waters ranging from pH 7,2-8,4; alkalinity of 35-356 mg/l and hardness of 47-402 mg/l.

2.3. Biology/Ecology

Crayfish are large, long-lived invertebrates; some can live for 12 years or even longer. *A. pallipes* matures at about 50 mm total length when 3-4 years old. It may reach 90 mm total length and 40 g in 5+ years. In extreme cases a maximum size of 120 mm has been recorded. Mating usually takes place in autumn when water temperature falls below 10°C, the female then carries the eggs (40-150) externally for 8-9 months. The juveniles may moult as many as seven times in the first year, but as adults, moulting only takes place once or twice per annum. Shed carapaces can often be found along the edges of lakes and are good indicators of the presence of crayfish.

Crayfish spend most of their time hiding under logs, rocks and amongst tree roots. They are most active at dusk and dawn and in the mating season in October/November. A wide range of food is included in the diet including algae, plants, water-fleas, mayflies, other crayfish and small fish. Lake crayfish populations have an important controlling influence on both plants and animals and consequently on water quality; they are known as "Keystone species". Predators include the otter (the distinctive crayfish carapaces are easily distinguished in otter spraints), mink eels, perch and salmonids.

2.4. Threats

Aphanomyces astaci, the crayfish plague fungus, has caused widespread depletion of stocks ever since it entered Europe from America in the 1860's. The disease is carried by American crayfish which are largely immune to its effects, but spores of the fungus can also be carried on damp fishing equipment and mud and this is presumably how the plague reached Ireland. The extinction of crayfish populations from a number of Irish midland lakes in the late 1980's has been well documented. This fungus usually causes total mortality amongst populations and then dies out itself.

Habitat destruction and water pollution are also partly responsible for the dramatic decline in *A. pallipes* throughout western Europe.

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3. OBJECTIVES

3.1. Ideal Objectives

i. Maintain the favourable conservation status of the species in Ireland.

ii. Reverse the decline in range of the crayfish through a reintroduction programme.

iii. Inform and educate the public about the importance and vulnerability of the crayfish in Ireland.

3.2. Constraints

i. Possible recurrence of the crayfish plague.

ii. Limited financial and personnel resources.

iii. Lack of detailed knowledge on the current distribution and status of the crayfish in Ireland.

iv. Insufficient information on how best to conduct crayfish reintroductions.

v. Possible introduction of exotic crayfish species.

vi. Lack of awareness about the ecology and biology of, and the ideal management practises for, the crayfish among landscape management organisations.

vii. Lack of public awareness about the crayfish in Ireland.

viii. Lack of controls on animal movement by man within European Union.

3.3. Management Potential

Because of the large annual numbers of anglers arriving in Ireland from other European countries with crayfish plague, it will not be feasible to permanently eradicate the plague from this country. Consequently, the potential for localised recurrences of crayfish plague is real and undermines our ability to protect all crayfish stocks, even within designated sites. Continued habitat damage and pollution present further difficulties for the conservation of this species. However, the crayfish is still widespread in Ireland and by developing a reintroduction protocol and reintroducing stock to sites where the plague has burned out it should be possible to maintain the present range and conservation status of this important animal.

3.4. Operational Objectives

i. Maintain crayfish populations at a favourable conservation status in selected SACs.

ii. Carry out re-introduction programmes into selected SACs, from which the crayfish is known to have been wiped out by plague.

iii. Carry out re-introductions to any SAC from which the species is eradicated by plague at some future date.

iv. Re-introduce crayfish to strategically situated non-SAC water bodies where it is estimated as likely to survive.

v. Inform NPWS staff, regional fisheries staff, OPW etc. about the ecology, biology and status of the crayfish and the approved management guidelines for sites which contain this species.

vi. Inform and educate the public about the importance and vulnerability of the crayfish in Ireland.

4. STRATEGIES

Objective 1. Maintain crayfish populations at a favourable conservation status in selected SACs.

–Relevant research staff, in consultation with the regional staff, to produce a list of pSACs in which crayfish should be maintained at a favourable conservation status.

–Training courses in crayfish monitoring to be arranged for relevant regional staff during spring 1998;

–Regular presence/absence surveillance (at least once annually) of crayfish at selected sites to be conducted by ranger staff.

–More detailed monitoring of crayfish (to estimate population density and recruitment) to be conducted by ranger staff every three years at selected sites.

Objective 2. Carry out re-introduction programmes into selected SACs, from which the crayfish is known to have been wiped out by plague

–Carry out pilot re-introduction programme into White Lake, Co. Westmeath starting in 1998.

–Identify other sites where crayfish is known to have been wiped out by plague.

–Locate acceptable donor populations for each.

–Introduce crayfish to selected sites according to guidelines established during pilot project.

Objective 3. Carry out re-introductions to any SAC from which the species is eradicated by plague at some future date

–Identify, through surveillance programme, the SACs at which plague eliminates crayfish populations.

–Follow guidelines established by the pilot project to reintroduce crayfish to such sites.

Objective 4. Re-introduce crayfish to strategically situated non-SAC water bodies where it is estimated as likely to survive

–Relevant research staff, in consultation with the Regional staff, to produce a list of suitable non-SAC water bodies.

–Follow guidelines established by the pilot project to reintroduce crayfish to such sites.

Objective 5. Inform NPWS staff, regional fisheries staff, OPW etc. about the ecology, biology and status of the crayfish and the approved management guidelines for sites which contain this species

–Produce a handbook which details the biology, ecology and status of the crayfish in Ireland and which outlines the approved guidelines for managing the sites and catchments where this animal is found.

Objective 6. Inform and educate the public about the importance and vulnerability of the crayfish in Ireland

–Produce and distribute an information leaflet on the freshwater crayfish for the general public.

–Heighten awareness of crayfish at local and national level through newspaper articles and radio/TV interviews.

3.9. Lithuania / Lituanie

Report on the progress towards the conservation of Bern Convention Invertebrates in Lithuania, 1996-1998

by Mr Jonas Augustauskas, Environmental Protection Ministry
of the Republic of Lithuania

The Red Data Book of Lithuania was published in 1992 (rare and endangered animal, plant and fungi species). Among invertebrates listed are 102 insect species, 17 beetle species, 47 moth species, 25 hymenoptera species, 6 dragonfly species and other insects; also 4 mollusca species, 6 crustacea and 1 leech species.

In 1997 a Law was passed on Protected Animal, Plant, Fungi Species and Communities. Since the Government approved this Law, all Red Data Book species are protected by the State.

It is prohibited to destroy and damage protected species and their localities (breeding sites). The perpetrator (physical or juridical person) which has done damage to a protected object by illegal activity has to compensate all damage (recover losses) and, if possible, restore the object to its former state. Methods of damage evaluation and tariffs were approved to calculate quantity of damage.

The Environmental Protection Ministry makes, orders, updates and organises publishing of the Red Data Book. In 1998 Red Data Book lists of all species will be updated and revised; new species of invertebrates and vertebrates will be included.

Every year, the Environmental Protection Ministry produces the "Red Lists" publication in which is announced all information related to rare and endangered animal, plant and fungi species which are inscribed (or are recommended for inscription) in the Red Data Book of Lithuania: their distribution, scientific researches, protection. Most space is allotted to reports on new localities (breeding, nesting sites) of species listed in the Red Data Book.

The formation of the new network of Protected Areas was finished in 1997. At present there are 5 National Parks and 30 Regional Parks. All National and Regional Parks have their reserve zones in which plants and animals are protected. Four strict Nature Reserves have been established in which all economic activities are prohibited. In 15 Botanical - Zoological Reserves (total area 18,377 ha) all animal and plant groups are protected. Six Entomological Managed Reserves with total area 461 ha are established specially for insect protection. In these are observed and recorded the state of insect populations; scientific researches and monitoring of insects have been carried out.

3.10. Luxembourg / Luxembourg

Rapport pour le Grand-Duché de Luxembourg

par Mr Marc Meyer, National Natural History Museum, Department of Zoology

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1. Pendant les dernières années, un système d'information géographique concernant les sites proposés dans le cadre de la Directive «Habitats» a été mis en place conjointement par le ministère de l'Environnement et le Musée national d'histoire naturelle. Ce système comprend une cartographie thématique en relation directe avec la banque de données biogéographiques «LUXNAT» et une banque de données spéciale pour gérer les sites et les mesures de protection et d'aménagement, «LUXSITE». Tous les invertébrés de la Convention de Berne présents actuellement dans notre pays ont été intégrés dans le choix des sites «Directive Habitats».

2. Les inventaires faunistiques-écologiques du Musée national d'histoire naturelle continuent, en particulier en ce qui concerne les invertébrés :

–les mollusques terrestres et d'eau douce ;
–les araignées ;
–les odonates des eaux courantes et stagnantes ;
–les sauterelles arboricoles ;
–les éphénéroptères, plécoptères et plécoptères des eaux courantes ;
–les coléoptères ;
–les lépidoptères.

Un programme de surveillance des BCIs n'a pas pu être entamé, faute de financement.

3. Certains projets de recherche du Musée rentrent directement dans l'aspect de la gestion des habitats y relatifs :

–étude pluridisciplinaire sur les colonies estivales de chauves-souris et leurs ressources alimentaires ;

–étude pluridisciplinaire des flore et faune d'une forêt riche en bois dépérissant et mort, en mettant l'accent sur les indicateurs saproxyliques, xylophages et xylophiles.

4. Plans d'action pour certaines espèces de la Convention de Berne :

–une étude récente menée par un collaborateur scientifique du Musée a documenté les effets négatifs des mesures de gestion standardisées sur *Lycaena dispar* ;

–les mesures de sauvegarde et de reproduction aidée en faveur de la dernière population de *Margaritifera margaritifera* continuent et semblent positives, toutefois faudrait-il améliorer la qualité de l'eau de la rivière en cause.

5. Le Groupe de travail entomologique conjoint du Musée et de la Société des naturalistes luxembourgeois a participé activement à la réalisation de la Liste rouge révisée des papillons diurnes européens.

3.11. The Netherlands / Pays-Bas

The present state of the BCIs in The Netherlands

Report by Mr. P.J. van HELSDINGEN, European Invertebrate Survey

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INTRODUCTION

Of the 14 Bern Convention invertebrates occurring in the Netherlands, five are extinct or probably extinct, five are critically endangered, one is endangered, one is vulnerable, one falls in the category 'Insufficiently Known', while one only sporadically appeared in our country in the past and therefore should be classified as a straggler (classified as Rare below).

The Netherlands being a lowland country, the fauna is poor by nature, because the variation in available natural habitats is scanty. The submontainous, mountainous, and alpine regions are completely lacking and limestone grasslands are rare and restricted to the southern tip of the country.

The Netherlands first of all are a country of wetlands and waterbodies, including the larger rivers. Most of these suffer from bad water quality and are sometimes heavily polluted. Even wetland reserves suffer from the bad water quality, because the reserves are situated higher than the surrounding polder areas, resulting in a permanent seeping away of the water from the reserves towards the polders. This relatively high position of wetland areas is caused by the continuous setting of the surrounding agricultural areas where the water table is artificially lowered on request of the farmers, who hold the best cards and have the greatest influence on the polder authorities. This leads to a shortage of water in the drier periods of the year, forcing management to choose between two evils: drying out of the wetland reserve, or pumping in of polluted water from the surrounding areas.

In many areas in the eastern part of the country the quality of the groundwater is severely deteriorating. Here, too, the country is largely drying out as a result of agricultural activities and water company activities. Heavy chemical pollution is seeping into the soil. Air pollution through industries and agriculture (intensive cattle breeding and cultivation of pigs) is a serious and persistent problem. A heavy toll is also paid because of housing development and the construction of new transport infrastructures and their impact on the available spaces left.

We can report only slight improvements in the general situation, despite all the plans which have been developed on the governmental level. The water quality is improving very slowly. The Nature Policy Plan has put the National Ecological Network politically firmly on the Dutch map. All good intentions are there, but the opposing forces are still too strong. The necessary reserves are acquired at much too slow a pace.

It is not surprising that under these circumstances the larger part of the fauna is under continuous stress and the species which are endangered will remain so, despite all good intentions. Changes and developments are reported upon below.

ODONATA

Sympecma braueri
[Present name: *Sympecma paedisca* Brauer]

National status: Critically endangered.
Distribution: Mesotrophic fens in eastern part of country. The species is strongly in decline since the seventies. Recently a new locality was discovered in a reserve.
Reasons for decline: Acidification; eutrophication; drying out; disappearance of seepage of groundwater; loss of habitat.
Conservation measures taken: General improvement of the environment is in extremely slow progress.
Conservation measures proposed: Speeding up of general improvements, such as suppression of excessive acidification and eutrophication and restoration of natural, dynamic groundwater regimes.

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Aeshna viridis

National status: Vulnerable.
Distribution: Fenlands in western and northwestern part of the Netherlands.
Reasons for decline: Eutrophication; pollution; loss of habitat; dependent on the Soldier Plant (*Stratiotes aloides*) which is very sensitive to toxic pollutants and equally vulnerable, although presently slowly recovering.
Conservation measures taken: General improvement of the environment is in extremely slow progress.
Conservation measures proposed: Speeding up of general improvements, such as suppression of excessive acidification and eutrophication and restoration of natural, dynamic groundwater regimes.

Main bibliography:
Geijskes, D.C. & J. van Tol, 1983. De Libellen van Nederland (Odonata). - (Hoogwoud, Netherlands).
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Schorr, M., 1996. *Aeshna viridis*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 2: 226-238

Stylurus flavipes
(*Gomphus flavipes*)

National status: Extinct.
Distribution: Has disappeared before 1950; not seen since early this century (1902) and not likely to return because the nearest European populations live in France and as far as Berlin.
Reasons for decline: Eutrophication; pollution of Rhine river basin and other large rivers.

Main bibliography:
Geijskes, D.C. & J. van Tol, 1983. De Libellen van Nederland (Odonata). - (Hoogwoud, Netherlands).
Verspreidingsgegevens van de Nederlandse libellen, 1995. - European Invertebrate Survey - Netherlands (Leiden).
Schorr, M., 1996. *Stylurus flavipes*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 2: 350-364.

Ophiogomphus cecilia

National status: Critically endangered.
Distribution: Has disappeared before 1950; last published record from 1936. For many years considered to have become extinct. Rediscovered (=returned?) in 1995, seen again in 1996, which might point to a relict population.
Reasons for decline: Eutrophication; canalisation of brooks.
Conservation measures taken: None.

Main bibliography:
Geijskes, D.C. & J. van Tol, 1983. De Libellen van Nederland (Odonata). - (Hoogwoud, Netherlands).
Verspreidingsgegevens van de Nederlandse libellen, 1995. - European Invertebrate Survey - Netherlands (Leiden).
Schorr, M., 1996. *Ophiogomphus cecilia*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 2: 324-340.

Oxygastra curtisii

National status: Rare.
The species does not belong to the regular fauna of the Netherlands. Probably there are temporary settlements. There was a breeding population in the southern part of the country from 1925-1928, and the species has been observed on several occasions more recently (around 1980).
Distribution: Temporary settlements only.
Reasons for decline: Temporary settlements only.
Conservation measures taken: None.

Main bibliography:
Geijskes, D.C. & J. van Tol, 1983. De Libellen van Nederland (Odonata). - (Hoogwoud, Netherlands).
Verspreidingsgegevens van de Nederlandse libellen, 1995. - European Invertebrate Survey - Netherlands (Leiden).

Schorr, M., 1996. *Oxygastra curtisii*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 2: 341-349.

Leucorrhinia albifrons

National status: Critically endangered.
Distribution: Very local in the Southeast and East. Small populations.
Reasons for decline: Acidification; eutrophication; loss of habitat; expected to disappear soon because of gradual acidification of mesotrophic fens.
Conservation measures taken: General improvement of environment.
Conservation measures proposed: Speeding up of general improvements, such as suppression of excessive acidification and eutrophication and restoration of natural, dynamic groundwater regimes.

Main bibliography:
Geijskes, D.C. & J. van Tol, 1983. De Libellen van Nederland (Odonata). - (Hoogwoud, Netherlands).
Verspreidingsgegevens van de Nederlandse libellen, 1995. - European Invertebrate Survey - Netherlands (Leiden).
Schorr, M., 1996. *Leucorrhinia albifrons*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 2: 266-278.

Leucorrhinia caudalis

National status: Extinct.
Distribution: Probably has disappeared because of gradual acidification of mesotrophic fens; last record from 1970; no natural recolonisation expected.
Reasons for decline: Acidification; eutrophication; loss of habitat.
Conservation measures taken: General improvement of environment.
Conservation measures proposed: Speeding up of general improvements, such as suppression of excessive acidification and eutrophication and restoration of natural, dynamic groundwater regimes.

Main bibliography:
Geijskes, D.C. & J. van Tol, 1983. De Libellen van Nederland (Odonata). - (Hoogwoud, Netherlands).
Verspreidingsgegevens van de Nederlandse libellen, 1995. - European Invertebrate Survey - Netherlands (Leiden).
Schorr, M., 1996. *Leucorrhinia caudalis*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 2: 279-291.

Leucorrhinia pectoralis

National status: Endangered.
Distribution: Very locally in the eastern part of the country in mesotrophic fens. Small populations only.
Reasons for decline: Acidification; eutrophication; loss of habitat.
Conservation measures taken: General improvement of environment.
Conservation measures proposed: Speeding up of general improvements, such as suppression of excessive acidification and eutrophication and restoration of natural, dynamic groundwater

regimes.

Main bibliography:

Geijskes, D.C. & J. van Tol, 1983. De Libellen van Nederland (Odonata). - (Hoogwoud, Netherlands).

Verspreidingsgegevens van de Nederlandse libellen, 1995. - European Invertebrate Survey - Netherlands (Leiden).

Schorr, M., 1996. *Leucorrhinia pectoralis*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 2: 292-307

COLEOPTERA

Dytiscus latissimus ?

National status: Extinct?
Distribution: Used to occur in larger lakes; last records from early seventies.
Reasons for decline: Changes in water quality?
Conservation measures taken: General improvement of water quality.
Conservation measures proposed: None.

Main bibliography:

Drost, M.B.P. *et al.*, 1992. De Waterkevers van Nederland. (Leiden Natural History Museum).

Foster, G.N., 1996. *Dytiscus latissimus*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 3: 31-39.

Graphoderus bilineatus

National status: Insufficiently known.
Distribution: Precise distribution unknown.
Reasons for decline: Unknown.
Conservation measures taken: None.
Conservation measures proposed: None.

Main bibliography:

Drost, M.B.P. *et al.*, 1992. De Waterkevers van Nederland. (Leiden Natural History Museum).

Foster, G.N., 1996. *Graphoderus bilineatus*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 3: 40-48.

Osmoderma eremita ?

National status: Extinct?
Distribution: ?
Reasons for decline: ?
Conservation measures taken: None.
Conservation measures proposed: None.

Main bibliography:
Luce, J.-M., 1996. *Osmoderma eremita*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 3: 64-69.

Cerambyx cerdo

National status: Critically endangered or Extinct.
Distribution: Former records from eastern provinces (stands of oak).
Reasons for decline: Unknown.
Conservation measures taken: None.
Conservation measures proposed: None.

Main bibliography:
Luce, J.-M., 1996. *Cerambyx cerdo*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 3: 22-26.

LEPIDOPTERA

Maculinea nausithous

National status: Critically endangered.
Distribution: Reintroduced at one site (reserve) in the South in 1990. The experiment has been successful and the population is slowly spreading from one meadow to several connecting road verges. The number of individuals is slowly increasing.
Reasons for decline: Wrong management of reserves.
Conservation measures taken: Changes in management (mowing intensities).
Conservation measures proposed: Management should follow the prescribed mowing intensities and time of the year.

Main bibliography:
Tax, M.H., 1989. Atlas van de Nederlandse dagvlinders. - (Vlinderstichting/Wageningen).
Wynhoff, I., 1996. *Maculinea nausithous*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 1: 164-171.

Maculinea teleius

National status: Critically endangered.
Distribution: Reintroduced at one site (reserve) in the South in 1990. The reintroduced population thrives on one meadow only, no further spreading has (yet) been observed.
Reasons for decline: Reasons for former decline (wrong management) have been lifted.
Conservation measures taken: Changes in management (mowing intensities).
Conservation measures proposed: None.

Main bibliography:

Tax, M.H., 1989. Atlas van de Nederlandse dagvlinders. - (Vlinderstichting/Wageningen).

Wynhoff, I., 1996. *Maculinea teleius*. In: Helsdingen, P.J., L. Willemse & M.C.D. Speight (Eds.), 1996. Background information on invertebrates of the Habitats Directive and the Bern Convention 1: 172-179.

Addition to the report of the Netherlands

by Mr Peter J. van Helsdingen

There is considerable progress with invertebrate faunistic research.

The European Invertebrate Survey - Netherlands has produced an atlas of Orthoptera in the Netherlands. It is not only an atlas with distribution maps, but includes information on biology, ecology and habitat preferences and even comprises a compact disk with the sounds these animals produce during certain activities.

Several other atlases are in preparation. This year we hope to produce an atlas on Freshwater Mollusca in the Netherlands. An atlas on Odonata is in an advanced stage of preparation and will appear at the end of this year.

Early next year an atlas of the Carabidae in the Netherlands will be published. Work on Aculeate Hymenoptera is progressing slowly (because of lack of funding) but an atlas should be ready by 1999.

Preliminary atlases on Syrphid flies and all Mollusca are planned for 1999. The work is carried out by amateur volunteers and supervised by E.I.S. - Netherlands. The latter will publish the atlases.

Red Lists have been produced by E.I.S. - Netherlands, and published by the Dutch Government, for Orthoptera and Odonata. All atlases mentioned above will have the production of Red Lists of the groups concerned as parallel activities.

E.I.S. - Netherlands has been recognised as the National Data Bank for Invertebrates. It is an independent NGO which carries out invertebrate faunistic research on contract for the government and provincial or local authorities.

3.12. Norway / Norvège

Protection and management of invertebrates in Norway

by Mr Kaare Aagaard, Norwegian Institute for Nature Research

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All the nine invertebrate species which are listed on the Bern Convention Appendix II and occurring in Norway, are proposed for protection according to the Nature Conservation Act. Two butterfly species, *Parnassius apollo* and *Parnassius mnemosyne*, are temporarily protected.

Some of the subpopulations of *P. mnemosyne* have been studied by capture/recapture methods every year since 1988. The studies unveiled a strong decrease in all the studied subpopulations 3-4 years ago. This general decrease, most certainly due to cold and rainy weather in June during these years, has however been followed by an increase in nearly all of the subpopulation during the last two years.

Population genetic studies of the two *Parnassius* species occurring in Norway have showed that the genetic variation between subpopulations of *P. mnemosyne* only 20 km apart is rather high. The *P. apollo* subpopulations are much less genetic divers even when comparing populations living several 100 km apart.

New or revised Red Data Lists for invertebrates are made for several insect groups. Only 3 species of a total of 2,111 species Lepidoptera are considered extinct while a total of 540 species are listed. Coleoptera comprises 3,430 species in Norway, 778 species are listed and 45 species are considered extinct. So far, about 440 species of Hemiptera are recorded in Norway and 91 of these species are proposed included in the Red Data List. Only 2 of the Hemiptera species are considered extinct.

A recent compilation of the knowledge of the pearl mussel Margaritifera margaritifera in Norway, concludes with a recommendation of a ban on catch and a protection of the remaining habitats. Measurements to reduce erosion and securing areas exposed to erosion, will be important. Preventing clear cutting and reducing the pollution of the localities are important. In some acidified areas, a reshaping of an environment for reintroduction will be necessary.

The appendices listing of species function is a very strong support for national attention and interest in protection of the invertebrate species in Norway. Several species with large populations on the European continent have their northern limit of distribution in the south of Norway. Species like the butterfly *Plebeius argyrognomon* which are known from less than five localities, all in small islands close to the city of Oslo, will most possibly go extinct if the habitats are not protected. In contrast to this, species with a limited distribution in countries south of Scandinavia, often occur even close to the cities in large populations. Species with either of these distribution pattern can only be given a necessary support from the Bern Convention through a geographical subdividing of the lists on the Appendices.

3.13. Slovakia / Slovaquie

Report on the progress towards the conservation of Bern Convention Invertebrates in Slovakia, 1996-1998

by Mr Jozef Kramárik, Department of Nature and Landscape Protection
(Ministerstvo _ivotného Prostredia Slovenskej Republiky)

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1. Organisational aspects

Survey and protection activities on invertebrates species (including ones protected by the Bern Convention) are mostly carried out by the Slovak Environmental Agency (expert organisation of the Ministry of the Environment of the Slovak Republic). The Administration of National Parks of the Slovak Republic, several research institutions as well as NGOs are cooperating bodies, too. To co-ordinate activities on specific species the so-called "gestor system" exists having among others four "gestor groups" for research and protection of selected invertebrate groups (water invertebrates, *Orthoptera*, *Coleoptera*, *Parnassius apollo*). In each "gestor group" experts from various scientific and nature protection institutions work and share experience. There is a lack of specialists for some invertebrates species which increases a need for co-operation and co-ordination among experts.

2. Continual activities at a national scale

–Inventarisation activities of specific protected areas (the most studied invertebrate species are *Mollusca*, *Odonata*, *Orthoptera*, *Coleoptera* and *Lepidoptera*);

–Mapping of wetlands (mostly *Odonata*, *Coleoptera*, *Crustacea*);

–Biotopes mapping.

3. Special projects

In May 1997 a project on *Parnassius apollo* (Protection of *Parnassius apollo* in Slovakia) has started with the aim of inventarisation of this species, its habitats and their state, monitoring of populations and habitats as well as practical measures for maintenance of these habitats (such as selective tree cutting). Restitution to other habitats is a part of this project, too.

Research of *Odonata* species is a part of the BIOTA Monitoring System. Standard methods are used to collect data.

Four finalised IUCN projects in Slovakia which included also research of invertebrate species:

–Commercial Fishponds Project;
–Military Areas Project (Biodiversity and Nature Protection in Areas used by former Soviet Army);
–Biodiversity Protection in the Protected Landscape Area Pol'ana;
–National Ecological Network of Slovakia.

With respect to listing *Helix pomatia* as a protected species in Slovakia, a study for collection and trade issues for this species was carried out in 1994.

3.14. Spain / Espagne

Main progress towards the conservation of Bern Convention Invertebrates in Spain since 1996

by Mrs M.A. Ramos, Museo Nacional de Ciencias Naturales (CSIC)

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1. Legal protection for invertebrates in Spain

Both the Bern Convention (1988) and the Habitats Directive (92/43/EEC) require Member States to maintain "at a favourable conservation status" the species of Community interest listed in the Annexes, and they stress for the first time the importance of habitats for the conservation of the species. In Spain, responsibility for ensuring that favourable conservation status lies with the Ministry for the Environment (ME) although most of its powers are transferred to the 17 Autonomous Regional Governments.

Apart from the protection afforded by the international conventions signed by Spain, the most general Spanish law in nature conservation is the National Endangered Species List (Royal Decree 439/90). Originally containing only vertebrates and plants, the first and unique invertebrate in the list (*Margaritifera auricularia*) was included in the "threatened with extinction" category in 1996 (Order 20324 of 29 August) after its rediscovery in Spain. A total of 10 other species (9 of them from the Canary Islands) will be added to the list after their approval by the National Commission of Flora and Fauna. A project has recently been launched to update the law, to enlarge the list reviewing the status of the invertebrates and to adjust it to European (EC) legislation.

The Atlantic stream crayfish (*Austrapotamobius pallipes*) is another invertebrate species for which collection (fishing) is forbidden by a state law (Royal Decree 1095/89).

A commission with wide representation among all the scientific, administrative and social sectors has been drawing up the National Strategy to fulfil the agreements of the Convention on Biological Diversity. It will be presented and discussed in Parliament in the next few months.

At regional level, some governments are publishing regional lists of protected species or red lists. Such is the case of the Madrid Region (Decree 18/92). Catalunya (law 3/1988 and Order of 16 March 1993), Asturias (Decree 32/90), the Balearic Islands (Decree 24/92), Navarra (Regional Law 2/93 and Regional Law 209/95), Andalucía (Decree 104/94), Aragón (Decree 49/95) or Valencia (Decree 265/94). Most of them do not include invertebrate species, and there is no plan either national or local to recover invertebrate species. We can therefore conclude that Spanish legislation is still behind as regards protection of invertebrates since all the laws have been designed with vertebrates, and especially the charismatic megavertebrates as the usual priority, with plants in second place.

2. Bern Convention and Habitats Directive Invertebrates

As regards the invertebrate species included in Directive 92:43/33C (Habitats Directive), at the end of 1995, the Dirección General de Conservación de la Naturaleza (Ministry for the

Environment) signed two research conventions, one with the Museo Nacional de Ciencias Naturales (hereafter MNCN) of the Spanish Research Council (CSIC) and the other with the Spanish Entomological Society.

The first convention involved not only bibliographical research and study of collections but also some sampling, in order to obtain in one year up-to-date information on non-insect species' distribution with a review of the biology and life cycles of the species (mainly those included in Annexes II and V) and estimates on population densities. In this way, it seeks to identify threats to the species and both measures and areas of special relevance for their survival. There were also emphasis on surveys of *Margaritifera auricularia* and *Maculinea nausithous* to fulfil the Bern Convention recommendations (T-PVS (96) 13, T-PVS (92) 24, T–PVS (94) 8 and T-PVS (96) 3) and on *Elona quimperiana* (Recommendation T-PVS (96) 33-5). A database was set up using UTM cartography with an accuracy of 10x10 km quadrants (1:200.000) for species with a wide distribution and 1x1 km (1:50.000) for rare species or those living in a small area or having a patchy distribution.

The second convention, mostly based on bibliographical references and unpublished data from specialists and collections aimed to produce an updated review of the insect species data-sheets compiled by Rosas *et al.* (1992) and map the species' geographical distribution with an accuracy of 10x10 km quadrants (1:200.000). A database was also set in this case.

A total of 37 invertebrate species included in the HD and of 32 included in the BC lists live in Spain. There follows a summary of the most relevant results obtained with these projects including a more detailed account on the BCIs Recommendations to Spain.

First project (Co-ordinator: M.A. Ramos)

The studied species in the first project were:

	Annexes	
	Habitats Directive	Bern Convention
COELENTERATA		
CNIDARIA		
Corallium rubrum (Linnaeus, 1758)	V	III
MOLLUSCA		
GASTROPODA-PROSOBRANCHIA		
Patella ferruginea Gmelin, 1791	IV	II
GASTROPODA-STYLOMMATOPHORA		
Elona quimperiana (Férussac, 1821)	II	II
Geomalacus maculosus (Allman, 1843)	II	II
Vertigo moulinsiana (Dupuy, 1849)	II	II
BILVALVIA-UNIONOIDA		
Margaritifera auricularia (Spengler, 1793)	IV	II
Margaritifera margaritifera (Linnaeus, 1758)	II & V	III
Unio elongatulus (Pfeiffer, 1825)	V	II
Unio crassus Philipsson, 1788	II & III	
BIVALVIA-ANISOMYARIA		
Pinna nobilis Linnaeus, 1957	IV	II

Lithophaga lithophaga (Linnaeus, 1758)	IV	II
ECHINODERMATA		
Centrostephanus longispinus (Philippi, 1845)	IV	II
ANNELIDA		
HIRUDINOIDEA-ARHYNCOBDELLA		
Hirudo medicinalis (Linnaeus, 1758)	V	III
ARTHROPODA		
CRUSTACEA-DECAPODA		
Austropotamobius pallipes (Lereboullet, 1858)	V	II
ARACNISA		
Macrothele calpeiana (Walckenaer, 1805)	IV	II
INSECTA-LEPIDOPTERA		
Maculinea nausithous (Bergsträsser, 1779)	II & IV	II

***Margaritifera auricularia* (Spengler, 1793)**

The most outstanding result has been the discovery of a live population of *Margaritifera auricularia* in a channel of the Ebro River (Ramos & Araujo, 1996, Araujo & Ramos, 1996) in Aragó. The Catalonian region was not investigated because the Regional Government denied the corresponding sampling permission although it seems that a good population still exists there. Since then, the population density, biology and ecology of the species have been under investigation. Studies *in situ* in the channel and in aquaria are being carried out to describe the anatomy of the species, its reproductive strategy, and larval development as a preliminary step to drawing up an action plan for species's recovery. Other ecological factors are being investigated to characterise the habitat and to detect the native fishes that could act as a host for *Glochidium metamorphosis*.

As a summary of the main results obtained with a view to a conservation strategy, it may be said that: i. both populations seem to be fragmented; ii. all the observed specimens are very big, the smallest specimen being 11 cm long, which creates doubts about the reproductive success of the species in natural conditions; iii. the aquarium specimens released all the larval stages, suggesting a high reproductive potential; and iv. in the presence of a sturgeon fish species, the *glochidium* parasitised fish gills for *metamorphosis*.

A pluridisciplinary approach to all these aspects is now in progress. It includes descriptions of the glochidium (Araujo & Ramos, 1998), the larval metamorphosis process, reproductive period in the wild, sec distribution and molecular estimates of the genetic variability of the populations. The possibility of obtaining fish gill infestations and the subsequent metamorphosis of the parasite mussel larvae in *ex situ* cultures not only allows us to be optimistic about the future of the species, but will also be important in designing an action plan for *Margaritifera auricularia* as recommended in the Bern Convention (T-PVS (96) 33).

However, both populations are highly endangered because of the work, which has already been approved, to cover the channel artificially in order to avoid water loss, and a project to

build three new dams on the lower Ebro river. Alternatives to preserve the species's habitat in the channel and guarantee farmers' needs have been presented and are now being studied and discussed.

A working team co-ordinated by the Ministry for the Environment and made up of the regional administration and scientists with experience and knowledge of the species has been set up as a preliminary step towards the design of an Action Plan to recover the species.

***Maculinea nausithous* (Bergsträsser, 1779)**

As a result of the work carried out in 1996 (Oruea *et al*., 1996) the species's range has been enlarged in six more 10x10 sq km quadrants besides the nine known prior to that date, which means a 43 % increase over the previously known area (Orueta *et al*., 1996). In addition, it has been found in nests of different ant species, suggesting less specificity than was thought before. There are three populations in Spain, located in the Cantabrian mountains, Soria and the Guadarrama mountains (Madrid). All are fragmented, being extremely so in Soria and Madrid. Apart from the usual threats to the species associated with habitat alteration, it seems that the most endangered population is the one in Soria due to plans to set up a camping site and build a dam in the species's area.

Apart from the global actions foreseen in the Action Plan for *Maculinea* butterflies in Europe (Munguira & Martin, 1997), the specific plans in Spain include: i. protection of the relict population in the Lozoya Valley, creating a small microreserve adjacent to the Natural (Regional) Park that exists in the area; and, ii. protection and management in Soria and the Cantabrian Mountains by keeping traditional management grazing regimes and creating small reserves to protect some of the most vulnerable populations (e.g.: Soria and Puerto de Tarna).

***Elona quimperiana* (Férussac, 1821)**

It is an Atlantic species occupying two separate areas, one in France and one in the Cantabrian Region on the Iberian Peninsula (Fig. 1). Current distribution in Spain suggests that it was more widely distributed in the pas (Puente *et al*., 1996) inhabiting also some humid areas in Rioja. It lives in caves and piles of dead leaves in beech and oakwoods. It is, therefore, difficult to evaluate population densities. Like *Geomalacus maculosus*, it can be considered to be less threatened, the main danger being the progressive reduction or transformation of its natural habitat.

As regards the other species, a more detailed account of some other relevant data can be found as an appendix. In short, some of them are native to Spain (*Macrothele calpeiana*), from the Mediterranean Sea (*Patella ferruginea, Pinna nobilis*) and most of them are in the southern peripheral area of their range. In some cases, this means ecological marginality, the populations being more threatened by changes in their natural habitats.

Lacustrine and riverine ecosystems can all be considered as fragile, especially the Bañolas Lake where one of the two Spanish populations of *Vertigo moulinsiana* lives as well as a possible native subspecies of *Unio elongatulus*. It has been confirmed that *Vertigo moulinsiana*, which was excluded from the IUCN Red Data List because of its wide distribution in Europe, is, however, clearly endangered on the Iberian Peninsula.

It can also be concluded that, although new populations of *Margaritifera margaritifera* and other unionoid species were discovered, this group is declining in Spain as is the case in the rest of Europe. The main causes of this decline are changes in agricultural methods, pollution and direct changes in water courses (dams, etc.). The dry periods in Spain in recent years have promoted engineering projects to cover artificially the network of channels in order to avoid wasting water. This would represent the loss of all the naiad populations living in these historical ecosystems.

Patella ferruginea and *Hirudo medicinalis* are among the most endangered species. More studies on their biology are needed and may be actions plans to recover them.

The opposite is the case of *Elona quimperiana* and *Geomalacus maculosus*, probably included on the International lists because of their decline in Brittany (France) and Ireland, respectively, but not endangered in Spain. Both have a wide distribution in the Cantabrian region in areas far from human influence. Therefore, their conservation seems to be ensured provided there are no changes in land use. They appear to be scarcer than they really are because of their high activity and tendency to live in caves and rock fissures.

Pinna nobilis is a similar case as its survival seems to be guaranteed if the *Posidonia oceanica* sea grasses are conserved. *Centrostephanus longispinus* is also a similar case. Its rarity is due mostly to the inaccessibility of its habitat.

Finally, the species range of *Macrothele calpeiana* "the cork tree black spider" (Fernández-, 1996) does not seem to be seriously endangered because most of its distribution is already included in protected areas. However, more date on its biology are needed, as well as a study of the population from Algeria (Lucas, 1846) and Ceuta (Blasco & Fernández, 1986).?

Second project (co-ordinator: E. Galante)

The studied insect species in the second project were:

	Annexes	
	Habitats Directive	Bern Convention
COLEOPTERA		
Buprestis splendens (Fabricius, 1775)	II & V	II
Cerambix cerdo (Linnaeus, 1758)	II & IV	II
Lucanus cervus (Linnaeus, 1758)	II	III
Osmoderma eremita (Scopoli, 1763)	II & IV	II
Rosalia alpina (Linnaeus, 1758)	II & IV	II
Cucujus cinnaberinus (Scopoli, 1774)	II & IV	II
Limoniscus violaceus (Müller, 1821)	II & IV	
LEPIDOPTERA		
Callimorpha quadripunctaria (Poda, 1761)	II & IV	
Coenonympha oedippus (Fabricius, 1787)	II & IV	II
Eriogaster catax (Linnaeus, 1758)	II & IV	II
Euphydryas aurinia (Rottemburg, 1775)	II	II
Graellsia isabellae (Graells, 1849)	II & V	II
Plebicula golgus (Hubner, 1819)	II & IV	II
ODONATA		
Coenegrion mercuriale (Charpentier, 1840)	II	II
Gomphus graslinii (Rambur, 1847)	II & IV	II
Lindenia tetraphylla (Van der Linden, 1825)	II & IV	II
Macromia splendens (Pictet, 1843)	II & IV	II
Opiogomphus cecilia (Fourcroy, 1785)	II & IV	II
Oxygastra curtisii (Dale, 1832)	II & IV	II

Leucorrhinia pectoralis (Charpentier, 1825)	II & IV	II
ORTHOPTERA		
Baetica ustulata (Rambus, 1838)	II & IV	II
DICTYOPTERA (MANTODEA)		
Apteromantis aptera (Fuente, 1894)	II & IV	II

As regards other insect species (Galante, 1996), it can be concluded that, in most cases, more thorough studies involving new sampling are needed to assess the distribution area, the biology and the status of the populations, especially in the case of rare species. On the whole, a good measure in favour of insect conservation seems to be preserving the forests in natural conditions by preventing the removal of undergrowth and dead trees.

In short, *Cucujus cinnaberinnus* (Scopoli, 1774) and *Limoniscus violaceus* (Müller, 1821) are species for which more studies are needed on their distribution areas. The data about the presence of *Coenonympha oedippus* (Fabricius, 1787) in Spain is thought to be a possible case of misidentification.

Plebicula golgus (Hübner, 1808-1813) is an endemic species from Sierra Nevada, very endangered by the construction of skiing facilities in that area. The study proposes the creation of a National Park (Gómez-Campos, 1987 and Munguira & Martin, 1989) at the southern limit of the species's range.

Ophiogomphus cecilis (Fourcroy, 1785) has been cited in the Iberian Peninsula, and although its status is completely unknown, protection of its habitat appears to be urgently needed.

Oxygastra curtisi (Dale, 1834) is declining in part of its range (Belgium, the United Kingdom and Switzerland). Good populations still exist in France, the Iberian Peninsula and in northern Morocco. However, it should be considered as very threatened.

Macromia splendens (Pictet, 1843) is a rare and very localised species whose geographical distribution is partly unknown in Spain. Research and protection of the areas where it lives should be the appropriate conservation measures.

Baetica ustulata (Rambur, 1838) is a very threatened species in Spain because of the skiing facilities built in Sierra Nevada, which is the only area on the Iberian Peninsula where the species is found.

From both projects we can conclude the importance of carrying out a species inventory as a preliminary step towards any other kind of study, and, therefore, to designing action plans for the species. It enabled a start to be made on studies of species biology, such as the one that is being launched on *Margaritifera auricularia*. They also showed the importance of international legislation and invertebrate lists as a tool to force countries to begin studies on relevant invertebrate species. It is also relevant to point out the need to review at periodical intervals the international lists once the different countries have the information required by the international legislation.

Finally, in connection with continental fauna, it is proposed that the species native to Mediterranean and coastal ecosystems (dunes, wetlands, etc.) be included. Another aspect that is missing is the inclusion of pollinator native insect species, avoiding the use of alien species and subspecies (e.g. Dutch *Bombus* spp. used in greenhouses in Almería). As regards conservation, it also seems important to promote the inventory of native species, including assessments of population status, for each country.

3. Research and Inventories

The "Fauna Iberica" Research Programme (Ramos, 1990, 1995), co-ordinated by the MNCN, continues to produce interesting results, such as the discovery of species new to science or previously unknown on the Iberian fauna, and detection of cases of sexual dimorphism where male and female were considered as different species. Its contribution is very important to the clarification of species' nomenclature. Through a series of checklists an attempt will be made to inventory in the short term, and by major phytoclimatic areas, all the 50,000-60,000 animal species living in Spain, with special reference to endemisms. Ten monographs in the Fauna Ibérica series, including identification keys, descriptions, geographical distribution and biological data, have been published, and seven others are in press. The production of a data bank, set up as a Geographical Information System, is also among its main objectives, but not enough financial support exists at present to develop it fully. The project, which began in 1989, has helped to create an atmosphere conducive to the promotion and improvement of both knowledge (systematic studies) and conservation of biodiversity as a whole.

Another project promoted by the European Topic Centre for Nature Conservation, and also co-ordinated by the MNCN, has set up a database, reviewing the taxonomic status and nomenclature of all the Habitats Directive species.

Appendix

***Geomalacus maculosus* (Allman, 1843)**
Is a Lusitanian endemism restricted in the Iberian Peninsula to the Atlantic area including northern Portugal, being widely distributed in the Cantabrian Region (Fig. 1) although its populations are restricted to particular habitats. It is crepuscular and prefers acid soils, being most frequent in granite mountain areas far from human influence. During the day, it hides in rock fissures or under bark. Adults are very active on rainy or very humid nights, while juveniles can also be observed at dawn. It was found in many localities but always in low numbers. According to Castillejo (1996), the only threat to the species could be the destruction of the native forests where it lives. Any transformation of the natural environment causes the species to disappear.

***Vertigo moulinsiana* (Dupuy, 1849)**
The Holartic species which was excluded from the IUCN Red Data List because of its wide distribution in Europe, is however, clearly endangered on the Iberian Peninsula. Gomez *et al.* (1996) focused on its current distribution area and population densities, concluding that *V. moulinsiana* was only present in marshy vegetation, especially *Cladium mariscus*, on the fungus at the edges of two small lakes: Estañá and Banyoles (Fig. 1). The sampling appeared to confirm the species' disappearance from other historical localities during the second half of this century. In Estañá, densities of about 730 specimens per square metre , suggesting that this population is extremely vulnerable. The Banyoles population area is larger, although no more than 50 specimens per square metre were found (Gomez *et al.*, 1996). The species requires stable palustrine habitats and its decline is mainly due to uncontrolled draining of these ecosystems although agricultural pollution is also involved.

***Margaritifera margaritifera* (Linnaeus, 1758)**
It appears to have declined in the Spanish salmon rivers over this century although new records were added to those reported by Bauer (1986), extending the species' area not only in Galicia but also in Asturias (Araujo & Ramos, 1996). It was usually found in gravel and rocky bottoms although it also occurred in sandy and muddy substrata in shady rivers. Its relative abundance varied among rivers from a few specimens to dense populations (about 5 specimens per square metre) in a few rivers. The main threats appear to be alteration of the

river courses through dam construction, and eutrophication resulting from changes in traditional agricultural practices. The study identified the need for more research into both the species' requirements and into populations of the salmon hosts in Spain and for protection of the species' habitat. Measures to promote access by trout and salmon to rivers where *M. margaritifera* lives are advisable.

***Unio elongatulus* (Pfeiffer, 1825)**

Several subspecies of this species have been described due to shell variability. According to Hass (1940) at least two of them lived in the Iberian Peninsula, while Altaba (1992) mentioned four in his revision of the unionids of Catalonia. This study provided no new data about species' variability but it revealed the need for a genetic approach to assess the taxonomic status of the Spanish populations. This appears to be the first step towards implementing conservation measures to ensure the preservation of genetic diversity of the species. *U. Elongatulus* is mostly distributed in northeast Catalonia and the northernmost part of the Valencia region. There are no records for the Gulf of Valencia or other freshwater habitats in this region (Martínez-Ortí, pers. com.) were it occurred in the past (Haas, 1918), pointing to a clear decline, probably due Water pollution resulting from the high degree of agricultural development. This study yielded new records in the Navarra, Aragón and La Rioja regions, as well as in the main course of the Ebro River where there were usually dense populations (Araujo & Ramos, 1996). In Aragón, the species is very abundant in some channels although the populations are highly threatened for the same reasons given for *M. auricularia*. In addition, the engineering work on the Ebro in Catalonia could be having serious effects on species' habitat. Like other unionids, this species is declining and is endangered by lagoon drainage and by work to coat the irrigation canals where it occurs.

***Patella ferruginea* (Gmelin, 1791)**

Is an endemic from the Mediterranean and the most endangered marine species. Its relative abundance in Paleolithic and Neolithic deposits indicates, however, an extensive former distribution in the western Mediterranean Basin (Templado, 1996). The coastal Iberian populations from Grana, Málaga and Almería have nearly become extinct over the last 10 years. The only record in the last five years was for two specimens in Cabo de Gata (Moreno, 1992). The rest can be considered to be relict populations. Several specimens were observed out of the wharf in Gibraltar (Templado, per. com.). The specimens were medium-sized, suggesting the possible existence of juveniles in the population. This is the first recorded population outside the Mediterranean. It may be said that the only viable populations of the species are in North Africa on the Mediterranean coast of Morocco and Tunisia. In the Spanish-owned Chafarinas Islands, there are normal populations (G. San Martin, pers. com.). Although G. Raso and Salas (1984) and Salas and Luque (1986) recorded the Alborán population as abundant, our census (Templado, Fauna IV, 1996) only found 28 specimens (ranging from 4 to 9 cm) throughout the island, indicating it is threatened with extinction. This led Templado (1996) to suggest that the Alborán population is now old and probably non-breeding. As the species has a very low reproductive rate, the main threat has been its use as food, fishing bait and as a collectors 'item. Moreover, construction of artificial beaches and sports facilities usually destroys its natural rocky habitat. Nothing is known about the reproductive biology of *Patella ferruginea*, especially its larval life, recruitment areas and juvenile development. Further research on these aspects are urgently needed.

***Pinna nobilis* (Linnaeus, 1758)**

The largest European bivalve species, and one of the largest in the world, is also a Mediterranean endemic, usually associated with seagrasses, especially *Posidonia oceanica* and *Cymodocea nodosa*. It seems to have been abundant in the past along all the coast. However, due to the decline in seagrasses, it is rare in the northwest part while in the Balearic Islands, Murcia and Almeria, S.E.. Spain there are still large well-conserved populations (Fig. 2). The highest density found by Templado (1996) was 9-10 specimens per 100 square metre, while over most of the area no more than one per 100 square metre was found. Low density in some areas led the author to suggest that these populations might be non-breeding because of the difficulties

regarding fertilisation due to it being a protandic hermaphrodite species. There is no specific legislation in Spain to protect *P. nobilis* although it benefits indirectly from the lax forbidding drag netting to a depth of 50 metres. However, there appears to be an urgent need to protect the littoral presenting well-preserved seagrasses. Apart from the risks associated with *Posidonia* beds, *P. nobilis* is also endangered by collecting and the anchorage of pleasure boats, mainly in the Balearic Islands. Few data exist on the species' life cycle and further more detailed research is needed.

***Lithophaga lithophaga* (Linnaeus, 1758)**
Is not an endangered species either in the Mediterranean or on the Atlantic coasts. However, it is a commercially valuable. Capture, mostly with pneumatic drills and dynamite leads, not only to the species' decline, but also to total habitat destruction. It lives all along the Spanish Mediterranean coast (Fig. 2), mainly in vertical walls from zero to 25 m depth, being most frequent in the first five metre. Total protection is the only way to conserve both the species and its habitat against the very destructive methods employed to extract specimens.

***Centrostephanus longispinus* (Philippi, 1845)**
It is the only representative of the Order *Diadermatoidea* in the Mediterranean Sea. Very few data exist on its biology. Most of the data were collected by the Fauna Iberica oceanographic expeditions. Its distribution seems to be highly influenced by temperature. It is restricted to a range between 80 and 130 m deep in the Balearic, Chafarinas, Herradura and Calaburras Islands, as well as on the Atlantic coast of Cádiz. Its particular habitats seem to be out of the area of influence of human activities, suggesting that the decline of the species might be due only to natural causes. More studies on the biology of the species are needed.

***Corallium rubrum* (Linnaeus, 1758)**
Being a species used as a semi-precious stone in jewellery, the principal threats are due to over exploitation, mainly by destructive methods, such as the Italian bar. Regulated control of fishing seems to be the only way to allow the populations to recover (Soriano, 1996).

***Hirudo medicinalis* (Linnaeus, 1758)**
This is one of the most endangered species. It has only been recorded in a small area in the Guadarrama Mountains and there is an urgent need for biological data (G.-Mas & Muñoz, 1996).

***Macrothele calpeiana* (Walckenaer, 1805)**
It is the type species of the genus, an endemic species in Spain and one of the two representatives of the Hexathelidae family in Europe. Its total area has been estimated at 37,000 km² in the south of Spain (Cádiz, Málaga, Granada, Sevilla and Huelva provinces). Three isolated fragmented populations were detected (Ferrández- 1996) and the known species range was enlarged. The main area of distribution is included in, or close to, already protected areas and, therefore, does not seem to be seriously endangered if the cork oak woods where it lives are not altered. A good measure to protect the species might be to enlarge the limits of the areas that are already protected. It is also recommended to monitor the most endangered populations living in Sierra de Aracena and Sierra de Huetor. Concerning conservation it seems also relevant to study the population from Algeria (Luxac, 1846) and Ceuta (Blasco & Ferrández, 1986) to test the alternative hypothesis about if they are native in the area or introduced from Spain or viceversa.

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3.15. Switzerland / Suisse

Rapport relatif à la protection des invertébrés en Suisse

par M. Yves Gonseth, CSCF, sous mandat de la division Nature
de l'Office fédéral de l'environnement, des forêts et du paysage (OFEFP)

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1. Introduction

En Suisse la protection des espèces est dans une large mesure garantie par la protection des milieux et des habitats. Ainsi aucun plan d'action national spécifique ciblé sur la protection d'espèces d'invertébrés citées dans les Annexes de la Convention de Berne n'a donc été estimé nécessaire à ce stade.

Ce rapport présente les travaux en cours qui ont un lien avec la faune invertébrée et/ou pourraient à terme influencer le statut de nombreuses espèces. Il fait le point sur l'évolution des projets déjà évoqués en 1996 lors de la dernière réunion du groupe d'experts (voir document T-PVS (96) 33). Il résume aussi quelques résultats d'études ponctuelles dont les apports théoriques sont importants dans le contexte d'une politique nationale de protection de la biodiversité.

La plupart des projets cités ici sont de portée nationale. Il est en effet impossible de résumer, voire même de connaître l'ensemble des actions ponctuelles entreprises aux niveaux régional (26 cantons) ou local par tous les acteurs potentiels (institutions publiques, universités, ONG, privés...).

2. Monitoring de la biodiversité en Suisse (MBD-CH)

Les travaux préparatoires relatifs à ce projet lancé par l'Office fédéral de l'environnement, des forêts et du paysage (OFEFP) ont permis de dégager une trentaine d'indicateurs pour lesquels des informations devraient être régulièrement récoltées en Suisse. Ils se répartissent en 3 catégories :

– les **indicateurs d'état** (11) avec, par exemple, le nombre d'espèces sauvages vivant en Suisse identifiables par méthodes standardisées (Z3) ; la tendance de l'évolution des effectifs d'espèces menacées choisies (Z6) ; le nombre des espèces largement répandues de groupes fauniques choisis et l'évolution des effectifs de certaines d'entre elles (Z7, Z8) ;

– les **indicateurs d'influence** (15) avec, par exemple, l'étendue des biotopes de valeur et des surfaces laissées à la nature (E1, E3) ; longueur des éléments paysagers linéaires (rivières, haies, lisières...) par km² et/ou influencés par l'homme (E4, E11, E12, E13, E14) ; production agricole par unité de surface (E7) ; proportion de surfaces forestières marquées par certains types d'exploitation (E8, E9, E10) ;

– les **indicateurs liés aux mesures de protection adoptées** (5) avec, par exemple, l'étendue des réserves naturelles (M1), la proportion d'espèces menacées bénéficiant d'habitats dans l'ensemble protégés (M3), l'étendue totale des surfaces exploitées sous contrat (protection de la nature ; M4) ou répondant aux normes de l'agriculture biologique (M5).

Les informations relatives à ces indicateurs seront rassemblées auprès d'institutions existantes qui les possèdent déjà ou directement sur le terrain par le biais d'un protocole d'échantillonnage standard. Pour des raisons budgétaires évidentes, ce dernier ne s'appliquera pas à tous les organismes vivants. Le tableau suivant résume la situation envisagée pour deux

indicateurs :

Taxons	Seront considérés	Z3	Z7
Oiseaux	les nicheurs	1	1
Mammifères	sans chauves-souris	1	3
Mammifères	chauves-souris	0	0
Reptiles	tous	1	3
Amphibiens	tous	1	1
Poissons	tous	2	2
Odonates	toutes	2	2
Lépidoptères	rhopalocères	2	1
Orthoptères	tous	2	1
Plantes vasculaires		0	0
Mousse		0	0
Champignons	Bolètales uniquement	2	3
Lichen		0	0
Mollusques			3

1 : opérationnels; 2 : envisageables à court terme; 3 : envisageables à long terme; 0 : pas utilisables

Dans tous les cas, une bonne coordination entre l'activité d'institutions déjà existantes (BdD nationales, instituts de recherche, services fédéraux et cantonaux...) et les (futurs) responsables du projet est indispensable.

3. Actualisation des listes rouges ; problématique des espèces rares et/ou menacées

Le protocole d'échantillonnage qui a été retenu et les moyens qui seront dévolus au projet MBD-CH ne suffiront pas pour actualiser les listes rouges déjà existantes, dresser des listes rouges pour des taxons non encore traités ou pour aborder un suivi des populations d'espèces rares ou menacées. Le CSCF a donc été chargé par l'OFEFP de développer puis de tenter d'appliquer une stratégie susceptible de couvrir ces manques.

Dans ce contexte, une attention particulière sera apportée au suivi des populations connues ainsi qu'à la découverte de nouvelles populations des espèces de l'Annexe II de la Convention de Berne qui se rencontrent sur le territoire suisse.

4. Compensation écologique et bioindication en milieu agricole

Depuis 1993, l'Office fédéral de l'agriculture (OFAG) rétribue (paiements directs à l'hectare) les agriculteurs qui acceptent d'extensifier une partie de la Surface agricole utile de leur domaine. Cette mesure s'est traduite par une augmentation rapide du nombre de surfaces dites de «compensation écologique» (SCE) dans la plupart des régions de Suisse. L'un des buts avoués de cette politique est une revitalisation du paysage agricole pour assurer la survie du plus grand nombre possible d'espèces végétales et animales sauvages.

Dès 1994, l'OFAG et l'OFEFP ont uni leurs efforts pour que les mesures envisagées soient couronnées de succès. Cette collaboration s'est notamment traduite :

– par le développement d'un outil d'évaluation des SCE par le biais de bio-indicateurs ; un premier document de synthèse proposant quelque 925 espèces de plantes et 350 espèces animales a été publié (1996) ; sur cette base, l'outil proprement dit a été développé d'abord en français (publié en juin 1997), adapté puis traduit en allemand (publié en septembre 1997) ;

– par la mise sur pied d'une commission paritaire (Forum national pour la compensation écologique) regroupant des représentants des milieux agricoles, de la protection de la nature et de la recherche; cette commission est entrée en fonction en décembre 1996 et a axé ses travaux sur les améliorations à apporter rapidement au système mis en place ; en janvier 1998, une série de propositions très concrètes, pour la plupart axées sur des objectifs de qualité, ont été faites à l'OFAG ;

– par le lancement de plusieurs projets visant à évaluer l'impact réel des mesures prises sur la biodiversité de zones-test : deux sont axés sur des espèces emblématiques, respectivement le lièvre et la perdrix grise ; un troisième, plus général, s'est focalisé sur l'étude des effets des mesures envisagées sur les peuplements d'oiseaux d'une vingtaine de communes de Suisse et sur les communautés de plantes vasculaires, d'araignées et de rhopalocères de plusieurs régions-test.

5. Typologie des milieux de Suisse

Ce projet, soutenu par l'OFEFP et Pro Natura (ex-Ligue suisse pour la protection de la nature), est en phase terminale puisque la version française de l'ouvrage est sous presse (sortie prévue en juin 1998). Cet ouvrage devrait permettre à son utilisateur de déterminer avec précision dans quel type de milieu il fait ses observations. Il recèle en effet pour chaque milieu une fiche signalétique comprenant les rubriques suivantes :

– **physionomie et écologie** : portrait-robot du milieu destiné à faciliter sa reconnaissance sur le terrain ;

– **valeurs biologiques** : énumération des espèces rares tributaires du milieu et de ses fonctions importantes pour la faune ;

– **relations avec l'homme** : énumération, si elles existent, des influences que le milieu subit et des formes d'utilisation qui sont compatibles avec son maintien ;

– **listes d'espèces** : végétales ou animales caractéristiques ou qui ont leur centre de gravité dans le milieu ;

– **phytosociologie** : indication de l'unité phytosociologique (le plus souvent alliance) à laquelle le milieu concerné appartient ; correspondance avec d'autres systèmes de classification tel CORINE ;

– **problèmes d'identification** : cette rubrique met l'accent sur les critères qui permettent d'éviter une confusion avec des milieux de structure et aspects voisins ;

– **exigences et menaces** : énumération des variables auxquelles le milieu est vulnérable ;

– **statut en Suisse** : degré de menace du milieu en Suisse défini par une comparaison de ses distributions potentielles et réelles évaluées sur la base de la distribution passée et actuelle de ses espèces caractéristiques.

L'ouvrage sera en outre illustré de plus de 400 photos couleurs de milieux, d'animaux et de plantes.

6. Projets relatifs aux milieux humides

Parallèlement à la réalisation de plusieurs inventaires nationaux relatifs à des milieux humides (hauts-marais, bas-marais, zones alluviales, sites de reproduction d'amphibiens, sites d'importance internationale pour les oiseaux d'eau), l'OFEFP acceptait à partir de 1994 le lancement de plusieurs projets d'inventaires d'organismes aquatiques :

– projet d'inventaire des Ephémères, Plécoptères et Trichoptères de Suisse réalisé sous l'égide du CSCF. Le premier Atlas de distribution émanant de ce projet, consacré aux Ephémères, est sous presse (sortie probable juillet 1998). Le second, consacré aux Plécoptères et qui sera agrémenté d'une clé de détermination actualisée de toutes les espèces, est en préparation (sortie probable en 1999) ;

– projet d'inventaire des Coléoptères hydradéphages, financé par des fonds privés et réalisé sous l'égide du CSCF ; il prévoit, en plus de la révision de l'ensemble des collections de musées ou de privés, la réalisation de nombreux relevés de terrain ; ce projet avance mais aucune publication n'est encore envisageable ;

– projet d'étude de plus de 200 mares et petits lacs de Suisse réalisée sous l'égide du Laboratoire de biologie aquatique de l'Université de Genève ; ce projet, lancé en 1996, allie une approche éco-phytosociologique à l'étude des peuplements de mollusques, d'odonates et de coléoptères de la quarantaine de mares visités chaque année ; ce projet devrait se poursuivre jusqu'en l'an 2000 ;

– les résultats d'un projet ponctuel effectué sur la distribution régionale d'une espèce de l'Annexe 2 de la Convention de Berne méritent d'être soulignés ici. Ils concernent la distribution de *Maculinea nausithous* dans l'Oberland bernois. Cette étude, effectuée sous l'égide de l'Ecole polytechnique de Zürich (EPF-Z), chaire «Nature et paysage», a en effet démontré que l'écrasante majorité des sites colonisés par l'espèce dans cette région étaient situés hors des limites des biotopes humides protégés ; soulignons ici que les limites de ces derniers ont été essentiellement tracées sur des critères botaniques !

6. Actualisation de l'inventaire national des pelouses sèches d'importance nationale

Les travaux de terrain relatifs à ce projet, dont la phase préparatoire a duré deux ans, ont débuté en 1996 ; principalement axés sur une évaluation de la qualité floristique des sites visités, cet inventaire prévoit toutefois une caractérisation pour chaque objet des structures présentes ayant un intérêt majeur pour la faune (buissons, lisières structurées, dalles rocheuses, tas de pierres, de branches etc...).

Parallèlement à l'inventaire proprement dit, l'OFEFP associé aux cantons de Vaud et de Genève, acceptait de financer l'étude d'une quarantaine de pelouses sèches de basse altitude du Jura occidental ; le but de ce travail, réalisé sous l'égide du CSCF et des musées de Genève et Bâle, étant d'évaluer l'influence de leur entretien sur leurs peuplements d'araignées, de rhopalocères et d'orthoptères. Ces travaux sont aujourd'hui terminés et une synthèse des résultats obtenus est en préparation. L'une des conclusions importantes qui en émane est qu'il n'**existe pas de corrélation absolue entre l'intérêt floristique et faunique des sites étudiés**. En d'autres termes, le recours à des indicateurs essentiellement floristiques pour hiérarchiser les pelouses sèches (==> pour les répartir en catégories de pelouses d'importances nationale,

régionale ou locale) risque de se traduire par le déclassement de sites de très haute valeur faunique, donc de très haute importance pour le maintien de la biodiversité des régions concernées. **Ce résultat, qui appuie ceux mentionnés au chapitre précédent, souligne l'importance d'une approche mixte (faune + flore) pour l'évaluation de la qualité des milieux dans le but de dégager des priorités de protection.**

7. Projets relatifs aux forêts

L'institut fédéral des forêts, de la neige et du paysage (FNP/WSL à Birmensdorf, ZH) a développé un réseau de surveillance des forêts de Suisse dans le cadre de deux projets intitulés «*Sanasylva inventory*» et «*Long term forest ecosystem research*». Les sites concernés sont régulièrement visités et les nombreuses informations récoltées permettent de suivre l'évolution de leur état de santé.

Plusieurs projets du WSL ont en outre trait aux invertébrés forestiers. Citons par exemple le suivi entomologique de surfaces forestières dévastées par le feu ou par la tempête ainsi qu'une approche de la biodiversité des lisières (échantillonnage par strates).

8. Autres projets relatifs aux invertébrés

Certains projets importants se sont terminés depuis 1996 ou sont en phase terminale. Pour les invertébrés, citons la parution de la version allemande du second volume de la série «*Papillons de la Suisse*» édité par Pro Natura (*Hesperiidae, Zygaenidae, Sphingidae...* ; la version française est sous presse), l'Atlas des Orthoptères de la Suisse (1997) et la prochaine publication de l'Atlas des Mollusques de la Suisse (juin 1998), de l'Atlas des Ephémères de Suisse (juillet 1998) et du catalogue des Diptères de la Suisse (août 1998).

3.16. Tunisia / Tunisie

Notes sur les principales activités actuellement développées dans le cadre de la Convention de Barcelone en matière d'espèces et d'habitats marins

par Mr Mohamed Saied, Regional Activity Centre for Specially Protected Areas, Tunisia

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1. Habitats marins

Dans le cadre des activités préparatoires à l'établissement en Méditerranée d'inventaires de la biodiversité marine et côtière, et plus spécifiquement d'inventaires nationaux de sites marins et côtiers, et suite à une recommandation de la 10e Réunion ordinaire des Parties contractantes (Tunis, 18-21 novembre 1997), l'établissement d'une classification de références d'habitats marins de la Méditerranée est en cours d'élaboration. A partir de cette classification, il est également prévu d'établir une liste d'habitats marins dont la conservation mérite une attention particulière, à utiliser comme référence dans l'identification des sites à inclure dans les inventaires (selon une approche similaire à celle utilisée dans le cadre de la Directive Habitats et du Réseau Emeraude).

Des versions provisoires de la classification et de la liste sont en cours d'élaboration par le CAR/ASP, en utilisant comme base de travail la classification des biocénoses utilisée pour déterminer les ZNIEFFs-mer (Zones naturelles d'intérêt écologique faunistique et floristique) en France, et dans une perspective de compatibilité et de complémentarité avec la classification paléarctique, conformément aux indications de la réunion d'experts de l'année dernière à Athènes.

Ces versions provisoires constitueront la base de travail pour une réunion d'experts sur les habitats marins en Méditerranée, coorganisée et cofinancée par le PAM (CAR/ASP) et le Gouvernement français, prévue en France au mois de novembre prochain.

La classification et la liste ainsi élaborées seront soumises à la 4e Réunion des points focaux pour les ASP (prévue au cours du premier trimestre 1999) pour finalisation. La liste sera ensuite transmise à la 11e Réunion des Parties contractantes pour adoption.

2. Espèces d'invertébrés marins

En nous appuyant sur les recommandations pertinentes de la 10e Réunion des Parties contractantes, nous comptons à partir de cette année nous employer à une évaluation, aussi bien au niveau des pays que de l'ensemble du bassin de la Méditerranée, du statut des espèces énumérées aux annexes du Protocole ASP. Il est à noter que plusieurs (35 dans l'annexe II et 13 dans l'annexe III) sont des invertébrés marins et font également partie des Annexes à la Convention de Berne. Cette activité doit être considérée comme préparatoire à l'entrée en vigueur du Protocole ASP.

La publication d'un répertoire incluant les espèces listées dans les annexes au Protocole est également prévue dans un futur proche.

3.17. Turkey / Turquie

Three important projects concerning invertebrates have been carried out:

–one on Odonata;
–one on Lepidoptera;
–one on Hirudinea fauna.

1. Odonata

Up to now no work has been done in Turkey on Odonata except of those few foreign researchers (SELYS 1850-1887, MORTON 1914-1929, SCHMIDT 1929-1965, St. QUENTIN 1932-1965, SCHNEIDER 1982-1992, DUMONT 1977-1994) and DEMIRSOY 1982-1995.

1.1. In this study, the samples which were collected from different parts of Turkey since 1966 and those collected for the last 15 years were compared to the samples present in Zoology Museum of Berlin and Hamburg, and Hydrobiology/Ecology Department of Gent University/Belgium. As a result, several synonym lists have been prepared for most of species including *Calopteryx* and *Cordulegaster*. Furthermore, the species were examined for their habits and behaviour on field. Their larvae were observed. At the end, the data and relevant literature were gathered together and for the first time comparative analysis was achieved.

1.2. Taking into consideration of Anatolian barriers (Anatolian Diagonal, North and South Anatolian Mountains), gaps (Amik Valley, Hamur stream, Çine stream, Kelkit Gap etc.) and geological period of Anatolian and Thrace regions, we have studied the hybrids among the population and their relationships.

1.3. We have projected the data on maps, regarding distribution areas, date of collection of the samples and number of males and females with respect to the information from the literatures.

1.4. The species whose existence are in danger due to environmental factors were determined and internationally catagorised. Possible protection methods for these species were advised.

1.5. The biotops that allow the survival of larvae were determined and the use of larvae as indicator for the degree of environmental pollution were stated. Unfortunately, some of the species were excluded from this examination due to either lack of larval samples or unavailability.

1.6. With the collective data which accumulated from all over Turkey, revision of the first work has already started (DEMIRSOY 1982). By using the facilities of Gent University, we have found the opportunity to study the different types of the species and for this we have started to revise the *Calopteryx* species of Turkey. For the first time, the transit between populations and gene flow among them were analysed on a large scale. The results were evaluated considering their geological past.

1.7. Documents which give description of varieties and species were stated. Synonyms were given. The results of the works related to Turkey including the habitation of species and their distribution out of Turkey were also provided by addition of relevant page numbers.

1.8. The species were analysed considering the last Glacial epochs of Anatolia (even Europe). Evolution and the relationships among the species were tried to explained with respect to their geological connections.

From the observations we have done in Anatolia for the last 25 years it is evident that the animals mentioned here are seriously subjected to various dangers. Members of this order, which are developmentally dependent on inland waters, have been recorded to encounter reducements in number oftenly in relation the factors such as water pollution and wetland extermination. In particular, the South Coast, which is rich in species, has experienced the extinction of some of the species which were confined distributally to that region. Among the main reasons for this we can include the new touristic avaibilities and the unproper wide application of insecticides.

2. Lepidoptera

In this report, totally 461 diurnal species of the order Lepidoptera (butterflies and moths) were studied from the faunistic, ecological and the environmental points.

Not only in the literature, but also unpublished data were taken into consideration, and a distributional map for each species listed in the report were prepared. Marked quadrates in each map were explained as localities in the text, with their provinces under the subtitle horizontal distribution for each species. Besides, the vertical distribution of each species were also indicated as minimal and maximal values.

In the report, endemic subspecies of the species, mentioned in the text were also added.

Ecologically, habitats were described, where the species inhabited. Foodplants of the caterpillars and the adults, phenology and the annual generations of each species were given.

Environmental problems regarding the wildlife of Turkish Lepidoptera were discussed and an evaluation was given consequently. Threatened species were determined, the necessary measurements were discussed.

In conclusion, the conservation of totally 275 diurnal species of Lepidoptera was proposed, and the necessity of further detailed researches on these subjects was emphasized. It was mentioned, that it is only possible to protect the threatened species of Lepidoptera in nature, if, not only their larval and imaginal foodplants, but also their living places (habitats) could be conserved, inside the established "reserve territories".

3. Hirudinea fauna

The aim of the study (Priority just about to medical leeches, determination of Hirudinea fauna in Turkey) carried out by Prof. Dr. D. Gülen, Yard. Doç. Dr. Selçuk Altinsaçli, Yard. Doç. Dr. Cüneyt Kubanç and Dr. Mustafa Kiliç was to investigate the presence of the fauna of Hirudinea in Turkey. The potential dangers against these populations were also investigated and the protective measures were proposed. The material were collected from 16 regions and 27 stations: Terkos (Durusu), Uluabat (Apolyont), Gala (Celtik), Kozan, Sapanca, Ak_ehir, Ayazma, Bey_ehir, Iznik, Manyas, Karamik, E_irdir lakes, lake _amlar and Büyük Menderes, Çoruh rivers between the dates of 14 March 1996 and 20 August 1997.

The leeches play an important role in medicine. Their parasite species use some animals as host. Of these, *Hirudo medicinalis* and *Limneatis nilotica* are known as human parasites. Hirudin that is obtained from this blood suckers have an importance in medicine. The leeches species of Turkey have been determined in this project. The Minister of Environment has been informed about the protection of the leeches that are economical important. The Minister has also been informed by this project about the dangers of decreases in the density of leeches population in Turkey. The leeches that were collected from their environment have been fixed and put under conservation. The description of environment has also been put aside. The marking technique has been used for the determination of population density. Some areas have been given priority in terms of their immediate conservation. The related literature in this project has been reviewed. Some pollutants have been observed as contributors to the pollution of leeches natural environment. It has been proved that the leeches collection should be carried out at special seasonal periods. The biological features of these recovered species have been given in this project. The figures the graphics and the statistical evaluation related to this work also been included in the text. The eastern part of Turkey has not been included in this project because this part of Country does not have the economical leeches reservoir as a bulk and some other reasons have also put off this project out of the region. The results of this project are new records for Turkey. Therefore this study is original in this field.

Four different leeches species (*Hirudo medicinalis, Limneatis nilotica, Piscicola geometrica* and *Herpobdella octooculata*) and their distributional density were observed in 27 stations. In addition the living environment of leeches species in their ecological system were evaluated in this study.

3.18. United Kingdom / Royaume-Uni

UK National Report

by Dr Ian F.G. McLean, Joint Nature Conservation Committee

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1. New Legal Protection for species listed on appendices of the Bern Convention

On 16 April 1998 a range of threatened plants and animals received new or additional protection in Great Britain under the provisions of the Wildlife and Countryside Act 1981. Among those species receiving new or additional protection on Schedule 5 are the following Bern Appendix species:

Species	English name	Level of protection
Lucanus cervus	Stag beetle	protected against sale
Coenagrion mercuriale	Southern damselfly	Full protection
Lycaena dispar	Large cooper	Full protection
Eurodryas aurinia	Marsh fritillary	Full protection
Margaritifera margaritifera	Freshwater pearl mussel	Full protection

2. Rio Convention on Biological Diversity

The statutory conservation agencies, in partnership with Government Departments, local government, voluntary conservation organisation and the commercial sector, have been preparing action plans for threatened species and habitats (biotopes). The species include a number listed on the Appendices of the Bern Convention. For those species whose plans already being implemented, a focus group for each species is bringing together those bodies who can together initiate action, to conserve existing populations and restore the range of species which have declined.

3. Policy on translocations and GMOs

Mindful of the many problems for biodiversity associated with the establishment and spread of non-native species, and the potential problems from the development and release of Genetically Modified Organisms (GMOs), the statutory conservation agencies (Joint Nature Conservation Committee, Countryside Council for Wales, English nature and Scottish Natural Heritage) are developing a new policy to deal with species and habitat translocations, to prevent deliberate or accidental establishment of non-native species and to address potential direct or indirect harm to biodiversity arising from the release of GMOs. It is anticipated that external consultation on the new policy will begin later in 1998.

APPENDIX 4

Conservation des espèces d'insectes menacées en Europe : pour une approche méthodologique standardisée

Intervention de Mr Pascal DUPONT, OPIE
Office pour l'information éco-entomologique (France)

Résumé

La gestion des espaces naturels ou semi-naturels nécessite de faire des choix raisonnés. Ces choix sont conditionnés par une bonne évaluation de l'état de conservation des espèces et des habitats menacés. Dans ce cadre, une approche méthodologique standardisée est préconisée pour élaborer une liste de références en Europe sur l'état de conservation des espèces et les habitats. Une coordination internationale facilitant la circulation des informations permettra d'orienter les plans d'actions nationaux non seulement en fonction des besoins de chaque pays mais aussi par rapport aux besoins d'autres pays membres. Cette collaboration devra aboutir à l'élaboration de plans d'action européens.

1. Gérer un espace naturel, c'est faire des choix

La majorité des espaces naturels protégés en France (réserves naturelles et parcs nationaux, notamment) sont dans l'obligation de réaliser des plans de gestion des sites pour des périodes de cinq années. Dans ce cadre, l'évaluation patrimoniale est une phase préalable très importante car elle permet d'orienter les futures opérations de gestion. A partir de cette évaluation, les gestionnaires doivent faire des choix raisonnés. Gonseth & Mülhauser (1997) citent le cas de La Grande Cariçaie en Suisse, où la décision de la mise en place d'une réserve forestière intégrale se fera au détriment de petites populations de *M. nausithous* (Annexe II de la Convention de Berne, et annexes II et IV de la Directive «Habitats-Faune-Flore»). Cependant, les gestionnaires des sites manquent d'outils pour pouvoir prendre de telles décisions, notamment en ce qui concerne les invertébrés. L'état de conservation des espèces et des habitats est une donnée importante pour aider à la décision, dans la mesures où l'on peut faire des comparaisons à différentes échelles patrimoniales (régionale, nationale ou européenne).

2. Vers un recensement européen des effectifs des populations d'espèces menacées

L'aire de répartition de notre patrimoine entomofaune est principalement ouest-paléartique. Si l'on se réfère aux espèces menacées d'insectes présentes dans les Annexes de la Convention de Berne et/ou celles de la Directive «Habitats-Faune-Flore», plus de 50 % des espèces sont recensées dans au moins cinq pays de la Communauté européenne. La conservation des espèces doit donc être envisagée à l'échelle européenne, et il est important d'avoir à ce niveau des approches méthodologiques standardisées (Shaw & Wind, 1997). La mise en place d'un programme à long terme de suivi et/ou de surveillance des populations d'espèces menacées est un des outils indispensables pour la conservation rationnelle des espèces aussi bien à l'échelle nationale qu'européenne. Actuellement, il existe un certain nombre d'expériences nationales (Dupont, 1997) qui concernent principalement les Lépidoptères Rhopalocères. La plus importante est celle menée depuis 1976 en Grande-Bretagne (Pollard & Yates, 1993). A notre connaissance, deux expériences engageant plusieurs pays existent en Europe, le «*Nature Monitoring Scheme*» qui concerne la Norvège, la Suède, le Danemark et la Finlande (From & Soderman, 1997), et le «*Butterfly Monitoring Scheme*» engageant les Pays-Bas et la Belgique (Flandre) (Van Swaay *et al.*, 1997). Récemment, une analyse englobant les résultats de cette dernière expérience sur les Lépidoptères avec le travail mené en Grande-Bretagne, a pu être réalisée car les protocoles d'échantillonnages étaient

standardisés (Van Strien *et al.*, 1997). Ces différentes coordinations nationales devraient être élargies à l'ensemble de l'Europe. Un des premiers objectifs doit être une standardisation des méthodologies pour estimer les effectifs des populations d'espèces menacées.

En effet, il est important d'obtenir pour chaque espèce un recensement des effectifs à l'échelle européenne et de réaliser une liste de référence. Cette liste pourra être utilisée comme étalon et les données acquises pour une espèce sur un nouveau site pourront être comparées avec ce référentiel européen. Ce travail permettra également une actualisation des sites où les populations sont les plus importantes. Ces sites pourront être choisis pour des études autécologiques ayant pour objectif d'améliorer la gestion conservatoire des espèces. Les résultats obtenus peuvent ensuite être extrêmement utiles pour la mise en place de plan d'actions de restauration des habitats dans les pays où les populations de ces espèces menacées sont résiduelles. Par ailleurs, ces populations résiduelles peuvent faire l'objet de travaux plus spécifiques afin de mieux comprendre les mécanismes d'extinction locale. La circulation des résultats de ces différentes études devra être facilitée entre les pays.

3. Développer des outils pour l'évaluation de l'état de conservation des habitats

L'acquisition et l'analyse des données sur l'état de conservation des habitats naturels et sur son évolution, sont des étapes indispensables pour définir et orienter les opérations de gestion d'un site naturel. La Directive «Habitats-Faune-Flore» a pris en compte cet aspect concernant l'évaluation des sites en l'intégrant dans les critères de sélection des Zones spéciales de conservation (Directive 92/43/CEE ; annexe III). La directive stipule que «*l'état de conservation d'un habitat naturel sera considéra comme favorable lorsque l'état de conservation des espèces qui lui sont typiques est favorable*» (Directive 92/43/CEE) ; article 1er).

L'utilisation de groupes d'invertébrés indicateurs est l'un des moyens permettant cette évaluation. Une approche comparative, dans un cadre biogéographique donné, entre des inventaires et une liste de références d'espèces potentiellement présentes sur le site apporte une quantité importante d'informations sur l'état de conservation des sites (Speight, 1997). Cette approche peut permettre l'identification des sites d'importance internationale comme cela a été réalisé avec l'entomofaune saproxylique et les milieux forestiers (Speight, 1989). La communication d'une liste de références internationales d'invertébrés saproxyliques (Good & Speight, 1996) a provoqué en France une actualisation des données connues pour les forêts de feuillus ce qui a permis la reconnaissance de nouveaux sites forestiers remarquables (Brustel, 1997).

4. Conclusions

L'élaboration de programmes d'action au niveau européen est nécessaire. Ceux-ci devront permettre une meilleure évaluation de l'état de conservation des espèces et des habitats à l'échelle européenne. Une coordination internationale facilitant la circulation des informations permettra d'orienter les plans d'action nationaux non seulement en fonction des besoins de chaque pays mais aussi par rapport aux besoins d'autres pays membres. Afin de réaliser cet objectif, trois recommandations sont requises :

i. les méthodologies pour évaluer l'état de conservation des espèces et des habitats menacés en Europe doivent être standardisées ;

ii. des programmes d'actions sur les espèces et les habitats doivent être élaborés à l'échelle européenne ;

iii. l'accès et la circulation des informations importantes concernant la gestion

conservatoire doivent être facilités, notamment pour les gestionnaires des espaces naturel.

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ANNEXE 5

Présentation relative à l'usage des endectocides et leurs effets sur l'entomofaune

Mr le professeur Jean-Pierre LUMARET, Université Paul Valéry Montpellier (France)

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1. Introduction

Les endectocides (avermectines et milbémycines) constituent un groupe de produits à usage antiparasitaire à large spectre qui agissent aussi bien contre les endoparasites que contre les ectoparasites du bétail. Très efficaces, ces lactones macrocycliques produites par fermentation par un Actynomycète du genre *Streptomyces* (Burg *et al.*, 1979) sont largement utilisées dans le monde entier (1 milliard de dollars des Etats-Unis en 1993) pour contrôler les parasites dans les élevages (bovins, équins, ovins, mais aussi caprins, chameaux, cerfs, chiens), et même en santé humaine contre certaines filarioses (Campbell, 1989). Leur action est celle d'un systémique, agissant à faible concentration, et leur persistance dans l'organisme permet la protection des animaux pendant plusieurs semaines. Les endectocides sont éliminés dans les déchets, essentiellement sous leur forme active. Ces substances utilisées en thérapeutique vétérinaire tendent à remplacer progressivement d'autres helminthicides, dont les effets sur les insectes coprophages se sont révélé variables : effets nuls ou négligeables pour certains (benzimidazoles, salicylanilides, imidazothiazoles) ; effets importants pour d'autres (dichlorvos, piperazine, phénothiazine). Les endectocides ont un fort impact à la fois sur les Nématodes et les Arthropodes, et leur persistance dans les fèces est plus ou moins prolongée selon les molécules utilisées, leur mode d'administration au bétail (injection sous-cutanée ; formulation pour-on : bolus intestinal) et le climat (Lumaret *et al.*, 1993). Leur impact sur les invertébrés non cibles est variable selon les formulations (Roncalli, 1989). Les principales conséquences peuvent être une mortalité +/- importante des insectes coprophiles, un changement dans la composition et la structure de leurs communautés, un ralentissement des processus de recyclage des excréments du bétail dans les pâturages (Cook, 1993 ; Doherty *et al.*, 1994 ; Doube, 1986 ; Fincher & Wang, 1993 ; Holter, 1979 ; Lumaret, 1986, 1997 ; Gunn & Sadd, 1994 ; Madsen *et al.*, 1990 ; Ridsdill-Smith, 1993 ; Sommer *et al.*, 1993 ; Wardhaugh *et al.*, 1993). Or, les insectes coprophages jouent un rôle majeur dans les processus de disparition des déjections du bétail (Fincher, 1981 ; Herd *et al.*, 1993). Lorsque des bouses de vache restent trop longtemps intactes dans les pâturages, des perturbations peuvent apparaître dans les processus de recyclage. De la sorte, l'accumulation des excréments peut mettre hors production des surfaces considérables de pâturages par l'élimination de l'herbe sous chaque dépôt, réduisant ainsi la productivité du milieu (Fincher, 1986). C'est ainsi que, dans les années 60, l'Australie perdait de cette façon un million d'hectares de pâturages par an du fait du non-recyclage des excréments par les insectes coprophages, obligeant ce pays à mettre en place un coûteux programme (plusieurs millions de dollars australiens) d'introduction massive de bousiers allochtones (Bornemissza, 1979 ; Doube *et al.*, 1991 ; Fincher, 1986 ; Kirk & Lumaret, 1991 ; Ridsdill-Smith, 1979 ; Waterhouse, 1974).

Cependant, si le caractère insecticide des rejets fécaux a été reconnu dans le cas des avermectines, il n'existe pas d'études comparées, globales et indépendantes vis-à-vis des firmes pharmaceutiques, décrivant les effets indésirables sur l'animal d'élevage et le biotope qui lui est associé. L'ivermectine, par exemple, est conditionnée sous diverses formulations, différentes doses et différents modes d'administration. En injection sous-cutanée et formulation non aqueuse, à la dose de 0,2 mg/kg, la persistance de l'ivermectine dans le plasma de l'animal traité est relativement courte, avec une demi-vie de 8,3 jours. La concentration retrouvée dans les bouses est de 3,9 ppm. La dose est augmentée en formulation

pour-on non aqueuse (0,5 mg/kg), ce qui augmente d'autant l'effet écotoxique potentiel de cette formulation (9;0 ppm retrouvés dans les bouses) (Sommer & Steffanssen, 1993). Enfin l'administration de l'ivermectine peut s'effectuer en formulation aqueuse sous la forme d'un bolus intestinal. Le bolus consiste en une capsule disposée dans le rumen de l'animal, qui libère dans le tube digestif en continu pendant plus de quatre mois (135 jours) de l'ivermectine à raison de 12,7 mg/jour. Pour l'éleveur, ce mode d'administration s'avère intéressant car il espace les périodes de traitement du bétail. Par contre, sur le plan environnemental, ce mode d'administration paraît le plus dangereux pour la faune des invertébrés coprophiles, tant par la durée d'action du traitement que par la concentration du produit dans les bouses (Wall & Strong, 1987 ; Herd *et al*., 1993 ; Strong & Wall, 1994).

2. Les recommandations proposées sont les suivantes :

i. mesurer dans les divers systèmes de production européens et sous divers climats la biodisponibilité des rejets d'antiparasitaires dans les pâturages, en déterminant leur cinétique de dégradation ;

ii. déterminer l'impact des rejets sur les écosystèmes par mesure de la toxicité des rejets animaux, en étudiant :

–le développement des œufs des nématodes parasites ;

–l'effet sur les divers groupes d'insectes coprophages (Diptères, Coléoptères, ...), avec comparaison de la biodiversité des communautés d'Arthropodes entre des pâtures supportant des troupeaux traités ou non par les endectocides ;

–l'effet sur le développement de la mésofaune du sol, y compris les nématodes du sol ;

iii. le mode d'administration au bétail des endectocides s'effectue de diverses manières : injection sous-cutanée ; formulation pour-on ; bolus intestinal. Nous recommandons que des études approfondies soient effectuées très rapidement afin d'évaluer l'impact à court et à long termes de l'utilisation des bolus intestinaux. En cas de risques majeurs pour les organismes non cibles des pâturages, des restrictions d'utilisation ou même une interdiction de ce mode de traitement devraient être envisagées.

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APPENDIX 6

Draft recommendation of the Group of Experts on the consequences of the use of endectocides on non-targeted invertebrates

The Group of Experts on the Conservation of Invertebrates of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention),

Having regard to the aims of the convention, which are to conserve wild flora and fauna and their natural habitats;

Recalling that Article 1, paragraph 2, of the convention requires the Contracting Parties to give particular emphasis to the conservation of endangered and vulnerable species;

Recalling that under Article 3 each Contracting Party must take steps to promote national policies for the conservation of wild flora, wild fauna and natural habitats, with particular attention to endangered and vulnerable species, especially endemic ones, and endangered habitats;

Noting that the veterinary use of endectocides administered to cattle in bolus form endangers all populations of coprophagous invertebrates (in particular Coleoptera Scarabaeidae and Geotrupidae and Diptera);

Recognising the paramount importance of these insects in all animal waste recycling processes;

Noting that one species of coprophagous Coleoptera (*Onthophagus furcatus* Fabr.) is on the European Red List of endangered species and that numerous species not on the red list are endemic;

Desirous to avoid any further loss of biological diversity in the continent,

Recommends Contracting Parties to the convention to promote studies in the very near future to measure the toxicity of treated animal waste in order to assess the short and long-term impact of intestinal boluses on the functioning of natural and modified pasture ecosystems;

Recommends that, in the event of a major risk to non-targeted organisms present in pastureland, restrictions or even a ban be issued on the use of this type of treatment.

APPENDIX 7

Draft Recommendation
on the conservation of *Maculinea* butterflies

Recommendation No. ... of the Standing Committee adopted on 4 December 1998, on the conservation of *Maculinea* butterflies

The Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats, acting under the terms of Article 14 of the convention,

Having regard to the aims of the convention to conserve wild fauna and its natural habitats;

Recalling that Article 1, paragraph 2, of the convention requires parties to give particular emphasis to the conservation of endangered and vulnerable species;

Noting that *Maculinea* butterflies have suffered a decrease in their umber throughout Europe and a reduction in their geographical distribution;

Noting that some *Maculinea* species have critically endangered population;

Desirous to avoid a further loss of biological diversity in Europe;

Aware that the design and implementation of recovery plans may be a useful tool to redress the situation of *Maculinea* species;

Recalling its recommendation No. 35 (1992) on the conservation of some species of invertebrates listed in Appendix II of the convention which asked France, Germany and Spain to carry out surveys on the distribution and conservation status of *Maculinea nausithous* and *Maculinea teleius*;

Recalling its recommendation No. 51 on action plans for invertebrate species in the appendices of the convention, which asked to consider the implementation of action plans for five species of *Maculinea* butterflies;

Recalling its recommendation No. 59 on the drafting and implementation of action plans for wild fauna species;

Referring to the framework action plan for the *Maculinea* butterflies in Europe, compiled by Dr Munguira and Dr Martin (document T-PVS (98) 5 revised);

Desirous to take prompt action for the conservation of European threatened butterflies and in particular of *Maculinea* butterflies,

Recommends that Contracting Parties to the convention of states invited to accede thereto or to attend sessions of the Standing Committee as observers consider carrying out (or, if appropriate, reinforcing) national action plans for *Maculinea* butterflies; take note, in that context, of the above-mentioned framework action plan on *Maculinea* butterflies; follow, in that context as far as possible, the suggestions contained in Recommendation No. 59 on the drafting and implementation of action plans for wild fauna species.