Strasbourg, 15 July 2008 **T-PVS (2008) 6**
[tpvs06e_2008]

CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Group of Experts on the Conservation of Invertebrates

Kongsvold Mountain Lodge, Norway
23-25 June 2008

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DRAFT REPORT

Document prepared by
the Directorate of Culture and Cultural and Natural Heritage

The Standing Committee is invited to:

1. Take note of the report of the meeting;
2. Thank the Norwegian government and in particular, the Museum of Natural History and Archaeology, in Trondheim, and the Directorate for Nature Management, for the efficient preparation of the meeting and the excellent hospitality; and
3. Take note of the activities proposed by the Group for its future work.

CONTENTS

1. Opening of the meeting

Mr. Øystein Størkersen, principal advisor on the Bern Convention at Norway's Directorate for Nature Management, welcomed the members of the Group of Experts on behalf of the Norwegian environmental authorities. He highlighted the beauty and conservation importance of the surrounding areas of the meeting venue, including three national parks. Mr.Størkersen stressed the increased interest in biodiversity in Norway, illustrated by a research programme to map its biodiversity hotspots. He further raised the need to focus more on taxonomical knowledge of invertebrate species. Mr. Størkersen wished the Group a fruitful meeting and concluded by asking the Group of Experts for guidance to the Standing Committee, which relies on experts' advice to take decisions that influence national policies.

The Chair of the Group of Experts, Ms.Marian Ramos (Spain), welcomed participants (a list of which is included in Appendix 1) and opened the meeting. Participants introduced themselves, highlighting their work and experience in the conservation of invertebrates in their countries.

2. Adoption of the Agenda

The draft agenda was adopted as it appears in Appendix 2.

3. Introduction by the Secretariat

The representative of the Secretariat recalled that the previous meeting of the Group of Experts took place in Strasbourg in June 2006. She also informed the Group that apologies had been received from three countries which were represented at the previous meeting: Austria, Denmark and Poland. However, additional countries were present at this meeting, such as France, Slovakia, Sweden and Turkey.

At the meeting in June 2006, the Group of Experts finalised the text of the European Strategy on the Conservation of Invertebrates, which the Standing Committee of the Bern Convention endorsed in November 2006. Through its Recommendation 120 (2006), the Standing Committee asked Contracting Parties to draw up and implement national strategies on invertebrate species and co-operate with each other for the conservation of invertebrates in Europe. The European Strategy was published at the end of 2007, and presented during a side-event at the 9th Conference of the Parties to the Convention on Biological Diversity (CBD), on 23 May 2008, where copies of the Strategy were distributed.

This meeting follows the invitation by the Norwegian government to host the Group of Experts on the Conservation of Invertebrates in 2008, and the meeting agenda closely reflects the agreed issues for future consideration discussed at the meeting in June 2006, such as the need to provide input into the work of other Group of Experts under the Bern Convention such as the new one on Biodiversity and Climate Change.

4. Progress in the conservation of invertebrates since the last meeting (June 2006) – National Reports

Oral reports were given by the following states: Albania, Croatia, Czech Republic, France, Greece, Hungary, Iceland, Lithuania, The Netherlands, Norway, Slovakia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom. The written reports received before and after the meeting can be found in Appendix 3 to this report.

Some common points of particular relevance were the development and publication of red lists, red books, atlases and recovery plans; national inventories and databanks of invertebrate species; policy and regulatory measures for invertebrates; the consideration of invertebrates and invasive alien species in policies and action plans; training, research and monitoring projects; taxonomic needs; invertebrates and protected areas (in particular, Natura 2000 sites); and the lack of sufficient numbers of specialists.

The national reports reflected a lot of progress and numerous activities for invertebrates conservation across Europe, but also highlighted critical challenges regarding scientific capacity and knowledge, and the impacts of invasive alien species and climate change on invertebrate species.

5. Presentation of the publication of the European Strategy for the Conservation of Invertebrates – Next steps

The secretariat transmitted the deep regret of the main author of the European Strategy, Mr John Haslett, for having to be absent at this meeting of the Group of Experts. The secretariat explained that the publication of the European Strategy had been prepared and carried out in 2007 and that Mr John Haslett had presented the publication at a side-event on the Bern Convention held during the 9th Conference of the Parties to the Convention on Biological Diversity (COP-9) in Bonn, on 23rd May 2008.

The secretariat gave a short presentation prepared by Mr Haslett and focused on three main issues for discussion: the need to gather support for the Strategy; plans to disseminate it; and action for its implementation at the national level. The Secretariat referred to the support of the Standing Committee expressed through Recommendation 120 (2006), which endorsed the European Strategy and asked Contracting Parties to develop and implement national strategies on invertebrate species, taking into account the European Strategy. In addition, both Sir David Attenborough and Prof. Robert May have expressed their support to the European Strategy by providing a foreword and a guest article, respectively, which are included in the publication.

Implementation of the Strategy should be a priority and for this, the involvement of the media, scientific community and decision-makers will be crucial. The French version of the European strategy to be available this year and Contracting Parties are welcomed to do their own translation of the European Strategy. Some delegates proposed conducting a gap analysis at the national level to assess what elements of the European Strategy are more relevant or urgent for their particular country.

The Group of Experts discussed the possibility of contacting their country delegates at the Standing Committee to reinforce the importance of invertebrates conservation and the tool provided by the European Strategy. The need to raise awareness of the Strategy in other fora under the Bern Convention was also highlighted, in particular with the Groups of Experts on Invasive Alien Species, and Biodiversity and Climate Change. It was recommended that future meetings of those Groups of Experts should include consideration of the European Strategy for the Conservation of Invertebrates.

Finally, the Group agreed that rather than a press release, it would be more useful to get a shorter and simplified version of the European Strategy, which they could then complement and translate into their own languages for use at the national level. The secretariat will provide the Group with this text.

6. Follow-up of the implementation of Recommendations from the Standing Committee related to *Margaritifera margaritifera* and *Margaritifera auricularia*

The Chair, Ms Marian Ramos, gave a presentation on the situation of *Margartifera* species in the European Union. She covered the status of these species and their ecological role, as well as the threats and limiting factors they face. Ms Ramos summarised the conservation actions carried out for both species, including the Recommendations and Action Plans developed under the Bern Convention, as well as research projects in different EU countries funded by LIFE. Ms Ramos added that in September 2007 the Spanish government adopted a strategy for the conservation of *Margaritifera auricularia*, present in four of Spain's regions, and another strategy for the control of the zebra mussel.

Ms Ramos asked members of the Group of Experts to send her updated information on their national data regarding *Margaritifera* species.

Mr Gilbert Cochet (France) gave an overview of *Margaritiferidae* in France, including the status and distribution of the Freshwater pearl mussel in French rivers and the dramatic habitat loss experienced. He mentioned the problems of reproduction, loss of host fish, and invasive alien species, as well as siltation and eutrophication. Regarding the giant freshwater pearl mussel, Mr Cochet provided historical records and the dramatic decline in its distribution range, pointing to fishing for pearls and mother-of-pearl as the main cause for the species loss. He stressed the effects of river dams and river engineering for hydro-power schemes, as well as the impacts of and dredging and

canalisation. Mr Cochet finished his presentation with information about a large population of giant freshwater pearl mussel, of between 20,000-50,000, discovered in September 2007 in the Charente river.

7. Climate change and invertebrate species: Contribution to the work of the Group of Experts on Biodiversity and Climate Change

Ms Deborah Procter (UK) summarised the work done on biodiversity and climate change under the Bern Convention. She participated in the second meeting of the Group of Experts on Biodiversity and Climate Change (March 2008) and informed the Group of the main conclusions of the reports commissioned by the Council of Europe on this issue, and linkages with invertebrate species and the European Strategy for the Conservation of Invertebrates. In particular, Ms Procter highlighted key conclusions from the report by Mr Brian Huntley, such as the need to focus conservation efforts on species and the provision of functional networks, as well as the importance of maintaining and enlarging the existing network of protected areas. She further selected some conclusions from the report on climate change and invasive alien species (IAS) by Ms Laura Capdevila-Argüelles, highlighting the difficulty of predicting climate change impacts on IAS and the need to focus on every aspect that influences the invasion process and its interactions with global change. Ms Procter concluded with the report by Ms Pamela Berry on climate change and the vulnerability of Bern Convention species and habitats, and its findings on the most vulnerable parts of Europe (the Arctic, mountain regions, and various coastal zones including the Baltic and parts of the Mediterranean Basin). She added that using the components of vulnerability (exposure, sensitivity and adaptive capacity), it should be possible to start to build up a picture of the vulnerability of Bern Convention species, including invertebrates.

The Group of Experts discussed this important issue and agreed that it is important to interact more with the Bern Convention's group of Experts on Biodiversity and Climate Change, and raise their awareness about the European Strategy for the Conservation of Invertebrates. The Group stressed the need to conduct more research on the biology of invertebrate species, and proposed to fill in the table to assess species vulnerability to climate change (in the report by Ms Berry) for the Bern Convention's invertebrate species.

8. Future work on invertebrates

The members of the Group of Experts discussed possible future activities of the Group in the context of the European Strategy on the Conservation of Invertebrates and its implementation. It asked the Secretariat to provide them with a short and simple summary of the European Strategy that they can then use at the national level and translate into their own languages. Contracting Parties are encouraged to conduct gap analysis of their national policies and laws on invertebrate conservation in relation to the European Strategy to identify and prioritise issues and measures that need to be taken at the national level. The next meeting of the Group of Experts will assess the follow-up of Recommendation 120 (2006) and the implementation of European Strategy in Contracting Parties. In order to do this, the Secretariat will provide a model format for written national reports to be submitted by Parties.

Participants agreed to liaise with the Group of Experts on Biodiversity and Climate Change as they prepare guidance for Parties on adaptation to climate change. In this respect, invertebrates will be included in the agenda for the next meeting of that Group of Experts (Strasbourg, 11-12 September 2008) so that they are informed about the European Strategy and invertebrates considerations are included in the draft recommendation that they prepare, as well as in the guidance on adaptation that will be developed next year under the Bern Convention. The Group of Experts also asked for closer co-operation with the Group of Experts on IAS, and inclusion of invertebrates issues at their next meeting, to be held in spring 2009, to raise their awareness about the European Strategy and have an input in the guidance on IAS that that Group of Experts is developing.

The Group of Experts asked the Secretariat to create a specific webpage for all the Bern Convention's instruments and documents on invertebrate conservation, such as Recommendations from the Standing Committee, action plans, the European Strategy, meeting reports and documents

and the presentations given at this meeting. The Secretariat will work on this and inform the members of the Group as soon as the webpage has been set up.

9. Any other business

Mr. Sajmir Beqiraj (Albania) invited the Group of Experts to hold its next meeting in Albania. The meeting date and place will be confirmed in the near future.

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Appendix 1

LIST OF PARTICIPANTS
/
LISTE DES PARTICIPANTS

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Appendix 2

Bern Convention Group of Experts
for the Conservation of Invertebrates

Kongsvold Mountain Lodge, Norway
23-25 June 2008

DRAFT AGENDA

Monday 23rd June 2008

1. Opening of the meeting by the Chair, Ms Marián Ramos
2.. Adoption of the draft agenda
3. Introduction by the Secretariat
4. Progress in the conservation of invertebrates since the last meeting (June 2006) – General comments (10 minutes per country)
5. Presentation of the publication of the European Strategy for Invertebrates by Mr John Haslett
6. Follow-up of the implementation of Recommendations from the Standing Committee related to *Margaritifera margaritifera* and *Margaritifera auricularia*
7. Climate change and invertebrate species: Contribution to the work of the Group of Experts on Biodiversity and Climate Change
8. Future work on invertebrates
9. Any other business

Tuesday 24th June 2008

8:00- 19:45 Field trip – by bus from the mountains through the Valley of Drivdalen to the valley of Sunndalen and the fjords. We will drive through the first nature protection area in Norway, along the river Driva, and to the localities of the Bern Convention species *Parnassius mnemosyne* and *Margaritifera margaritifera*

Wednesday 25th June 2008

09:30 – 16:00 Symposium on systems of knowledge on invertebrates and management challenges (see separate programme)

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Appendix 3

NATIONAL REPORTS
/
RAPPORTS NATIONAUX

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1. Albania / Albanie
2. Austria / Autriche
3. Croatia / Croatie
4. Czech Republic / République tchèque
5. France / France
6. Greece / Grèce
7. Lithuania / Lituanie
8. Norway / Norvège
9. Slovakia / Slovaquie
10. Spain / Espagne
11. Sweden / Suède
12. Switzerland / Suisse
13. The Netherlands / Pays-Bas
14. United Kingdom / Royaume-Uni
15. Turkey / Turquie

1. ALBANIA / ALBANIE

Progress in the conservation of invertebrates in Albania, 2006 – 2008

by Dr. Sajmir Beqiraj
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Institutional aspect

As a country under continuous reforms, some changes occurred during two last years, too, in organizational and structural aspects of some environmental institutions in Albania. Among the most relevant are the creations of the *National Agency of Natural Resources* (09. 08. 2006) and the *National Agency of Environment and Forests* (former Environmental Institute), 23. 08. 2006. These changes imply some aspects of invertebrate conservation, at least organizational aspects, since these new institutions are dealing with environment and biodiversity monitoring and conservation.

Another reform, which is being implemented since 2006, is the so called *Academic Research Reform*. This reform aims to approach toward Universities the research institutions that formerly were under the Academy of Sciences, aiming to improve the research quality in the universities. This way, some issues dealing with invertebrate research and conservation, which were objects of those former institutions, now are under the competences of the universities.

Legal aspect

The following environmental laws and decisions have been approved from July 2006 to May 2008 in Albania:

- Law on Biodiversity Protection (20. 07. 2006)
- Law on Protection of Environment from Transboundary Impacts (26. 03. 2007).
- Law on Definition of Rules and Procedures for the International Trade of Endangered Species of Wildlife Flora and Fauna (31. 1. 2008).
- Decision for the approval of the Red List of Albanian Flora and Fauna (08. 05. 2007).
- Decision for the Enlargement of the Protected Area in Dajti Mountain National Park (21. 06. 2006).
- Decision for the claim of Mountain Area: Mali me Gropa – Bize – Martanesh, as *"Protected Landscape" (Category V)* (31. 01. 2007).
- Decision for the approval of the National Action Plan for the Disuse and Elimination of Sustainable Organic Pollutants (20.12. 2006).

Related directly or indirectly to the invertebrates, these laws and decisions effect the invertebrate conservation in Albania, since they are related to their protection in general, but also to specific protection, such as from organic pollutants and illegal trade; as well as improvement of their habitat quality through the enlargement of protected areas.

Among them, it is worthy to emphasize the approval of the Red List of Albanian Flora and Fauna for the first time by a decision of the Minister of Environment. This list includes 298 invertebrate species, with the following species number for the major groups:

Gastropoda:	62 sp.	Decapoda:	56 sp.	Coleoptera:	22 sp.
Bivalvia:	45 sp.	Odonata:	4 sp.	Lepidoptera:	77 sp.
Scaphopoda:	1 sp.	Mantoptera:	3 sp.	Echinodermata:	23 sp.
Cephalopoda:	4 sp.	Orthoptera:	1 sp.	**Total: 298 sp.**	

Policy aspect

- Publication of the *Red Book of Albanian Fauna* (November 2006).

After the electronic version, as a database, prepared in 2005, the Red Book of Albanian Fauna was published as a printed book in November 2006. (This is the second and a renewed version, after the first publication: *Red Book – endangered plants, plant associations and animals of Albania*, published in 1997).

224 invertebrate species were included in the Red Book of Albanian Fauna (2006), of which 5 are sponges, 8 cnidarians, 1 annelid, 61 mollusks, 21 crustaceans, 125 insects and 3 echinoderms. For each species was given information on the threatening status (after IUCN criteria, version 3.1, 2001), species identification, bioecology, habitat description, global distribution, distribution in Albania, threatening causes and conservation measurements.

- Publication of *Invasive Species of Albania* (2007).

24 invertebrate species were included in this book, of which 1 is nematode (*Ditylenchus destructor*), 1 is bivalve (*Dreissena polymorpha*), 1 is crustacean (*Penaeus japonicus*), while 21 others are insects (*Acanthosceliedes obtectus, Aedes albopictus, Bemisia tabaci, Bothynoderes punctiventris, Callosobruchus chinensis, Ceratitis capitata, Cirphis unipuncta, Cydia molesta, Heliothis armigera, Hyphantria cunea, Laphygma exigua, Leptinotarsa decemlineata, Pectinophora gossypiella, Phthorimaea operculella, Phyllocnistis citrella, Quadraspidiotus perniciosus, Sitophilus calandra zeamais, Trialeurodes vaporariorum, Trogoderma granarium, Vasates lycopersici, Viteus vitifoliae*). For each invasive species was given information on systematic, species description, biology, introduction pathways and control measures. A general information was given also on the impact of invasive alien species on ecosystems, economy and human health; entry pathways of invasive alien species; national and international framework conditions and legal basis.

This book also includes the Action Plan on Invasive Species in Albania. The goal of this Action Plan is to promote the development and implementation of coordinated measures and cooperative efforts to prevent or minimize adverse impacts of invasive species on biodiversity, as well as their consequences for the economy, human health and well being. The principal objectives are: to rapidly increase awareness and information on IAS issues and control mechanisms; to identify and prioritize key actions to be implemented at the national and regional level; to strengthen national and regional capacity and cooperation to deal with IAS issues; to prevent the introduction of new IAS; to support rapid response to detected incursions. The topic issues of this Action Plan are: education and awareness raising, capacity building, research and monitoring, legal and organizational implementation. For each issue there were described the objectives, measures (actions), time periods for their implementation, priority degree and potential actors.

- *Environmental Inter-sectoral Strategy* (November 2007).
- *Strategic Action Plan for Shkodra Lake – Albania and Montenegro* (May 2007).
- *Management Plan for marine and coastal area of Vlora district* (2006).
- *Management Plan for Vjosa – Narta protected area* (2006).

Publication of the above issues, despite not directly targeted to the invertebrates, they effect them, too, since they involve actions related to monitoring and conservation of biodiversity, including invertebrates.

Environmental publications

- *Biodiversity treasures of Albania*.

This publication highlights habitats and ecosystems diversity of many areas of Albania of high natural values, including coastal areas, wetlands, lakes, rivers, mountains, canyons, landscapes, forests, protected areas, transboundary ecosystems. Invertebrate populations have been also mentioned as one of the most important biodiversity values of these areas.

- *Guide to the coastal Wetlands of Albania*

Among others, in this publication has been described the fauna of 10 coastal lagoons: Velipoja, Viluni, Kune, Vaini, Patok, Rrushkulli, Karavasta, Narta, Orikumi and Butrinti. The role of invertebrates has been emphasized, especially the benthic macroinvertebrates, as one of the most important component in the diversity, biomass and functioning of the coastal lagoons.

- *Cave of Treni – a rare natural and historical value*.

Besides other values, invertebrate fauna of this cave has been described, including Plathelminthes, Nematoda, Mollusca, Oligochaeta, Acarina, Araneida, Myriapoda, Crustacea and Insecta. This was among the very few attempts for assessing the macroinvertebrates in Albanian caves.

Research activities

- Fauna Monitoring in Wetland areas, including benthic macroinvertebrates and insects *(Univ. Tirana; MoE)*.
- Initial studies on Meiofauna and Araneida *(Museum of Natural Sciences)*.
- Study on benthic macroinvertebrates in Vlora Bay *(CISM Project, INTERREG III, Italy – Albania)*.
- Study on benthic macroinvertebrates in Saranda Bay *(University of Tirana)*.
- Study on macrozoobenthos of shallow rocky coast of Shengjini *(University of Tirana)*.
- Study on macrozoobenthos of Albanian coastal lagoons *(Univ.Tirana–Univ.Lecce, INTERREG III, Italy – Albania)*.
- Situation of Benthic Macroinvertebrates in Vjosa River and their Relationships with Water Quality and Environmental State (*StEMA Project, EU*).

Except the *Fauna Monitoring in Wetland areas* (the first listed here above) and *Study on macrozoobenthos of Albanian coastal lagoons* (the sixth listed here above), which are continuous studies, the other studies listed here have started during two last years (2006 – 2008). Most of them are implemented within the framework of international projects, especially focused on marine environment. Progress is also being done on freshwater and terrestrial invertebrate studies. It is worthy to mention the initial studies on meiofauna and araneids, two groups which were almost totally unstudied before.

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2. AUSTRIA / AUTRICHE

Progress in the conservation of invertebrates in Austria, 2006-2008

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Matters of nature conservation remain the concern of regional, rather than National Government in Austria.

The Provincial Government of Burgenland reports:

Continued mapping of the distributions of fresh-water mussels (Unionidae) and of crayfish and participation in a National study of fungal infections of crayfish, as noted in the 2006 report to this Group of Experts.

Continued inventorying and mapping of Odonata listed in Annex II of the EU Habitats Directive and also recording the incidence of the beetles *Lucanus cervus* and *Cerambyx cerdo* within the Burgenland Natura 2000 sites.

A project to record threatened butterfly species in the dry grassland habitats of the Leithagebirge area and implementing appropriate protection measures is under way.

The Provincial Government of Salzburg reports:

Continued effort to make inventories of selected groups of invertebrates within particular NATURA 2000 sites in Salzburg Province. The invertebrate groups targeted vary between sites, but focus on Lepidoptera, Odonata, Orthoptera and some Mollusca.

Similar inventory work continues to be undertaken in other Protected Areas in the Salzburg region, particularly wetlands and fresh water habitats, and in some instances the results will aid the development of land management plans for the Protected Areas concerned.

Continued support is being given to the new biodiversity data-base, which includes invertebrates, in Salzburg´s Natural History Museum (Haus der Natur).

Continued effort to implement legislation and associated practical measures for the protection of invertebrates and their habitats as previously detailed in the 2006 report.

No information from other regional government offices in Austria has been made available.

The Austrian Delegate apologises for his personal absence at the meeting.

3. CROATIA / CROATIE

Invertebrate Conservation in Croatia (2006-2008)

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INTRODUCTION

Due to its geographical position, Croatia is on contact of several climate zones and on the dividing line between 4 biogeographical regions: Mediterranean, Alpine, Continental and Pannonian. In the terms of biodiversity and the number of endemic species, Croatia is one of the richest countries in Europe. Diversity of fauna is especially expressed in the number of invertebrate species recorded in Croatia.

So far, 15.228 terrestrial, 1.850 freshwater (including Ephemeroptera, Tricoptera, Plecoptera, Odonata) and 5.655 marine invertebrate species are listed in Croatian fauna (**Table 1**).

Table 1. Number of invertebrate species in Croatia

MARINE INVETEBRATES	
Phyllum	**No. of taxa**
SARCOMASTIGOPHORA	676
SPOROZOA	24
MYXOZOA	25
CILIOPHORA	207
PORIFERA	221
PLATYHELMINTHES	129
GNATHOSTOMULIDA	5
CNIDARIA	339
CTENOPHORA	10
ROTIFERA	31
GASTROTRICHA	36
CEPHALORHYNCHA	13
ACANTHOCEPHALA	5
NEMATODA	312
PRIAPULIDA	3
KAMPTOZOA	6
NEMERTINA	27
MOLLUSCA	866
SIPUNCULA	18
ECHIURA	2
ANNELIDA	595
TARDIGRADA	4
ARTHROPODA	1594
PHORONIDA	1
BRYOZOA	263
BRACHYOPODA	11
HEMICHORDATA	4
ECHINODERMATA	104
TUNICATA	123
CHORDATA	1
Total	**5.655**

TERRESTRIAL INVERTEBRATES	
Phyllum	**No. of taxa**
ASCHELMINTHES	127
MOLLUSCA	470
ANNELIDA	141
TARDIGRADA	7
ARTHROPODA	14483
Total	**15.228**

FRESHWATER INVERTEBRATES	
Phyllum	**No. of taxa**
PROTOZOA	268
PORIFERA	4
PLATYHELMINTES	20
CNIDARIA	6
ASCHELMINTHES	360
MOLLUSCA	156
ANNELIDA	99
TARDIGRADA	7
ARTHROPODA	930
Total	**1.850**

As the present status of research and conservation of invertebrates in Croatia is not nearly adequate, there is still no comprehensive list of invertebrate taxa and there is not much known about the conservation status of most invertebrate species.

DEFINING THE PROBLEMS

The most important problems regarding researching and protection of Invertebrates in Croatia stem from:

- Lack of experts (zoologists – specialists) – there is not enough specialist for certain invertebrate groups. Some groups are excellently explored, some completely unexplored
- Data deficiency about areas of distribution of the invertebrate species – less than half of the territory is thoroughly explored
- Lack of monitoring of the invertebrate populations – systematic monitoring is very rare and often concentrated on small number of invertebrate groups, mostly butterflies.
- Outdated and questionable literature data
- Old zoological collections (poorly preserved)
- Many unpublished and inaccessible data in private collections
- Lack of financial resources, concentrated on more "charismatic" species – the majority of the financial resources for nature protection is concentrated on "charismatic" groups of animals like large carnivores or birds, while very small amount is reserved for invertebrate conservation.

RESEARCH AND CONSERVATION ACTIVITIES

There is recent positive trend in faunistic researches, especially on Coleoptera, Diptera, Lepidoptera, Trichoptera, Plecoptera, Araneae, Copepoda, Isopoda and overall underground fauna.

Additional impulses that are contributing to the research and conservation of invertebrates are:

- international cooperation
- international projects
- EU application funds
- established Croatian Ecological Network
- NATURA 2000 proposal
- engagement of young biologists in the scope of various institutions (Faculty of Science, Croatian Natural History Museum, State Institute for Nature Protection, NGO's etc.)

Red lists of threatened species

From the 2003. State Institute for Nature Protection has published 6 **Red lists of threatened invertebrate species**: sea anemones, butterflies, ground beetles, stoneflies, dragonflies and underground fauna.

Red books of dragonflies and underground fauna are currently in print, whilst Red book of butterflies is in preparation.

All the red lists are placed on the Internet web site of the Institute (http://www.dzzp.hr/eng_redlist.htm), together with the search page through the red lists (http://www.cro-nen.hr/crvena_lista.php)

There are 700 invertebrate taxa on current red lists. (**Table 2.**)

Table 2. Number of threatened invertebrate taxa

Group	EX	RE	CR	EN	VU	NT	LC	DD	Total
Butterflies	0	0	5	2	4	10	0	17	38
Dragonflies	0	2	6	5	5	12	0	6	36
Sea anemones	0	0	8	20	37	7	13	31	116
Ground beetles	0	0	38	35	63	76	143	40	395
Stoneflies	0	2	1	3	11	4	26	35	82

Underground invertebrates	1	0	0	9	11	4	0	8	33

Handbooks for inventory and monitoring of flora, fauna and habitats

In order to update the data about areas of distribution of the species and habitats in Croatia, in the year 2006, State Institute for Nature Protection has published **Handbooks for inventory and monitoring of flora, fauna and habitats.** So far, for the invertebrates there is only handbook for inventorying and monitoring of butterflies. Handbook consists from two parts, first one describes the methodology of inventorying and monitoring, and the other one is a modular part containing sheets with descriptions of an individual taxon or a habitat and field form sheets.

Primarily the handbooks are intended for amateurs and nature fans, like school children, hikers, fishermen, rangers in nature protected areas etc., but should also help experts and scientists in their professional work

Inventorying of *Maculinea* butterflies

Last year, in collaboration with several county public institutions for the management of protected natural values, an action of Inventorying the *Maculinea teleius and M. nausithous* was started. These two species of butterflies are critically endangered and strictly protected under the Nature Protection Act in Croatia. In scope of the project, a promotional leaflet was published. Leaflet contains short description about these two species and their habitat, description of their life cycle, reasons of the endangerment and a simple form sheet. The project and the leaflet were presented in many schools across Croatia and many biology professors with their students were involved in this action.

Inventorying of the underground fauna

Significant contribution to the research and conservation of the subterranean invertebrates was given by the Croatian Biospeleological Society (HBSD) through the project "*From the Development of a Biospeleological Cadastre, Education and Popularization to the Protection of the Animate World of Croatia's Underground*". The project was conducted in to stages from 2000 until 2007. As a result after intensive research across Croatia "***An Overview of the Cave and Interstitial Biota of Croatia* (2002)"** and ***"Catalogue of Cave Type Localities of Croatian Fauna* (2006)"** were published.

Croatian National Ecological Network (CRO-NEN)

Additional impulse to the research of invertebrates was given through the project ***"Building-up the National Ecological Network as a Part of the Pan-European Ecological Network & NATURA 2000 Network"*** - LIFE III (2002.). The result of the project is a final proposal for network of nationally and internationally important areas. National Ecological Network was established in October 2007, and included in Pan-European Ecological Network (PEEN).

Very important component of this project is the establishment of National Biodiversity Monitoring Programme which will include a wide variety of associates-expert and amateur. This will ensure systematic gathering of data and biodiversity monitoring in Croatia.

CRO-NEN is spreading across 47 % of land and 39 % of the sea. There are 71 sites for invertebrates (19.073,35 km², 33,7%).

NATURA 2000

One of the obligations Croatia has to meet in the accession process to the European Union is determination of the areas important for conservation of threatened European species and habitats that will become part of the NATURA 2000.

In order do so, State Institute is conducting the project ***"Institutional Building and implementation of NATURA 2000 in Croatia"* - PHARE 2005.** As a follow up of the LIFE CRO-NEN project, the project started at the beginning of 2008. The final proposal for NATURA 2000 sites will be realized in the middle of 2009. To make proposal for invertebrate sites more intensive research is needed.

35 terrestrial and freshwater invertebrate species listed on ANNEX II of the Habiatas Directive are present in Croatia (**Table 3.**). Priority species are: *Osmoderma eremita, Rosalia alpina, Nymphalis vaualbum*. There are 37 invertebrate species from ANNEX IV (**Table 4.**), and 5 from ANNEX V (*Helix pomatia, Hirundo medicinalis, Astacus astacus, Austropotamobius pallipes, Austropotamobius torrentinum, Corallium rubrum, Scyllarides latus*)

Table 3. List of invertebrate species from ANNEX II of the Habitat Directive, present in Croatia

Crustacea	*Austropotamobius pallipes*
	Austropotamobius torrentinum
Lepidoptera	*Callimorpha quadripunctaria*
	Coenonympha oedippus
	Colias myrmidone
	Dioszeghyana schmidtii
	Erannis ankeraria
	Eriogaster catax
	Euphydryas aurinia
	Gortyna borelii lunata
	Hypodryas maturna
	Leptidea morsei
	Lycaena dispar
	Maculinea teleius
	Maculinea nausithous
	Nymphalis vaualbum
Coleoptera	*Cerambyx cerdo*
	Lucanus cervus
	Morimus funereus
	Osmoderma eremita
	Rosalia alpina
	Stephanopachys substriatus
	Leptodirus hochenwarti
	Carabus variolosus
Odonata	*Coenagrion ornatum*
	Cordulegaster heros
	Leucorrhina pectoralis
	Lindenia tetraphylla
	Ophiogomphus cecilia
Orthoptera	*Paracaloptenus caloptenoides*
Gastropoda	*Theodoxus transversalis*
	Vertigo angustior
	Vertigo moulinsiana
Bivalvia	*Unio crassus*
	Congeria kusceri

Table 4. List of invertebrate species from ANNEX IV of the Habitat Directive, present in Croatia

Lepidoptera	*Apatura metis*
	Coenonympha oedipus
	Colias myrmidone
	Dioszeghyana schmidtii
	Erannis ankeraria
	Eriogaster catax
	Gortyna borelii lunata
	Hypodryas maturna
	Leptidea morsei
	Lopinga achine
	Lycaena dispar
	Maculinea arion
	Maculinea nausithous
	Maculinea teleutis
	Nymphalis vaualbum
	Parnassius apollo
	Parnassius mnemosyne
	Proserpinus proserpina
	Zerynthia polyxena
Coleoptera	*Cerambyx cerdo*
	Leptodirus hochenwarti
	Osmoderma eremita
	Rosalia alpina
Odonata	*Aeshna viridis*
	Cordulegaster heros
	Leucorrhina caudalis
	Leucorrhina pectoralis
	Lindenia tetraphylla
	Ophiogomphus cecilia
	Stylurus flavipes (Gomphus flavipes)
Orthoptera	*Paracalopterus caloptenoides*
	Pholidoptera transsylvanica
	Saga pedo
Bivalvia	*Lithophaga lithophaga*
	Pinna nobilis
	Unio crassus
	Congeria kusceri

PRESENT THREATS AND RISKS TO INVETEBRATE FAUNA IN CROATIA

The largest threats to diversity of the invertebrate fauna in Croatia stem from anthropogenic impact - especially on fresh waters and all types of wet habitats (melioration, canalizing of rivers and streams, hydro-electric plants, pesticide use etc.), natural succession of the grassland habitats due to

depopulation of the mountain areas and from increasing pressure of invasive alien species (*Caulerpa taxifolia, C. racemosa, Amorpha fruticosa, Orconetces limosus, Dreissena polymorpha,Gambusia affinis, Oncorhynchus mykiss, Carrasius gibelio Lepomis gibbosus* etc).

LEGAL FRAMEWORK

The Ministry of Culture, Directorate for Nature Protection is responsible for the nature protection in Croatia. Under Nature Protection Act, endangered species are protected in two categories: strictly protected and protected taxa. Strictly protected taxa are wild taxa threatened with extinction in the area of the Republic of Croatia; narrowly distributed endemics or wild taxa for which the adequate method of protection has been laid down by international treaties to which Croatia is a party. Protected taxa are indigenous wild taxa that are vulnerable or rare, but not threatened with extinction in the area of the Republic of Croatia; wild taxa that are not threatened, but due to their appearance easily mistaken for those threatened, including wild taxa for which the adequate method of protection has been determined by international treaties to which Croatia is a party.

By the Ordinance on proclamation of wild taxa protected and strictly protected, enacted in January 2006, 50 invertebrate taxa are protected and 200 are strictly protected. (**Table 5.**). Plus, entire underground fauna in Croatia is strictly protected.

Table 5. Protected and strictly protected taxa in Croatia

TAXONOMIC GROUP	PROTECTED	STRICTLY PROTECTED
HOLOTHUROIDEA	16	/
ASTEROIDEA	/	1
ECHINOIDEA	1	/
COLEOPTERA	1	/
LEPIDOPTERA	14	26
ODONATA	5	32
CRUSTACEA	6	4
HIRUDINEA	/	2
BIVALVIA	1	5
GASTROPODA	4	124
CNIDARIA	2	2
PORIFERA	/	4
TOTAL	50	200

+ entire underground fauna in Croatia is strictly protected

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4. CZECH REPUBLIC / REPUBLIQUE TCHEQUE

The Progress in the Conservation of Invertebrates in the Czech Republic (2006-2008)

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The progress in the invertebrate conservation should be mentioned in four separate branches.

1. Red List

Firstly, as the most recognizable progress action – the Red List of Invertebrates (Farkač, Král & Škorpík, 2005) was printed (antedated). This is the first Czech Red List of all the invertebrate groups, following the IUCN criteria and creates very important reference source to the future. Actually, the publication finalized the process of preparation of this list, which had lasted for 5 years. The details were presented in last progress report. Red list is covering 26550 species in total, redlisted are 6435 species (627 in category RE, regionally extinct, 1354 in category CR, critically endangered, 1700 in category EN, endangered, 2190 in category VU, vulnerable and 564 in category NT, nearly threatened).

2. Grid Atlases

From the area of the Czech Republic there have been published distributional (based on central european grid system) atlases of butterflies (Beneš & Konvička, 2002), earthworms (Pižl, 2002), water molluscs (Beran, 2002), spiders (Buchar & Růžička, 2002), cerambycid beetles (Sláma, 1998), carabid beetles (partial atlas based on the collection of carabidologist J. Pulpán, Skoupý (2004) all mentioned in the last progress reports. Beside the grid atlases was also published distributional study based on river system mapping, devoted to mayflies and stoneflies (Soldán et al., 1998).

New monograph of invasive and alien species was published (Mlíkovský & Stýblo, 2006), covering also invertebrate groups. From them distribution of 153 species of insects (incl. homopterans, heteropterans etc.) was published in grid map. Next to insects in similar way were published grid maps of 4 species of molluscs, 2 nematods, 2 plathelminths and 1 species of cnidarian.

The atlas of elateroid beetles (Elateridae, Throscidae, Melasidae, Lissomidae, Cerophytidae) is in on-line form and permanently actualized (Mertlik, 2008). Grid maps of particular species of invertebrates are also published in scientific papers. In preparation are still atlases of moths ("Macrolepidoptera") (Konvička, pers. comm.), terrestrial molluscs (Juřičková, pers. comm.), newly: dragonflies (A. Dolný pers. comm.), meloid beetles, branchiopod crustaceans and crayfish.

As a novelty should be seen the on-line project of grid mapping of selected species of invertebrates at the www.biolib.cz. Through this project, designed for the public recording, is surveyed (and immediately published) distribution (on the basis of grid mapping) of beetles (e.g. *Lucanus cervus*, *Cucujus cinnaberinus*, *Oryctes nasicornis*, *Polyphylla fullo*, *Gnorimus spp.*, *Oxythyrea funesta*, *Protaetia aeruginosa*, *Calosoma spp.*, *Chalcophora mariana*), orthopteroid insects (*Psophus stridulus*, *Gryllotalpa gryllotalpa*, *Mantis religiosa*), crayfish species and medicinal leech (*Hirudo medicinalis*).

Also among the distribution studies (grid mapping projects) should be included the completing of reports under Article 17 of the Habitas Directive, covering also the Bern Convention invertebrate species (see below).

3. Legal framework

From the legal point of view the Czech Republic finalized the acquirement of the Habitat Directive by issuing the Ministerial Decree 175/2006, which is completing the list of legally protected species by adding the IV-annex species into. Widened, actualized and expert based list of protected species is still in the state of proposal.

The Natura 2000 sites designation process is in the phase of minor amendments after the seminar of continental bioregion in April 2006. The II and IV annex species are subject of complex monitoring following standard methods aiming to the FCS statements. The year 2007 was the first reporting year under the Article 17 of the Habitats Directive, the term (June) was fulfilled. The reports presented very detailed survey of the knowledge of annexed species, as the roughest mapping unit was declared grid "square", mostly were point localization used. The status was assessed after the agreed methodology, using evaluation matrix. All the reports are downloadable at the www.biomonitoring.cz. Short conclusion of the conservation status of the invertebrate groups (insects and "non-insects") is below:

	Insects	Non insects invertebrates
FV	8	5
U1	9	3
U2	33	8
XX	0	1
Sum	50	17

4. Action plans and recovery programs

In the past there were prepared three action plans – for three butterfly species – *Euphydryas aurinia, Euphydryas maturna* and *Parnassius mnemosyne*. From this list, only one species was selected to the official (ministerial) agreement, the last two were kept off, mostly due to political and practical complications, although they have begun to be partially implemented in praxis.

Two species of butterflies, extinct in the second half of 20th century, *Parnassius apollo* and *Lycaena helle* were reintroduced at the break of millenia. The first project has begun in 1980´s, now is considered as very successful example of NGO´s work, located in northern Moravia, Štramberk. The second case is widely known but unofficial. Both of these projects are a bit questionable due to their unsatisfactory documentation.

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5. FRANCE / FRANCE

ACTIONS MENEES EN FRANCE POUR LA CONSERVATION DES INVERTEBRES (2006-2008)

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INVENTAIRES ET SUIVIS

Echelle nationale

- Odonates

Le programme INVOD (INVentaire national des ODonates), comprenant 220 000 données de répartition et géré par la Société Française d'Odonatologie, a été remplacé par le protocole Cilif (Complément à l'inventaire des libellules de France). Celui-ci permet d'avoir des données plus précises que des données basiques de répartition (une date/un observateur/une espèce/des coordonnées géographiques). Il permet notamment d'avoir une meilleure caractérisation des sites et des micro-habitats et d'acquérir des données complémentaires orientées principalement sur l'autochtonie des espèces.

Pour plus de renseignements : http://www.libellules.org

- Ephémères, Plécoptères et Trichoptères

L'inventaire des Ephémères, des Plécoptères et des Trichoptères de France se poursuit. Celui-ci est coordonné par l'OPIE Benthos. Actuellement la base renferme plus de 20 000 données.

Pour plus de renseignements : http://www.invfmr.org

- Le Suivi Temporel des Rhopalocères de France (STERF)

Ce programme a été lancé en 2006 à l'initiative du Muséum national d'histoire naturelle. L'objectif est de pouvoir suivre l'évolution de la faune sur l'ensemble du territoire national, aussi bien dans les « milieux ordinaires » que dans les « milieux protégés ». Le protocole est similaire au « Butterfly Monitoring Scheme » mis en place dans plusieurs autres pays d'Europe.

Pour plus de renseignements : http://www2.mnhn.fr/vigie-nature/

- L'enquête Anthidies

Dans le cadre de son projet "pollinisateurs sauvages", l'OPIE a lancé en 2008 une enquête nationale pour améliorer les connaissances sur la répartition des Anthidies (Hymenoptera, Apidae, Anthidiini).

Pour plus de renseignement :
http://www.insectes.org/opie/insecte.php?page=/opie/pages_dyna.php&idpage=505

- Le projet d'atlas national des Mollusques

Un projet d'atlas national des mollusques se profile après la publication de la liste des mollusques de France, par le Muséum National d'Histoire Naturelle. Les difficultés taxonomiques, dûes à la haute diversité biologique en France, ralentissent ce projet.

Zone méditerranéenne

- Inventaire de *Saga pedo* et de *Zerynthia polyxena*

Un réseau de naturalistes bénévoles a mis en place un inventaire sur quatre régions du sud de la France pour ces deux espèces méditerranéennes présentes à l'annexe II de la Convention de Berne et aux annexes II et IV de la directive habitats faune flore. Cette démarche a permis d'augmenter de manière importante nos données de répartition concernant ces deux espèces .

Pour plus de renseignements : http://www.onem-france.org

Echelle régionale ou départementale

- Insectes

De multiples projets se mettent en place à l'échelle régionale ou départementale. En région Rhône-Alpes par exemple, le muséum de Lyon poursuit la coordination d'inventaires entomologiques, en relation avec le Réseau Entomologique Rhônalpin (RERA). L'atlas des Coléoptères Cerambycidae et celui des Buprestidae sont en cours d'édition. L'inventaire des coléoptères Elateridae, Eucnemidae et Troscidae ainsi que celui des Macrolépidoptères, sont en cours de réalisation.

Pour plus de renseignements : http://www.museum-lyon.org

Dans cette région encore, le suivi des Lépidoptères rhopalocères liés aux zones humides se poursuit également. Il est coordonné par le Conservatoire des Espaces Naturels de Rhône-Alpes, avec l'appui scientifique et technique de l'OPIE.

- Margaritiferidae

Pour *Margaritifera margaritifera,* poursuite des inventaires avec les Parc naturels Régionaux (Morvan, Limousin-Millevaches, Livradois-Forez, Périgord-Limousin, Haut-languedoc), les conservatoires (Lorraine, Auvergne, Limousin) et diverses collectivités (régions, départements, collectivités unies par un contrat de rivière, …)

Pour *Margaritifera auricularia* : inventaires sur plusieurs cours d'eau à l'occasion d'études d'impacts. Le résultat est la découverte d'individus vivants dans au moins 5 cours d'eau.

GESTION CONSERVATOIRE DES ESPECES

Evaluation de l'état de conservation des espèces

Conformément à l'article 17 de la directive habitats faune flore, la France a transmis à la Commission Européenne le premier état des lieux de la conservation des espèces et des habitats des annexes de cette directive. Ce travail important, coordonné par le Muséum National d'Histoire Naturelle, s'est déroulé en 2006 et 2007. La partie sur les insectes a été réalisée sous la coordination de l'OPIE ; celle sur les Unionidae et les Margaritiferidae a été rédigée par Gilbert Cochet.

Pour plus de renseignements : http://www.natura2000.fr

Plan nationaux de restauration

Le Ministère de l'Ecologie, de l'Energie, du Développement Durable et de l'Aménagement du Territoire (MEEDDAT) lance actuellement trois plans nationaux de restauration en faveur d'invertébrés :

- - sur les Odonates (plan axé sur les Odonates protégés en France. Toutes les espèces inscrites à l'annexe II de la Convention et présentes en France sont prises en compte) ;
- - sur les Maculinea (*M. arion*, *M. alcon* « écotype *alcon* », *M. alcon* « écotype *rebeli* », *M. nausithous* et *M. teleius*) ;
- - sur les Nayades (*M. margaritifera* et *M. auricularia).*

  La rédaction de ces plans de restauration débutera cette année ; elle doit durer un an.
- - Dans le cadre d'une démarche en faveur des pollinisateurs sauvages, un quatrième plan national de restauration est en préparation; il portera sur les Apoïdés.

La démarche des plans nationaux de restauration s'inscrit dans le cadre de la recommandation n°120 (2006) sur la stratégie européenne de conservation des invertébrés et plus précisément de la recommandation n°51 sur les plans d'actions concernant les espèces d'invertébrés dans les annexes de la Convention.

Insectes coprophages et endotectocides

La prise en compte de l'impact des traitements vétérinaires sur la faune des invertébrés non-cibles se poursuit en France. Un programme d'études est en cours dans les Alpes et les Pyrénées dans un réseau d'espaces protégés (Parcs Naturel régionaux et Réserves Naturelles). Il doit permettre de mieux connaitre l'impact des pratiques vétérinaires des éleveurs, en fonction de la phénologie des communautés de coprophages et en fonction de l'altitude. La coordination scientifique de ce programme est assurée par Jean-Pierre Lumaret (UMR CEFE, Université de Montpellier). Au sein d'un groupe de travail européen

(Dung Organism Toxicity Testing Standardisation (DOTTS) Group), Jean-Pierre Lumaret a participé à l'élaboration de tests toxicologiques pour évaluer l'imparct de ces produits vétérinaires sur la faune des coprophages. Ce travail a fait l'objet d'une publication [1]. Ces tests ont vocation à être intégrés dans les processus d'homologation des matières actives des médicatents vétérinaires.

Parallèlement, la création éventuelle d'une mesure agro-environnementale territorialisée est à l'étude.

Programmes locaux de restauration de *Margaritifera margaritifera*

Plusieurs parcs naturels régionaux ont débuté une démarche pour tenter de préserver des populations reproductrices de *Margaritifera margaritifera* : LIFE dans le Morvan, plan de restauration dans le Livradois-Forez …

Pour *Margaritifera auricularia*, une coopération est en place avec un éleveur d'esturgeon pour obtenir des reproductions en aquarium. Un projet est en cours pour tenter de reconnecter l'une des dernières populations de *Margaritifera auricularia* avec la dernière population au monde *d'Acipenser sturio*.

INFORMATISATION DES CONNAISSANCES

Coléoptères saproxyliques

Le CEMAGREF, en partenariat avec l'IFN et l'ESA Purpan et la collaboration de l'OPIE, développe un Système d'Information sur l'Ecologie des Coléoptères Saproxyliques Français (FRench Information System on Saproxylic BEetle Ecology, FRISBEE). L'objectif de cette base est (1) d'évaluer l'état de conservation des peuplements forestiers à partir de l'analyse d'assemblage d'espèces et (2) de permettre des analyses fonctionnelles par rapport aux processus de dégradation du bois mort. Cette base est compatible avec la base de Stockland sur les espèces saproxyliques, développée dans le nord de l'Europe.

Pour plus de renseignements : http://www.nogent.cemagref.fr/site-internet/frisbee/

Lépidoptères

A partir des informations présentes dans la littérature nationale et européenne, l'OPIE a élaboré depuis 2003 deux bases de données :

- une base de données « répartition ». Elle réunit actuellement 120 000 données.
- une base de données sur l'autécologie des espèces (biogéographie, biologie, structure et dynamique des populations).

Ces bases de données concernent l'ensemble des familles de Lépidoptères.

En 2007, l'OPIE a entrepris l'élaboration d'un Système d'Information sur les Macro-lépidoptères. L'objectif de ce système d'information est d'être un outil d'aide à la décision pour les gestionnaires d'espaces, permettant :

- une évaluation de la qualité des inventaires, en particulier pour mettre en évidence le besoin éventuel d'accroître la pression d'inventaire ;

[1] Lumaret *et al.*, 2007. New screening test to predict the potential impact of ivermectin-contaminated cattle dung on dung beetles. Vet. Res. 38 : 15-24

- une évaluation de l'état de conservation des milieux pour la faune des Lépidoptères, à partir de l'analyse de l'ensemble des espèces inventoriées.

Margaritiferidae

Toutes les données sur les deux Margaritiferidae ont été saisies dans le système CARDOBS (carnets d'observations) de l'INPN. (Inventaire National do Patrimoine Naturel).

VULGARISATION SCIENTIFIQUE ET COMMUNICATION

Formations entomologiques

L'OPIE et la Société Française d'Odonatologie organisent chaque année des stages de formation technique et scientifique sur différents groupes d'Insectes et plus spécifiquement sur les espèces menacées en France et en Europe. Pour plus de renseignement : http://www.insectes.org/opie/insecte.php?page=/opie/pages_dyna.php&idpage=341

Information sur les espèces de l'annexe IV de la directive habitats

L'objectif de cette action consiste à présenter ces espèces et leurs milieux de façon claire et sympathique, afin d'accompagner de façon positive les discussions et les courriers rappelant les contraintes administratives impliquées par une protection stricte, tant à l'extérieur qu'à l'intérieur des zones Natura 2000. Le public visé est constitué par les partenaires des DIREN, en particulier les élus locaux, les aménageurs et les administrations locales.

En 2007, des fiches présentant les 19 espèces de Lépidoptères présentes en France et qui figurent à l'annexe IV de la directive habitats faune flore, ont été réalisées par le MEEDDAT. Ces fiches sont disponibles à l'adresse suivante :

http://www.ecologie.gouv.fr/Papillons-decouvrir-19-especes-de.html

Fin 2008, un peu plus de 40 autres fiches sont attendues ; outre les amphibiens, elles présenteront les espèces de libellules, d'orthoptères et de coléoptères de l'annexe IV de la directive habitats faune flore qui vivent en France.

Vulgarisation

Tous les deux ans, un festival du Film sur l'insecte (FIFI) se déroule dans la région Languedoc-Roussillon, organisé par l'OPIE-LR. Il s'est tenu en 2007 à Prades (66).

Pour plus de renseignement : http://opielr.free.fr/

Margaritiferidae

Un ouvrage de vulgarisation a été tiré à 10 000 exemplaires, en lien avec les acteurs de l'eau. Des formations des acteurs de la pêche et des rivières (ONEMA : Office National de l'Eau et des Milieux Aquatiques, fédération de pêche, maisons de la rivière, techniciens de rivière …) ont été réalisées sur tous les territoires concernés par les deux espèces. La participation à plusieurs colloques a permis de transmettre les connaissances sur les deux espèces.

6. GREECE / GRECE

Καθ. ΙΩΑΝΝΑ ΗΛΙΟΠΟΥΛΟΥ – ΓΕΩΡΓΟΥΔΑΚΗ
Δ/ΝΤΡΙΑ ΜΟΝΑΔΑΣ ΔΙΑΧΕΙΡΙΣΗΣ
ΠΕΡΙΒΑΛΛΟΝΤΟΣ, ΡΥΠΑΝΣΗΣ ΚΑΙ
ΟΙΚΟΤΟΞΙΚΟΛΟΓΙΑΣ
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Report of Greece for the meeting for the Bern Convention Group of Experts

By Prof. J. Iliopoulou – Georgudaki

In the following are reported only the national scale projects which are related to the Bern Convention on the Conservation of Invertebrates.

The first is joined to the revision of the Red Data Book. In this frame, a project is running about the record and evaluation of threatened invertebrate species aiming to establish an action plan for protection.

The second is a data base for the aquatic invertebrates, the first phase of which is finished.

Furthermore, many other research programs are running in the Universities and Research Institutes which are referred to different invertebrate groups.

So far, the knowledge of invertebrates' status in Greece, probably like in other countries, is not equivalent for all the species groups. For example, more complete studies concern the terrestrial invertebrates like molluscs, arachnids, part of insects etc.

It is expected that in the near future a national strategy will be established for the biodiversity through which will be a promotion of the knowledge for more invertebrate groups, driving to better conservation, protection and recovering activities, on ecosystem and species basis, taking into account the European Strategy.

7. LITHUAIA / LITUANIE

PROGRESS IN CONSERVATION OF INVERTEBRATES IN LITHUANIA, 2008

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About 18, 000 animal species, 6, 000 mushroom species and 1, 800 plant species make up biological diversity in Lithuania. At present, about 17, 000 invertebrate species are known in Lithuania.

Legislative base

In the Ministry of the Environment, the Biological Diversity Division of the Nature Protection Department is responsible for the protection of biodiversity in Lithuania. Scientific research is carried out at the Institute of Ecology of Vilnius University, Vilnius and Klaipėda Universities, Kaunas Vytautas Magnus University. National laws and related regulations on wildlife and protected animal, plant and mushroom species and communities, as well as the relevant EU legislation, provide the legal basis for the protection of biodiversity of the Republic of Lithuania. In the policy of nature conservation, special attention is paid to the protection of invertebrate species.

In January 2008, the testing of the information system for the registration of protected species and communities was completed. The system was designed to enable a systematic accumulation of data on the localities of rare, endangered and vulnerable wild animal, mushroom and plant species and communities protected in Lithuania. This system helps to assess the status of protected species and communities and to decide on necessary measures to improve it.

The specialists of scientific institutions, subdivisions of the Ministry of the Environment and its subordinate institutions will provide data to the information system. Only verified data will be stored in the database. The access to the created database is not restricted only to civil servants and scientific researchers, but is also open to the general public.

The Red Book of Lithuania published in 2007 lists 767species of animals (135 species of invertebrates), plant, lichen and mushroom. Along with the status of protected species populations and species description, major threats and measures for the protection of the listed species are provided in this publication.

Table 1. Invertebrates species included in Red Data Book of Lithuania 2007

	Categories						
	0 (Ex)	**1 (E)**	**2 (V)**	**3 (R)**	**4 (I)**	**5 (Rs)**	**Total**
Molluscs	-	1	–	4	–	–	**5**
Spiders	–	–	–	2	–	–	**2**
Insects	9	4	14	63	33	–	**123**
Crustaceans	1	-	2	-	1	–	**4**
Leeches	–	–	-	–	–	1	**1**
Total	**10**	**5**	**16**	**69**	**34**	**1**	**135**

Activities in protected areas

The territories designated following the Habitats Directive in accordance with the national law are called "areas important for habitat protection". Currently, the third stage of new area designation is taking place and area selection criteria are being revised in Lithuania. The list of localities meeting the selection criteria for habitat protection areas has been compiled. The list contains 299 localities with a total area of 659 thousand ha covering 10% of the Lithuanian territory. At present, nature management plans have been suggested for 119 protected areas, whereas management plans for 18 protected areas have been developed to improve the status of invertebrate species.

In 2006, regulations were adopted for the evaluation of the effect of implementation of plans, programmes and the scheduled economic activity on designated and potential territories of Natura 2000, which help to predict the future effect of a plan, programme or project and to decide on the necessity of the assessment of their potential effect on the environment. Evaluating the effect, great importance is given to the needs of rare protected invertebrates and their habitats

In 2005, methodologies for the monitoring of species of European Community interest were prepared, including those for the monitoring of invertebrate species. Also, individual monitoring plans were developed for 10 habitat protection areas. In 2008, the monitoring of 15 invertebrate species was started in 72 habitat protection areas.

Education and promotion of invertebrates protection

Close attention is devoted to education and promotion of nature protection ideas both among specialists and general public. In 2006, the "Guide to Species Protected under the EU Habitats Directive" was published. It presents identification keys and original illustrations of 43 invertebrate species. The publication "Recommendations for the Management of Habitats of Some Species of European Community Interest" provides recommendations related to the protection status and threats of endangered species (including 6 invertebrate species), as well as to nature management and restoration activities.

In 2006, the training was given to specialists of nature protection services on identification of rare species and protection of their habitats. During the period 2006 to 2008, training courses on the monitoring of invertebrate species were provided for ecologists and biologists. The courses involved both theoretical and practical approach.

Scientists of the Institute of Ecology of Vilnius University give lectures on rare and protected invertebrate species, participate in ecological schools and professional development courses for teachers.

Scientific research on invertebrates

In 2006, the monograph "Insects of Lithuanian Coastline Habitats" was prepared.

In 2006–2007, "Study on the Lithuanian Fauna" was prepared at the Institute of Ecology of Vilnius University under the commission of the Ministry of the Environment where the data of previous publications on Lithuanian invertebrates and the material of major Lithuanian collections were summarized. The level of investigation, systematic status and trends of distribution of the Lithuanian invertebrate fauna were determined, the status of introduced and alien species was assessed and the measures for the control of species abundance were presented.

The monitoring of the alien species *Cameraria ohridella* Deschka & Dimic 1986 has been carried out since 2007. Monitoring of alien crayfish is carried out so.

At present, the investigation on Lithuanian dragonfly species in cooperation with Polish scientists is in progress and the atlas of Lithuanian dragonfly species is being prepared for publication.

In 2008, a scientific programme on the impact and distribution of alien and invasive species in Lithuanian ecosystems was started. Separate teams of scientists will investigate marine, freshwater and terrestrial invertebrates in this complex programme.

8. NORWAY / NORVEGE

Protection and maagement of invertebrates in Norway. Status 2008

by
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National protection of the Bern Convention species

The Bern Convention Appendices has been important in setting priorities for national action for the listed species. At the moment there are 12 invertebrate species listed by the Bern Convention that are also distributed in Norway. Two butterfly species were protected on 1st of June 1989 (Parnassius apollo and Parnassius mnemosyne), and the protection of the freshwater mussel (Margaritifera margaritifera) was most recently updated on 30th December 1992. The following species were all protected by Royal Decree dated 21st December 2002: Hirudo medicinalis, Leucorrhinia caudalis, Leucoirrhinia albifrons, Leucorrhinia pectoralis, Coenonympha hero, Cucujus cinnaberinus and Dytiscus latissimus. The two Parnassius-butterfly species were added to this Royal Decree. The beetle Graphoderus bilineatus was added to the mentioned Royal Decree on 13th July 2005.

The European Crayfish

The European Crayfish Astacus astacus has been protected for a long time, and most recently updated through the Act 'Relating to Salmonids and Fresh-water fish etc.' (4th May 1992). A regulation opens for a short annual period of fishing. The plague transferred by the North-American Signal Crayfish has been documented a few times in Norway. Even if the total population of European Crayfish has been declining in Norway, due to the plague and invasive plants species (Elodea Canadensis), Norway as one of a few European countries still holds a large and viable population of this species. The management authority have in 2006 and 2007 initiated action directed at building a barrier in a riverine system to stop the spread of the Signal Crayfish from Sweden into Norway. In 2007 some ponds containing Signal Crayfish were treated as to kill of this species. A closer collaboration with zoo-traders and angling societies has been initiated to inform the public on the regulations applying to import of alien species. All decapods are strictly prohibited to import today. A new national action plan for the European Crayfish will be issued in 2008.

The freshwater mussel

A programme for developing action plans for threatened species was started in 2005. One of the first action plans to be published was one for the freshwater mussel (DN-report 2006-3). The implementation of the action plan has being a follow up of years of mapping and research. The annual budget for this species is now up to 50.000,- euro.

The beetle Cucus cinnaberinus

New action plans are being developed in 2008 for the beetle Cucujus cinnaberinus. While research work has been going on for years since the beetle was discovered in Norway in the 1990ies.

Butterflies

The long term monitoring of *P.mnemosyne* started in 1988 was terminated in 2001 and there are no regular monitoring of any of the listed butterflies species at present

The Leucorrhinia species

The protection of the three Leucorrhina-species has initiated further research into their distribution and occurrence.

Other species

The beetles Dytiscus latissimus is considered widespread and numerous in Norway. While the Graphoderus bilineatus is only recently discovered in Norway and added to the most recent national red list in 2006.

The new Threatened Species Unit and Red Lists

The Government has established in Trondheim a new unit for management of species data. At present there 10 ful time employees and the unit has an overall budget of 2 mill euros. The unit has inter alia been given the task to issue revisions of the national Red List. The most recent edition was issued in December 2006.

Invertebrate Bern Convention species on the National Red List (2006):

Hirudinea	
Hirudo medicinalis	VU
Malacostraca	
Astacus astacus	EN
Odonata	
Leucorrhinia albifrons	NT
Leucorrhina caudalis	VU
Leucorrhinia pectoralis	VU
Cucujidae	
Cucus cinnaberinus	VU
Dytiscidae	
Dytiscus latissimus	LC
Graphoderus bilineatus	VU
Nymphalidae	
Coenonymnpha hero	EN
Papilionidae	
Parnassius Mnemosyne	VU
Bivalvia	
Margaritifera margaritifera	VU

9. SWEDEN / SUEDE

Report on invertebrate conservation in Sweden 2006-2008

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http://www.artdata.slu.se

Species Action Plans

210 Species Action Plans (out of c. 350 planned) are currently under implementation in Sweden and much governmental resources are allocated into these (www.naturvardsverket.se). The action plans include 190 invertebrate species (*Acmaeops marginata, Aesalus scarabaeoides, Agonopterix atomella, Agonopterix bipunctosa, Agrilus mendax, Ampedus cardinalis, Ampedus nigerrimus, Anacampsis fuscella, Andrena argentata, Andrena batava, Andrena bimaculata , Andrena gelriae, Andrena hattorfiana, Andrena humilis, Andrena labialis, Andrena marginata, Andrena morawitzi, Andrena nycthemera , Anoplius aeruginosus, Anoplodera scutellata, Anoplodera sexguttata, Anthophora plagiata, Anthophora retusa, Anthrenochernes stellae, Apalus bimaculatus, Aphodius merdarius, Aphodius putridus, Aphodius quadriguttatus, Aradus angularis, Aradus aterrimus, Aradus laeviusculus, Aradus signaticornis, Astacus astacus, Atypus affinis, Baptria tibiale, Belomicrus borealis, Bembion cruciatum, Bembix rostrata, Biphyllus lunatus, Bledius atricapillus, Boros schneideri, Bothrideres contractus, Buprestis novemmaculata, Buvatina stroemella, Calitys scabra, Calosoma auropunctatum, Calosoma reticulatum, Canthophorus impressus, Cassida ferruginea, Cassida murraea, Cerambyx cerdo, Ceruchus chrysomelinus, Cerylon impressum, Chalcophora mariana, Cheiracanthium pennyi, Cheiridium museorum, Chesias rufata, Chlorophorus herbstii, Choerades igneus, Chortodes morissi, Cicindela maritima, Clivina collaris, Coleophora albella, Coleophora conyzae, Coleophora genistae, Coleophora scabrida, Conisania leineri, Copris lunaris, Corticaria planula, Corticeus fraxini, Cryptophagus lysholmi, Cucujus cinnaberinus, Cyrtopogon luteicornis, Dasypoda suripes, Denticollis rubens, Digitivalva arnicella, Digitivalva valeriella, Diplocoelus fagi, Dircaea australis, Doronomyrmex goesswaldi, Dromaeolus barnabita, Dufourea halictula, Dysauxes ancilla, Dyschirius laeviusculus, Elater ferrugineus, Emus hirtus, Enicmus brevicornis, Ennearthron pruinosulum, Eresus sandaliatus, Ethmia dodecea, Eublemma minutata, Eucosma scorzonerana, Euphydryas aurinia, Euphydryas maturna, Eupoecilia sanguisorbana, Euroleon nostras, Exocentrus adspersus, Gnorimus variabili , Gorgonocephalus caputmedusae, Grammoptera ustulata, Halictus leucaheneus, Harpalus autumnalis, Harpalus flavescens, Harpalus hirtipes, Heptaulacus sus, Hormopeza obliterata, Hyphoraia aulica, Ips sexdentatus, Ischnomera sanguinicollis, Laemophloeus monilis, Larca lata, Leiopus punctulatus, Lepidurus apus, Leptura nigripes, Leptura pubescens, Leptura revestita, Limnadia lenticularis, Lithostege farinata, Lithostege griseata, Lopinga achine, Lynceus brachyurus , Lytta vesicatoria, Maculinea alcon, Maculinea arion, Margaritifera margaritifera, Megachile lagopoda, Melandrya dubia, Melitaea britomartis, Melitta tricincta, Meloe brevicollis, Mesosa curculionoides, Mirificarma lentiginosella, Myricaria germanica, Myrmeleon bore, Nemophora cupriacella, Nemophora minimella, Nomada argentata, Nomada armata, Nomada fuscicornis, Nomada similis, Oidaematophorus vafradactylus, Omphiscola glabra, Onthophagus illyricus, Orthotomicus longicollis, Osmia maritima, Osmoderma eremita, Parnassius mnemosyne, Philodromus fallax, Phyllonorycter staintoniella, Phytoecia nigricornis, Plagionotus detritus, Platynus longiventris, Plebejus argyrognomon, Podalonia luffii, Prolita solutella, Prostomis mandibularis, Pseudanodonta complanata, Pseudocleonus grammicus, Pseudoptilinus fissicollis, Pseudoterpna pruinata, Psophus stridulus, Pytho kolwensis, Scolitantides orion, Scopula ornata, Scopula virgulata, Scotopteryx luridata, Scotopteryx mucronata, Scythris crypta, Siphlonurus armatus, Solva marginata, Sphecodes cristatus, Sphex rufocinctus, Stauroderus scalaris, Stenagostus rhombeus, Stephanopachys linearis, Stephanopachys substriatus, Stratiomys chamaeleon, Synchita separanda, Tasgius globulifer, Tebenna bjerkandrella, Tetratoma desmarestii, Tragosoma depsarium, Triaxomasia caprimulgella, Triops cancriformis, Trisetum subalpestre, Unio crassus, Upis ceramboides, Vertigo moulinsiana, Xyletinus tremulicola and Xylomya czekanovski*).

Base-line inventory of Species listed in the Habitats Directive

During 2004-2008 Sweden conducted inventories of Protected and Natura 2000 areas of all invertebrate species listed on Annex 2 and Odonata species listed in Annex 4 of the EU Habitats Directive. All results are entered into and available in the Species Gateway (see below), though the distribution of a few sensitive species are not shown in detail for the general public. In parallel, guidelines for reaching favourable conservation status of these species have been produced. With the beginning of 2009, the species will be monitored at a regular basis to follow the development of their distribution, populations and conservation status.

Reporting on invertebrates species according to Article 17 in the Species- and Habitat Directive

Following the EU Habitats Directive the Member States have an obligation to preserve the listed species and habitats. It also obliges the Member States to assess the conservation status of all species and habitats of Community interest every sixth year. This obligation is formulated under Article 17 of the Habitats Directive. The Swedish assessment was reported to the European Commission in June 2007 by the Swedish Species Information Centre on commission by the Swedish Environmental Protection Agency. Here, range, populations size, habitat and future prospect were assessed for each species in each of the biogeographic regions (i.e. Alpine, Boreal and Continental region) in which they occur.

The assessment revealed large differences in conservation status between the species. The conservation status of species and populations are, in general, more favourable in the northern part of the country.

Many species are threatened and fail to reach a favourable conservation status. This is often due to decreasing range and excessive loss of habitat, in conjunction with small population sizes. The situation is especially serious for listed butterflies and woodland insects. Butterflies and some other insects that thrive in traditionally managed, semi-natural grasslands suffer from the abandonment of traditional agricultural practises as well as the transformation of grasslands into woodland. Prescribed burning of woodland in central and northern Sweden has, however, improved the situation for several beetle species associated with fire and burnt wood. See report:

The Species Gateway

The Species Gateway (Artportalen: http://artportalen.se) is an Internet-based reporting system for observations developed and hosted by the Swedish Species Information Centre on commission by the Swedish Environmental Protection Agency. Its content is transferred every night to GBIF. The Gateway is used by amateur biologists, the skilled general public, the governmental monitoring programs, firms of consultants and others. Currently, it encompasses >14 million observations. Out of these, 550,000 are invertebrates, covering 8,200 different species. It is also possible to upload pictures at the Species Gateway in order to verify the identity of the report. Today there are 21,000 invertebrate pictures. Everybody have open access to the observations, pictures, maps, etc., with the exception of a few species that are regarded as particularly sensitive.

The Saproxylic Database – Biodiversity in dead wood

Together with Norway Sweden has constructed a database with ecological information about some 7000 species dependent on dead wood. Out of these some 4000 are invertebrates.

www.saproxylic.org -> go to database -> Username: sapro; password: leave empty -> Logg on.

The Red List of Swedish species

In 2005, Sweden published The 2005 Red List of Swedish Species. Here, 11,498 invertebrate species were assessed against the IUCN Red List Criteria, out of which 1991 (17%) were classified as red-listed and 776 (6.7%) as threatened, respectively. We have now started the process for the 2010 Red List assessment.

The Swedish Taxonomy Initiative

ArtDatabanken (The Swedish Species Information Centre) was 2001 commissioned by the government to make revisions and developing keys for the identification of all Swedish multicellular organisms, more than 50 000 species. This project, designed to run for c. 20 years, will result in a considerable improvement of the infrastructure of Swedish taxonomy. See: http://www.artdata.slu.se/english/.

It includes four parts:

1. Inventories, where we hitherto have conducted two large-scale projects, one utilizing Malaise-traps targeting Hymenoptera, Diptera and other insects, and one targeting marine invertebrates. In the former an estimated 40 million specimen have been collected. Among the so far two-three percent identified specimens more than 500 species new to science and another 500+ new to Sweden have been found. Among the marine invertebrates more than 20 n.sp and another one hundred species new to Sweden have been identified, particular among the meiofauna.

2. Taxonomic revisions. Large groups of organisms, e.g., certain fungi, worms and parasitic wasps, are currently so poorly known that extensive research is needed before any comprehensive identification keys can be produced. To that end, The Swedish Taxonomy Initiative has hitherto during the years 2002-08 granted c. 8 million Euro for taxonomic research.

3. Popular science presentation of all multicellular species that can be identified without advanced technology in the Encyclopedia to the Swedish Flora and Fauna (Nationalnyckeln till Sveriges flora och fauna). The majority of the text is in Swedish, but all keys are bilingual (Swedish and English) and there is a section with key facts in English for every species. In order to make the Encyclopedia attractive and useful to non-professionals, the majority of the species are illustrated with beautiful colour illustrations. We estimate the series will cover about 40,000 species in 120 volumes.

4. Support to the biological museums. During the years 2002-08 the biological museums have been subsidized with about 130 Million Euro through this venture. In particular, the museums have received subsidies for curating and digitizing their collections.

10. SLOVAKIA / SLOVAQUIE

INVERTEBRATE CONSERVATION IN SLOVAKIA

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Introduction

The Slovak Republic is situated in the middle of the Europe on the boundary line of the Pannonian and Carpathian regions that creates conditions for the very rich animal species diversity. There are more than 934 species of spiders (Araneae), more than 386 species of Crustacea, 118 species of Orthoptera, 801 species of Heteroptera, more than 6500 species of Beetles (Coleoptera), more than 5779 species of Hymenoptera, more than 3500 species of Butterflies (Lepidoptera) or more then 4620 species of Diptera living in the Slovak Republic.

Distribution

- exctinct species in Slovak Republic: *Dytiscus latissimus* only historical findings within river basin of Hron and Hornad rivers, *Coenagrion mercuriale* – only three historical findings in Podunajska nížina lowland near the Danube river (Brtek & Rotschein).
- very rare species only on few isolated localities: *Hypodryas aurinia, Hypodryas maturna, Coenonympha hero, Pamassius apollo, Lopinga achine, Leucorrhinia pectoralis, Ophiogomphus cecilia, Palingenia longicaudata, Saga pedo, Graphoderus bilineatus, Carabus hungaricus, Austropotamobius torrentium, Hirudo medicinalis*
- endangered species with wide distribution area but insufficient data about their distribution in Slovakia: *Cerambyx cerdo, Rosalia alpina, Lucanus cervus, Cucujus cinnaberinus, Osmoderma eremita, Lycaena dispar, Maculinea nausithous, Maculinea teleius, Maculinea arion, Zerynthia polyxena, Parnassius mnemosyne, Eriogaster catax, Proserpinus proserpina, Callimorpha quadripunctaria, Helix pomatia, Astacus astacus*

Legal Protection

32 species under Bern Convention have been reported up to now in Slovakia (see Table 1). All these species are included in the red lists of the Slovakian fauna. In Slovakia majority species from the Bern convention (except of *Palingenia longicaudata*) are protected by national legislation (Regulation No. 492/2006 of the Ministry of the Environment of the Slovak Republic).

With a view to implement the Habitats Directive (92/43/EEC), Slovakia develops the network of NATURA 2000 sites. Many of them have been designated for the protection of rare and endangered invertebrates: 18 Natura 2000 sites have been proposed for the protection of Leucorrhinia pectoralis, 15 sites for Ophiogomphus cecilia, 62 sites for Cerambyx cerdo, 76 sites for Rosalia alpina, 2 sites for Graphoderus bilineatus, 104 sites for Lucanus cervus, 53 sites for Cucujus cinnaberinus, 15 sites for Osmoderma eremita, 4 sites for Hypodryas maturna, 1 site for Hypodryas aurinia, 68 sites for Lycaena dispar, 16 sites for Maculinea nausithous, 22 sites for Maculinea teleius, 26 sites for Eriogaster catax and 3 sites for Austropotamobius torrentium.

Factors that endanger invertebrate species

In the last years, increasing negative tendency may be observed in Slovakia on the habitats of the endangered invertebrate species, including those protected by several international agreements.

1) Rare xylophilous and saproxylophilous beetles: (*Osmoderma eremita, Cerambyx cerdo, Cucujus cinnaberinus, Lucanus cervus, Rosalia alpina*) are endangered by losing their natural habitats (loss of nature habitats by the unsuitable forest economy (feeling hosts trees), elimination of streamside vegetation, elimination old trees alleys or parks, deforestation prior mining of raw materials or built-up areas, use of different chemical agents (insecticides) in forests ecosystems.

2) Main causes of the endangerment of invertebrates of the nonforests habitats: *(Maculinea sp., Lycaena dispar, Lopinga achine, Hypodryas maturna, Hypodryas aurinia, Parnassius apollo, Parnassius mnemosyne, Saga pedo*) (meadows, xerotherms) are:

- abandonment of the traditional methods of management (cease of grazing, mowing) or wrong management of the meadows
- appearing of succession communities of different shrub species and natural seeding of invasive herb or tree species
- aforestation of steppe and steppe-forest sites often by non-original tree species
- mining of raw materials
- built-up areas
- use of different chemical agents (insekticides)

3) A major problem for aquatic environment as habitat for threatened invertebrate species: (*Coenagrion mercuriale, Stylurus flavipesis, Leucorrhinia pectoralis, Ophiogomphus cecilia, Palingenia longicaudata, Dytiscus latissimus, Graphoderus bilineatus, Hirudo medicinalis*) is the water quality of the water bodies, draining of wetlands, decreasing of the groundwater level, elimination of the macrophytes, intensive aquaculture. The most drainage canals in Slovakia are situated in lowland in South-West, South and South-East of Slovakia. Many of the wetland reserves are isolated from their surroundings and from the nearest wetlands.

Activities to improve selected habitats

- LIFE projects aimed at invertebrates:

„Restoration of the Wetlands of Zahorie Lowland" The main project objective is to restore the original water conditions and to reach the favourable conservation status of the forest and wetland habitats at 8 project localities - Sites of Community Interest. The duration of the project is four years (2005 - 2008). During this period specific restoration and management measures are being implemented at individual project sites, including the restoration of water regime, improvement of the habitat conditions for most threatened plant and animal species (*Leucorrhinia pectoralis, Maculinea teleius, Maculinea nausithous, Lycaena dispar, Hirudo medicinalis*) at 8 Sites of Community Importance.

„Restoration and Management of Sand Dunes Habitats in Zahorie Military Training Area" The project shall contribute to the development of NATURA 2000 network through the conservation, restoration and management of important sand dunes and dry heaths habitats and species (*Maculinea arion, Hypodryas aurinia, Colias myrmidone*) at the territory of Military Training Area Zahorie on Zahorie Lowland at 3 Sites of Community Importance. The duration of the project is four years (2006- 2010).

- action plans for 4 target butterfly species: *Parnassius apollo, Maculinea arion, Maculinea nausithous, Maculinea teleius* (action plan is approved by the Ministry of the Environment of the Slovak Republic only for *Parnassius apollo*).
- monitoring of threatened species from the Bern Convention: 2003 – 2006 inventory of the species in Natura 2000 sites, 2007 – by the partial monitoring system BIOTA (Lepidoptera (*Maculinea arion, Maculinea teleius, Maculinea nausithous, Parnassius apollo,* Coleoptera (*Osmoderma eremita, Lucanus cervus, Cerambyx cerdo, Cucujus cinnaberinus*). The most data about the distribution of endangered species under Bern convention are from scientists on local or regional level. State Nature Conservancy of Slovak Republic prepared a project with the aim on monitoring the annex species on national level. Monitoring, and practical implementation of action plans for target invertebrates species is very problematic (insufficient financial support by the state, problematic ownership relations, lack of personal capacities). As State Nature Conservancy is not the owner or user of state-owned land, nor the delegated management authority within protected areas (National Parks, Protected Landscape Areas, NATURA 2000 sites, small-area reserves) there are many problems for species and habitats conservation,

because nature protection interest usually does not correspond with economical interests of other state organisations, that are delegated users/occupants of the area (State forestry, Military forests and estates, state supported agriculture, river basins managements).

Table 1. List of species of invertebrates from the Bern Convention – II and III means IInd and IIIrd Appendix of the Convention; Slovak Red Data Book: (CR, VU, EN etc. categories of threat according to the IUCN

No.	Group of Invertebrates	Species	Bern Convention (Appendix)	Slovak Red Data Book of Animals - Invertebrates
1.	Odonata	*Coenagrion mercuriale*	*II*	**Ex**
2.	Odonata	*Stylurus (Gomphus) flavipes*	**II**	**VU**
3.	Odonata	*Leucorrhinia pectoralis*	**II**	**EN**
4.	Odonata	*Ophiogomphus cecilia*	**II**	**EN**
5.	Ephemeroptera	*Palingenia longicaudata*	**II**	**CR**
6.	Orthoptera	*Saga pedo*	**II**	**EN**
7.	Coleoptera	*Cerambyx cerdo*	**II**	**LR:nt**
8.	Coleoptera	*Rosalia alpina*	**II**	**VU**
9.	Coleoptera	*Dytiscus latissimus*	**II**	**Ex**
10.	Coleoptera	*Graphoderus bilineatus*	**II**	**VU**
11.	Coleoptera	*Lucanus cervus*	**III**	**LR:lc**
12.	Coleoptera	*Cucujus cinnaberinus*	**II**	**LR:nt**
13.	Coleoptera	*Osmoderma eremita*	**II**	**EN**
14.	Coleoptera	*Carabus hungaricus*	**II**	**EN**
15.	Lepidoptera	*Coenonympha hero*	**II**	**CR**
16.	Lepidoptera	*Hypodryas maturna*	**II**	**CR**
17.	Lepidoptera	*Hypodryas aurinia*	**II**	**CR**
18.	Lepidoptera	*Lycaena dispar*	**II**	**VU**
19.	Lepidoptera	*Maculinea arion*	**II**	**VU**
20.	Lepidoptera	*Maculinea nausithous*	**II**	**CR**
21.	Lepidoptera	*Maculinea teleius*	**II**	**EN**
22.	Lepidoptera	*Zerynthia polyxena*	**II**	**VU**
23.	Lepidoptera	*Parnassius apollo*	**II**	**EN**
24.	Lepidoptera	*Parnassius mnemosyne*	**II**	**VU**
25.	Lepidoptera	*Lopinga achine*	**II**	**EN**
26.	Lepidoptera	*Eriogaster catax*	**II**	**LR:nt**
27.	Lepidoptera	*Proserpinus proserpina*	**II**	**EN**
28.	Lepidoptera	*Callimorpha quadripunctaria*	**II**	-
29.	Mollusca	*Helix pomatia*	**II**	-
30.	Crustacea	*Astacus astacus*	**III**	-
31.	Crustacea	*Austropotamobius torrentium*	**III**	**EN**
32.	Annelida	*Hirudo mecidinalis*		**VU**

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11. SPAIN / ESPAGNE

Report on the progress towards the conservation of Invertebrates in Spain since 2006.

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1. Legal protection of invertebrates in Spain

The Ministry of the Environment, and Rural and Marine Affairs (ARM) is responsible for nature conservation in Spain, although, as previously reported, many of its powers have been transferred by law to the 17 Autonomous Regional Governments, plus the 2 Autonomous Cities of Ceuta and Melilla. In relation to the Bern Convention, it is those powers that deal with species conservation and management that are particularly relevant.

Relevant actions at national level include: The Law 42/2007, of 13 December, "On the Natural Heritage and the Biodiversity" revoke the law 4/1989 and the annexes (1995), modify the Law of Coasts (22/1988) and integrates the Directive 92/43/CEE). Its aim is to fulfil Spanish commitments with the CBD (1992) and the Johannesburg Submit (2002). Its annexes include a high number of invertebrates in different categories. In addition, the Sectorial Conference has approved (September 6, 2007) a national strategy for the conservation of *Margaritifera auricularia* and another for the control the zebra mussel (*Dreissena polymorpha)*. More recently (30 may, 2008), a national strategy has been approved for *Patella ferruginea*. The responsibility of converting these agreements into autonomic legislation lies with the regional authorities. In addition, the creation and implementation of recovery plans for other species included in the "threatened with extinction" category, even though mandatory under Spanish law, is left to the regional governments. As a result, conservation measures and protection levels among regions are sometimes dissimilar. This can be very detrimental to the overall conservation of species, and/or to its genetic variability, for those living in more than one region or in the border between two regions. Additionally, it may be more difficult to coordinate strategies between regional governments and may lead, for example, to duplication of research projects, and to an inefficient management of resources.

Another relevant initiative at national level, since 2003 was the elaboration of the Red Book of Invertebrate species in Spain, mostly devoted to continental arthropods and molluscs. It has been published by the MMA in 2006.

The following table provide a summary of the species included by each taxonomical Order.

Table 1. Number of species and UICN categories of the Red Book of Invertebrate species in Spain (Verdú & Galante eds., 2006)

			UICN Category			
Type	Order	Extint (EX)	Critically Endangered (CR)	Endangered (EN)	Vulnerable (VU)	Total
Arthropoda	Araneae			1	7	8
	Coleoptera		3	10	56	69
	Decapoda		1		1	2
	Dictyoptera			1	2	3
	Diptera			1	3	4
	Ephemeroptera			6	1	7
	Hemiptera				9	9
	Hymenoptera			5	9	14
	Lepidoptera			7	12	19
	Odonata		3	3	12	18

	Opiliones			1	1	2
	Orthoptera				13	13
	Plecoptera				7	7
	Pseudoscorpiones				1	1
	Trichoptera				1	1
Total Arthropoda			7	35	136	177
Mollusca	Architaenioglossa				1	1
	Neotaenioglossa	1	2	3	10	16
	Neritopsina		2	1		3
	Pulmonata		4	11	54	69
	Unionoida		1	1	2	4
	Veneroida				2	2
Total Mollusca		1	9	16	69	95

The book coordinated by Verdú & Galante (2006) includes the work of numerous experts of the Spanish Entomological and Malacological Societies. The list of species in this book was the first step toward a wider project, to make a more detailed study of the species listed as "Critically Endangered". The objectives of this project are: 1) to review and map species distribution areas, 2) to review population status, biology and life cycles of the species, and 3) to evaluate real or potential threats in order to propose measures to protect species habitats or to control commercial exploitation. The result is the Atlas of the critically endangered invertebrates in Spain (only insects and molluscs), which is in press. It will follow a revision of the species included as "vulnerable".

At the regional level some governments have published protection lists or "red" lists, including invertebrate species. According to the received information, these are: Comunidad Valenciana (2004), La Rioja (1995, 1998), Galicia (2007), Andalucía (2003), Extremadura (2001), Navarra (1995, with the first invertebrate in 1996). Other regional governments are preparing their red lists or catalogues (eg. Catalonia, whose draft catalogue includes 120 invertebrate species available at http://ichn.iec.cat/pdf/PROT_INV_ICHN_2008(web).pdf) or are complementing their legislation to include invertebrates (eg. Baleares or Navarra). Baleares is publishing files on the endangered species for public dissemination including the available knowledge on the biology and distribution maps. Andalucía started an ambitious and detailed plan toward a Red Book and Atlas of Endangered Invertebrates that has been published in 2008. It includes 4 phyla, 23 orders and 114 families of continental and marine invertebrates. The government of Castilla la Mancha is also working in the Red List and Atlas of the molluscs of the community (expected to be published in 2009).

It is relevant a LIFE project in Extremadura (2003/NAT/E/000057) (2004-2007) on the Endangered Arthropods in Extremadura. It included the study of distribution, biology, conservation status and measures to be undertaken (including biotopes, monitoring, dissemination and public awareness) to conserve *Macromia splendens, Oxygastra curtisii, Gomphus graslinii, Coenagrion mercuriale, Lucanus cervus, Cerambyx cerdo y Graellsia isabelae*. The study area was the LICs (localities of special interest) in the region. It will be the basis for designing Recovery Plans on these species.

2. Bern Convention and Habitats Directive Invertebrates

With respect to the invertebrate species included in Directive 92/43/EEC (Habitat Directive), and the Bern Convention:

Austropotamobius pallipes is the only arthropod species in Spain for which regional governments have approved recovery plans (eg. La Rioja, 2000, Navarra, 1996, Aragón, 2006) or are in progress (Catalonia, Galicia). Recovery plans on the species include species distribution and/or active research plans addressed to get information on population genetics, captive breading and invasive alien species competing with this species (Catalonia, Galicia, Pais Vasco, La Rioja, Aragón and Comunidad Valenciana). Some relevant results

Margaritifera auricularia. It should be highlighted the National Strategy for the conservation of *this species* (September 6, 2007) and another National Strategy for the control the zebra mussel (*Dreissena polymorpha)*. This invasive alien species is known to occur in the Ebro river and its channels as well as in the Segura and Júcar basins. Damages on *Margaritifera auricularia* specimens have been already reported. Aragón has a recovery plan for the species (BOA, 2005) that is an important achievement for the conservation of the most dense populations of the species known to date but unless the large-scale modifications (installing lockgates, covering bottoms and slopes with concrete) that the Canal Imperial is suffering are stopped, the recovery of the species will be jeopardized.

País Vasco launched a plan to search for naiad species in the region but It could not identify any *Margaritifera* spp. population (http://www.ingurumena.ejgv.euskadi.net/r49-434/es/contenidos/informe_estudio/nayades_alava/es_doc/indice.html).

Navarra (2004-2007) and La Rioja (2005) signed agreements with Museo Nacional de Ciencias Naturales (CSIC) to carry out preliminary studies on *M. auricularia* and other naiad species in these regions. In addition the Ebro Hydrographic Confederation also signed a similar agreement (2006) for monitoring the conservation status of the species in this basin.

For ***Margaritifera auricularia***, two LIFE-Nature projects have been carried out, one coordinated by Catalonia (2000NAT/E/7328) and the other by Aragón (LIFE04NAT/E/0033).

The main results achieved by the LIFE project in **Catalonia** (2001-2004) were: 1) a detailed cartography (SIG) of the populations in Catalonia, 2) promising results for a future re-population through infestation of host fish with glochidia of the naiad, 3) establishment of methodologies and building of an experimental channel for *ex-situ* breeding and captive infestation of host fish, 4) protocols to monitor and prevent works that could negatively impact the habitat of the species, 5) inclusion in the Natura 2000 Network of the areas inhabited by the more dense populations. According to project coordinator, Núria Gázquez Prat, the invasion of the zebra mussel, *Dreissena polymorpha*, was paralleled with the unexpected stop in the emission of glochidia. This represents an important problem that continues to date. The invasion of the zebra mussel has substantially changed the water ecosystem in the lower Ebro River. Currently Catalonia is close to publish a Recovery Plan for the species and has a project to continue the works for the long-term conservation of *M. auricularia*. On December 2005 the Departament of Environment of Generalitat de Catalunya signed an agreement with the Institut de Recerca i Tecnologia Agroalimentaria for the *ex-situ* breading and captive infestation of fishes. It is also carrying out new studies on ecotoxicology and feeding of the species.

Aragón LIFE-Nature project (2004-2007) main goal was to guarantee the conservation of *M. auricularia* in the region by applying the guidelines of the Recovery Plan. It seeked to: 1) localize populations not yet discovered, 2) improve quality of the habitats both in the channels (Imperial, Tauste and Lodosa) and in the Ebro River, specially those qualified as Communitary Interest Localities, 3) apply preventive and corrective measures to eliminate potential impacts of the engineering works in the channels, 4) *ex-situ* breading and maintenance of a stock of juveniles for the reintroduction of the species in natural habitats, 5) protect and reinforce the natural populations of the threatened host fish *Salaria fluviatilis*, 6) *ex-situ* infestation of the host fish and maintenance of infested fishes *in situ* under controlled conditions ("seminatural" breeding), 7) Public awareness of the importance of conserving natural populations of *M. auricularia* in the Ebro Basin. The final report, including the discovery of new important populations is in progress.

Margaritifera margaritifera. The Community of Castilla Leon has also got a LIFE project (LIFE-03-NAT-E-000051) for the conservation of this species. It signed an agreement with MNCN (CSIC) for scientific advise (2005) on a LIC area in Zamora.

Galicia is working on a Recovery Plan for the species to be published soon. In the meantime 108 localities in 52 rivers have been prospected. Alive specimens were found in 37 localities with higher densities in the northern basins. The range of the species is therefore wider than previously reported. The project on population age structure and conservation measures will start in 2008 and currently the methodology to accomplish it is in study.

Alien species

A major concern for freshwater ecosystems in Spain derives from the recent introduction of the invasive bivalve *Dreissena polymorpha* (Zebra mussel) in the Ebro river and most recently in the Segura and Júcar rivers. The species was first detected in the year 2000. The General Directorate for Nature Conservation carried out an early assessment of the situation and a proposal for action (MMA, 2001). A task force was established with the participation of the Ministry of the Environment, Cataluña, Aragón and ENDESA (The company which runs the nuclear facility of Ascó). Research and monitoring was undertaken as well as education and awareness. Finally the Sectorial Conference has approved (September 6, 2007) a National Strategy for the control *Dreissena polymorpha*.

Other molluscs species

In the last years a vast amount of new genus and species of prosobranch hydrobiids are been discovered and described, some of them close to extinction. This rich fauna and the highly diverse habitats in which they live are seriously threatened by human activities. Urgent measures should be taken, especially at national and regional levels to preserve this biodiversity.

References

Verdú, J.R. & Galante eds. (in press). El Libro Rojo de los Invertebrados de España. Dirección General para la Biodiversidad. Ministerio de Medio Ambiente. Madrid

12. SWITZERLAND / SUISSE

Report about conservation of Invertebrates in Switzerland since 2006

National reference centre Nature Conservation and Biodiversity
Passage Maximilien de Meuron 6, CH-2000 NEUCHATEL
phone : 0041 32 7 257 257 - website : http//www.cscf.ch - email : Yves.Gonseth@unine.ch

Status overview of the Species of the Bern Convention in Switzerland

Species	occurrences (in km2)			Comment
	1980	1990	2000	
Unio mancus	6	1	17	declining
Astacus astacus	169	229	177	declining
Austropotamobius pallipes	92	303	190	declining
Austropotamobius torrentium	51	77	107	declining
Coenagrion mercuriale	7	14	32	new localities recently discovered but still at risk
Leucorrhinia albifrons	2	2	5	one of the most endangered species in CH
Leucorrhinia caudalis	5	11	13	declining (great reduction of it's occurrence area)
Leucorrhinia pectoralis	13	14	18	declining (great reduction of it's occurrence area)
Ophiogomphus cecilia	31	143	111	stable
Oxygastra curtisii	1	13	20	stable
Sympecma paedisca	5	8	4	one of the most endangered species in CH
Saga pedo	3	7	7	very local, stable
Cerambyx cerdo	8	64	24	at risk of decline (rarefaction of old trees)
Dytiscus latissimus	0	0	0	extinct, last observation 1929
Graphoderus bilineatus	0	0	3	one metapopulation in a big nature reserve
Lucanus cervus	23	54	372	still common but at risk of decline (rarefaction of old trees)
Osmoderma eremita	1	3	1	one of the most endangered species in CH
Rosalia alpina	13	34	61	apparently stable
Eriogaster catax	0	2	1	one of the most endangered species in CH
Graellsia isabellae	0	1	0	Introduced (population stable)
Hyles hippophaes	6	2	0	one of the most endangered species in CH
Proserpinus proserpinus	24	28	3	one of the most endangered species in CH
Coenonympha hero	0	0	0	extinct, last observation 1976
Coenonympha oedippus	1	0	1	one of the most endangered species in CH
Erebia christi	1	3	4	stable (habitat not threatened and protected)
Erebia sudetica	30	0	35	very local, light decline ; conservation program in progress
Euphydryas aurinia	49	123	133	apparently stable in the Prealps, declining elsewhere
Lopinga achine	33	49	122	declining at least regionaly
Lycaena dispar	0	8	46	rare but in light expansion
Maculinea arion	285	308	399	apparently stable in the Alps, declining elsewhere
Maculinea nausithous	61	80	167	apparently stable
Maculinea teleius	38	48	140	apparently stable in the Prealps, declining elsewhere
Parnassius apollo	291	371	539	apparently stable in the Alps, declining elsewhere
Parnassius mnemosyne	77	33	105	Extinct in the swiss Jura; apparrently stable in the Alps
Zerynthia polyxena	0	0	1	erratism / introduction (no stable population)

Number of grid cells (1 x 1 km) in which every species of the annex 2 has been mentioned during the two last decades. The sampling effort has not been the same for every group: very low for aquatic coleopteran it has been much more intensive for molluscs, decapoda, orthoptera, butterflies and dragonflies for example.

National revision's strategy of the red list status of species

Beginning of the program: 1999

Topics: periodical revision (every15 years) of already existed lists and publication of new ones (www.cscf.ch/page10304.html)

Based on field work (prospective sampling of never and re-sampling of already visited areas)

Established with IUCN criterias and categories

Terminated projects:

- **Odonata** (running and standing waters) revised red list published in 2002
- **Orthoptera** (scrubs, dry and humid grasslands) revised red list published in 2007

Projects being in progress:

Aquatic organisms (running and standing waters):

Mollusca (aquatic), Trichoptera, Ephemeroptera, Plecoptera;

beginning: 2002; last season of fieldwork : 2006

publication of revised (M/E) and new (T/P) red lists expected in 2008(9)

Mollusca (terrestrial) (forest, scrubs, dry and humid grasslands)

beginning : 2005; fieldwork until 2007

publication of the revised red list expected in 2010

Saproxylic coleoptera (forest, scrubs)

(Buprestidae, Cerambycidae, Lucanidae, Cetoniidae)

beginning : 2006; fieldwork until 2012

Rhopalocera (scrubs, dry and humid grasslands)

beginning: 2006; fieldwork until 2011 (2012)

Expected projects

Formicidae of the Formica group (open forests)

Soil macrofauna: (Forest, scrubs, dry and wet grasslands, agricultural land...)

Araneae, Coleoptera Carabidae, Staphylinidae

National program of designation of high priority species

Topic: analysis of the available data to propose a national set of high priority species (candidates for conservation programms at national and regional level)

Criteria: threat of every species + responsability of Switzerland for their conservation in Europe + faisability/efficiency of the potential conservation mesures)

Beginning of the program (for Invertebrate): 2005

List published on internet in 2007 (www.cscf.ch/page19391_fr.html)

It is foreseen to make periodical revisions of the already existed lists and to propose new ones on the bases of the new red lists.

Conservation program of high priority species

Period of the program: 2001-2006(7)

Topic: re-sampling of all the known sites with populations of a choice of high priority species; precise cartography of their habitats; evaluation of their population size

Species concerned:

Carcharodus lavatherae, Pyrgus onopordi, Pyrgus cirsii, Chazara briseis , **Coenonympha oedippus**, Coenonympha tullia, **Lopinga achine**, Melitaea deione, Melitaea britomartis, Iolana iolas, **Lycaena dispar**, Maculinea alcon, **Maculinea teleius, Maculinea nausithous**, Plebeius argyrognomon

Program finished. Report sent to the regional authorities (cantons). Regional conservation programs in progress.

Emerald network

(Network of areas of special conservation interest; part of the paneuropean ecological network [PEEN])

Topic: designation, with the help of the cantons, of areas that could be candidate for the PEEN

Criteria: presence of high priority species (endemic or subendemic) and/or sites of very high biodiversity (flora and fauna; especially threatened species)

Beginning of the program: 2000

Already chosen sites: 30 (lowland; already protected); will be officially proposed in 2009.

New candidates (fieldwork already done): 18 (high altitude; without protection status). Negotiations with the cantons in progress

The whole process is very long and is going very slowly forward. The main reason of this fact is the extreme prudence of the cantons that are afraid of the potential responsibilities, duties and costs (conservation measures, monitoring) linked to the Emerald network areas. As result of these hesitations, WWF Switzerland recently lodged a complaint against the state to the Council of Europe. The effectiveness of this initiative is a matter worth keeping an eye on.

National monitoring of the biodiversity (BDM-CH)

Beginning of the program: 2002

Topic: following the evolution of the species diversity of (randomly) chosen sampling units (www.biodiversitymonitoring.ch/english/aktuell/portal.php)

Diversity of the species in the country and in its regions

Scale: biogeographical regions; number of units: 6

Chosen invertebrate groups: Rhopalocera, Odonata, Orthoptera

Diversity of the species in the landscape

Scale: 1 km2; number of sampling units: 400

Chosen invertebrate group: Rhopalocera

Diversity of the species in the landscape

Scale: 10 m2; number of sampling units: 1600

Chosen invertebrate group: Mollusca (terrestrial)

Other groups expected: Plecoptera, Ephemeroptera, Trichoptera

Program in progress

Revision of the federal forest and agricultural policies

Topic: conservation and/or increase of the biodiversity of forests and agricultural land by the means of financial contributions for:

Management of chosen agricultural and forest surfaces compatible with the conservation of the wild flora and fauna

Networking of agricultural surfaces of high ecological quality and/or important for the conservation of target species (flora and fauna; invertebrates and vertebrates)

Creation of forest reserves

Management of forest areas compatible with the conservation of species having high national or regional priority (many invertebrates)

Conservation of rare forest communities/habitats

Beginning of the agricultural policy: 1993, revised (ecological quality) in 2001 (www.blw.admin.ch/themen/00006/00051/index.html?lang=fr); new qualitative and quantitative objectives are actually negotiated between Ministry of environment and Ministry of agriculture

Beginning of the new forest policy: 2007 (www.bafu.admin.ch/artenvielfalt/01020/01021/index.html?lang=en)

13. THE NETHERLANDS / PAYS-BAS

REPORT ON THE PRESENT STATE OF THE BCI'S IN THE NETHERLANDS (2008)

Reported by P. J. van Helsdingen
European Invertebrate Survey – Netherlands, Leiden, Netherlands

INTRODUCTION

For a description of the general pressures on the natural environment in the Netherlands I refer to the introductory remarks in the report presented at the last meeting (Strassbourg 2006). The Netherlands remains a country where the economic developments are thought to be of paramount importance, followed by integration of new immigrants, health care, educational system and prevention of traffic jams. Nature conservation, landscape and rural development are on the agenda too, of course, but developments are very slow. *Homo sapiens* Linnaeus, 1758 clearly is the best protected species.

BERN CONVENTION INVERTEBRATES

General situation

All BCI's that occur naturally in the Netherlands are included, through the Habitats Directive as intermediary, in the Fauna and Flora Act in the Netherlands. This officially necessitates to designate Natura 2000 sites. The Netherlands are lagging behind in establishing sites but if compared to other European countries we are not extremely slow (according to a spokesman of the Ministry of Agriculture, Nature and Food Quality). The targets of the Rio de Janeiro agreement therefore will not be reached according to schedule.

Present state of the BCI's

In general biodiversity in the Netherlands is under continuous threat. The human population is increasing, the economic activities get priority and necessitate new traffic infrastructures in their wake. Present demands for food production and biofuel result in a reversal in agricultural practises: not less land surface for agricultural production and more space for natural developments but fallow land again taken into production, with negative influence on the fauna of those areas.

Most of the invertebrates of the National Fauna and Flora Act are monitored in national programs. There are hardly any changes in their threat status to be mentioned. See table 1.

Astacus astacus is now restricted to a single site. The possibilities for introduction into nearby suitable sites are considered.

All Lepidoptera are monitored by the Dutch Butterfly Society. This year the butterfly population in general is in severe decline. This is thought to have been caused by bad breeding results in 2007 when there was an early warm period but a cold summer, an unfavorable climatic condition for this group.

A continuous monitoring program is carried out for the Stag Beetle *Lucanus cervus* which has restricted but stable populations in the eastern part of the country. *Graphoderus bilineatus* is less rare than usually assumed, but it still is classified as vulnerable.

All dragonflies are monitored yearly. The group is popular and well-studied by amateurs and professionals.

GOVERNMENTAL ACTIVITIES

National Ecological Network

Another initiative, the establishment of the National Ecological Network through the Netherlands seems to be an never ending problematic enterprise. The initiative originally was a national task but it

has been reallocated to the provincial level recently. There is general resistance from agricultural side to offer land for this purpose. The network should be completed by 2018 but it is generally expected that this deadline will be passed.

Other initiatives

The Ministry of Agriculture, Nature and Food Quality established a separate Data Authority. It is the national centre for registration of plant and animal species in a central database. It is based upon cooperation between the national NGO's and the government.

The Ministry has reserved 20 million Euro for setting up a reliable database of wild plant and animal habitats. This plant and animal database is under construction. Government agencies and construction companies can consult the database to see where endangered species are to be found.

On 22 May this year World Biodiversity Day was used for the presentation of the National Species Register of the Netherlands, now available on the Internet (http://nederlandssoortenregister.nl). It comprises all the plants and animals of the Netherlands with the exception of the unicellulates. When available pictures of the species are included. James Edwards, Executive Director of the Encyclopedia of life (EOL), came over to the Netherlands to officially accept this Dutch database and sign an official agreement for acceptance and future updating. The Netherlands are the first country which handed over its completed data set. The database was brought together under the supervision of the European Invertebrate Survey – Netherlands with the support of the national NGO's which possess databases of specific taxonomic groups.

Habitat approach

The species protection efforts of the past are replaced by a new strategy, the Habitat Approach. The

Habitat Approach aims both to protect and conserve species and to make room for economic development. The approach targets habitat areas and the groups of species they support, instead of concentrating on individual species. The habitat approach requires integration into other nature policies, particularly into the National Ecological Network. The habitat approach combined with the National Ecological Network and Natura 2000 forms a complete battle plan in the struggle to conserve plant and animal species. For this purpose 300 target species were selected.

Table 1. BCI's occurring in the Netherlands, their present status and activities. V = vulnerable, E = endangered, CE = critically endangered.

	Taxon name	*Bern*	*Status*	*Remarks*
Decapoda	Astacus astacus	BC III	nearly extinct	local introduction prepared
Coleoptera	Cerambyx cerdo	BC II	extinct	
	Dytiscus latissimus	BC II	CE	rediscovered on one site
	Graphoderus bilineatus	BC II	V	monitored
	Lucanus cervus	BC III	Rare	monitored
	Osmoderma eremita	BC II	extinct	since 1946
Lepidoptera	Coenonympha hero	BC II	extinct	monitored
	Hypodryas aurinia	BC II	extinct	monitored
	Lycaena dispar	BC II	CE	monitored
	Maculinea arion	BC II	extinct	monitored
	Maculinea nausithous	BC II	CE	monitored
	Maculinea teleius	BC II	CE	monitored
Odonata	Aeshna viridis	BC II	V	monitored
	Coenagrion mercuriale	BC II	extinct	since 1955

	Gomphus flavipes	BC II	V	monitored
	Leucorrhinia albifrons	BC II	E	monitored
	Leucorrhinia caudalis	BC II	extinct	since 1970
	Leucorrhinia pectoralis	BC II	E	monitored
	Ophiogomphus cecilia	BC II	CE	monitored
	Oxygastra curtisii	BC II	Rare	monitored
	Sympecma paedisca	BC II	V	monitored
Ephemeroptera	Palingenia longicauda	BC II	extinct	
Gastropoda	Helix pomatia	BC III	V	restricted distribution
Unionoida	Margaritifera auricularia	BC II	extinct	
Hirudinea	Hirudo medicinalis	BC III	Rare	

14. UNITED KINGDOM / ROYAUME-UNI

Bern Convention - Invertebrates Group of Experts Meeting

UK Report 2006

BERN Species

Eight invertebrate species listed in the Bern Appendices occur in the UK:

Lucanus cervus
Margaritifera maragritifera
Austropotamobius pallipes
Hirudo medicinalis
Coenagrion mercuriale
Eurodryas aurinia
Lycaena dispar
Helix pomatia

The status of all these species other than *Lycaena dispar* have recently been reported on under the Habitats and Species Directive. These reports can be found at: www.jncc.gov.uk/page-4063. *Lycaena dispar* is a re-introduction that has not so far managed to re-establish. It is monitored at its re-introduction site.

UK Biodiversity Action Plan

www.ukbap.org.uk

This is an on-going area of work that delivers action for species and habitats assessed to need urgent conservation action. Following a review in 2006/7 there are now 431 invertebrate species listed under the UK BAP, this includes five Bern Appendix species. Action for these species will be taken forward either by individual Species Action Plans or through targeted habitat action. Further details are available from: www.ukbap.org.uk/NewPriorityList.aspx

National Biodiversity Network (NBN)

www.nbn.org.uk

The National Biodiversity Network (NBN) continues to develop it's key areas of activity, standard setting, linking and using data and information. One of the key tools to make this happen is the NBN Gateway: developed to allow people to view and download biodiversity data that is being shared by participants within the NBN.

Datasets are sent by data providers and these are collated to a single database. However, data providers remain the owners of the datasets and control access to them on the Gateway.

The Gateway holds species occurrence data and GIS layers that represent the boundaries of wildlife sites (both statutory such as SSSIs and local wildlife sites) that are used to create maps and reports for a geographic area.

The Gateway database continues to grow and currently holds over 18 million occurrence records in approximately 130 datasets. These datasets have been contributed by over 50 different organisations, including government agencies, national recording schemes and local records centres.

Further setials are available from: www.searchnbn.net

Species Status Assessment Programme

www.jncc.gov.uk/species/Species_Status_Assessment/Default.htm

This is an umbrella programme designed to house all taxon conservation status assessment work – it provides a mechanism to appraise, approve and publish conservation status. The programme

works through a number of taxon specific expert groups, membership of which is be drawn from across the invertebrate conservation community. The programme determines species of conservation concern within the UK including IUCN Red List status.

Reviews of Odonata, Butterflies and Syrphidae are in press. Reviews of Araneae and Trichoptera are in prep. A review of Aculeate hymenoptera is underway and should be ready early next year.

The Biological Records Centre

www.brc.ac.uk

The Biological Records Centre (BRC) based at the Centre for Ecology and Hydrology (Monks Wood) is co-funded by JNCC and the Natural Environment Research Council (NERC). Two invertebrate distribution atlases have been published in the last two years: Aculeate Hymenoptera of Britain and Ireland: Part 6 and Fleas. A number of recording schemes now have web sites hosted by BRC with the aim of encouraging recording and natural history studies. Further details are available here: www.brc.ac.uk/hostedSchemes.htm Online recording has been trialed for some species e.g. to track the spread of the invasive alien species Harmonia axyridis details are on the web site: www.harlequin-survey.org.

Butterfly Monitoring

www.ukbms.org

The UK Butterfly Monitoring Scheme is a multi partner initiative with funding from NGO and government organisations. It was established in 1976 and has continued to develop since then. In recent years a new recording protocol has been trialed that reqires fewer visits and is suitable for a greater variety of sites across the UK. This will supplement the existing network that continues to provide regular monitoring at 120 sites.

Moths Count

www.mothscount.org

Macro moth recording in the UK has been re-invigorated with the setting up of a new initiative: Moths Count. This is led by Butterfly Conservation and funded by a consortium of NGO and government organisations.

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15. TURKEY / TURQUIE

Turkish Report

Bern Convention Group of Experts on the Conservation of Invertebrates

This report briefly represents the recent activities on the conservation of invertebrates of Turkey.

The reason why we have ignored the studies on invertebrates is largely due to the fact that their sizes are rather small, that they can hide themselves quite easily, that they can move around fast, that they live partly in water, in soil or in the tissues of plants. The failure on the observation of invertebrates is partly because of the excess number of the species of invertebrates. The availability of the observation on mammals, birds and a lot of plant species has led to the increase of our knowledge on such living organisms.

Our homeland Turkey, which possesses a rich fauna of invertebrates, has been carrying out some studies in accordance with the Bern Convention. Compared to the studies carried out on invertebrates, the studies conveyed on the above mentioned groups are worth mentioning.

When we study the information on invertebrates we conclude the following points:

1. Inventory studies is one of these. In the studies conducted by both universities and research institutions of the ministeries, the fauna of the species of terrestrial and aquatic invertebrates is being investigated. Although we have detailed information on groups such as Mollusca, Odonata, Heteroptera, unfortunately we do not have sufficient information on the other groups of invertebrates (Table 1-5). The Ministry of Environment and Forestry has already taken this particular topic into their agenda and has been planning to start an extensive inventory study on invertebrates in the near future. The availability of material records in the museums of the institutions and their transfer to the database in the light of the previous literature are retaining great importance within the framework of this study. Although there exists a database opened into access by Tubitak (The Scientific and Technological Research Council of Turkey) in this field, this database is not sufficient enough to be utilized. To compensate for this lack, **Turkish Noah's ark biodiversity database** has been initiated in 2007. But as the working conditions of the invertebrates mentioned above have been difficult, obtaining information and its transfer to the database is thus prevented.

Another step taken in this field is the **Twinning: Covenant Nature Project** realized between 2005-2007. Within the context of this project, a preliminary evaluation on Odonata and some groups of Coleoptera has been realized. It seems that this problem will not be resolved in the very near future, because the invertebrates form a large group of animals and there is not satisfactory information obtained as a result of field surveys in Turkey.

In addition, that we still do not have a **national natural history museum** is a very important deficiency in this field in Turkey. Although we have a rich material and knowledge accumulation on invertebrates both in the museums of the institutions of the ministeries and the universities, we strongly feel the absence of a national natural history museum and we have all been looking forward to the solution of this problem. Environment and Forestry Ministry has been carrying out its efforts to fill in this gap.

2. The red list preparatory studies are still going on with the contribution of **IUCN Mediterranean Office**. The first to be studied on this field are the freshwater fishes and the vascular plants. The invertebrates are among the groups to be studied afterwards. The difficulty in obtaining the sound and regularly recorded output is one of the most serious problems we have been facing in this field. It is planned that the Ministry of Environment and Forestry be in corporation with other institutions.

3. In our day where great transformations both in Turkey and the world are taking place, Nature Protection Law Draft has been arranged in line with the **Global Environment Facility (GEF-II) Project**, in order to find a reasonable solution to this problem in the best possible manner as soon as possible. After the completion of the legal procedure, it is believed that the application of Nature

Protection Law will provide us with some great convenience in the solution of some existing problems.

At a time when our EU membership is being debated and processed, we all believe that in the overcoming of such challenging problems, not only the scientists and technical staff, but also the political leaders should work together and share the required responsibility.

Table 1. The list of some animal groups and their number of species

(The Scientific and Technological Research Council of Turkey, database) (2000)

Category	Number of species
Vertebrata	1256
Tunicata	28
Protozoa	82
Invertebrata	17235
Total	**18601**

Table 2. The list of some animal groups and their number of species

(The National Strategy and Action Plan for Biodiversity in Turkey, 2007)

Category	Number of species	Number of endemic species	Rare and endangered species	Extinct species
Vertebrata				
Reptilia/Amphibia	141	16	10	-
Aves	460	-	17	-
Mammalia	161	37	23	4
Pisces/ Freshwater	236	70	-	4
Pisces/ Marine	480	-	-	-
Total (Vertebrata)	**1478**	**123**	**50**	**8**
Invertebrata				
Mollusca	522	203	-	-
Lepidoptera	6.500	89	89	-
Orthoptera	600	270	-	-
Odonata	114	-	-	-
Coleoptera	~10.000	~ 3.000	-	-
Heteroptera	~1400	~200	-	-
Homoptera	~1500	~200	-	-
Total (Invertebrata)	**14786**	**7562**	**89**	**?**

Table 3. The list of some animal groups and their number of species (2008)

Phyla	Number of species
Annelida	406
Arthropoda	24876
Bryozoa	151
Cnidaria	106
Mollusca	946
Nematoda	78
Platyhelminthes	139
Rotifera	193
Tardigrada	48
Total	**26943**

Table 4. The list of some insect orders and their number of species (2008)

Ordo	Number of species	Number of endemic species
Collembola	23	
Diplura	3	
Protura	2	
Coleoptera	8166	1508
Dermaptera	20	
Dictyoptera	50	
Diptera	1000	
Embioptera	1	
Ephemeroptera	121	
Heteroptera	1526	175
Homoptera	1500	200
Hymenoptera	2544	289
Lepidoptera	6500	89
Mecoptera	10	
Microcoryphia	5	
Neuroptera	126	
Odonata	114	
Orthoptera	600	270
Phasmatodea	2	
Phthiraptera	34	
Plecoptera	100	
Psocoptera	2	
Siphonaptera	16	
Strepsiptera	12	
Thysanoptera	180	4
Trichoptera	125	
Zygentoma	4	
Total	**22786**	**2535**

Table 5. The list of some families of Coleoptera and their number of species (2008)

Families of Coleoptera	Number of species	Number of endemic species
Alleculidae	96	36
Anobiidae	88	17
Apionidae	115	
Bostrychidae	22	
Bruchidae	85	2
Buprestidae	400	100
Byturidae	3	
Cantharidae	210	115
Carabidae	700	
Cerambycidae	750	180
Chrysomelidae	500	60
Cicindellidae	30	
Cleridae	77	8
Coccinellidae	85	
Corticariidae	22	
Cryptophagidae	21	
Cucujidae	11	
Curculionidae	664	55
Dermestidae	71	
Dytiscidae	120	
Elateridae	458	151
Euchemidae	4	
Gyrinidae	10	
Histeridae	120	6
Hydraenidae	10	
Hydrophilidae	100	5
Lampyridae	13	
Leiodidae	68	8
Lycidae	1	
Lyctidae	5	
Malachiidae	104	
Meloidae	160	15
Mordellidae	45	4
Nitidulidae	52	
Ptinidae	39	
Scarabaeoidea	658	234
Scolytidae	107	
Silphidae	22	
Silvanidae	15	
Staphylinidae	1600	400
Tenebrionidae	486	112
Trixgidae	10	
Trogositidae	9	
Total	**8166**	**1508**

Appendix 4

REPORT OF THE SEMINAR ON "SYSTEMS OF KNOWLEDGE ON INVERTEBRATES AND MANAGEMENT CHALLENGES"

A symposium for the Bern Convention Group of Experts for the Conservation of Invertebrates and invited speakers at Kongsvold 25 June 2008. Arranged by the Museums of Natural history and Archaeology, NTNU, supported by the Directorate of Nature Management, Norway and reported by Kaare Aagaard, Torbjørn Ekrem and Elisabeth Stur.

The symposium focused on the present state of zoological nomenclature and identification, data information flow from invertebrate collections and data bases, and on facilitation of data registration and invertebrate monitoring in the field.

The main topics raised by the speakers were:

- the need for a "taxonomical backbone"
- updated identification keys to the more than 100 000 species of invertebrates in Europe
- development of "barcoding" as a tool to facilitate species identification
- digitalization of data from:
  - museums collections
  - private collections
  - public observation recording schemes
  - literature
  - research institutions and programs
- presentation of information to the public
  - through national web pages
  - through exhibitions and publications
- knowledge based management
  - European Red Lists
  - Action Plans for species and localities

The first section reported activities in these fields in Nordic countries. The Swedish Species Information Centre at Uppsala has taken up the heritage after Carl Line by publishing a complete dictionary to the Nordic fauna and flora. Ulf Gärdenfors demonstrated the first five volumes on invertebrates and showed the plan for the future publication of this excellent series. The Species Information Centre also run a species reporting system based on observation from the public and support taxonomic research and museums collections in Sweden.

In most of the Nordic countries there are National Environment or Nature Research Institutes. **Ilpo Mannerkoski** from the Finnish Environment Institute (SYKE) in Helsinki talked about the invertebrate monitoring projects in Finland. A total of 3,3 million specimens and 113 species of butterflies have so far been recorded by the National butterfly recording scheme that started in 1991. The Finnish Moth monitoring scheme has recorded 5,5 million specimens and more than 700 species since 1993. Monitoring schemes of butterflies or insects in general are run in agricultural landscapes and in dry meadows. Finland has

established expert group or data bases for several invertebrate group like molluscs, spiders, flies beetles, wasps, bugs and water insects. The mussels *Margaritifera margaritifera* and *Unio crassus* are monitored.

Iceland is poor in invertebrate species and no Bern Convention invertebrate species are found. However, its dynamic landscape with eruption of new islands from sub-oceanic volcanoes give excellent opportunities to study long term colonization of barren land. **Erling Olafsson** has followed the flora and fauna on Surtsey from its eruption in 1963-67. So far, more than 360 species have be found together with 68 vascular plants, 75 mosses, 70 lichens, 24 fungi and 12 breeding bird speices.

The second section covered activities of independent European or international organisations which focus their work on invertebrates or include them.

Deborah Procter, Peterborough reported from the IUCN and its SSC (Species Survival Commission). The Invertebrate Conservation Sub-Committee (ICSC) function is to provide a structure and guidance for a pool of expert knowledge and practical expertise on invertebrate biology, assessments and conservation management, with special reference to the SSC Strategic Plan. The group is chaired by Prof. Michael Samways. ICSC works alongside existing initiatives e.g. the Mollusc and Odonata specialists groups. A European Focal point has been established, but is at an early stage in its development; anyone keen to help develop this group please get in contact (deborah.procter@jncc.gov.uk).

The IUCN Red List Unit in Cambridge have been commissioned by the EU to produce a series of European Red Lists. The invertebrate species to be covered the European Species Assessments programme are: butterflies (Rhopalocera), Odonata, non-marine Mollusca and saproxylic Coleoptera. The project officer, Helen Temple (helen.temple@iucn.org) , has started to contact invertebrate specialists and would welcome input from across Europe.

European Invertebrate Survey was founded by John Heath (UK) and Jean Leclerg (Belgium) in around 1970. The aim was to establish European centres for taxonomic groups and produce European maps of distribution. The registration of public and private collections was the main scope of the activity. **Peter J. van Helsdingen** from Leiden has been active in the project since the early years and reported both from the active groups in the Netherlands and commented the inactive phase for the International EIS. Nederland EIS is organised with a central bureau and has ambition to keep a group coordinator per taxon, a newsletter, a journal and to build up a collection of data in a database, at the moment containing 2,0 million records on invertebrates. Data are collected from private collections, museums collections, literature and fieldwork. The mission of EIS –Nederland is to bring together distribution and ecological data of as many invertebrate taxa as possible, to make available acquired knowledge in any form and to promote interest in invertebrates within the general public.

DNA barcoding is a valuable tool for taxonomy, ecology, biomonitoring and palaeolimnology

Torbjørn Ekrem, Trondheim reported briefly on what DNA barcoding is and the analytical chain, before presenting a few results from a case study on non-biting midges (Diptera: Chironomidae). He also gave an overview of the International Barcode of Life initiative (www.dnabarcoding.org) which goal is to analyse 5 million specimens and barcode 500K species within five years. Several institutions in Norway have joined this international endeavour, and have created their Norwegian Barcode of life Network (www.dnabarcoding.no). It is obvious that large barcoding projects will only work if taxonomists are actively integrated when assembling the DNA library and traditional taxonomy also is important to be able to discover errors in the analytical chain. Therefore, the

Norwegian Barcode of Life wishes to focus primarily on taxonomic groups where they have species knowledge. Also, due to our history and geographic placement, Norway also wishes to focus some effort in the Polar Regions. Thus, together with colleagues in Canada, New Zealand, USA, Denmark and Australia we have created "PolarBOLI" the Polar Barcode of Life Initiative (www.dnabarcoding.org/polar).

The third section started with reports on Global Biological Information Facility (GBIF) activities in two countries.

From Switzerland, **Yves Gonseth**, Neuchatel, reported on the GBIF influence on the links between museums and their scientific collection on one side and the role and activities of the national databanks on the other side. Focus was on data management, dataflow and collaboration between institutions. In the general context, there are two main biodiversity data resources, observation data and specimen data. There are six national databanks in Switzerland with about 6,0 million data on flora and fauna. Data resources are unpaid naturalists, national and regional monitoring projects, natural history collections, independent field studies, scientific publications, nature institute projects and academic research. The 37 natural history collections in Switzerland contain more than 42 million specimens in botanical and zoological collections. Only a small part of the potentially available information has yet been digitalized. All the 19 major institutions have agreed to publish their data online via the centralized Swiss GBIFdata node which is fully operational since 2008?

The open access to the digitalized data in museum collections in Norway is an important aspect of the Norwegian GBIF work according to **Tommy Prestø**, Trondheim. Museum data in Norway have been computerized since late 1980s. A national "Museum Project" followed by a permanent organization MUSIT has so far digitalized 45% of all natural history collections in Norway. The results are presented on the web by single museums or through the "Norwegian Biodiversity Information Centre". The data are presented on a map service system which makes it possible to ask for distributional information for a species or a group or for all recorded species in a locality or district. The map accuracy is variable down to 100m scale. The GBIF node in Norway is located at The Natural History Museum in Oslo and support at the moment 2,3 million posts.

Serdar Tezcan, Izmir, presented the richest insect collection of Turkey in Lodos Entomological Museums (LEMT). The collection is built up mainly during the last 50 years and contains about 10 000 species and 244 type specimens. The types are mostly species of Homoptera and Heteroptera. LEMT is also focused on projects of creating awareness in primary school students.

PESI or Pan-European Species-directories Infrastructure is an EU framework project within the Seventh Research Framework Programme (FP7). It is linked to several projects from FP4 to FP5 and FP6 like Fauna Europe, Species 2000, BioCASE, EDIT and MarBEF. PESI's rationale is to define a working program to carry out EDIT ambitions on the integration of European expert(ise) network and on the integration of European taxonomic information infrastructure (taxonomic backbone). The components of PESI are the communities of zoology, botany, marine and mycological experts trough a framework of experts networks, focal point networks, authority files and standards, data e-infrastructure and e-service. Taxonomical experts and national focal points will provide reliable data on taxonomy and distribution which are presented through a technical integrated infrastructure. The presentation on PESI by Yde de Young was presented by **Kaare Aagaard**, Trondheim.

Program

Chair: Torbjørn Ekrem, Museum of Natural history and archaeology, NTNU, Trondheim.

Ulf Gärdenfors, The Swedish Species Information Centre, Uppsala: The SwedishTaxonomy Initiative and the Encyclopedia of the Swedish Flora and Fauna

Ilpo Mannerkoski: Finnish Environmental Research institute (SYKE), Helsinki: Invertebrate monitoring projects in Finland

Erling Olafson, Natturufrædistofnun Islands, Reykjavik: Invertebrate colonization of Surtsey

Deborah Procter, Joint Nature Conservation Committee, Peterborough, UK: IUCN European Red List Assessments for butterflies, dragonflies, molluscs and some saproxylic beetles

Peter J. van Helsdingen, National Museums of Natural History, Leiden: "European Invertebrate Survey Nederland - or how to avoid friction in a country"

Torbjørn Ekrem, Museum of Natural history and archaeology, NTNU, Trondheim: The International Barcode of Life project and Norway's initiative in the field of DNA barcoding.

Chair: Elisabeth Stur, Museum of Natural history and archaeology, NTNU, Trondheim

Yves Gonseth, Centre Suisse de cartographie de la faune (CSCF), Musee d´histoire naturelle, Neuchãtel,: GBIF, an international initiative that has unexpected but very positive influence in the management and use of the Swiss Museum collections

Tommy Prestø, Museum of Natural history and archaeology, NTNU, Trondheim: Open access to the digitalized invertebrate data in museum collections in Norway. Presentation of results through GBIF and national WEB portals

Serdar Tezcan, Department of Plant Protection, Faculty of Agriculture, University of Aegean, Izmir.: The richest insect collection of Turkey: Lodos Entomological Museum, Turkey (LEMT)

Kaare Aagaard, Museum of Natural history and archaeology, NTNU, Trondheim: The PESI project – a Pan-European Species-directories Infrastructure, a new EU project proposal