

Strasbourg, 3 November 2011  
[files19e\_2011.doc]

**T-PVS/Files (2011) 19**

CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE  
AND NATURAL HABITATS

**Standing Committee**

31<sup>st</sup> meeting  
Strasbourg, 29 November – 2 December 2011

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**Implementation of Recommendation No. 132 (2007)  
on the conservation of fungi in Europe**

**REPORT BY THE GOVERNMENTS**

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

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## **AUSTRIA / AUTRICHE**

### **Follow-up of Recommendation No. 132 (2007) on the conservation of Fungi in Europe**

An Austrian red list was published.

An atlas of distribution is online <http://austria.mykodata.net/>

In Carinthia fungi are protected by law. [http://www.ktn.gv.at/156688\\_DE-](http://www.ktn.gv.at/156688_DE-).

In some Austrian Länder collecting of Fungi is regulated by law.

<http://www.tirol.gv.at/bezirke/innsbruck-land/umwelt-naturschutz-pilzschutzv/>

<http://www.salzburg.gv.at/pilzeschutz.htm>

**CROATIA / CROATIE****Report on implementation of the  
Recommendation No. 132 (2007) on the conservation of fungi in Europe**

Conservation of fungi in Croatia is of a recent data. It started in 1998 with the first Ordinance on Protection of Fungi (OG 79/98) designating 130 fungi species fully protected. Very important step in fungal conservation in Croatia was made by production of the *Red list of Croatian Fungi* (Tkalčec et al. 2005) that includes 349 threatened species, of which 314 are currently strictly protected. The Red List includes the following taxonomic groups:

- Division *Basidiomycota*: order *Agaricales* (in a wide sense), class *Aphyllorphales* (orders *Aleurodiscales*, *Cantharellales*, *Hericiales*, *Hymenochaetales*, *Lachnocladiales* and *Polyporales*) and the class *Gasteromycetes* in the classical sense
- Division *Ascomycota*: class *Orbiliomycetes*, class *Pezizomycetes*, orders *Eurotiales* and *Onygenales* of the class *Eurotiomycetes*, orders *Helotiales* and *Rhytismatales* of the class *Leotiomycetes* and orders *Hypocreales* of the class *Sordariomycetes*.

The Red list was followed by the study entitled “Areas of Importance for fungi as a part of National Ecological Network” (Tkalčec et al. 2005) that selected 52 areas in Croatia suitable for inclusion in the National Ecological Network (NEN), of which 43 areas were officially included in the NEN by adoption of the Regulation on proclamation of the ecological network (OG 109/07). This was then followed by the production of the *Red Book of Fungi of Croatia* (Ministry of Culture and State Institute for Nature Protection, 2008) giving detailed overview of 314 endangered and potentially endangered fungal species out of a total of 349 fungal species included in the *Red List of Croatian Fungi*.

For the moment, legal protection of fungi is regulated by the Nature Protection Act (OG 70/05, 139/08 and 57/11) and two related ordinances. One is the Ordinance on proclamation of wild fauna as protected and strictly protected (OG 99/09) where 314 endangered fungi species are listed as *strictly protected* and 32 widely distributed species from families *Boletaceae*, *Marasmiaceae*, *Russulaceae*, *Cantharellaceae*, *Hydnaceae* and *Tuberaceae* which are suitable for human consumption, are listed as *protected* and can be gathered for commercial purposes. The second one is the Ordinance on Protection of Fungi (OG 34/02) which regulates in details the gathering of *protected* species of fungi for personal needs and for the purpose of processing, trade and other businesses. Gathering of fungi can be done only upon the permit issued by the Ministry of Culture, Nature Protection Directorate. Permit can be issued only to the natural or legal persons registered for the commercial activity of gathering fungi from the wild and their activity is controlled by the nature protection inspection. Having in mind that this Ordinance is in force since 2002 it is planned to replace it with the new one in the course of 2012.

Beside the protection regime based on the strict protection or regulation of gathering, protection of fungi is also assured through the procedure of appropriate assessment of the impact of plans, programmes and projects on the national ecological network (NEN) due to the fact that 43 areas of importance for fungi are part of the NEN. According to the article 36 of the Nature Protection Act and Ordinance on the appropriate assessment of the impact of plans, programmes and projects on the ecological network (OG 118/09), appropriate assessment is obligatory for every plan, programme or project that alone or in combination with other plans, programmes and projects, could have a significant impact on the conservation objectives and on the integrity of the NEN.

## CZECH REPUBLIC / RÉPUBLIQUE TCHÈQUE

### Conservation status of Fungi in the Czech Republic

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The Czech Republic implemented the requirements of the Habitat Directive, resp. Convention on the Conservation of European Wildlife and Natural Habitats and concerned recommendations, by issuing the Ministerial Decree No. 175/2006 which is completing the list of legally protected species by adding the IV-annex species into.

The conservation status of further listed fungi was set by the Ministerial Decree No. 395/1992 as amended. According to above mentioned decree 27 species were declared **critically endangered**: *Camarops tubulina*, *Tricholoma inodermeum*, *Dermoloma josserandii*, *Hohenbuehelia abietinum*, *Rhodotus palmatus*, *Boletus fechtneri*, *Boletus regius*, *Beletus (Xerocomus) moravicus*, *Rusula helodes*, *Geastrum pouzarii*, *Bisocogniauxia simplicitor*, *Ramariopsis subarctica*, *Montagnea arenaria*, *Tuber aestivum*, *Phellodon confluens*, *Amanita caesarea*, *Amanita vittadinii*, *Floccularia straminea*, *Spongipellis fractipes*, *Agrocybe stepposa*, *Rhodocybe obscura*, *Xerula melanotricha*, *Chamonixia caespitosa*, *Marasmiellus carneopallidus*, *Pseudorhizina sphaeospora*, *Armillaria ectypa*, and *Inocybe acutella*.

In total, 13 species of fungi are listed in the Ministerial Decree No. 395/1992 as **highly endangered**: *Omphalina discorosea*, *Suillus flavidus*, *Volvariella caesiotincta*, *Ascotremella faginea*, *Amylocystis lapponica*, *Otidea concinna*, *Cortinarius nanceinensis*, *Microglossum viride*, *Hygrophorus piceae*, *Clitocybe barbulatum*, *Pseudoplectania vogesiaca*, *Hygrocybe sciophana*, and *Entoloma babingtonii*.

The following 6 fungi species are listed in the Ministerial Decree No. 395/1992 as **endangered**: *Russula alnetorum*, *Geastrum hungaricum*, *Tubaria confragosa*, *Hysterangium calcareum*, *Bovista paludosa*, and *Pholiota henningsii*.

The first version of Red list of endangered fungi species in the Czech Republic was compiled by Holec & Beran (2006), which contains altogether 119 species.

The protection of fungi species is also included in the National Biodiversity Strategy of the Czech Republic, which is the compendium of the needs, problematic issues and main objectives. The main issues of species protection are mentioned in Chapters devoted to *In situ* as well as *Ex situ* Biodiversity Conservation, Sustainable use and Identification, Monitoring of Biodiversity and Research Biodiversity strategy. The above mentioned framework strategies were incorporated also into the National strategy for Species and Landscape protection in the Czech Republic (updated in 2009), which sets priorities for the upcoming period.

Altogether three protected areas declared according to the Nature Conservation and Landscape Protection Act No. 114/1992 are designated for fungi species conservation. These are following: Luční u Tábora National Nature Monument designated for xerothermic fungi species, especially genus *Boletus* and others; and Velký vrch u Vršovic National Nature Monument designated also for protection of rare and endangered xerothermic fungi species - especially *Boletus* and *Amanita* species; Rendezvous u Valtic National Nature Monument where is a site of endangered Polyporus species like *Inonotus andersonii* (Holec & Beran 2006).

### References

HOLEC J. & BERAN M. [eds.] (2006): Červený seznam hub (makromycetů) České republiky. – Příroda, Praha, 24: 1–282.

**ESTONIA / ESTONIE**

**National report of Estonia on the Bern Convention  
Standing Committee Recommendation No. 132 (2007)  
on the Conservation of Fungi in Europe**

Authority concerned:

Ministry of the Environment  
Nature Conservation Department  
Narva mnt 7a  
Tallinn  
Estonia

## Report to recommendation no 1:

Habitat management importance is being addressed in several sectors in Estonia. In areas which are Special Protection Areas (SPAs) or Special Areas of Conservation (SACs) all proposed activities which alone or in conjunction with other activities may potentially significantly affect the Natura 2000 site environmental impact assessment is mandatory. Also outside of Natura 2000 network environmental impact shall be assessed upon application for a development consent if the proposed activity which is the basis for application for development consent which potentially results in significant environmental impact. In forestry there are minimum quotas of old dead wood on cuttings, which have been designed for the protection of species requiring dead wood (such as fungi, lichens and invertebrates). There are also special designated species protection sites for fungi in Estonia where fungi habitat requirements are especially targeted.

## Report to recommendation no 2:

Estonian species protection has been following largely Guidance for the Conservation of Mushrooms of Europe. Estonia has 46 species of protected fungi, which are divided to 3 protection categories' (9 in first category, 27 in second category and 10 in third category). And also 51 species of lichens are protected. According to the Nature Conservation act for all species in first protection category action plans shall be compiled by species experts and established by the regulation of Ministry of Environment. For species in second and third category action plans are compiled when needed. For all fungi species in first protection category and one in the second category the action plan is being compiled at the moment. As the work usually also includes fieldwork and surveys these these action plans are comprehensive documents including species biology, threats and management needs and are the bases on concrete management actions.

Mushrooms are targeted also in nature conservation areas management plans and the important sites of threatened fungi species outside of large protected areas special species protection sites. At the moment there are 33 species protection sites designated for 19 protected fungi species in Estonia and 10 sites for 11 lichen species (some sites target 2 lichen species).

Protected fungi species and their habitats are monitored in Estonia.

National red lists are regularly updated and fungi is one of the species groups assessed and the main problems indicated.

The occurrence of threatened macrofungi and indicator fungi and lichens are one of several criteria (habitat structure, stand history, occurrence of other indicator species such as insects, mosses and vascular plants) used to identify Woodland Key Habitats in Estonia.

There is also initiation to target more less studied species groups (including besides some insect and lichen groups also fungi families Russulaceae, Corticiaceae, Helotiaceae and Sordariomycetes) in scientific and species protection work.

Report to recommendation no 3:

In nature conservation work we try to involve scientists in the work we are doing- scientists are the ones giving guidance and their best knowledge for the conservation of fungi.

For the public there are many autumn “camps” all over Estonia where active mushroom pickers are guided by the best specialists in nature. They learn the habitats, edible and poisonous fungi and all picked fungi are used in exhibitions in nature museums and other similar places where nature education events are held. Such exhibitions are very popular and help raise awareness of fungi and their habitats and involve more people in fungi conservation.

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**FRANCE / FRANCE**

MINISTÈRE DE L'ÉCOLOGIE, DU DÉVELOPPEMENT DURABLE,  
DES TRANSPORTS ET DU LOGEMENT

*Direction générale de l'aménagement  
du logement et de la nature  
Direction de l'eau et de la biodiversité  
Sous-direction de la protection et de la valorisation des  
espèces et de leurs milieux  
Bureau de la faune et de la flore sauvage*

La Défense, le 15 juillet 2011

**Suivi de la recommandation N° 132 (2007) relative à la conservation  
de la fonge en Europe**

**Rappel des engagements stipulés dans la recommandation n° 132 :**

- 1. address habitat management as a priority within different sectors, for the conservation of fungi species in Europe*
- 2. take into consideration the Guidance for the Conservation of Mushrooms in Europe and apply it in the elaboration and implementation of their national conservation policies for larger fungi.*
- 3. seek to engage all who benefit from fungi in efforts to conserve their habitats.*

Le présent rapport fait un état des lieux des démarches relatives à la connaissance et à la conservation de la fonge en France s'inscrivant dans le cadre de la recommandation n°132 de la convention de Berne. Dans un souci de cohérence et de présentation générale des démarches françaises, la rédaction reprend principalement l'ordre retenu par le document « Guidance for the conservation of Mushrooms in Europe » (GCME). Chaque chapitre fait référence, soit à un point de la recommandation, soit à un chapitre du « Guide pour la conservation des champignons en Europe ».

**I- Taxonomie, index synonymiques et référentiels taxonomiques de la fonge en France.**

*Référence : chapitre 7.1 du GCME.*

La France a développé une démarche de structuration des référentiels taxonomiques, pilotée par le Muséum national d'Histoire naturelle. Concernant la flore et la fonge, l'association Tela Botanica met en place des groupes de travail pour des régions spécifiques (France métropolitaines et départements et collectivités d'outre-mer) et par groupes taxonomiques. Les différents chapitres du référentiel taxonomique sont ensuite rassemblés au sein d'un unique référentiel taxonomique pour la France : [Taxref](#). Ce référentiel est mis à jour régulièrement et est mis à disposition sur le site internet de l'Inventaire national du patrimoine naturel. Ces démarches sont soutenues par le Ministère en charge de l'écologie.



S'agissant des champignons supérieurs, un travail important a été réalisé par la Société Mycologique de France et a abouti à la publication de l'index synonymique des Basidiomycètes (COURTECUISSÉ R., 2010 : Index synonymique de la fonge de France I-Basidiomycota, Société Mycologique de France, Office national de forêts). Le second volume concernant les Ascomycètes est en cours de rédaction et doit être publié en début d'année 2012.

Ces index sont ensuite intégrés au référentiel taxonomique français (Taxref).

Ainsi, en 2011, le référentiel taxonomique français fait apparaître :

- 9 281 noms taxons de *Basidiomycota* valides ;
- 4 420 noms de taxons d'*Ascomycota* valides ;

Les autres groupes de Champignons (*Chytridiomycota*, *Glomeromycota* et *Zygomycota*) font également l'objet d'un travail d'index synonymique dont la publication est prévue en 2013.

*Nota bene* : Un tableau récapitulatif est joint à la présente note.

Les activités en matière de taxonomie concernant les champignons sont relativement limitées en France. Le laboratoire de cryptogamie du Muséum national d'histoire naturelle représente l'activité la plus importante dans ce domaine mais les activités de recherche scientifiques concernent majoritairement des territoires géographiques hors de l'Europe.

## **II- Listes rouges et listes d'espèces menacées des Champignons supérieurs**

*Référence : chapitre 7.1 du GCME.*

La France a structuré un partenariat entre le Comité français de l'UICN, le Muséum national d'Histoire naturelle ainsi que d'autres partenaires référents pour différents groupes taxonomiques en vue du développement de la liste rouge française de l'UICN. Cette collaboration a permis de structurer les démarches de listes rouges régionales (nationale et infra-nationales) et de développer des documents de référence.

La Société Mycologique de France (R. COURTECUISSÉ) a organisé un travail de cotation des champignons supérieurs selon les critères UICN (liste rouge). A ce jour, l'ensemble des espèces de Basidiomycètes a fait l'objet d'une pré-cotation et ce travail est en cours pour les Ascomycètes.

L'édition de la liste rouge des Champignons supérieurs est prévue en 2013, suite à la mise en place d'une commission de validation ad hoc.

Par ailleurs, il est à signaler quelques initiatives de listes rouges concernant des régions administratives ou des départements (Alsace, Loire-Atlantique, Nord-Pas-de-Calais, [Lorraine](#)...). Ces initiatives ne respectent cependant généralement pas les critères de l'UICN.

## **III- Programmes d'inventaires et de connaissance des champignons supérieurs**

*Référence : chapitre 7.1 du GCME.*

### **1- La prise en compte des champignons dans le cadre des programmes d'inventaires généraux :**

De nombreuses espèces de champignons supérieurs ont été inventoriées dans le cadre des inventaires des zones naturelles d'intérêt écologiques, faunistique et floristique (ZNIEFF), mais la prise en compte de ce groupe taxonomique n'est pas systématique et ne couvre qu'une partie limitée du territoire. Dans certaines régions, des champignons supérieurs font partie de la liste des espèces déterminantes de ZNIEFF (listes d'espèces et d'habitats utilisées comme critères pour définir les zones).

Le programme CARNET B (cartographie nationale des enjeux territoriaux de biodiversité remarquable) prend en compte les champignons parmi les espèces devant être inventoriées. Initié en 2010 pour une durée de dix ans, ce projet consiste à développer des inventaires de la biodiversité afin de permettre des restitutions cartographiques des enjeux de biodiversité par mailles (10kmx10km). Il a

été engagé, dans un premier temps, sur deux régions test (Centre et Lorraine) avant d'être étendu à l'ensemble de la métropole.

## **2- Les inventaires spécifiques à la fonge :**

Les programmes d'inventaires sont majoritairement mis en place par les différentes sociétés mycologiques couvrant des territoires hétérogènes. La Société Mycologique de France (SMF) encadre ces démarches.

Il est à noter que différentes structures réalisent également des inventaires en lien avec la SMF, ce sont en particulier :

- Le Conservatoire botanique national pyrénéen et de Midi-Pyrénées
- diverses sociétés linnéennes (de Bordeaux, de Seine-Maritime, de Provence...) et associations naturalistes (Charente Nature, association botanique et Mycologique du Loiret, Naturalistes parisiens, Association des naturalistes de la vallée du Loing et du pays de Fontainebleau...)

L'Office national des forêts (ONF), établissement public chargé de la gestion des forêts domaniales, anime également un réseau interne de Mycologues. Cette démarche a été mise en œuvre dans le cadre d'un partenariat avec la SMF et trois laboratoires de recherche. Une partie des activités de ce réseau concerne l'inventaire et le suivi des Champignons supérieurs. Cette action constitue un volet de la mise en place du [réseau RENECOFOR](#) en France.

Les données d'inventaire sur le territoire métropolitain ne sont pas, à ce jour rassemblées au sein d'une base de donnée unique. Il est en conséquence difficile d'estimer le nombre de données produites.

## **3- Développement des connaissances sur la biologie et l'écologie des Champignons supérieurs**

Les connaissances sur l'écologie des champignons supérieurs ont progressé ces dernières années.

Les travaux ont notamment porté sur l'identification des milieux favorables aux espèces, des démarches ont également été initiées afin de développer une connaissance plus fine, en particulier pour caractériser la présence des espèces en fonction des habitats (au sens phytosociologique). Cependant ces travaux sont encore très ponctuels et demandent une double compétence qui reste rare au sein de la communauté scientifique et naturaliste.

En France, le domaine de recherche sur la biologie des champignons le plus développé concerne le fonctionnement des symbioses plantes-champignons à travers l'étude des mycorhizes.

## **IV- Conservation de la biodiversité des champignons supérieurs**

Référence : chapitre 7.2 et 7.3 du GCME, et points n°1 et 3 de la recommandation n°132.

### **1- La prise en compte des champignons dans les politiques de protection des espaces :**

*Points n°1 de la recommandation n°132.*

#### ***a- La gestion des espaces protégés en France :***

Le réseau Natura 2000 français couvre 6,8 millions d'hectares, soit 12,4% du territoire terrestre métropolitain. Les espaces protégés bénéficiant d'une protection réglementaire forte représentent 1,23% du territoire métropolitain.

La prise en compte des habitats dans la gestion des espaces protégés est de plus en plus importante par les gestionnaires. La démarche Natura 2000 a particulièrement permis de faire évoluer les approches en matière de gestion, ce qui permet une approche plus globale des enjeux de biodiversité, notamment, la prise en compte des groupes taxonomiques mal connus dont font partie les champignons supérieurs.

#### ***b- La prise en compte des champignons dans les politiques de gestion des espaces naturels :***

La France n'a pas initié de démarche en vue d'identifier les territoires importants pour la conservation de la biodiversité des champignons supérieurs à ce jour. Cette démarche n'est pas considérée comme réalisable en l'absence d'outils adaptés (notamment de liste rouge).

Néanmoins le réseau des ZNIEFF (Cf. III-1) inventorie les espaces à enjeux écologiques particuliers prenant notamment en compte la fonge.

Les collaborations ont tendance à se développer entre gestionnaires d'espaces naturels et spécialistes de la fonge afin de prendre en compte ces enjeux dans la gestion des milieux naturels.

De telles initiatives ont été mises en place par l'ONF (RENECOFOR), le Conseil général de Seine-Saint-Denis pour la gestion des espaces verts, diverses réserves naturelles nationales et régionales et Parcs nationaux.

## **2- La protection réglementaire des espèces et l'utilisation raisonnée des ressources :**

*Points n°2 de la recommandation n°132.*

Il n'y a pas d'espèces de champignons supérieurs à ce jour strictement protégées en France (certains Lichens sont cependant protégés au niveau régional). Néanmoins, tous les taxons de champignons non cultivés sont soumis à une réglementation, mise en œuvre par arrêtés préfectoraux sur la base de l'arrêté ministériel du 13 octobre 1989 modifié. Cette réglementation a pour objectif de maintenir les ressources et rétablir ou éviter de porter atteinte à l'état de conservation des espèces. Les arrêtés définissent les parties ou produits des espèces soumis à réglementation, les modalités, les parties du territoire ainsi que les périodes où la réglementation s'applique. Les mesures de police administrative s'appliquent indifféremment au propriétaire, gestionnaire, simple promeneur ou ramasseur professionnel.

Dans la pratique, les arrêtés préfectoraux définissent un volume maximal de champignons pouvant être récolté par personne et par jour. Cette réglementation est mise en œuvre pour l'ensemble de la métropole.

## **V- Les réseaux de mycologues professionnels et bénévoles**

*Référence : chapitre 7.5 du GCME.*

Ce sont en premier lieu les sociétés mycologiques et associations apparentées qui représentent le réseau des mycologues amateurs. La Société Mycologique de France a récemment estimé que le nombre de sociétés mycologiques était d'environ 270 en France, comprenant entre 10 000 et 12 000 membres. Il existe par ailleurs 4 fédérations de sociétés mycologiques (Fédération des associations mycologiques méditerranéennes ; F.A.M. de l'Ouest ; F. mycologique et botanique du Dauphiné-Savoie ; F. mycologique de l'Est).

Plusieurs organismes ont une activité professionnelle en relation avec la Mycologie. Ce sont des structures de recherche scientifique (universités, laboratoires scientifiques) ou des structures en charge de la conservation de la biodiversité et gestionnaires d'espaces naturels (Conservatoires, associations, ONF...).

S'agissant des organismes de recherche scientifique, les principales structures développant une activité concernant la biodiversité de la fonge (à titre principal ou secondaire) sont :

- le Centre d'écologie fonctionnelle et évolutive (Université de Montpellier) ;
- l'Université Paul-Sabatier à Toulouse (domaine de l'écologie des Champignons) ;
- la Faculté des sciences pharmaceutiques et biologiques – Université de Lille II ;
- le Muséum national d'Histoire naturelle – laboratoire de cryptogamie (taxonomie, écologie, collections...) ;
- l'Institut national de recherche agronomique ([INRA de Bordeaux](#)) ;
- [l'INRA de Nancy](#) ;
- l'INRA de Marseille.

Certaines de ces structures organisent des diplômes universitaires en Mycologie. De nombreuses formations continues sont également organisées par les sociétés mycologiques locales.

**VI. Eléments de bibliographie :**

*Référence : chapitre 7.4 du GCME.*

Courtecuisse R. Lécure C. Moreau P.-A., Les espèces déterminantes du Nord-Pas-de-Calais. *Bull. Soc. Mycol. Nord Fr.* 78 p.55-75.

Courtecuisse R. 1992, Programme d'inventaire mycologique national et de cartographie des *Mycota* français.

Courtecuisse R. & Duhem B. – 2011 – Guide des champignons de France et d'Europe. 3<sup>ème</sup> édition revue et augmentée.

Editions Delachaux & Niestlé (La Martinière)

Corriol G. 2004, Méthode d'intercalibration, programme RENECOFOR – Réseau « mycologie », Bellême, 23-25 sept. 2004

Eyssartier G. & Roux P. – 2010 – Le guide des champignons, France et Europe. Editions Belin (partenariat SMF).

Guinberteau J. – 2011 – Le petit guide des champignons des dunes. Editions Confluences (Bordeaux)

Laurent P. 2003, Liste rouge des champignons d'Alsace, in « Les listes rouges de la nature menacée en Alsace » Odonat, p. 276-335.

Roux P. – 2006 – Mille et un champignons. Edité à compte d'auteur.

***Revues scientifiques :***

Cryptogamie ; revue éditée par le Muséum national d'Histoire naturelle.

Les documents mycologiques ; revue éditée par la Société Mycologique du Nord de la France.

De nombreuses autres revues ou bulletins sont édités par les sociétés ou fédérations.

## GEORGIA / GÉORGIE

### Fungal Biodiversity of Georgia and its Conservation Issues

According to the mycological and phytopathological literature and other sources, up to 6500 species of fungi are recorded in Georgia. Taking into account unpublished but identified materials real figure exceeds 7000. However, it is assumed, that the number of fungal species 5 time exceeds the number of native plants (hawksworth, 1991b, 1997). Than there are approximately 20 500, (number of species of vascular plants 4100 x 5) species of fungi, which means, that there are 13 500 more than known in Georgia.

Peronosporales, Taphrinales, Erysiphales, Uredinales, Ustilaginales, Agaricales, Ganodermatales, Fistulinales, Hymenochaetales, Poriales, Russulales, Lycoperdales, Phallales, etc, as well as some genera of mitosporic fungi are groups of fungi, that have been studied more thoroughly than other groups in terms of species composition.

Unfortunately, scientific data is not available on representatives of such mycorrhizal genera as *Endogone* and *Glomus*. The data on Laboulbeniales and all entomogenous and hypogenous fungi is very scarce. The same applies to lichenicolous and muscicolous fungi and freshwater species (Ingoldian fungi).

Macrofungi are more important from mycobiotic complexes of forest ecosystems, since many of them are mycobionts, old forest indicator species and have conservation value. Among macrofungi "Agarics" (Agaricales, Boletales, Cortinariales, Poriales, Russulales, Schizophyllales) are the perfect example of this. Such ecological groups of macrofungi as mycorrhizal (81 species), lignicolous ("xylophilic") (128 species), letter saprotrophs (132 species), humus saprotrophs (91 species) etc. are found in Georgia.

The number of species of mycobionts connected with their phytobionts are as follows: *Fagus orientalis* -81; *picea orientalis* – 73; *Quercus iberica* – and other species – 43; *Pinus kochiana* -33; *Abies nordmanniana* -14; *Betula* spp- 4; *Populus tremula* -4 .

There are approximately 200 species of edible fungi reported in Georgia; more than 50 species belong to poisonous or are regarded as suspicious or conditionally suspicious. It is worth mentioning that over 80 macrofungi has original local names in Georgia. From the given number of edible fungi species mainly consume approximately 30 species. Three species are known to be used in folk medicine: *Bovista nigrescens*, *Inonotus obliquus*, *Phalus impadicus*.

Some data is available on changes in fungal diversity in Georgia and other places. It is stated that, about 600 species of microfungi (Agaricales s.l.) are reported in Georgia and about 140 species were not revealed (again re-found). Of course, threats to fungi in Georgia are similar to those in other countries. Consequently, worldwide experience must be taken into consideration. At present, there is no special list of endangered fungi for Georgia. Although, the following ten species of fungi from Georgia were included in Red Data Book of USSR (1984). *Amanita caesarea*, *Clathrus ruber*, *Clavariadelphus pistillaris*, *Grifola frondosa*, *Hericium coralloides*, *Mutinus caninus*, *Pseudocolus fusiformis*, *Sparassis crispa*, *Strobilomyces floccopus*, *Tuber aestivum*. It is clear, that this number is not realistic. In reality over 100 species of macrofungi should be included in Red list of Georgian Fungi.

The database has been created including Georgian fungus (about 1100 species). The personnel of the Institute of Botany are involved in the compilation of electronic maps of Georgian fungus, which is available on the web-site: [www.cybertruffke.org.uk](http://www.cybertruffke.org.uk).

In parallel with this activity a checklist and preliminary Red list of Fungi of Georgia should be compiled according to IUCN category and using methodology and approaches proposed by European experts.

In addition, public educational activities must be undertaken to raise awareness on the role and significance of fungi in ecosystems and for mankind and what actions need to be taken in future. The efforts must focus on specialist training, including training of field mycologists for protected areas. The preparation of preliminary list of species to be included in red List of fungi of Georgia is in process.

Dry collections of fungi of Georgia are stored in the Herbaria of Janashia State Museum (TGM), Ketskhoveli Institute of Botany (TBI) and Khanchaveli Institute of plant protection (TBIP). These collections also comprise important specimens (incl. type material) from Caucasus, Iran, Turkey, Russia and Europe.

## **HUNGARY / HONGRIE**

### **SHORT REPORT ON THE CONSERVATION OF FUNGI IN HUNGARY**

Legal conservation of mushrooms was launched in 2005 when 35 macrofungi species were included to the list of protected species. Thus all of detailed measures that assigned in the Act No.LIII. of 1996 on Nature Conservation are applied for this species too.

According to the new Act No. XXXVII. of 2009 on Forests, Protection of Forests and Management of Forests the collecting of forest goods including Fungi could not threaten the biodiversity and the communities of the forests. The forest manager has to allow the collection for personal needs, but above this amount it is allowable only with the consent or permission of forest managers. The hypogeous macrofungi (i.e. truffles) could be collected only with the permission of forest managers. A detailed regulation were elaborated for the determination of conditions of hypogeous fungi collection. Regarding mushrooms it is notable, that for the conservation of protected species the forest authority could restrict or could forbid i.e. the removal of dead wood.

Many of actions mentioned in the Guidance for Conservation of Mushrooms are realized by NGOs (mainly by Hungarian Mycological Society) with governmental financial support. Among others short leaflet guidances were published in 2009 about the sustainable collecting of mushrooms (Codex of collecting wild mushrooms; Tips for mushrooms collecting – In favour of the protection of mushrooms' habitats and productivity). A programme was implemented on volunteer basis for collecting the georeferred data of protected mushroom species. Two study-aids about Fungi were published for using of elementary and secondary schools.

## **LATVIA / LETTONIE**

### **Recommendation No 132 (2007) On the conservation of Fungi in Europe**

*Recommends that Contracting Parties:*

- 1. address habitat management as a priority within different sectors, for the conservation of fungi species in Europe;*
- 2. take into consideration the Guidance for the Conservation of Mushrooms in Europe and apply it in the elaboration and implementation of their national conservation policies for larger fungi.*
- 3. seek to engage all who benefit from fungi in efforts to conserve their habitats.*

Fungi Red Data book for Latvia was published in 1997

62 fungi species are included in the list of strictly protected species list adopted by Cabinet of Ministers Regulations No 396 “Regulations on strictly protected species list and list of protected species with exploitation limitations”

Fungi conservation is integral part of habitat (protected nature areas and micro-reserves concept) conservation. Existing habitat conservation provides good background for fungi conservation as well for sustainable use of fungi species used by humans.



## MALTA / MALTE

### MALTA'S NATIONAL REPORT ON THE IMPLEMENTATION OF RECOMMENDATION NO. 132 (2007) ON THE CONSERVATION OF FUNGI IN EUROPE

Strict legal protection was afforded in 2006 to the following two species: *Boletopsis grisea* and *Sarcosphaera coronaria* [= *Sarcosphaera crassa* ]. The “Flora, Fauna and Natural Habitats Protection Regulations, 2006” (Legal Notice 311 of 2006, as amended) prohibits via Regulation 24, the deliberate picking, collecting, cutting, uprooting, destruction/damage, keeping, and/or trading of any specimen of these two species. In addition all endemic species are also protected under Regulation 26 of the same legal notice. The exploitation of *Pleurotus eryngii* is regulated on the other hand via Regulation 27 of the same legal notice.

The first assessment of the status of fungi in the Maltese Islands was done in 1989 and published in the national Red Data Book, which addressed 18 species of macrofungi and listed 131 microfungal taxa. The conservation status of these taxa however would need a re-assessment. The status of fungi was partly assessed more recently by the 2005 State of the Environment Report for Malta under the indicator “Status of Selected Groups of Species”. With regards to fungi, the following is documented: ‘Many species are confined to a few areas, particularly forest remnants and selected garigue sites, of which a good number are protected. Nevertheless, the increase in human disturbance in a number of areas has led to a possible decline in mycoflora .... However limited population assessments have been carried out on these species.’

Individual species of fungi are not in themselves threatened locally, since there is very limited trade in wild mushrooms, essentially limited to the edible *Pleurotus eryngii* var. *ferulae*. Indeed, the main concern with fungi in Malta lies with habitat loss/modification rather than exploitation. The most effective approach to the conservation and protection of fungi in Malta is through habitat conservation. A number of important mycological sites have been designated whether as scheduled areas (i.e. as areas of ecological importance [AEI] and/or sites of scientific importance [SSI]) and/or as protected areas. Some areas are also covered by more than one designation. Some sites have indeed gained their protected status partly due to the fungi they support.

## MOLDOVA / MOLDOVA

### The conservation of fungi in Moldova

The natural biological diversity of the Republic of Moldova is strongly influenced by its geographic position. The territory of the republic is situated at the interference of three biogeographic zones; Central-European zone – represented by the Central Plateau of Codrii (54,13 % or 18,3 thousand km<sup>2</sup>); Euro-Asiatic zone – represented by the regions of forest steppe and steppe ( 30,28 % or 12,23 thousand km<sup>2</sup>); Mediterranean zone – fragments of xerophytes forest steppe in the southern part of the republic (15,59 % or 5,27 thousand km<sup>2</sup>).

The biodiversity is vast at all levels of living material organization – genotype, population, genome, biocoenosis, ecosystem and landscape the biodiversity of agricultural plants and domestic animals (intraspecific, specific, agrosystemic) is very vast.

The natural ecosystems, including aquatic ones (lacustrine, paludous, river), cover only about 15 % of the republic. These ecosystems are fragmented and situated adjacent to anthropically modified ecosystems (agricultural and urban), the level of their degradation is very high. The majority of species occur at the boundary of their biogeographical zones, which increase their vulnerability to impacts.

The nature protection system in the Republic of Moldova is regulated according to the following law codes, decisions and decrees in the field of nature protection, biodiversity and forest management. The most important pieces of law are:

- The 1993 Law on Environmental Protection; and in particular Chapter 6, section 5, devoted to biodiversity and nature monument protection;
- The 1995 Law on Protection of the Animal Kingdom;
- The 1995 Law on Zones and Strips for Rivers and Water Basins Protection;
- The 1998 Law on Protected Areas;
- The 1993 Law on Cultural and Natural Monument Protection;
- The 2005 Law on the Red Book of the Republic of Moldova;
- The 2007 Law on the National Ecological Network;
- The 2007 Law on the zoological gardens.

The Law on Vegetal Kingdom (2008) is the regulation of general relations in the sphere of protection, use and restoration of the spontaneous plants and other vascular plants which don't have agricultural destination, mosses, algae, lichens, as well **as mushrooms**, their communities and growing places.

Assurance of the vegetal kingdom protection is ensured by:

- establishment of rules and protection norms, use and restoration of the vegetal kingdom items;
- prohibition and limited use, in case of necessity, of the vegetal natural resources;
- organization of scientific researches, directed to the application of measures of protection of the vegetal kingdom items;
- information system development concerning the vegetal kingdom items and citizens training to have an adequate attitude towards them;
- inclusion of rare and endangered species in the Red Book of the Republic of Moldova.

The country's flora is diverse. It has 5513 plant species: vascular plants -1989 species, non-vascular plants -3524. According the floristic composition forest ecosystems are the richest, followed by steppe ecosystems.

***Mycophyta species*** (1200 species) form the natural ecosystems of the Republic of Moldova are not studied enough. The macromycetes make up more than 400 species, including: Basidiomycetes – 363 species and Ascomycetes – 52 species. The majority of them populate the forest ecosystems biotopes. About 70 mushrooms species are comestible. The main cause of Mycophyta biodiversity diminution is the impact of the human factor, expressed by habitats destruction and pollution.

The Red Book of the Republic of Moldova (second edition) includes 242 species: 117 plant species, **9 mushroom** species and 116 animal species.

The present edition of the Red Book of the Republic of Moldova logically and conveniently adds to the aggregate of international obligations of our state. This time we give a new list of species taken under state protection, at the same time, substantially revising the plants and animals status, according to the Classification of the International Association for Nature Conservation (IUCN).

The current edition of the Red Book is a document, elaborated on a solid scientific base, in which the actual state of critically endangered and vulnerable species of wild fauna and spontaneous flora are characterized. Thus the prognostication and elaboration of certain concrete actions as to the conservation, reproduction and rational development of these species will become possible.

Each species of animals or plants is reserved a page in the book which includes the Latin and Romanian term, the species picture, the map with the spreading area in the republic, the description of the species – status, spreading, habitat, quantitative aspect, limitative factors, biological particularities, reproduction in captivity (for animals), cultivation( for plants), state and protection measures and sources of information.

<b><i>Micofite Mycophyta</i></b>			
<b>Nr.</b>	<b>Specia Species</b>	<b>Familia Family</b>	<b>Cat.rarității State of endanger</b>
1	Boletus aereus Fr. - Hrib arămiu	Boletaceae	VU
2	Hypoloma thrausta (Schn.ap Kalchbr.) Urbn. - Hifolomă traustă	Strophariaceae	EN
3	Phylloporus rhodoxanthus (Schw.) Bres. - Filopor roz-galben	Boletaceae	VU
4	Amanita muscaria (Fr.) Hook. - Amanită-de-muscă	Amanitaceae	VU
5	Amanita solitaria (Fr.) Secr. - Amanită solitară	Amanitaceae	VU
6	Morchella steppicola Zer. - Zbârciog-de-stepă	Morchellaceae	VU
7	Clavariadelphus pistillaris (Fr.) Donk. - Clavaridelf pistilar	Clavariaceae	VU
8	Hygrophorus mesotephrus Berk et Br. - Higrofor mezotefru	Hygrophoraceae	EN
9	Mutinus caninus Fr.- Mutin canin	Phallaceae	VU

It is being elaborated the 3rd edition of the Red Book of the Republic of Moldova.

Also, the Law on Protected areas includes lists of protected species of mushrooms.

	<b><i>Fungi</i></b>	<b><i>Ciuperci</i></b>	<b><i>Грибы</i></b>
1	Amanita muscaria (Fr.) Hook	Amonită de muscă	Мухомор красный
2	Amanita solitaria (Fr.) Secr.	Amonită solitară	Мухомор одиночный
3	Boletus aereus Fr.	Hrib amăru	Болетус темно-бронзовый
4	Boletus regius Krombh	Hribul-rege	Болетус королевский
5	Calocybe ionides (Fr.) Kiinn	Nicolete violet	Калоцибе лиловатый
6	Clavariadelphus pistillaris	Claviariadelf	Клавариадельфус пестиковый
7	Cortinarius rickenianus R.Mre	Cortinarul-richeni	Патинник рикени
8	Hygrophorus mesotephrus Berk.Br.	Higrofor mezotefru	Гигрофорус мезотепфрус

9	<i>Hypholoma thrausta</i> Schulz.(Kolchb.) Mrbn.	Hifolomă traustă	Гифолома трауста
10	<i>Laccaria amethystea</i> (Bull.) Murrill	Lacarie ametistină	Лакария светло-лиловая
11	<i>Lactarius volemus</i> (Fr.) fr.	Lăptică dulce	Подмолочник
12	<i>Leucopaxillus giganteus</i> (Fr.) Sing.	Leucopaxil gigant	Леукопаксилус гиганский
13	<i>Melanoleuca grammopodia</i> (Fr.) Pat.	Melanoleucă gramopodă	Меланолейка коротковатоножка
14	<i>Morchella steppicola</i> Zer.	Zbîrciog de stepă	Сморчок степной
15	<i>Mutinus caninus</i> Fr.	Mutin canin	Мутинус собачий
15	<i>Phylloporus rhodoxantus</i> (Schw.) Bres.	Filopor rodoxant	Филопор красно-желтый
16	<i>Russula melleolens</i> Quel.	Hulubiță de miere	Сыроежка медовая

In 2005 the Ministry of Environment with financial assistance of the World Bank and regional Environmental Center has published a series of books "The vegetal and animal kingdom of Moldova". A separate volume of this collection is dedicated to the species of fungi.

If in the Red Book is presented the endangered and vulnerable species, the collection "The vegetal and animal kingdom of Moldova", quasi-integral describes the flora and fauna of the republic in ecological terms of species in decline and the species with a satisfactory environmental status, but need to be known and protected by society.

In Moldova there are a lot of professional mycologists, working in the Institutes of the Academy of Science of Moldova, but there is a single professional mycologist specializing in macrofungi, Doctor Ștefan Manic, the director Scientific Reserve "Codrii". Currently Mr. Manic elaborate the study "Macrofungi from the Republic of Moldova".

## NORWAY / NORVÈGE

### Report from Norway on Rec. No. 132 (2007) on the conservation of fungi in Europe

Referring to the follow-up of Recommendation no 132 (2007) to the Contracting Parties of the Bern Convention, to:

- *Address habitat management as a priority within different sectors, for the conservation of fungi species in Europe;*
- *Take into consideration the Guidance for the Conservation of Mushrooms in Europe and apply it in the elaboration and implementation of their national conservation policies for larger fungi; and*
- *Seek to engage all who benefit from fungi in efforts to conserve their habitats;*

We will give some information related to this theme in the following:

Norway has rather recently issued an updated Red List of Species (2010). Red-listing of fungi mainly concerns macrofungi that is macroscopically easily visible species. Among plant parasites rust and smut orders have also been assessed (Pucciniales and Ustilaginales). Woodlands are by far the dominant habitat for fungi in Norway in general, followed by certain types of extensively managed agricultural habitats.

A number of Red-listed lignicolous species are more or less strictly confined to specific tree species, especially large numbers being associated with spruce, pine or aspen, and some are also strictly confined to oak.

The most important hotspot habitats for mycorrhizal fungi are calciphilous lime woodlands, low-herb oak woodlands, lime-hazel scree woodlands, calciphilous pine woodlands and calciphilous spruce woodlands.

More rare or demanding species of grassland fungi often grow together on small hotspots in meadows, typically with a long grazing continuity, no fertilizer and on calcareous soils.

The most important hotspot habitats for soil saprotrophic fungi are calciphilous dry meadows and calcareous rock outcrops.

For the Red List of fungi in Norway 3011 species have been evaluated, with a further 1979 species sorted as NE (not evaluated, mainly due to limited available data) or NA (not applicable or unsuited for evaluation). The 2010 Red List for fungi contains 900 species, of which 418 are classified as threatened (CR, EN or VU), and 302 as near threatened (NT). 177 were designated as DD (data deficient) and three were regarded as regionally extinct (RE). There are 298 species of lignicolous fungi on the 2010 Red List, 118 grassland fungi, 259 mycorrhizal fungi and 226 soil saprotrophic fungi.

An outline of the impact factors on the fungal flora in Norway can be found in Kålås, J.A., Viken, Å., Henriksen, S. & Skjelseth, S. (eds.) 2010. The 2010 Norwegian Red List for Species. Norwegian Biodiversity Information Centre, Norway, pp. 95-99.

Norway has also recently issued the first attempt to red-list nature types, ref. Lindgaard, A. & Henriksen, S. (red.) 2011. Norsk rødliste for naturtyper 2011. Artsdatabanken, Trondheim. [in Norwegian]. To some degree the population trend for fungi in selected nature types where fungi constitutes a major part of the biodiversity, has been decisive for the redlisting of these nature types.

Norway passed a new general legislation on biodiversity in 2009, - Act of 19 June 2009 No. 100 relating to the management of biological, geological and landscape diversity (Nature Diversity Act). Some of the main sections which impact the management of the fungal flora in Norway include:

Section 4 gives the management objectives for habitat types and ecosystems, while section 5 gives management objectives for species. Section 9 gives provisions for the precautionary principle, while section 10 describes the ecosystem approach and cumulative environmental effects. Section 13 gives quality norms for biological, geological and landscape diversity. Section 15 gives principles for species management, and sections 21 gives details for regulating removal of plants and fungi. Section 23 gives provisions for designating “priority species”. Section 33 gives objectives relating to protected areas, and section 47 describes the management of protected areas. Section 52 gives provisions for “selected habitat types”.

Since 2006 the Norwegian Directorate for Nature Management has worked out and implemented a number of Action Plans related to individual species, groups of species or habitats. Typically, these Action Plans last for five years, after which an evaluation if the Action Plan has reached its goals is being made. Relating to fungi, the following Action Plans will be more or less relevant:

Two Action Plans are directly concentrating on fungus species:

- Only one Action Plan has so far been initiated for a particular fungus species, that is *Pycnoporellus alboluteus*. This species might be proposed as a “priority species” under the Nature Diversity Act in the near future.
- Another Action Plan is dealing with a large group of fungi, having in common that they are more or less confined to grazing meadows. Under this plan 65 red-listed fungus species are focused, representing the following genera: *Camarophylloopsis* (2 pp), *Clavaria* (8 spp), *Clavulinopsis* (1 sp), *Dermoloma* (3 spp), *Entoloma* (28 spp), *Geoglossum* (3 spp), *Hygrocybe* (14 spp), *Microglossum* (3 spp), *Porpoloma* (1 sp) and *Trichoglossum* (2 spp). Preliminarily, 21 of these species are proposed as candidates for “priority species” under the Nature Diversity Act, with species-specific regulations. However, the decision as to the feasibility of this proposal will probably lay some years ahead.

A number of Action Plans on nature types has fungi as a major, or at least significant, reason for selecting them:

- Old, hollow oaks. A number of red-listed lignicolous fungi uses oak as substrate. This nature type passed as one of the first “selected habitat types” under the Nature Diversity Act in Norway, in May 2011.
- Calciophilous linden forests. A major part of the biodiversity associated with this nature type are lignicolous fungi, as well as mycorrhizal fungi and soil saprotrophic fungi. This nature type also passed as one of the first “selected habitat types” under the Nature Diversity Act in Norway in May 2011.
- Traditional, unfertilized hayfields. Also in this nature type there are a large number of red-listed fungi, particularly, and naturally, of grassland fungi. Again, this nature type has passed as one of the first “selected habitat types” in Norway.
- Traditional hayfields in bogs and mires. This nature type contains, to a lesser degree than the foregoing, some red-listed fungi. Also this type has passed as a “selected habitat type” in Norway.

Lastly, there are a few other Action Plans on nature types that to a various degree include red-listed fungi:

- Open, shallow calcareous ground in the Oslofjord area (several red-listed fungi)
- Special sandy areas in the inland (a few red-listed fungi)
- Coastal heathlands (a few red-listed fungi)
- Rich, wetland forests (a few red-listed fungi)
- Coastal pine forests (a few red-listed fungi)

We believe the general Norwegian system of species protection (where no fungus species are included so far), and the regulation and management plans for various types of protected areas (ranging from National Parks to Nature Reserves) are adequately well known to the Bern Convention.

## POLAND / POLOGNE

The report was prepared on the basis of Recommendation no. 132 (2007) on the conservation of fungi in Europe. Adopted on 29 November 2007 by the Standing Committee of the Bern Convention, the Recommendation commits the Parties to the Convention to implement proper management of fungi natural habitats as a priority in different sectors. The Signatories should also consider the guidelines attached to the Recommendation concerning the conservation of macrofungi (*Guidance for the Conservation of Mushrooms in Europe*) while developing and implementing national fungi protection policies as well as involve in the conservation all the sectors which benefit from fungi collection.

Poland was the first country which introduced species conservation of fungi in 1983 in Europe.

### 1. Legal acts which regulate the conservation of fungi:

- The Nature Conservation Act of 16 April 2004 (Journal of Laws of 2009 no. 151 item 1220, as amended)
- Regulation of Minister of the Environment of 9 July 2004 on wild fungi species under protection (Journal of Laws of 2004 no. 168 item 1765)

The Regulation distinguishes the wild fungi species under:

- special protection (52 taxa of fungi and 57 taxa of lichens); these species are specially protected against: picking, total or partial damaging; damaging their natural habitats; changing of water conditions, using chemical substances, damaging forest bed and soil in their habitats; harvesting, collection, storing, possessing, dissecting or processing whole fungi or their parts; selling, purchasing, offering for sale, exchange or donation of fresh, dead, processed or dissected fungi, their parts or derivative products; exporting or importing fresh, dead, processed or dissected fungi, their parts or derivative products.
- partial protection (one fungi species – *Inontus obliquus* and nine species of lichens) including the species which can be harvested and the ways of their harvest

These rules also regulate which of the aforementioned fungi species require delimitation of protected zones in their locations (4 lichen species).

Moreover, the Regulation determines prohibited activities concerning particular species and groups of species, exceptions to these activities and methods of fungi conservation. The Regulation provides certain exceptions from the prohibited activities. It is also possible to receive individual exceptions issued on the base of the Nature Conservation Act.

- The Forest Act of 28 September 1991 (Journal of Laws of 2011 no. 12 item 59)  
The Act introduces a ban on damaging fungi and mycelium. It is allowed, however, to collect fruits of the forest, e.g. fruiting bodies of edible mushrooms without signs of decay, excluding specified locations. Collection of mushrooms is allowed for individual needs as well as for industrial purposes (pursuant to an agreement with the forestry commission), according to the Ordinance below.
- Regulation of Minister for Environmental Protection, Natural Resources and Forestry of 28 December 1998 on the detailed rules of protection and harvest of fruits of the forest and principle of apiary location in forest areas (Journal of Laws of 1999 no. 6 item 42).

### 2. Red lists of endangered species

The publication entitled “Red List of Plants and Fungi in Poland” (Z. Mirek, K. Zarzycki, W. Wojewoda, Z. Szeląg (ed.) Instytut Botaniki PAN, Kraków 2006) includes the latest red lists of fungi in Poland. On “Red list of macrofungi in Poland” there are 963 species which are endangered in Poland. “Red list of lichens in Poland” includes 886 species. “Red list of rare slime molds in Poland” includes 82 species that have been rarely reported in Poland (1-5 reports).

### 3. Educational activities

In order to promote knowledge and scientific achievements in the field of fungi conservation in Poland various meetings, seminars or conferences are held. A few examples are listed below:

- On 13 April 2011 in a scientific seminar **"Fungi Conservation in Forest Areas"** was held in Poznań where the topics of threats to fungi and fungi conservation on national and international level were discussed. The seminar was organized by the Polish Forest Society as a part of the "Scientific Bases for Flora, Fungi and Endangered Animals Protection in Forest Areas" cycle. The main aim of the seminar was to promote the most important scientific achievements in this field. Among other topics, the methods of fungi protection in environmentally valuable areas and *ectomycorrhizal fungi conservation were discussed*.
- On 10-12 September 2009 **Mycological Section of the Polish Botanical Society** seated in the Department of Mycology of the University of Warmia and Mazury in Olsztyn organized the Polish Mycological Symposium "Interdisciplinary Nature of Mycology" in collaboration with the Olsztyn branch of the Polish Botanical Society. The aim of the symposium was to make insight into mycological research conducted in Poland in various disciplines and scientific fields which use fungi as their research material: from biology and biotechnology, through phytopathology, hydromycology, medical and veterinary mycology to political sciences. During the Panel Discussion an initiative group was established (from 8 academic centres) in order to prepare all the formal stages for establishing the **Polish Mycological Society**.
- The Polish Ecological Club has run an extensive campaign for promoting knowledge on the role of fungi and the rules of their conservation. An **educational package** for primary schools was prepared and sent to 3900 schools across Poland as a part of the campaign,

### 4. Conservation measures

Various activities are carried out to provide species protection of fungi, e.g.:

- The Forest Research Institute is involved in activities focusing on reproduction and reintroduction of *Fibroporia gossypium* (Speg.) (syn. *Antrodia gossypium*) in the places of its natural occurrence (stands of spruce) as well as *ex situ* activities aiming at species protection of the following fungal genera: *Tuber* (truffle), *Thelephora*, *Scleroderma*, *Boletus*, *Suillus*, *Rhizopogon*.
- In the Ińsko and Szczecin Landscape Parks a register of fungi species under legal protection, endangered and very rare fungi species is kept. According to the latest figures, the number of the species on the list has exceeded 300, and the total number of locations – around 1200. These data are also transferred to Polish database <http://grzyby.pl/rejestr-grzybow-chronionych-i-zagrozonych.htm>. The collected data were used for the following purposes:
  - ✓ preparation of the project documentation and establishment of the first mycological nature reserve in Poland named "Osetno" (in 2008), with the total area of 111,590 ha (OJ of the Zachodniopomorskie Province no. 96 item 2075),
  - ✓ preparation of the documentation and successful application for a decision to protect a xylobiont refuge of 20 ha area as well as several dozen of other smaller xylobiont refuges,
  - ✓ promotion of knowledge on the fungi importance and conservation through preparing and occasional delivering of multimedia presentations entitled "Xylobiont refuges" (Domian, 2009).
- The Regional Directorate for Environmental Protection commissioned drawing up the documentation: "Valorization of Protected and Endangered Fungi in Opolskie Voivodeship and Proposals for Active and Passive Protection" (Kozak M., P. Mleczek, 2009). Its results are used in strategic evaluation procedures, environmental impact assessment of proposed projects, and discussing land development conditions. In this way, they contribute to preserving rare and protected fungi locations and habitats in Opolszczyzna.
- In 2004 the Warmińsko-Mazurskie Voivodeship was home to implantation of 120 thalluses of *Lobaria pulmonaria*.



## 5. Research

- Research conducted since 1997 in the Mycology and Forest Phytopathology Department of Warsaw University of Life Sciences on the possibility of using active protection activities (translocation, introduction) with certain tree fungi is very promising, especially for such species as *Fomitopsis (Laricifomes) officinalis*.
- The Institute for Agricultural and Forest Environment (IAFE) of the Polish Academy of Sciences in Poznań conducts research on the species diversity of agricultural landscape, documentation of protected plants and fungi locations, monitoring of the locations and development of protection methods for the species characteristic of agricultural landscape.

**SERBIA / SERBIE**

**Report  
on the Recommendation no. 132 (2007) on the conservation of fungi in Europe  
in Serbia**

Regarding the Recommendation No. 132 (2007) of the Standing Committee on the conservation of fungi in Europe, adopted by the Standing Committee on 29 November 2007, several important projects, strategies and policies have been developed and some of them are established in order to take the necessary steps to conserve of fungi species and their habitats.

**1. The Current Legal Framework harmonized with EU Regulations and Bern Convention**

- The National Spatial Plan of the Republic of Serbia (2010-2010)
- The National Environmental Protection Programme (2010-2019)
- The National Strategy on Biological Diversity (2011-2018)
- The Law on Environmental Protection (Off. Jour of RS, No. 135/04, 36/09, 36/09-other law and 72/09-other law)
- The Law on Nature Protection (Off. Jour of RS, No 36/09 , 88/2010 and 91/2010-corr),
- The Law on Forest The Law on Forestry ( Off Jour of RS No 30/10)
- The Law on wild fauna and hunting (Off Jour of RS No 18//10)
- The Law on Agriculture(Off Jour of RS No 41//09)
- The Animal Welfare Law(Off Jour of RS No 41//09)
- The Rulebook on criteria for selecting of habitat types including lists of priority natural habitat types and measures for their conservation (Off Jour of RS No 35/10)
- Regulation on Ecological Network(Off Jour of the RS No 102/2010),
- Rulebook on proclamation and protection of strictly protected and protected wild flora and fauna and fungi (Off. Jour of RS No 5/10),
- Regulation on putting under control use and trade of wild flora and fauna (Official Gazette No. 31/05, 45/05, 22/07, 38/08, 9/10),
- The Rulebook on particular technical and technological solutions which facilitate undisturbed and safe communication of wild animals (Off. Jour of RS No 72/10).

**2. The Status of Fungi species in Serbia**

**2.1. Strictly Protected Fungi species**

Although fungi species are not considered in any international conservation agreements (e.g. Bern Convention and Habitat Directive), they were considered in national conservation actions in Serbia.

According to the Bern Convention and the Guidance for Conservation of Larger Fungi in Europe, Serbia as the Contracting Partie has taken appropriate and necessary legislative and administrative measures to ensure the special protection of the wild flora species including fungi species.

In accordance with the Law on Nature Protection, the Rulebook on proclamation and protection of strictly protected and protected wild flora and fauna and fungi regulates wild species of plants, animals and fungi in order to preserve biological diversity, the natural gene pool, i.e. species that are extremely important for the Republic of Serbia, from an environmental, eco-system, biogeographical,

scientific, health, economic and other aspects, as strictly protected wild species or protected wild species and shall establish measures for protection of protected species and their habitats.

Fungi species proclaimed by this Rulebook as strictly protected wild species shall be listed in Appendix I – Strictly protected wild species (hereinafter referred to as: Appendix I), as following list:

### Appendix I

FUNGI		
FAMILY	SPECIES (Scientific name)	SPECIES (English name)
<b>Agaricaceae</b>	<i>Battarrea phalloides</i> (Dicks.) Pers.	
<b>Amanitaceae</b>	<i>Amanita vittadinii</i> (Moretti) Sacc.	
<b>Entolomataceae</b>	<i>Entoloma bloxamii</i> (Berk. & Broome) Sacc.	
<b>Hygrophoraceae</b>	<i>Hygrocybe calyptriformis</i> (Berk. & Broome) Fayod	
	<i>Hygrocybe coccineocrenata</i> (P.D. Orton) M.M. Moser	
	<i>Hygrocybe punicea</i> (Fr.) P. Kumm.	
	<i>Hygrophorus marzuolus</i> (Fr.) Bres.	
<b>Physalacriaceae</b>	<i>Rhodotus palmatus</i> (Bull.) Maire	
<b>Psathyrellaceae</b>	<i>Panaeolus semiovatus</i> (Sowerby) S. Lundell & Nannf.	
<b>Strophariaceae</b>	<i>Psilocybe serbica</i> M.M. Moser & E. Horak	
<b>Tricholomataceae</b>	<i>Catathelasma imperiale</i> (Fr.) Singer	
	<i>Leucopaxillus giganteus</i> (Sowerby) Singer	
<b>Boletaceae</b>	<i>Boletus dupainii</i> Boud.	
	<i>Boletus impolitus</i> Fr.	
	<i>Boletus regius</i> Krombh.	
	<i>Boletus rhodoxanthus</i> (Krombh.) Kallenb.	
	<i>Boletus satanas</i> Lenz	
	<i>Leccinellum crocipodium</i> Bresinsky & Manfr. Binder	
	<i>Phylloporus rhodoxanthus</i> (Schwein.) Bres.	
	<i>Strobilomyces strobilaceus</i> (Scop.) Berk.	
<b>Geastraceae</b>	<i>Geastrum fornicatum</i> (Huds.) Hook.	
	<i>Geastrum melanocephalum</i> (Czern.) V.J. Staněk	
	<i>Geastrum schmidelii</i> Vittad.	
	<i>Myriostoma coliforme</i> (Dicks.) Corda	
<b>Pezizaceae</b>	<i>Sarcosphaera coronaria</i> (Jacq.) J. Schröt.	
<b>Phallaceae</b>	<i>Mutinus caninus</i> (Huds.) Fr.	
	<i>Phallus hadriani</i> Vent.	
<b>Fomitopsidaceae</b>	<i>Fomitopsis rosea</i> (Alb. & Schwein.) P. Karst.	
<b>Meruliaceae</b>	<i>Podoscypha multizonata</i> (Berk. & Broome) Pat.	
<b>Polyporaceae</b>	<i>Hapalopilus croceus</i> (Pers.) Donk	
	<i>Polyporus umbellatus</i> (Pers.) Fr.	
<b>Albatrellaceae</b>	<i>Albatrellus ovinus</i> (Schaeff.) Kotl. & Pouzar	
<b>Hericiaceae</b>	<i>Hericium alpestre</i> Pers.	
	<i>Hericium cirrhatum</i> (Pers.) Nikol.	
	<i>Hericium coralloides</i> (Scop.) Pers.	
	<i>Hericium erinaceus</i> (Bull.) Pers.	
	<i>Pycnoporellus alboluteus</i> (Ellis & Everh.) Kotl. & Pouzar	
	<i>Scutiger pes-caprae</i> (Pers.) Bondartsev & Singer	

Regarding the Article 7 of this Rulebook, Protection and conservation of strictly protected and protected wild species including Fungi species have been conducted by taking measures and actions to manage populations, such as:

- 1) protection of habitats;
- 2) monitoring of the populations of species condition and the factors of their endangerment, in particular monitoring and reducing the climate change impacts on highly vulnerable species and their habitats;

- 3) bio-technical measures;
- 4) reintroduction of species to the territory of the Republic of Serbia or in its individual parts, i.e. breeding species in the conditions outside of the natural habitat (*ex situ*) and in the natural habitat (*in situ*) for their reintroduction to nature;
- 5) rehabilitation and revitalization of damaged habitats;
- 6) implementation of compensatory measures by establishing a new site that has the same or similar characteristics as the damaged site and the introduction of species to other sites in order to increase their number;
- 7) support for scientific research, educational activities and popularization of conservation and protection of species;
- 9) collecting of parent specimens for reproduction, breeding of their offspring and trade for commercial purposes in the registered plantations and farms;
- 10) displacement of specimens of strictly protected species in the case of accidents (air, water and land pollution, mass occurrence of reptiles, amphibians, etc..)
- 11) increase of the abundance of strictly protected species above the optimal number, provided by a special programme, that is, a development programme of the hunting area, carried out by the Ministry competent for agriculture, forestry and water management;
- 12) finding a suitable site for the reintroduction of the migratory species, as a site suitable for the development cycle of species or habitat of migratory species (feeding, wintering, resorts, brood of hens, migratory corridors, changing the hair).

## **2.2 Protection and Use of Fungi species**

According to the Law on Environmental Protection (Off. Jour of RS, No. 135/04, 36/09, 36/09-other law and 72/09-other law), Art. 27<sup>th</sup> and 28<sup>th</sup>, Protection and Use of Flora and Fauna including Fungi species regulates In order to protect biodiversity and biological resources, i.e. autochthonic plant and animal species and their spreading and control introduction and growth of plant and animal species of foreign origin.

Regulation on putting under control use and trade of wild flora and fauna (Official Gazette No. 31/05, 45/05, 22/07, 38/08, 9/10) regulates use and trade of wild flora and fauna and fungi listed in Appendix III, as folloing:

### **Appendix III, Fungi (15)**

#### **Фам. Boletaceae**

1. *Boletus aerreus* Bull. Fr.
2. *Boletus reticulatus* (Paulet) Fr.
3. *Boletus edulis* Bull. Fr.
4. *Boletus pinophilus* Pilat &Dermerk

#### **Фам. Cantharellaceae**

5. *Cantharellus cibarius* L. Fr.
6. *Craterellus cornucopioides* Pers.

#### **Фам. Russulaceae**

7. *Lactarius deliciosus* (L.) S.F.Gray.
8. *Lactarius deterrimus* Groger

9. *Lactarius salmonicolor* Heim & Lecl.
10. *Lactarius sanguifluus* (Paul.) Fr.
11. *Lactarius semisanguifluus* Heim & Lecl.

**Фам. Marasmiaceae**

12. *Marasmius oreades* (Bolt. Fr.) Fr.

**Фам. Tuberaceae**

13. *Tuber magnatum* Pico
14. *Tuber aestivum* Vittad.

### 2.3. National of Fungi Red-list

In accordance with the Law on Nature Protection, Article 36<sup>th</sup>, regulates that Protected species within the meaning of this Law are determined on the basis of national and international red lists or red books, expert findings and scientific knowledge.

Red book, i.e. the list containing the endangered wild plant, animal and fungi species, the locality in which they are found, numbers of species population and the degree of endangerment shall be established by the Ministry at the request by the Institute on Nature conservation in collaboration with scientific organizations and experts.

In this regard, Project on Red-List of Fungi species has been prepared by the Natural History Museum, Belgrade.

Project proposal Creation of the Serbian Red list of fungi and evaluation of their threatening factors (Prepared by the expert Mr Boris Ivančević, senior curator, natural history museum, Belgrade)

#### Objectives

- Long-term preservation and protection of the fund of fungi in Serbia, particularly species with international importance and endangered species, according to international standards.
- Development of the quantitative national Red List of fungi according to IUCN criteria with the evaluation of the vulnerability degree of individual species as a tool for practical protection and active management of protected species and ecosystem as a whole.
- Presentation to wider community and raise awareness about the importance of and the role of fungi in the environment and the needs of their conservation.

The proposed project relates to the so-called "macro-fungi," an artificially formed but practical group in which species are not strictly located by their phylogenetic affiliation, but by the size of the sporocarp, which can be in this group identified with the naked eye, the size of 2 mm or larger. Species with smaller sporocarps or the ones that do not have it at all do not belong to the "micro-fungi".

Last years of the 20th century came to a halt in mycological research and conservation activities on fungi in Serbia. This stagnation performed due to the known general situation and thereby caused economic and social difficulties. The efforts of mycologists to review the actual frames of fungi threats in Serbia and their conservation are remained insufficient because of the reasons that are entirely outside the scope of mycology, the science of fungi. Unfortunately, processes for which there are strong indications that they endanger the fungi are intensified. The pressure on forest habitats, the massive amounts of fungi collected in commercial purposes associated with numerous negative effects that we believe cause serious damage to ecosystems and fungi. The extent of these negative processes is not exactly known as Serbia has no research to accurately determine the consequences. Quantitative tools and techniques for an accurate of the vulnerability of species of fungi in Serbia will be improved.

**References:**

- National Strategy on Biological Diversity of the Republic of Serbia;
- The Law on Environmental protection (Off. Jour of RS, No. 135/04, 36/09, 36/09-other law and 72/09-other law)
- The Law on Nature Protection, (Off. Jour of RS, No 36/09 , 88/2010 and 91/2010-corr),
- The Rulebook on proclamation and protection of strictly protected and protected wild flora and fauna and fungi (Off. Jour of RS No 5/10),
- The Regulation on taking under control use and trade of wild flora and fauna (Official Gazette No. 31/05, 45/05, 22/07, 38/08, 9/10)
- Project proposal Creation of the Serbian Red list of fungi and evaluation of their threatening factors Objectives (Prepared by the expert Mr Boris Ivančević, senior curator, natural history museum, Belgrade)

Prepared by Snezana Prokic,  
Focal Point for Bern Convention

Belgrade, 7<sup>th</sup> July 2011.

# THE NETHERLANDS / PAYS-BAS

## REPORT OF THE NETHERLANDS ON THE FOLLOW-UP OF RECOMMENDATION No. 132 (2007) ON THE CONSERVATION OF FUNGI IN EUROPE

*by the Ministry of Economic Affairs, Agriculture and Innovation  
Department of Nature, Landscape and Rural Affairs*

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## 1. INTRODUCTION AND ACKNOWLEDGEMENTS

In a letter of 11 May 2011, the secretary of the Bern Convention asked contracting parties to send a complete although concise report on the implementation of each of the three paragraphs of Recommendation No. 132 (2007) on the conservation of fungi in Europe. The three paragraphs are the following:

- (1) Address habitat management as a priority within different sectors, for the conservation of fungi species in Europe;
- (2) Take into consideration the Guidance for the Conservation of Mushrooms in Europe and apply it in the elaboration and implementation of their national conservation policies for larger fungi;
- (3) Seek to engage all who benefit from fungi in efforts to conserve their habitats.

Since a both complete and concise report was asked for and since the document on the Guidance for the Conservation of Mushrooms in Europe is actually the basis of all three paragraphs in Recommendation No. 120 (2006), we decided to straightforwardly take all actions from the Guidance document (Document T-PVS (2007) 13). Subsequently, we asked some colleagues and specialists from relevant NGOs to provide us with available information on to what extent corresponding efforts in the Netherlands regarding the actions are of have been made. We hereafter present the results in Chapter 2.

### Acknowledgements

We greatly acknowledge Eef Arnolds, Roel van Raaij and Dorien Reiche for providing us with available relevant information.

## 2. IMPLEMENTATION BY THE NETHERLANDS OF THE GUIDANCE FOR THE CONSERVATION OF MUSHROOMS IN EUROPE (DOCUMENT T-PVS (2007) 13)

Actions ▼	Corresponding efforts in the Netherlands ▼
<b>7.1 UNDERSTANDING AND DOCUMENTING EUROPEAN FUNGAL BIODIVERSITY</b>	
<b>GPC related targets:</b> <ul style="list-style-type: none"> <li>• <i>Developing a working list of European species</i></li> <li>• <i>Production of a European Red List of threatened fungi, starting with macrofungi</i></li> <li>• <i>Providing methods for fungal conservation based on best practice</i></li> </ul>	
<b>(a) Improve autecological knowledge and publish methods for fungal conservation</b>	For the Netherlands, the autecology of all native fungal species has been summarized in a national checklist of macrofungi (Arnolds <i>et al.</i> 1995). A revision and extension of this list will be completed by 2012. Autecological knowledge in the Netherlands is mainly based on field surveys by amateur mycologists and earlier mycosociological studies (1975-2000) by professional mycologists of Wageningen UR in many important vegetation types. We are not aware of current autecological studies by professionals.
<b>(b) Secure funding for and produce a European red-list assessment of macrofungi</b>	The Dutch Ministry of Economic Affairs, Agriculture and Innovation has funded the publication of a proposal for an updated national red list of macrofungi (Arnolds & Veerkamp 2008). The publication may also be used as a contribution to a European red list. In the past, members of the <i>Nederlandse Mycologische Vereniging</i> (Netherlands Mycological Society) have been involved in the development of methods for a European red list on a voluntary basis.
<b>(c) Co-ordinate the red-listing of different species groups and analyse habitat deficiencies in order to identify and rank threats to national biodiversity.</b>	Coordination of periodically compiling an updated national red list for mushrooms in the Netherlands is supervised by the Dutch Ministry of Economic Affairs, Agriculture and Innovation. For mushrooms as well as other species groups, probable causes of decline are also analysed (see 7.2.i).
<b>(d) Ensure that a highly competent mycologist is involved with the red-list assessments of macrofungi according to current</b>	Highly competent mycologists are involved in compiling national red lists for mushrooms in the Netherlands. Dutch national red lists are compiled according to both Dutch red list criteria and following IUCN criterions for regional red lists today.



<b>IUCN criteria.</b>	
<b>(e) Ensure sufficient funding and organization for red-list assessments to take place at regular intervals, every 5-10 years</b>	On average, proposals for updated national red lists are produced every ten years in the Netherlands, including for mushrooms. Publishing of the proposals is financed by the Ministry of Economic Affairs, Agriculture and Innovation (see also 7.1.b). On basis of the proposals, the ministry publishes formal red lists in the Official Publication of the Dutch Government.
<b>(f) Develop a working list of European species</b>	The online <i>Nederlands Soortenregister</i> (Dutch Species Catalogue; see: < <a href="http://www.nederlandsesoorten.nl/nlsr/nlsr/english.html">http://www.nederlandsesoorten.nl/nlsr/nlsr/english.html</a> >) contains the names of all indigenous species in the Netherlands, including of all fungi (i.e., macro- and microfungi and myxomycota). The list may be used as a contribution to a European list; however, we are not aware of the involvement of Dutch specialists in developing such a list.
<b>7.2 CONSERVING EUROPEAN FUNGAL BIODIVERSITY</b>	
<b>GSPC related targets:</b> <ul style="list-style-type: none"> <li>• <i>Identifying and conserving Important Fungal Areas</i></li> <li>• <i>Conserving fungi on land used for agriculture, forestry, recreation and other human activities</i></li> <li>• <i>Conserving threatened fungal taxa</i></li> </ul>	
<b>(a) Identify Important Fungal Areas (IFAs) and key habitats across Europe</b>	Several mushroom species have been formally selected as ‘typical species’ for habitat types in the Netherlands that are or will be protected under the EU Habitats Directive. Important Fungal Areas, however, have only been informally indicated on the basis of a quantitative analysis of red list species in km-squares (Jalink 1999). These IFAs have not received a noticeable role so far in the conservation of nature areas in the Netherlands. Nonetheless, on occasion of the centennial of the Netherlands Mycological Society in 2008, the private nature conservation organisation <i>Vereniging Natuurmonumenten</i> has started to develop a ‘new’ nature area near the Dutch forest <i>Voorsterbos</i> with special attention to key habitats for fungi.
<b>(b) Develop management plans to ensure protection of IFAs</b>	Except for the conservation of habitat types and its typical mushroom species under the EU Habitats Directive (see 7.2.a), we are not aware of special attention for the conservation of IFAs in the Netherlands.
<b>(c) Ensure coordination between IFA and Important Plant Area management</b>	Since IFAs currently have not had a noticeable role in nature conservation practice in the Netherlands, there seems to be no need for coordination between IFAs and IPAs.
<b>(d) Promote continued grazing and absence of fertilization and tillage in old grasslands</b>	So far, the management of old unimproved grasslands in the Netherlands, which are considered to be amongst the most threatened habitats in the Netherlands (Arnolds & Veerkamp 2008), has merely focused on botanical and/or ornithological values and fungi have rarely been taken into account.
<b>(e) Reduced nitrogen emissions, especially in areas with predominantly nutrient poor soils</b>	Although nitrogen emissions have been reduced in the Netherlands, the emissions are still a persistent environmental problem, including in relation to a potential recovery of fungal species in forests. A range of policy efforts should contribute to a further reduction of nitrogen emissions and depositions in the Netherlands (for a summary, see Van der Zande <i>et al.</i> 2010).
<b>(f) Promote retention trees in managed forests</b>	In the Netherlands, forest managers tend to avoid large clear cuts today and usually also leave some retention trees.
<b>(g) Increase amount of coarse deadwood left to decay</b>	Although both in ‘nature-oriented forests’ and ‘multifunctional forests’ in the Netherlands, levels of dead wood still can’t match the levels of dead wood of real pristine forests, the amounts of coarse dead wood have increased considerably.
<b>(h) Ensure funding for mapping and monitoring of IFAs and other important fungal habitats for their quality, conservation status and trends.</b>	As indicated in, 7.2.a, the status of IFAs in conservation in the Netherlands is limited. Within the framework of Natura 2000, however, ‘typical species’ of protected habitats, including mushroom species, are both mapped and their trends are or will be monitored. In addition, the Dutch Network Ecological Monitoring assesses the trends of mushrooms of forests. (See: < <a href="http://www.netwerkecologischemonitoring.nl/meetnetten/paddenstoelen">http://www.netwerkecologischemonitoring.nl/meetnetten/paddenstoelen</a> >; in Dutch).
<b>(i) Analyse the Red List and consider appropriate mechanisms to alleviate the threats, this is likely to include a mix of policy measures, protected areas, habitat action and some species-</b>	In relation to recent national red lists and assessing population trends of forest mushrooms (see 7.2.h) in the Netherlands, threats to species are analysed. See Arnolds & Veerkamp (2008) and, for example, the <i>Dossier paddenstoelen</i> (Mushroom file) in the online <i>Compendium voor de Leefomgeving</i> (an internet source by the Netherlands Environmental Assessment Agency (PBL), Statistics Netherlands and Wageningen UR):

<b>specific actions.</b>	<p>&lt; <a href="http://www.compendiumvoordeleefomgeving.nl/dossiers/nl0102-paddestoelen.html?i=8-85">http://www.compendiumvoordeleefomgeving.nl/dossiers/nl0102-paddestoelen.html?i=8-85</a> &gt; (in Dutch).</p> <p>The analyses also provide a basis for species-specific conservation measures within the framework of the so-called <i>Leefgebiedenbenadering</i> ('Habitats approach' policy; a pro-active species policy on a local scale, supplementing the Dutch National Ecological Network (EHS) and Natura 2000) (see also 7.5.a).</p>
<b>7.3 USING EUROPEAN FUNGAL DIVERSITY SUSTAINABLY</b>	
<b>GSPC related targets:</b> <ul style="list-style-type: none"> <li>• <i>Protecting fungi from over-exploitation</i></li> <li>• <i>Providing guidelines to enable sustainable livelihoods dependent on fungal resources</i></li> </ul>	
<b>(a) Monitor the future impact of harvesting on macrofungi communities</b>	Legislation in the Netherlands (i.e., the Panel Code and local acts) strongly discourages the picking of mushrooms (see also Woldendorp & Bakker 2007). Harvesting edible fungi in the Netherlands is very limited compared to other European countries and mainly carried out by individuals on a non-commercial basis. We are not aware of monitoring in the Netherlands of possible effects of the harvesting.
<b>(b) Develop harvest guidelines to protect macrofungi and associated organisms</b>	N/A (see a)
<b>7.4 PROMOTING EDUCATION AND AWARENESS ABOUT EUROPEAN FUNGAL DIVERSITY</b>	
<b>GSPC related targets:</b> <ul style="list-style-type: none"> <li>• <i>The importance of fungal diversity, and the need for its conservation, incorporated into communication, educational and public-awareness programmes</i></li> </ul>	
<b>(a) Fund national fungal education and awareness co-ordination posts</b>	<p>In the Netherlands, no special funding is related to fungal education and awareness. However, several educational activities or products regarding mushrooms are organised or produced, including by (local departments of) the organisations IVN (Association of Environmental Education), KNNV (Royal Dutch Society for Natural History) and Netherlands Mycological Society. Examples include the following:</p> <ul style="list-style-type: none"> <li>- numerous mushroom field trips for the public, notably in autumn;</li> <li>- mushroom working groups;</li> <li>- lectures on mushrooms by members of the organisations;</li> <li>- mushroom activities for young people;</li> <li>- educational flyers and booklets on mushrooms;</li> <li>- information on mushrooms in centres for visitors of nature areas.</li> </ul> <p>Fungal diversity of the Netherlands has also been addressed in a recent book on biodiversity of the Netherlands (Arnolds <i>et al.</i> 2010).</p>
<b>(b) Incorporate fungi into national school education curriculum</b>	In general, national Dutch policy on environmental education has served as a framework or has influenced new national guidelines for reforming the curriculum in favour of knowledge regarding sustainability and the environment (see Verheijen <i>et al.</i> 2010) and the new programme for biology exams in secondary education (see Commissie Vernieuwing Biologieonderwijs 2010). However, in the guidelines and programme, mushrooms are only implicitly addressed (in terms of 'plants and animals' and 'biodiversity').
<b>(c) Produce fungal identification guides in local languages</b>	In the Netherlands, various Dutch-language mushroom guides are available on a commercial basis. Professional mycologists may qualify this fact, however, by emphasizing that the guides are translations of foreign books and that the guides do not comprehensively cover the diversity of macro-fungi in the Netherlands.
<b>(d) Organise accessible fungal forays and provide talks in local communities</b>	See 7.4.a.
<b>(e) Produce practical habitat management guidance and run workshops for land managers</b>	A practical handbook with guidelines for nature management in relation to fungi has been published in the Netherlands (Keizer 2003). In addition, a number of so-called <i>veldwerkplaatsen</i> (field workshops involving mycologists and nature managers, including foresters) have been organised in which mycologists shared their knowledge with nature managers.
<b>(f) Promote IFAs and SAPs among all sectors of society</b>	N/A; See 7.2.a.
<b>(g) Support the production of a</b>	-

<b>pan European book/website on the conservation of fungi</b>	
<b>7.5 BUILDING CAPACITY FOR EUROPEAN FUNGAL CONSERVATION</b>	
<b>GSPC related targets:</b> <ul style="list-style-type: none"> <li>• <i>Ensure that the number of trained mycologists working in fungal conservation is sufficient to implement national fungal conservation strategies</i></li> <li>• <i>Networks for fungal conservation activities established or strengthened at national, regional and international levels</i></li> </ul> <b>Additional target:</b> <ul style="list-style-type: none"> <li>• <i>Development of national, regional and international fungal conservation strategies to guide the GSPC related targets</i></li> </ul>	
<b>(a) Develop regional, national and European fungal conservation strategies</b>	In the Netherlands, Dutch provinces may take local conservation measures for a total of 13 mushroom species (see also 7.2.i). We are not aware of activities aiming at or contributing to the development of European fungal conservation strategies.
<b>(b) Ensure an appropriate number of professional mycologists working with ecology, population dynamics and taxonomy of fungi in reference collections and universities.</b>	Although Dutch institutions, including CBS Fungal Biodiversity Centre and Wageningen University, are involved in various fungal research projects in the Netherlands (see < <a href="http://www.narcis.nl/?Language=en">http://www.narcis.nl/?Language=en</a> >; search, for example, with “fungi”), the total number of professional mycologists in the Netherlands appears to have decreased substantially over the last decades.
<b>(c) Ensure that trained mycologists are employed by national conservation agencies</b>	We are not aware of trained mycologists being employed by national conservation agencies in the Netherlands or of efforts to realise that.
<b>(d) Support non-professional mycologists who record the distribution of fungi, and secure the necessary level of collaboration with professional mycologists to ensure high data quality</b>	Recording of the distribution of fungi in the Netherlands is carried out and organised on a voluntary basis by non-professional mycologists of the Netherlands Mycological Society. Monitoring of mushrooms of forests (see 7.2.h) is supported by the Dutch government.
<b>(e) Produce guidance and run workshops for conservation practitioners</b>	In the Netherlands, this is done mainly by the Netherlands Mycological Society, in particular, its Committee on Fungal Conservation, by means of: <ul style="list-style-type: none"> <li>- publications (e.g., Keizer 2003; see also 7.4.e);</li> <li>- a recent widespread flyer on the mycological importance of coniferous forests for fungi and the consequences of forest management;</li> <li>- field trips with nature conservationists (e.g., field workshops for foresters (see also 7.4.e) related to the monitoring network programme with financial support of the Ministry of Economic Affairs, Agriculture and Innovation);</li> <li>- specialised meetings with lectures on different aspects of fungal conservation;</li> </ul> However, actual implementation of mycological knowledge in practical nature management appears to be still rather exceptional.
<b>(f) Increase the number of volunteer recorders for fungi supporting fungal conservation</b>	The Netherlands Mycological Society promotes mycological field research by approachable workshops, publications, lectures and excursions, and occasionally exhibitions (see also 7.4.a). These activities are not funded by other institutions.
<b>(g) Enhance communication and information exchange between scientists and fungal conservationists</b>	Most scientists working on fungi are also active in fungal conservation. Within the Netherlands Mycological Society, a close cooperation exists between professional mycologists, amateur mycologists and fungal conservationists.
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