

Global Assessment of Taxonomic Needs and Capacities

Detailed information on the background and the questionnaire are published online at <http://www.gti-kontaktstelle.de/q.html> and are attached as information.

PART I: National biodiversity inventories – the state of knowledge of your country's fauna and flora

Classification of groups varies depending on author; we are aware that the groups we use are not recognized as valid by all. We do not claim that our groups are valid or accepted by all taxonomists, but the classification of these groups suits our work best.

For the assessment of knowledge of national fauna & flora, we aim for the number of native species occurring within the **political borders of your country**. Feel free to add as much detail as you feel to be adequate or needed by inserting rows. If you know a published good and reliable national assessment of species numbers, just refer to the publication and we will fill in the numbers for you. However, the estimate how many species are already described in your country is beyond our knowledge and we would like you to give a personal estimate of how many species per group you estimate for your country.

If you compile or check the species numbers, please indicate only the number of species that reproduce regularly in your country. For instance, many bird species are known, but we are more interested in the regularly reproductive species. Please exclude migrants, vagrants, or rare visitors, but you may note them separately.

PART II: National and regional biodiversity collections, data centres, and other relevant recourses for taxonomic information

One major obstacle identified by the GTI was the lack of resources available for scientists and conservation practitioner in developing countries. While in developed/industrialized countries several resources are typically available, access is limited to a selected group of researchers or information is not available at all for most developing countries and many taxa. Also some groups (like vertebrates and plants) are known worldwide quite well, while for instance information on molluscs is hardly available. To reduce this taxonomic impediment we would like to start a database where what kind of information related to taxonomy is available. We focus here on taxonomic needs and hence want to identify scientific collections (specimens, any samples), online databases on species distributional ranges, and related.

PART III: National conservation efforts and protected areas – the state of taxonomic information available for conservation management

For many protected areas (PA) worldwide, species numbers are hardly available online. Some PA's have species inventories, but these inventories are mostly "grey literature" and hardly available. We intend to assess the level and state of knowledge of biodiversity for national protected areas and conservation programs; to use an internationally compatible PA unit, we focus on National Parks here and assess the species numbers per taxa.

Please fill in at least the grey shaded areas. Return to renner.smns@naturkundemuseum-bw.de by 15 November 2007.

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Thank you for your cooperation!

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If you do NOT wish to be cited in any document derived from this questionnaire, please check here:	

PART I: National biodiversity inventories – the state of knowledge of your country's fauna and flora

GROUP	SPECIES NUMBERS national	ESTIMATE (% of known species)	REFERENCES (add citation below)
Microorganisms*:	?	?	?
Plants*:	2754 ¹	99 ²	1, 2
Higher Plants*:	³		1, 2
"Ferns"*:	55 ⁴	99 ⁵	1
"Mosses"*:	849	?	3
Algae*:	¹⁹	?	16
Fungi (Macromycetes)*:	3-4000 ¹²	??	15
Animals*:			
Invertebrata*:			
Arthropoda*:			
Insecta*:			
Mollusca*:	242 ⁹	?	12
Other Invertebrata: Elateridae	149 ¹⁴	?	18
Other Invertebrata: Collembola	More than 534 ¹⁸	?	21
Other Invertebrata: spiders	830 ²⁰	?	8
Other Invertebrata: butterflies	161 ¹⁵	?	9
Vertebrata*:			
Lampreys:	4 ¹⁶	?	19
Fish*:	55 ¹⁷	?	19
Amphibians*:	21	?	5, 20
Reptiles*:	17 ⁶	?	6
Birds*:	403 ¹³	?	7, 17
Mammals*:	87-88	?	4
Other groups			
lichenised fungi (formerly lichens)	1480 ⁷	70-80 ⁸ ??	10, 11
Bats:	23 ¹⁰	90 ¹¹	13, 14

REFERENCE SECTION PART I: please specify all relevant references and sources used (books, papers, URLs, personal communications, etc.):

- 1: Kubát K., Hrouda L., Chrtek J. jun., Kaplan Z., Kirschner J., Štěpánek J. & Zázvorka J. (2002): Klíč ke květeně České republiky. - Academia, Praha. See also <http://www.ibot.cas.cz/seznam/index.html>
- 2: Dr. J. Štěpánek (Institute of Botany ASCR, Pruhonice, <http://www.ibot.cas.cz>)
- 3: Kučera J. & Váňa J. (2003): Check- and Red list of bryophytes of the Czech Republic. - Preslia 75: 193-222.
- 4: Anděra M. et al: Atlas rozšíření savců v České republice. - Národní museum, Praha. See also www.biolib.cz
- 5: Moravec J. (ed.) (1994): Atlas rozšíření obojživelníků v České republice. Atlas of Czech amphibians. - Národní museum, Praha.
- 6: Mikátová B., Vlašín M., Zavadil V. (eds.) (2001): Atlas rozšíření plazů v České republice. Atlas of the distribution of reptiles in the Czech Republic. - AOPK ČR, Brno, Praha.
- 7: Štastný K., Bejček V. & Hudec K. (1997): Atlas hnízdního rozšíření ptáků v České republice 1985-1989. - Nakladatelství a vydavatelství H & H, Jinočany.
- 8: Buchar J. & Růžička V. (2002): Catalogue of spiders of the Czech Republic. - Peres, Praha.
- 9: Beneš J., Konvička M., Dvořák J., Fric Z., Havelda Z., Pavlíčko A., Vrabec V. & Weidenhoffer Z. (2002): Motýli České republiky: Rozšíření a ochrana I, II. - Společnost pro ochranu motýlů, Praha.
- 10: Vězda A. & Liška J. (1999): Katalog lišejníků České republiky. - Institute of Botany,

* Please include all organisms occurring regularly in the country; note current extinctions separately (in brackets). Note any migrants or non reproductive population parts of highly mobile organisms separately.

- Academy of Sciences of the Czech Republic, Průhonice.
- 11: Kocourková J. (2000): Lichenicolous fungi of the Czech Republic (the first commented checklist). - Acta Mus. Nat. Pragae, ser. B (Hist. Natur.) 55: 59-169.
- 12: Juříčková L., Horský M. & Beran L. (2001): Check-list of the molluscs (Mollusca) of the Czech Republic. - Acta Soc. Zool. Bohem. 65: 25-40.
- 13: Anděra M. & Horáček I. (2005): Poznáváme naše savce. 2nd ed. - Sobotáles, Praha, 328 pp.
- 14: M. Andreas, PhD., in litt., The Silva Tarouca Research Institute for Landscape and Ornamental Gardening <http://www.vukoz.cz>
- 15: The assessment made by J. Holec, PhD. (National Museum Prague, <http://www.nm.cz/english/departments/mycology.php>)
- 16: POULÍČKOVÁ A., LHOTSKÝ O., DŘÍMALOVÁ D. (2004): Prodrómus sinic a řas ČR. - Czech Phycology 4: 19-33.
- 17: VAVŘÍK M. (2004): Seznam ptáků České republiky. - In: Faunistická komise ČR [online] - URL: <http://fkcs.sweb.cz>. State: 15/06/2004
- 18: J. Mertlík (2007): The check-list of Elateridae Leach, 1815 from Czech and Slovak Republics. State 26/09/2007 URL: http://www.elateridae.com/pag_uni.php?idp=14
- 19: Lusk S. & Hanel L. (2005): Změny biodiversity ichtyofauny. - In: Vačkář D. (ed.), Ukazatele změn biodiversity, pp. 197-207, Academia, Praha.
- 20: Zavadil V., Rozinek R. & Kerouš K. (2005): Hodnocení a sledování změn obojživelníků. - In: Vačkář D. (ed.), Ukazatele změn biodiversity, pp. 224-235, Academia, Praha.
- 21: Rusek J. (2005): Indikátory změn půdní diversity. - In: Vačkář D. (ed.), Ukazatele změn biodiversity, pp. 249-261, Academia, Praha.

COMMENTS, SUMMARY, any other information to consider:

- ¹ The counts are based on all known taxa listed in Kubát et al. (2002) and including cultivated, hybrids, apomictic species but without *Taraxacum* sect. *Ruderalia* (over 100 other taxa), infraspecific taxa. The count of native taxa (excluding crosses of native species) is 2256 only (see Pyšek et al. 2002, Preslia)
- ² If excluding all apomictic taxa.
- ³ This is ambiguous term. We should rather distinguish between vascular and non-vascular plants. If so, the count is the same as in 1.
- ⁴ The count only for Polypodiophyta.
- ⁵ Currently, new taxa are prepared for description or newly proved for CR especially in the genus *Dryopteris* and *Asplenium*.
- ⁶ Including 6 alien species.
- ⁷ The updated version of older checklist (see Vězda et Liška 1999) comprises 1480 species of lichenised fungi (i.e., without 156 species of lichenicolous fungi, see Kocourková 2000, and without synonyms and dubious names) (Dr. J. Liška, Institute of Botany ASCR, Pruhonice in litt.).
- ⁸ The number of lichenized fungi with lichenicolous can reach up to 2000 but this is really difficult to say as there are not many Czech specialists and the taxonomy is very complicated (Dr. J. Liška, in litt.).
- ⁹ Thereof, 13 are aliens.
- ¹⁰ Thereof, 3 occur irregularly.
- ¹¹ The other two species were not yet published but confirmed (M. Andreas, PhD., in litt.).
- ¹² Only Macromycetes are reported. The assessment of other Fungi is very problematic as it is a difficult taxonomic group (J. Holec, PhD., in verb.).
- ¹³ Thereof, 379 species observed at least once since 1950, 15 species observed only before 1950, 9 are alien species, 2 have doubtful native occurrences, 10 species are from breeding, 5 are not yet classified (sorted) species (see <http://fkcs.sweb.cz>).
- ¹⁴ Extinct species included. The count concluded on the manual counting from the manuscript by P. Petřík as the number was missing.
- ¹⁵ Thereof, 11.2% became extinct.
- ¹⁶ Thereof, 2 species became extinct.
- ¹⁷ Thereof, 6 species and one form became extinct. Plus 11 alien species.
- ¹⁸ 334 species according to *Fauna Europaeae* (unpubl.) and other more than 200 species confirmed by Prof. J. Rusek. Thereof, 17 species became extinct and 137 species are critically endangered.
- ¹⁹ There is only database of Algae and Cyanophyta available but precise numbers are missing (L. Hodač, Dept. of Botany, Faculty of Sciences, Charles Univ., Prague, (<http://botany.natur.cuni.cz>))
- ²⁰ Currently, there are ca 30 other newly documented taxa but not included in the cited reference (M. Řezáč, PhD., in litt., Agency of Nature Conservation and Landscape Protection of the CR, www.nature.cz).

PART II: National and regional biodiversity collections, data centres, and other relevant recourses for taxonomic information

II.1: Are there **scientific biodiversity collections, biodiversity data centres or other relevant institutional biodiversity data providers** available for your country?

Don't know	
NO	
YES	X

* Please include all organisms occurring regularly in the country; note current extinctions separately (in brackets). Note any migrants or non reproductive population parts of highly mobile organisms separately.

Please provide references or resources in the Reference section below.				
Please provide the major holdings of biodiversity collections you know of or please provide further contacts that will help in the comments section below:				
INSTITUTION, COLLECTION Name	ACRONYM	HOLDINGS (taxonomic groups, approx. # of specimens/records)	LOCATION	REFERENCES (add citation below)
		Vascular plants, ca 8 mil.	Czech Republic	1-5
		Culture Collection of Algae of Charles University of Prague (CAUP) ¹	Department of Botany, Faculty of Sciences, Charles Univ., Prague	6
		The Gene Bank ²	Crops Research Institute	7
		botanical and zoological gardens ³	Czech Republic	8

II.2: Is this list complete?	
Don't know	
NO	X
YES	
<p>Comments: There is no official institute coordinating the biodiversity collections in the Czech Republic.</p> <p>¹ There are 193 different strains of cyanobacteria and algae; 53 of them are included in Image gallery</p> <p>² At the present, twelve Czech institutions taking part in the The Czech National Programme on Plant Genetic Resources (NP) hold 50 000 accessions of plant genetic resources. The NP deals with gathering (including collecting missions), documentation, characterization, evaluation and conservation of plant genetic resources and provides services to users. The Gene Bank in the Crops Research Institute (http://www.vurv.cz) provides long-term storage of seed samples (under -18 °C or -5 °C respectively) for all seed-propagated collections and provides services of the National Information System on Plant Genetic Resources (so-called EVIGEZ, see genbank.vurv.cz/genetic/resources/asp2/l_evigez_c.htm). All institutions participating on the NP have close partnerships with users within the country and abroad and provide them samples of genetic resources (yearly 4-5 thousand accessions!), in harmony with the International Treaty. International collaboration and effective cooperative links have been set up particularly within the European Cooperative Programme. All Czech collections are fully documented in passport and evaluation data (based on National Descriptor Lists for over 40 crops) are available for 62% of accessions. Recently, detailed inventory has been carried out and current data were completed by newly collected information, including data on</p>	

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viability and accessibility of accessions and regeneration needs. Among all accessions 74% are freely available, while other 18.4% are accessible under the particular conditions and 5.7% need urgent regeneration. (see more by Dotlačil & Roudná in Petřík et al. 2007).
 3 There are 70 botanic gardens and arboretums with 73 100 of registered taxa (Roudná 2006) and 15 zoological gardens.

II.3: Are **online biodiversity information resources available** for your country (e.g., databases from national/regional surveys & inventories, species distribution, status of threatened species, etc.)?

Don't know

NO

Partly for vascular plants, see comments.

YES

Please provide references or resources in the Reference section below.

Comments (particularly on geographic/taxonomic coverage, reliability/quality of information, etc.):

Many data sources for vascular plants exist in the Czech Republic: approximately 8 million herbarium specimens, nearly a million records in Karel Domin's card index (deposited in the Institute of Botany ASCR), data from Phytocartographic syntheses, ca one million records stored in the FLDOK database, as well as over one million floristic samples stored in the Czech National Phytosociological Database (www.botzool.sci.muni.cz), Natura 2000 data (www.natura2000.cz) etc. Data from Czech regional projects of grid mapping of flora are available only on personal request.

II.4: Are datasets from scientific collections **available online** for your country?

Don't know

NO

Partly for vascular plants, see ref. 1-5

YES

Please provide references or resources in the Reference section below.

Comments: See references 2-4, 6

II.5: Is **access** to these online resources **free**?

Don't know

NO

YES, unlimited access

YES, but limited public access

X

Describe access specifications (pay per view, registration, etc.):
 Registration needed.

Comments:

In the case of providing phytosociological data, the applicants should contribute to the national database with their own data or help with digitisation of other data.

REFERENCE SECTION PART II: please specify all relevant references and sources used (books, papers, URLs, pers. communications, etc.):

1: www.mzm.cz/mzm/ostatni/seznam_herbarovych_sbirek.html

2: <http://botanika.bf.jcu.cz/jpcbs>

3: www.mzm.cz/Botanika/

4: www.sci.muni.cz/botany/dbase_cz.htm

5: www.ibot.cas.cz

6: <http://botany.natur.cuni.cz/algo/caup.html>

7: Petřík P. (ed.), Čámská K., Dotlačil L., Hruška J., Fanta J., Peterová P., Poštulka Z., Roudná M. & Vokasová L. (2007): Review of knowledge base and biodiversity research results

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from the Czech Republic that directly contribute to the sustainable use of biodiversity in Europe. - URL: www.ibot.cas.cz/biop.
8: Roudná M. (ed.) (2006): Assessment of capacity-building needs: Access to genetic resources and Benefitsharing, conservation and sustainable use of biodiversity important for agriculture, forestry and research - Czech Republic (Project Report). - Ministry of the Environment, Prague.

COMMENTS, SUMMARY, any other information to consider:

PART III: National conservation efforts and protected areas – the state of taxonomic information available for conservation management

III.1: Are biodiversity inventories available for National Parks in your country?	
Don't know	Partly.
NO	
YES	
If YES , please specify (number/percentage or names of parks):	4 national parks (1.51% of the area of the CR)
YES (other individually protected areas beside National Parks)	24 protected landscape areas (13% of the area of the CR)
If YES , please specify (number/percentage or names):	1757 small-sized protected areas (1.05% of the territory of the country) ¹

III.2: How many biodiversity inventories or monitoring projects were conducted for National Parks in your country?	
Don't know	X
Number of National Parks with inventory/monitoring projects:	

III.3: What percentage of known species occur within or are covered by protected areas in your country?		
	National Parks	Any protected area
Microorganism:	?	
Plants:	?	
Spermatophyta:	?	
Bryophyta:	?	
Algae:	?	
Fungi:	?	
Invertebrata:	?	
Arthropoda:	?	
Insecta:	?	
Other Arthropoda:	?	
Mollusca:	?	
Other Invertebrata:	?	
Vertebrata:	?	

III.4: Which or how many National Parks in your country have a complete or partial species inventory?	
Don't know	

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Number parks with partial inventory:	4
Number parks with complete inventory:	

COMMENTS, SUMMARY, any other information to consider:

¹Of these, 302 (17.2% of the total number of reserves) have complete species lists for vascular plants (see Pyšek P., Jarošík V. & Kučera T. (2002): Patterns of invasion in temperate nature reserves. – Biol. Conserv. 104: 13–24). It is very complicated to obtain such information from responsible administrations or people. It is also a question what means the "complete inventory". Many "popular groups" have many inventories but scattered throughout whole country without any organisation.

III.5: For which **groups are inventories** available in your country (only consider largest National Park with at least partial inventories):

					Species numbers in <u>National Park:</u> <u>Krkonošský národní park/Giant</u> <u>mountains National Park (www.krnap.cz)</u>		
	Don't know	NOT available	Available	Total number of species	Threatened number of species	Estimate % threatened Species detected	REFERENCES (add citation below)
Microorganism:			x	887	?	?	2
Plants:							
Spermatophyta:			x	1250 ²			4
Bryophyta:	X			?	247	?	5
Algae:	X ¹						3
Lichens:				?	292	?	6
Fungi:			X	ca 1500 ³	47	ca 3%?	7
Invertebrata:	X						
Arthropoda:	X						
Insecta:	X						
Other Arthropoda:	X						
Mollusca:	X						
Other Invertebrata:	X						
Vertebrata:			x	378	144 ⁴	?	1
Cyclostomata			x	1	1	?	1
Pisces			x	28 ⁵	2	?	1
Amphibia			x	11 ⁶	10	?	1
Reptilia			x	6	6	?	1
Aves			x	279	98 ⁷	?	1
Mammalia			x	76	27 ⁸	?	1

REFERENCE SECTION PART III: please specify all relevant references and sources used (books, papers, URLs, pers. communications, etc.):

If the **same references** as in PART II, please tick here:

1: Dr. J. Flousek (in litt.), www.krnap.cz

2: Marečková M., Kopecký J., Čermák L., Chrtek J. & Jeník J. (2007): DIVERSITY OF BACTERIA IN THE ANEMO-OROGRAPHIC SYSTEM IN THE KRKONOSE MOUNTAINS. – In: Book of Abstract, Rhizosphere 2,

* Please include all organisms occurring regularly in the country; note current extinctions separately (in brackets). Note any migrants or non reproductive population parts of highly mobile organisms separately.

- Montpellier: p. 26-31.
- 3: Nováková S. (2002): Algal flora of subalpine peat bog pools in the Krkonoše Mts. - Preslia 74: 45-56.
- 4: Štursa J. (2006): Komentovaný červený seznam cévnatých rostlin Krkonoš (česká strana). - Ms., depon in the Administration of the NP.
- 5: Váňa J. (2006): Komentovaný červený seznam mechorostů Krkonoš (česká strana), verze 2006. - Ms., depon in the Administration of the NP.
- 6: Halda J. (2006): Komentovaný červený seznam lišejníků Krkonoš. - Ms., depon in the Administration of the NP.
- 7: Fellner R. (2006): Seznam ohrožených druhů hub Krkonoš se zřetelem k maloplošným chráněným územím KRNPu. - Ms., depon in the Administration of then NP.
- 8: Ministry of the Environment (2005): Third National Report of the CR to the Convention on Biological Diversity. - Prague. URL: <http://www.env.cz>.
- 9: Petřík P. (ed.), Čámská K., Dotlačil L., Hruška J., Fanta J., Peterová P., Poštulka Z., Roudná M. & Vokasová L. (2007): Review of knowledge base and biodiversity research results from the Czech Republic that directly contribute to the sustainable use of biodiversity in Europe. - URL: www.ibot.cas.cz/biop.
- 10: Zima J. (ed.) (2006): National capacity self-assessment in the CR for fulfilment of the obligations of the Rio Conventions. - Ministry of the Environment, Prague.

COMMENTS, SUMMARY, any other information to consider:

Other comments:

- 1: 228 taxa reported by Nováková (2002). However, the total number of species in the NP Krkonoše is not known.
- 2: Thereof, ca 900 are native species.
- 3: Very rough assessment. Only macromycetes are included.
- 4: Occasionally reported taxa excluded. The counts refer to the Czech and Polish sites of the NP.
- 5: Thereof, 23 are non-native.
- 6: Thereof, on the Czech side only 7 species (6 are threatened)
- 7: The count is for the case if 71 occasionally reported taxa excluded.
- 8: The count is for the case if 16 occasionally reported taxa excluded.

CONCLUDING COMMENTS: See for more information related to taxonomy in the Third national report of the CR on CBD (Ministry of the Environment 2005, but see also Zima 2006): "...Czech Environmental Information Agency (CENIA) was established to operate and develop a unified environmental information system including primary data validation and information syntheses (<http://www.cenia.cz>). Many data are stored by different research institutions, universities, private sectors, NGOs or individuals. Some coordination is also made through the Biodiversity Clearing House Mechanism of the Czech Republic (<http://www.chm.nature.cz>). There are several projects of several organizations focusing on the taxonomy. Common coordination of all projects is missing as well as unequivocal priority setting. The level of taxonomy is on a very good level in the Czech Republic. There is a long-term tradition of science branches at universities and there are lots of institutions which deals with this agenda (universities, Academy of Science, museums, etc.) This is mostly focused on higher plants and fauna. Gaps are in taxonomy of some groups of invertebrates, unicellular and prokaryotes..."

However, the review (Petřík et al. 2007) revealed that: "...the decrease of specialists in taxonomy knowledge and need for higher standard of education has been widely recognized in the present (see, e.g., the Global Taxonomic Initiative on <http://www.biodiv.org/programmes/cross-cutting/taxonomy/default.shtml>). In the Czech Republic, there is an urgent need for establishment of a centre for taxonomic knowledge and identification of organisms. The centre should serve for post-doc studies and officials involved in nature conservation. Therefore, the Ministry of the Environment in cooperation with GBIF should coordinate data accessibility and form some data platform. There is a lack of individual capacities in the exchange of information. Only two national coordinators are responsible for establishing and up-dating of the CBD Clearing House Mechanism and

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*the Biosafety CHM. However, this work frequently consists of single actions and does not ensure regular up-dating and maintenance of the systems. There are several research projects dealing with biodiversity in the Czech Republic (<http://aplikace.isvav.cvut.cz>). The central role of concerted action has the **Biodiversity Research Center** (a network of research institutions involved in biodiversity studies and international projects or centres of excellence with aim to educate young researchers in the field involved in)..."*