

## Research needs expressed in the Decisions of the Conference of the Parties to the Convention on Biological Diversity: Cross-Cutting Issue: Global Taxonomy Initiative

Effective conservation and management of biodiversity depends in large part on our understanding of taxonomy (<http://www.cbd.int/gti/default.shtml>). Unfortunately, inadequate taxonomic information and infrastructure, coupled with declining taxonomic expertise, hinders our ability to make informed decisions about conservation, sustainable use and sharing of the benefits derived from genetic resources. Governments, through the Convention on Biological Diversity, have acknowledged the existence of a "taxonomic impediment" to the sound management of biodiversity, and have developed the Global Taxonomic Initiative to remove or reduce the impediment.

The cited Decisions that express research needs are VI/8, VIII/3, IX/22, X/39 and XI/29.

### Direct research needs

Decision	Paragraph	Chapeau / Heading	Text	Source <a href="http://www.cbd.int/decisions/">http://www.cbd.int/decisions/</a>
VI/8	Annex I Part I Para 3	The GTI has been established [...] to underpin decision-making [...] by addressing:	<b>The lack of taxonomic information on the identity of components of biological diversity in many parts of the world.</b>	<a href="http://www.cbd.int/decisions/cop-06.shtml?m=COP-06&amp;id=7182">cop-06.shtml?m=COP-06&amp;id=7182</a>
VI/8	Annex I Part II Planned Activity 8	Forest biological diversity	<b>Taxonomic studies and inventories at the national level, which provide for a basic assessment of forest biological diversity.</b>	
VI/8	Annex I Part II Planned Activity 9	Marine and coastal biological diversity.	Two major elements of <b>taxonomic work within marine and coastal ecosystems can be considered as high priority</b> for achieving the Convention's objectives in marine and coastal systems, namely <b>ballast water organisms, and key organisms for monitoring the health of mangrove systems through their invertebrate fauna</b> . The ballast water organisms sub-element will require, <i>inter alia</i> , a <b>focus on pelagic juvenile stages of benthic organisms</b> . The second element focuses	<a href="http://www.cbd.int/decisions/cop-06.shtml?m=COP-06&amp;id=7182">cop-06.shtml?m=COP-06&amp;id=7182</a>

			on mangroves, which are among the world's most rapidly changing systems. Within the marine and coastal biodiversity programme of work there is a need to <b>develop taxonomic support for baseline monitoring of invertebrate fauna in mangrove systems.</b>	
VI/8	Annex I Part II Planned Activity 10	Dry and subhumid lands biodiversity.	<p>The <b>knowledge base on the organisms that maintain the crucial soil crust should be developed</b> at national and regional levels, as well as <b>the need for greater knowledge of the micro-organisms in nutrient cycling, and increased taxonomic information of pests and diseases.</b></p> <p>In many parts of the world, there is a <b>need to increase taxonomic capacity to identify the lichens</b>, and to then develop identification tools.</p> <p>Taxonomic work will need to develop easy-to-use <b>identikits for key soil lichens, algae, soil invertebrates, pest insects and other herbivores, and other taxa</b> that will be the harbingers of change.</p>	
VI/8	Annex I Part II Planned Activity 12	Agricultural biological diversity.	<p>Within the programme of work on agricultural biological diversity, several areas require taxonomic capacity in order to deliver fully on their objectives. The <b>need for taxonomy ranges from classical taxonomy of the species living in agricultural ecosystems, to the taxonomy of wild relatives of agriculturally important species, to access to existing taxonomic information including basic knowledge on the functional relationships between organisms</b> often recorded by taxonomists.</p> <p>Within the agricultural biodiversity work programme specific taxonomy-related activities are envisaged in the following subject areas: <b>pollinators; soil and other below-ground biodiversity, to support agricultural production systems, especially in nutrient cycling; and natural enemies of pests and diseases.</b></p>	
VIII/3	Annex I Para 22	Additional Planned Activities.	<p>Stimulate and undertake efforts to <b>carry out All-Taxon Biodiversity Inventories (ATBIs) in existing or planned protected areas. Gap analyses of representative taxa found in protected areas</b>, in the context of the distribution and presence of those taxa at other sites nationally and regionally, demonstrating the development and use of such analyses in protected area selection and management.</p> <p>Mobilization <b>of primary occurrence data of species</b> in a protected</p>	<a href="http://www.cop8.org/cop-08.shtml?m=COP-08&amp;id=11015">cop-08.shtml?m=COP-08&amp;id=11015</a>

			area, provision of these data to country of origin, and <b>analysis of distributions using a niche modelling system.</b>	
IX/22	Annex	Output 4.8.1	<b>Establish an inventory of species with economic and ecological values for forest biological diversity</b> , their conservation status, ecology, and distribution, including potential indicators of below-ground biodiversity, and appropriate sampling systems, by 2015;	<a href="http://www.cbd.int/decisions/cop/?id=11665">cop/?id=11665</a>
IX/22	Annex	Output 4.9.2	<b>Produce a guide to the major groups of marine algae by 2012;</b>	<a href="http://www.cbd.int/decisions/cop/?id=11665">cop/?id=11665</a>
IX/22	Annex	Output 4.10.1	<b>Establish an inventory of species with economic and ecological values for dry and sub-humid lands biodiversity</b> , their conservation status, ecology, and distribution, including potential indicators of below-ground biodiversity, and appropriate sampling systems, by 2015;	<a href="http://www.cbd.int/decisions/cop/?id=11665">cop/?id=11665</a>
IX/22	Annex	Output 4.12.2	<b>Produce keys to all genera of bees of the world by 2012;</b>	<a href="http://www.cbd.int/decisions/cop/?id=11665">cop/?id=11665</a>
IX/22	Annex	Output 4.13.2	<b>Identify risks from climate change for existing protected areas in mountain regions</b> and provide information to reduce impact of climate change on small protected areas by 2010;	<a href="http://www.cbd.int/decisions/cop/?id=11665">cop/?id=11665</a>
X/39	Para 6	The Conference of the Parties	<i>urges</i> Parties and <i>invites</i> other Governments and organizations to <b>increase the knowledge base on ecological range and the condition of the species</b> in order to better meet the user-needs <b>in respect of bioindication of ecological health;</b>	<a href="http://www.cbd.int/decisions/cop/?id=12305">cop/?id=12305</a>

#### Indirect research needs

Decision	Paragraph	Chapeau / Heading	Text	Source
VI/8	Annex I Part II Para 12	Programme of work for the GTI.	<b>Address the problems of insufficient knowledge of all components of biological diversity</b> (including their classification, description, value and function) and lack of taxonomic capacity, to overcome what has been termed "the taxonomic impediment".	<a href="http://www.cbd.int/decisions/">http://www.cbd.int/decisions/</a>
VI/8	Annex I Part II Planned Activity 1	Country-based taxonomic needs assessment.	Undertake as a priority activity, <b>assessments of national taxonomic capacity to identify and, where possible, quantify national and regional-level taxonomic impediments and needs.</b>	<a href="http://www.cbd.int/decisions/cop-06.shtml?m=COP-06&amp;id=7182">cop-06.shtml?m=COP-06&amp;id=7182</a>
VI/8	Annex I Part II Planned Activity 2	Regional taxonomic needs assessment.	Existing <b>activities need to be broadened to include all taxa</b> , as well as input from the full range of biodiversity stakeholders needing taxonomic information.	

VI/8	Annex I Part II Planned Activity 3	Global taxonomic needs assessment.	It is widely recognized that generally <b>there is very little data available on global diversity and distribution patterns</b> , and where it does exist it is usually in non-standardized formats that may restrict its usefulness.	
VI/8	Annex I Part II Planned Activity 8	Forest biological diversity.	In decision IV/7, the Conference of the Parties agreed that countries would review specific indicators of forest biological diversity derived by the major international processes related to sustainable forest management. <b>Depending on the selection of the criteria and indicators chosen, additional taxonomic studies and inventories will then be required.</b> While there is a need to continue <b>developing knowledge</b> in many components of forest ecosystems, the least known, and <b>highest priority</b> , is the <b>below-ground biological diversity</b> .	
VI/8	Annex I Part II Planned Activity 11	Inland waters biological diversity.	For the purposes of the GTI targeted activities in rapidly increasing worldwide <b>knowledge of freshwater fish and invertebrates are proposed as high priority</b> .	<a href="http://cop-06.shtml?m=COP-06&amp;id=7182">cop-06.shtml?m=COP-06&amp;id=7182</a>
VI/8	Annex I Part II Planned Activity 12	Agricultural biological diversity.	Outputs would include: easy-to-use <b>keys to families, genera and species of pollinators; automated identification systems for pollinators; development of standard methods for identification of soil biodiversity to different taxonomic levels; increased knowledge of soil biodiversity to aid in the identification of indicators of the "health" of below-ground biological diversity.</b>	
VI/8	Annex I Part II Planned Activity 16	Support in implementation of Article 8(j).	<b>Traditional knowledge systems include taxonomic information</b> , which if used in combination with Linnaean taxonomies could support the GTI. <b>Comparison of indigenous taxonomies and Linnaean taxonomies</b> in different regions could be made to provide general principles to assist in the conservation and sustainable use of elements of biodiversity in different ecosystems.	
VIII/3	Para 4		<b>Notes that the taxonomic impediment is particularly serious in countries with mega-diversity;</b>	
VIII/3	Para 5	The Conference of the Parties	<b>Emphasizes the need to build and retain capacity to address the taxonomic impediment.</b>	<a href="http://cop-08.shtml?m=COP-08&amp;id=11015">cop-08.shtml?m=COP-08&amp;id=11015</a>
VIII/3	Para 9		<i>Urges Parties and other Governments that have not done so to:</i> <b>Undertake or complete or update</b> , as a matter of priority, <b>national</b>	

			<b>taxonomic needs assessments</b> , including related technical, technological and capacity needs.	
VIII/3	Annex I Para 3	Additional Planned Activities.	An <b>increased knowledge of the species composition of mountains</b> through national taxonomic studies and inventories; <b>Working lists of organisms</b> - assembling working lists of organisms occurring in montane areas including their vernacular names, with reference to altitude and relief; <b>Working identification keys</b> – producing identification keys in printed and electronic form useful for the conservation, monitoring and sustainable use of organisms in montane areas; <b>Hot spots and protected areas</b> – providing relevant taxonomic information, infrastructure and human resources to identify hot spots of mountain biodiversity and to establish and monitor protected areas.	<a href="http://www.cop8.org/cop-08.shtml?m=COP-08&amp;id=11015">cop-08.shtml?m=COP-08&amp;id=11015</a>
VIII/3	Annex I Para 10		<b>Databases of invasive alien species and occurrences of invasions</b> , developed and/or expanded, and made widely available; <b>Working identification keys for known invasive alien species</b> associated with key invasion pathways produced and disseminated; <b>Working lists of organisms</b> in areas that are exposed or susceptible to key invasion pathways produced and utilized by local monitoring authorities.	
VIII/3	Annex I Para 17		Improved and augmented <b>biodiversity inventories of protected areas of all kinds</b> , also to be expanded into monitoring efforts to record changes of species and populations over time. <b>Taxonomic guides for key invertebrate organisms, lower plants and microorganisms, economically important and threatened species</b> . Information on <b>current distribution and occurrence of important species in protected areas</b> , including <b>population trends</b> . <b>Identification of habitats and priority setting for establishing new protected areas</b> , through <b>plotting distributions of species</b> at local, national and regional levels. Mobilization and augmentation of specimen and observational-level data pertaining to species to allow modelling of current distributions and distributions under different models of climate change and of other biotic and a biotic changes (e.g. land-use change, invasive species).	
X/39	Para 2	The Conference	<i>urges</i> Parties and other Governments to <b>conduct taxonomic-needs</b>	<a href="http://www.cop8.org/cop/?id=12305">cop/?id=12305</a>

		of the Parties	<b>assessments</b> , where applicable, with particular regard to the full range of end-users and their need for taxonomic support in the implementation of all relevant articles and work programmes of the Convention;	
X/39	Para 3	The Conference of the Parties	<i>encourages</i> Parties, other Governments and relevant organizations to determine priority taxonomic needs in the [...] thematic areas and cross-cutting issues of the Convention;	<a href="http://cop/?id=12305">cop/?id=12305</a>
XI/29	Para 7	The Conference of the Parties	<i>Recognizes</i> the importance of <b>increasing the scientific standing of taxonomic research</b> , strengthening taxonomic expertise, in particular on lesser studied or known groups	<a href="http://cop/default.shtml?id=13190">cop/default.shtml?id=13190</a>
XI/29	Para 14	The Conference of the Parties	<i>Recognizing</i> the need for financial resources for capacity-building, including the consolidated guidance to the financial mechanism, <i>urges</i> Parties and <i>invites</i> other Governments, organizations and donors to provide adequate financial and technical support for Parties to <b>carry out taxonomic projects and activities that prioritize the implementation of the Strategic Plan for Biodiversity 2011–2020</b> ;	<a href="http://cop/default.shtml?id=13190">cop/default.shtml?id=13190</a>
XI/29	Annex	Parties, other Governments and relevant organizations and stakeholders shall consider the following actions:	Action 4: By 2015, produce and continue to share taxonomic tools (e.g., field guides, online tools such as virtual herbaria, genetic and DNA sequence-based identification tools such as barcoding) and risk-analysis tools in the context of invasive alien species and biosafety, taking into account the identified needs of users; and facilitate the use of those tools to identify and analyse: (i) threatened species; (ii) invasive alien species; (iii) species and traits that are useful to agriculture and aquaculture; (iv) species subject to illegal trafficking; and (v) socio-economically important species, including microbial diversity. Action 9: Facilitation of all-taxa inventories in targeted national, regional and subregional priority areas such as biodiversity hot spots, key biodiversity areas, protected areas, community-conserved areas, sustainable biodiversity management zones, and socio-ecological production landscapes considered under the <i>Satoyama</i> Initiative and other programmes in which biodiversity inventories are a priority for decision-making.	<a href="http://cop/default.shtml?id=13190">cop/default.shtml?id=13190</a>