

Table 1: Numbers of threatened species by major groups of organisms (1996–2009)

	Estimated Number of described species ¹	Number of species evaluated by 2009	Number of threatened species ^{2,3} in 1996/98	Number of threatened species ^{2,3} in 2000	Number of threatened species ^{2,3} in 2002	Number of threatened species ^{2,3} in 2003	Number of threatened species ^{2,3} in 2004	Number of threatened species ^{2,3} in 2006	Number of threatened species ^{2,3} in 2007	Number of threatened species ^{2,3} in 2008	Number of threatened species ^{2,3} in 2009	Number threatened in 2009, as % of species described ^{2,3}	Number threatened in 2009, as % of species evaluated ^{2,3,4}
Vertebrates													
Mammals ⁵	5,490	5,490	1,096	1,130	1,137	1,130	1,101	1,093	1,094	1,141	1,142	21%	21%
Birds	9,998	9,998	1,107	1,183	1,192	1,194	1,213	1,206	1,217	1,222	1,223	12%	12%
Reptiles	9,084	1,677	253	296	293	293	304	341	422	423	469	5%	28%
Amphibians ⁶	6,433	6,285	124	146	157	157	1,770	1,811	1,808	1,905	1,895	29%	30%
Fishes	31,300	4,443	734	752	742	750	800	1,171	1,201	1,275	1,414	5%	32%
Subtotal	62,305	27,893	3,314	3,507	3,521	3,524	5,188	5,622	5,742	5,966	6,143	10%	22%
Invertebrates													
Insects	1,000,000	2,619	537	555	557	553	559	623	623	626	711	0.1%	27%
Molluscs	85,000	2,306	920	938	939	967	974	975	978	978	1,036	1%	45%
Crustaceans	47,000	1,735	407	408	409	409	429	459	460	606	606	1%	35%
Corals	2,175	856	1	1	1	1	1	1	4	235	235	11%	27%
Arachnids	102,248	32	11	11	11	11	11	11	11	18	18	0.02%	56%
Velvet Worms	165	11	6	6	6	9	9	9	9	9	9	5%	82%
Horseshoe Crabs	4	4	0	0	0	0	0	0	0	0	0	0%	0%
Others	68,658	52	9	9	9	9	9	24	24	24	24	0.03%	46%
Subtotal	1,305,250	7,615	1,891	1,928	1,932	1,959	1,992	2,102	2,109	2,496	2,639	0%	35%
Plants⁷													
Mosses ⁸	16,236	95	---	80	80	80	80	80	80	82	82	1%	86%
Ferns and Allies ⁹	12,000	211	---	---	---	111	140	139	139	139	139	1%	66%
Gymnosperms	1,021	909	142	141	142	304	305	306	321	323	322	32%	35%
Flowering Plants	281,821	10,876	5,186	5,390	5,492	6,279	7,796	7,865	7,899	7,904	7,948	3%	73%
Green Algae ¹⁰	4,053	2	---	---	---	---	---	---	0	0	0	0%	0%
Red Algae ¹⁰	6,081	58	---	---	---	---	---	---	9	9	9	0.1%	16%
Subtotal	321,212	12,151	5,328	5,611	5,714	6,774	8,321	8,390	8,448	8,457	8,500	3%	70%
Fungi & Protists													
Lichens	17,000	2	---	---	---	2	2	2	2	2	2	0.01%	100%
Mushrooms	31,496	1	---	---	---	---	---	1	1	1	1	0.003%	100%
Brown Algae ¹⁰	3,067	15	---	---	---	---	---	---	6	6	6	0.2%	40%
Subtotal	51,563	18	---	---	---	2	2	3	9	9	9	0%	50%
TOTAL	1,740,330	47,677	10,533	11,046	11,167	12,259	15,503	16,117	16,308	16,928	17,291	1%	36%

NOTES (for rows and columns as indicated by the superscripted numbers):

1. The sources used for the numbers described species in each taxonomic group are listed below.

2. Threatened species are those listed as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU).

3. The numbers and percentages of species threatened in each group **DO NOT** mean that the remainder are all not threatened (i.e., are Least Concern). There are a number of species in many of the groups listed as Near Threatened or Data Deficient (see Tables 3a and 3b). These figures also need to be considered in relation to the number of species evaluated as shown in column two (see note 4).

4. Apart from the mammals, birds, amphibians and gymnosperms (i.e., those groups completely or almost completely evaluated), the figures in the last column are gross over-estimates of the percentage threatened due to biases in the assessment process towards assessing species that are thought to be threatened, species for which data are readily available, and under-reporting of Least Concern species. The true value for the percentage threatened lies somewhere in the range indicated by the two right-hand columns. In most cases this represents a very broad range. For example, the true percentage of threatened insects lies somewhere between 0.1% and 27%. Hence, although 36% of all species on the IUCN Red List are listed as threatened, this figure needs to be treated with extreme caution given the biases described above.

5. The number of described and evaluated mammals excludes domesticated species like sheep (*Ovis aries*), goats (*Capra hircus*), Dromedary (*Camelus dromedarius*), etc.

6. It should be noted that for certain amphibian species endemic to Brazil, it has not yet been possible to reach agreement on the Red List Categories between the Global Amphibian Assessment (GAA) Coordinating Team, and the experts on the species in Brazil. The 2004-2008 figures for Amphibians displayed here are those that were agreed at the GAA Brazil workshop in April 2003. However, in the subsequent consistency check conducted by the GAA Coordinating Team, many of the assessments were found to be inconsistent with the approach adopted elsewhere in the world, and a "consistent Red List Category" was also assigned to these species. The "consistent Red List Categories" are yet to be accepted by the Brazilian experts; therefore the original workshop assessments are retained here. However, in order to ensure comparability between results for amphibians with those for other taxonomic groups, the data used in various analyses (e.g., Bailliet *et al.* 2004, Stuart *et al.* 2008, Vié *et al.* 2009) are based on the "consistent Red List Categories". Therefore, figures for Amphibians in Table 1 above will not completely match figures that appear in other analyses.

7. The plant numbers **DO NOT** include species from the 1997 IUCN Red List of Threatened Plants (Walter and Gillett 1998) as those were all assessed using the pre-1994 IUCN system of threat categorization. Hence the numbers of threatened plants are very much lower when compared to the 1997 results. The results from this Red List and the 1997 Plants Red List should be combined together when reporting on threatened plants.

8. Mosses include the true mosses (Bryopsida), the hornworts (Anthocerotopsida), and liverworts (Marchantiopsida).

9. The ferns and allies include the club mosses (Lycopodiopsida), spike mosses (Sellaginellopsida), quillworts (Isoetopsida), and true ferns (Polypodiopsida).

10. Seaweeds are included in the green algae (Chlorophyta), red algae (Rhodophyta), and brown algae (Ochrophyta or Heterokontophyta).

Sources for Numbers of Described Species:

Vertebrates

Mammals – From Wilson and Reeder (2005; see <http://www.bucknell.edu/mmsw3/>), with deviations based on new revisions and published papers that have appeared since the accounts in Wilson and Reeder (2005) were compiled and largely up until 31 December 2007, but there are a few exceptions where new species published in 2008 and 2009 have been included, while others are currently under review. In cases where there are alternative taxonomic treatments, the Global Mammal Assessment coordinating team working with the relevant IUCN SSC Specialist Group has advised on which treatment to follow.

Birds – BirdLife International. 2009. The BirdLife checklist of the birds of the world, with conservation status and taxonomic sources. Version 2. Available from http://www.birdlife.info/docs/SpcChecklist/Checklist_v2_June09.zip [xls zipped 1 MB]. Accessed: 31 October 2009.

Amphibians – From Frost, D.R. 2009. *Amphibian Species of the World: an Online Reference. Version 5.3 (12 February, 2009)*. Available at: <http://research.amnh.org/herpetology/amphibia/index.php>. Accessed: 31 October 2009.

Reptiles – Based on the figures (as of October 2009) provided by *The TIGR Reptile Database* compiled by Peter Uetz and Jakob Hallermann. Available at: <http://www.reptile-database.org>. Accessed: 31 October 2009.

Fishes – Based on Froese, R. and Pauly, D. (eds). 2009. *FishBase*. World Wide Web electronic publication. www.fishbase.org. version (09/2009). Accessed: 31 October 2009.

Invertebrates

Insects – Estimates of the number of insects in the world vary from about 720,000 to more than 1 million, but the most reasonable mid-point figure appears to be about 1 million (see discussion in Chapman, A.D. 2009. *Numbers of Living Species in Australia and the World, 2nd edition*. Australian Biological Resources Study, Canberra. Available at: <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/04-02-groups-invertebrates.html#insecta>. Accessed 31 October 2009).

Crustaceans – The estimated number of described species of Crustacea in the world varies from 25,000 to 68,171 but the best estimate is 47,000 (see discussion in Chapman, A.D. 2009. *Numbers of Living Species in Australia and the World, 2nd edition*. Australian Biological Resources Study, Canberra. Available at: <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/04-02-groups-invertebrates.html#crustacea>. Accessed 31 October 2009).

Molluscs – The estimated number of described mollusc species ranges from 50,000 to 120,000. The best estimate by Chapman (2009) appears to be about 85,000 species. (For further discussion on the numbers of molluscs, see Chapman, A.D. 2009. *Numbers of Living Species in Australia and the World, 2nd edition*. Australian Biological Resources Study, Canberra. Available at: <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/04-02-groups-invertebrates.html#mollusca>. Accessed 31 October 2009).

Corals – Corals fall under the Phylum Cnidaria and are primarily in the Class Anthozoa, although there are some in the Class Hydrozoa. The number of described species reported here are for species typically regarded as 'corals' and are largely based on Spalding *et al.* (2001) (Alcyonarian corals); and Cairns (1999) (Scleractinian corals). The remainder of the cnidarians, anemones, jellyfish, etc., are treated under 'Others'.

Arachnids (spiders, scorpions, etc) – Estimates of the number of described arachnids vary from 60,000 to 102,248, the latter is from Chapman (2009) and is calculated from a breakdown of the numbers by Order and appears to be the best figure to use (see discussion in Chapman, A.D. 2009. *Numbers of Living Species in Australia and the World, 2nd edition*. Australian Biological Resources Study, Canberra. Available at: <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/04-02-groups-invertebrates.html#arachnida>. Accessed 31 October 2009).

Velvet Worms – The number of described species of Onychophora (velvet worms) would appear to be around 165 (for further details see discussion in Chapman, A.D. 2009. *Numbers of Living Species in Australia and the World, 2nd edition*. Australian Biological Resources Study, Canberra. Available at: <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/04-02-groups-invertebrates.html#onychophora>. Accessed 31 October 2009).

Horseshoe Crabs – Horseshoe crabs are placed on the Red List under the traditional class "Merostomata" which excludes the fossil sea scorpions; only four species are extant today (see <http://en.wikipedia.org/wiki/Merostomata> for further details).

Others – This is a miscellaneous group of invertebrate species that have been assessed for the IUCN Red List. The total number of described species is based on the estimated totals from the following groups from which the assessed species come: Annelida - segmented worms (16,763), Cnidaria - anemones, jellyfish, etc. but excluding the corals which are treated separately (7,620), Echinodermata - starfish (7,003 species), Myriapoda - centipedes and millipedes (16,072), Nemertina - ribbon worms (1,200), and Platyhelminthes - flat worms (20,000). (For further details on the numbers in these groups see: Chapman, A.D. 2009. *Numbers of Living Species in Australia and the World, 2nd edition*. Australian Biological Resources Study, Canberra. Available at: <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/04-02-groups-invertebrates.html>. Accessed 31 October 2009).

Plants

Mosses – Based on information provided by Chapman, A.D. 2009. *Numbers of Living Species in Australia and the World, 2nd edition*. Australian Biological Resources Study, Canberra. Available at <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/04-03-groups-plants.html#bryophyta>. Accessed 31 October 2009.

Ferns and allies – Based on information provided by Chapman, A.D. 2009. *Numbers of Living Species in Australia and the World, 2nd edition*. Australian Biological Resources Study, Canberra. Available at <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/04-03-groups-plants.html#ferns>. Accessed 31 October 2009.

Gymnosperms – Based on Donaldson (2003), Farjon (2001), Mabberley (1997) and the updated figures from Chapman (2009). (For further discussion see Chapman, A.D. 2009 . Numbers of Living Species in Australia and the World, 2nd edition. Australian Biological Resources Study, Canberra. Available at <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/04-03-groups-plants.html#gymnosperms>. Accessed 31 October 2009).

Flowering Plants (Magnoliophyta = Magnoliopsida+Liliopsida) – The number of described species ranges from 223,300 to 315,903. The number used here is based on Chapman (2009). For alternative views on the numbers of seed plant species see Mabberley (1997), Schmid (1998), Govaerts (2001, 2003), Bramwell (2002), Thorne (2002), Scotland and Wortley (2003), Paton *et al.* (2008), and Kier *et al.* (2009). (For further discussion see Chapman, A.D. 2009 . Numbers of Living Species in Australia and the World, 2nd edition. Australian Biological Resources Study, Canberra. Available at <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/04-03-groups-plants.html#magnoliophyta>. Accessed 31 October 2009).

Fungi & Protists

Lichens - The figure of 10,000 from Groombridge and Jenkins (2002) appears to be too low, so the number described is now based on information provided by Chapman, A.D. 2009 . Numbers of Living Species in Australia and the World, 2nd edition. Australian Biological Resources Study, Canberra. Available at: <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/04-04-groups-fungi.html#lichen>. Accessed 31 October 2009.

Mushrooms - Number of mushroom-forming fungi (=Basidiomycota excluding the 7 lichenised species) based on Kirke *et al.* (2008) (for discussion see Chapman, A.D. 2009 . Numbers of Living Species in Australia and the World, 2nd edition. Australian Biological Resources Study, Canberra. Available at: <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/04-04-groups-fungi.html#fungi>. Accessed 31 October 2009).

Green (Chlorophyta), Red (Rhodophyta) and Brown (Ochromytha or Heterokontophyta) Algae – From Guiry, M.D. and Guiry, G.M. 2009. *AlgaeBase* . World-wide electronic publication, National University of Ireland, Galway. <http://www.algaebase.org>. Accessed on 31 October 2009.