

**Table 1a: Number of species evaluated in relation to the overall number of described species, and numbers of threatened species by major groups of organisms.**

|                                          | Estimated Number of described species <sup>1</sup> | Number of species evaluated by 2022 (IUCN Red List version 2022-2) | % of described species evaluated by 2022 (IUCN Red List version 2022-2) | Number of threatened species <sup>2</sup> by 2022 (IUCN Red List version 2022-2) | Estimated % threatened species in 2022 (IUCN Red List version 2022-2) <sup>2,3,4</sup> |                                                                                  |                                                                          |
|------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------|
|                                          |                                                    |                                                                    |                                                                         |                                                                                  | Lower estimate (threatened spp. as % of extant evaluated species)                      | Best estimate (threatened spp. as % of extant data sufficient evaluated species) | Upper estimate (threatened and DD spp. as % of extant evaluated species) |
| <b>VERTEBRATES</b>                       |                                                    |                                                                    |                                                                         |                                                                                  |                                                                                        |                                                                                  |                                                                          |
| Mammals <sup>5</sup>                     | 6,596                                              | 5,973                                                              | 91%                                                                     | 1,340                                                                            | 23%                                                                                    | 27%                                                                              | 37%                                                                      |
| Birds                                    | 11,188                                             | 11,188                                                             | 100%                                                                    | 1,400                                                                            | 13%                                                                                    | 13%                                                                              | 13%                                                                      |
| Reptiles                                 | 11,733                                             | 10,222                                                             | 87%                                                                     | 1,842                                                                            | 18%                                                                                    | 21%                                                                              | 33%                                                                      |
| Amphibians                               | 8,536                                              | 7,486                                                              | 88%                                                                     | 2,606                                                                            | 35%                                                                                    | 41%                                                                              | 50%                                                                      |
| Fishes                                   | 36,367                                             | 25,351                                                             | 70%                                                                     | 3,551                                                                            | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| <b>Subtotal</b>                          | <b>74,420</b>                                      | <b>60,220</b>                                                      | <b>81%</b>                                                              | <b>10,739</b>                                                                    |                                                                                        |                                                                                  |                                                                          |
| <b>INVERTEBRATES</b>                     |                                                    |                                                                    |                                                                         |                                                                                  |                                                                                        |                                                                                  |                                                                          |
| Insects                                  | 1,053,578                                          | 12,441                                                             | 1.2%                                                                    | 2,345                                                                            | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| Molluscs                                 | 113,813                                            | 9,032                                                              | 8%                                                                      | 2,399                                                                            | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| Crustaceans <sup>6</sup>                 | 80,122                                             | 3,197                                                              | 4%                                                                      | 745                                                                              | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| Corals                                   | 5,574                                              | 831                                                                | 15%                                                                     | 253                                                                              | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| Arachnids                                | 110,615                                            | 441                                                                | 0.40%                                                                   | 251                                                                              | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| Velvet Worms                             | 210                                                | 11                                                                 | 5%                                                                      | 9                                                                                | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| Horseshoe Crabs                          | 4                                                  | 4                                                                  | 100%                                                                    | 2                                                                                | 50%                                                                                    | 100%                                                                             | 100%                                                                     |
| Others                                   | 157,543                                            | 905                                                                | 0.57%                                                                   | 157                                                                              | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| <b>Subtotal</b>                          | <b>1,521,459</b>                                   | <b>26,862</b>                                                      | <b>2%</b>                                                               | <b>6,161</b>                                                                     |                                                                                        |                                                                                  |                                                                          |
| <b>PLANTS<sup>7</sup></b>                |                                                    |                                                                    |                                                                         |                                                                                  |                                                                                        |                                                                                  |                                                                          |
| Mosses <sup>8</sup>                      | 21,925                                             | 329                                                                | 1.5%                                                                    | 181                                                                              | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| Ferns and Allies <sup>9</sup>            | 11,800                                             | 747                                                                | 6%                                                                      | 288                                                                              | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| Gymnosperms                              | 1,113                                              | 1,046                                                              | 94%                                                                     | 436                                                                              | 42%                                                                                    | 42%                                                                              | 44%                                                                      |
| Flowering Plants                         | 369,000                                            | 60,470                                                             | 16%                                                                     | 24,000                                                                           | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| Green Algae <sup>10</sup>                | 12,929                                             | 16                                                                 | 0.1%                                                                    | 0                                                                                | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| Red Algae <sup>10</sup>                  | 7,568                                              | 58                                                                 | 0.8%                                                                    | 9                                                                                | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| <b>Subtotal</b>                          | <b>424,335</b>                                     | <b>62,666</b>                                                      | <b>15%</b>                                                              | <b>24,914</b>                                                                    |                                                                                        |                                                                                  |                                                                          |
| <b>FUNGI &amp; PROTISTS<sup>11</sup></b> |                                                    |                                                                    |                                                                         |                                                                                  |                                                                                        |                                                                                  |                                                                          |
| Lichens                                  | 17,000                                             | 86                                                                 | 0.5%                                                                    | 62                                                                               | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| Mushrooms, etc.                          | 120,000                                            | 539                                                                | 0.4%                                                                    | 226                                                                              | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| Brown Algae <sup>10</sup>                | 4,541                                              | 15                                                                 | 0.3%                                                                    | 6                                                                                | Insufficient coverage                                                                  |                                                                                  |                                                                          |
| <b>Subtotal</b>                          | <b>141,541</b>                                     | <b>640</b>                                                         | <b>0.5%</b>                                                             | <b>294</b>                                                                       |                                                                                        |                                                                                  |                                                                          |
| <b>TOTAL</b>                             | <b>2,161,755</b>                                   | <b>150,388</b>                                                     | <b>7%</b>                                                               | <b>42,108</b>                                                                    |                                                                                        |                                                                                  |                                                                          |

**NOTES:**

- The numbers of described species in Table 1a should be used with caution as these are not always be up to date for all taxonomic groups. The sources used for the figures currently shown in the table are listed below.
- Threatened species are those listed as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU).
- Where <80% of species within a group have been evaluated, figures for % threatened species are not provided because there is insufficient coverage for these groups. It is only possible to provide reliable figures for % threatened species for those groups that are completely or almost completely evaluated (e.g., mammals, birds, amphibians and gymnosperms).
- The percentage of threatened species can be calculated for those groups that are completely or almost completely evaluated (>80% of species evaluated), but the actual number of threatened species is often uncertain because it is not known whether Data Deficient (DD) species are actually threatened or not. Therefore, a range of percentages is provided: **lower estimate** = % threatened extant species (if all DD species are not threatened); **best estimate** = % threatened extant species (if DD species are equally threatened as data sufficient species); **upper estimate** = % threatened extant species (if all DD species are threatened). If a single figure is required for reporting purposes, the best estimate figure should be used.
- The number of described and evaluated mammals excludes domesticated species like sheep (*Ovis aries*), goats (*Capra hircus*), Dromedary (*Camelus dromedarius*), etc.
- Crustaceans include six classes: Branchiopoda (fairy shrimp, clam shrimp, etc.); Cephalocardia (horseshoe shrimp); Malacostraca (crabs, lobsters, shrimp, woodlice, etc.); Maxillopoda (barnacles, copepods, etc.); Ostracoda (seed shrimp) and Remipedia (remipedes)
- The plant numbers **DO NOT** include species from the 1997 IUCN Red List of Threatened Plants (Walter and Gillett 1998) as those assessments used the pre-1994 IUCN system of threat categories. Hence the numbers of threatened plants in Table 1b are much lower when compared to the 1997 results. When reporting on threatened plants, the results from the current web version of The IUCN Red List should be combined with the 1997 Plants Red List. Since there have been many taxonomic changes for plant species since 1997, careful comparison of the current and 1997 species lists will be needed when combining these results to avoid double-counting.
- Mosses include the true mosses (Bryophyta), the hornworts (Anthocerotophyta), and liverworts (Marchantiophyta).
- The ferns and allies include club mosses and spike mosses (Lycopodiopsida), quillworts (Isoetopsida), horsetails (Equisetopsida) and ferns (Marattiopsida, Polypodiopsida and Psilotopsida).
- Seaweeds are included in the green algae (Chlorophyta, Charophyta), red algae (Rhodophyta), and brown algae (Ochrophyta).
- Many of the described species in these groups are not eligible for assessment on the IUCN Red List as they are considered micro-organisms.

**Sources for Numbers of Described Species:**

**Vertebrates**

**Mammals** – Mammal Diversity Database. 2022. v. 1.9, released 1 April 2022. [www.mammaldiversity.org](http://www.mammaldiversity.org). American Society of Mammalogists. Accessed 09 December 2022. The ASM Biodiversity Committee stewards the Mammal Diversity Database, an updatable and online database of mammal taxonomic and biodiversity information. Partly based on Wilson, D.E. and Reeder, D.M. (eds). 2005. *Mammal Species of the World*, 3rd Edition. John Hopkins University Press, Baltimore (available at <https://www.departments.bucknell.edu/biology/resources/msw3/>), updated using the IUCN Red List and other literature. The IUCN Red List deviates from Wilson and Reeder (2005), especially in cases where there are alternative taxonomic treatments; in such cases the Global Mammal Assessment coordinating team working with the relevant IUCN SSC Specialist Group advise on which treatment to follow. A number of differences and deviations are also based on new revisions and published papers that have appeared since the accounts in Wilson and Reeder (2005) were published. There are a number of recently described species which are currently under review and hence these are not included in the numbers cited here.

**Birds** – Handbook of the Birds of the World and BirdLife International. 2022. Handbook of the Birds of the World and BirdLife International digital checklist of the birds of the world. Version 7. Available at: [http://datazone.birdlife.org/userfiles/file/Species/Taxonomy/HBW-BirdLife\\_Checklist\\_v7\\_Dec22.zip](http://datazone.birdlife.org/userfiles/file/Species/Taxonomy/HBW-BirdLife_Checklist_v7_Dec22.zip). Accessed: 09 December 2022

**Reptiles** – Based on the figures (as of March 2022) provided by The Reptile Database compiled by Peter Uetz and Jiri Hošek. Available at: <http://www.reptile-database.org>. Accessed: 09 December 2022. For current total number of species on this website, see <http://www.reptile-database.org/db-info/SpeciesStat.html>

**Amphibians** – Frost, D.R. 2022. *Amphibian Species of the World: an Online Reference*. Version 6.1 (09 December 2022). Electronic Database accessible at: <https://amphibiansoftheworld.amnh.org/index.php>. American Museum of Natural History, New York, USA. doi.org/10.5531/db.vz.0001.

**Fishes** – Based on Frick, R. Eschmeyer, W.N. and Van der Lan, R. (eds). 2022. *Eschmeyer's Catalog of Fishes: genera, species, references* (<http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>). Electronic version accessed: 09 December 2022.

## Invertebrates

**Insects** – Roskov Y., Ower G., Orrell T., Nicolson D., Bailly N., Kirk P.M., Bourgoin T., DeWalt R.E., Decock W., Nieukerken E. van, Zarucchi J., Penev L., eds. (2019). *Species 2000 & ITIS Catalogue of Life, 2019 Annual Checklist*. Digital resource at <http://www.catalogueoflife.org/annual-checklist/2019/info/totals>. Species 2000: Naturalis, Leiden, the Netherlands. ISSN 2405-884X. Accessed 09 December 2022.

**Crustaceans** – Roskov Y., Ower G., Orrell T., Nicolson D., Bailly N., Kirk P.M., Bourgoin T., DeWalt R.E., Decock W., Nieukerken E. van, Zarucchi J., Penev L., eds. (2019). *Species 2000 & ITIS Catalogue of Life, 2019 Annual Checklist*. Digital resource at [www.catalogueoflife.org/annual-checklist/2019](http://www.catalogueoflife.org/annual-checklist/2019). Species 2000: Naturalis, Leiden, the Netherlands. ISSN 2405-884X. Accessed 09 December 2022.

**Molluscs** – MolluscaBase (2022). MolluscaBase. Available at <http://www.molluscabase.org>. Accessed: 09 December 2022.

**Corals** – Corals fall under the phylum Cnidaria and are primarily in the class Anthozoa (orders Alcyonacea, Antipatharia, Corallimorpharia, Helioporacea, Scleractinia, although there are some in the class Hydrozoa (family Milleporidae). The number of described living species reported here are from Roskov Y., Ower G., Orrell T., Nicolson D., Bailly N., Kirk P.M., Bourgoin T., DeWalt R.E., Decock W., Nieukerken E. van, Zarucchi J., Penev L., eds. (2019). *Species 2000 & ITIS Catalogue of Life, 2019 Annual Checklist*. Digital resource at [www.catalogueoflife.org/annual-checklist/2019](http://www.catalogueoflife.org/annual-checklist/2019). Species 2000: Naturalis, Leiden, the Netherlands. ISSN 2405-884X. Accessed: 09 December 2022

**Arachnids (spiders, scorpions, etc)** – Roskov Y., Ower G., Orrell T., Nicolson D., Bailly N., Kirk P.M., Bourgoin T., DeWalt R.E., Decock W., Nieukerken E. van, Zarucchi J., Penev L., eds. (2019). *Species 2000 & ITIS Catalogue of Life, 2019 Annual Checklist*. Digital resource at [www.catalogueoflife.org/annual-checklist/2019](http://www.catalogueoflife.org/annual-checklist/2019). Species 2000: Naturalis, Leiden, the Netherlands. ISSN 2405-884X. Accessed 09 December 2022.

**Velvet Worms (Udeonychophora)** — Oliveira, I.S., Hering, L. and Mayer, G. (2006-2022). The Onychophora Website. Digital resource at <http://www.onychophora.com/index.htm>. Accessed 09 December 2022. For number of described species see <http://www.onychophora.com/list.htm>.

**Horseshoe Crabs (Merostomata)** — Class Merostomata excludes the fossil sea scorpions; only four species are extant today: Roskov Y., Ower G., Orrell T., Nicolson D., Bailly N., Kirk P.M., Bourgoin T., DeWalt R.E., Decock W., Nieukerken E. van, Zarucchi J., Penev L., eds. (2019). *Species 2000 & ITIS Catalogue of Life, 2019 Annual Checklist*. Digital resource at [www.catalogueoflife.org/annual-checklist/2019](http://www.catalogueoflife.org/annual-checklist/2019). Species 2000: Naturalis, Leiden, the Netherlands. ISSN 2405-884X. Accessed 09 December 2022.

**Others** – "Others" includes all of the invertebrate groups listed in Catalog of Life that are not included in the groups listed above. Roskov Y., Ower G., Orrell T., Nicolson D., Bailly N., Kirk P.M., Bourgoin T., DeWalt R.E., Decock W., Nieukerken E. van, Zarucchi J., Penev L., eds. (2019). *Species 2000 & ITIS Catalogue of Life, 2019 Annual Checklist*. Digital resource at [www.catalogueoflife.org/annual-checklist/2019](http://www.catalogueoflife.org/annual-checklist/2019). Species 2000: Naturalis, Leiden, the Netherlands. ISSN 2405-884X. Accessed 09 December 2021).

## Plants

**Mosses** – Christenhusz, M.J.M. and Byng, J.W. 2016. The number of known plant species in the world and its annual increase. *Phytotaxa*. 261(3): 201-217. <http://dx.doi.org/10.11646/phytotaxa.261.3.1>

**Ferns and allies** – State of the World's Plants 2017: [https://stateoftheworldsplants.org/2017/report/SOTWP\\_2017.pdf](https://stateoftheworldsplants.org/2017/report/SOTWP_2017.pdf)

**Gymnosperms** – Christenhusz, M.J.M. *et al.* (2011). A new classification and linear sequence of extant gymnosperms. *Phytotaxa*. 19: 55–70 (cited in State of the World's Plants 2017: [https://stateoftheworldsplants.org/2017/report/SOTWP\\_2017.pdf](https://stateoftheworldsplants.org/2017/report/SOTWP_2017.pdf)).

**Flowering Plants (Magnoliophyta = Magnoliopsida+Liliopsida)** – State of the World's Plants 2017: [https://stateoftheworldsplants.org/2017/report/SOTWP\\_2017.pdf](https://stateoftheworldsplants.org/2017/report/SOTWP_2017.pdf).

## Fungi & Protists

**Lichens** - The estimated total number of lichen species currently ranges between 17,000 (Chapman 2009) and 28,000 (Thell *et al.* 2012). The figure presented in Table 1a will be updated as soon as a more accurate figure can be confirmed.

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 02 September 2010.

Thell, A., Crespo, A. Divakar, P.K., Kärnefelt, I., Leavitt, S.D., Lumbsch, H.T. and Seaward, M.R.D. 2012. A review of the lichen family Parmeliaceae - history, phylogeny and current taxonomy. *Nordic Journal of Botany* 30(6): 641-664

**Mushrooms, brackets, rusts, smuts, jelly fungi, etc.** - Ascomycota and Basidiomycota (excluding the lichenised species).

Kirk P.M. (2019). *Species Fungorum* (version Oct 2017). In: *Species 2000 & ITIS Catalogue of Life, 2019 Annual Checklist* (Roskov Y., Ower G., Orrell T., Nicolson D., Bailly N., Kirk P.M., Bourgoin T., DeWalt R.E., Decock W., Nieukerken E. van, Zarucchi J., Penev L., eds). Digital resource at [www.catalogueoflife.org/annual-checklist/2019](http://www.catalogueoflife.org/annual-checklist/2019). Species 2000: Naturalis, Leiden, the Netherlands. ISSN 2405-884X. Accessed 09 November 2022.

**Green (Charophyta, Chlorophyta), Red (Rhodophyta) and Brown (Ochrophyta) Algae** – From Guiry, M.D. and Guiry, G.M. 2022. *AlgaeBase*. World-wide electronic publication, National University of Ireland, Galway. <http://www.algaebase.org>. Accessed on 09 December 2022. For taxonomy search, see <https://www.algaebase.org/browse/taxonomy/>