The IUCN Amphibians Initiative:

A record of the 2001-2008 amphibian assessment efforts for the IUCN Red List

Contents

Introduction

This document is a record of the Amphibians Initiative pages of the “old” IUCN Red List website, which was replaced in 2018. The content of these pages provided a detailed account of the 2004 Global Amphibian Assessment and its 2006 and 2008 update, and the majority of the text was last updated in 2008. The Amphibian Red List Authority of the IUCN SSC Amphibian Specialist Group has compiled this information as a record of this remarkable body of work.

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Amphibians on the IUCN Red List - Home Page

Included in the IUCN Red List is the comprehensive assessment of the conservation status of the world's 6,000+ known species of frogs, toads, salamanders, and caecilians. Here you will find key findings of the assessment, as well as individual species accounts including IUCN Red List threat category, range map, ecology information, and other data for every amphibian species.

While updates to the amphibian database have been incremental, there has not been a major comprehensive amphibian assessment since 2004. However, the global overview provided by the 2004 assessment remains relevant, and it is still accessible in depth at this website. Since 2004 the database has been slowly but continually updated to include newly described or revalidated species and new information. The assessment of amphibians is ongoing and relies on the expertise of hundreds of herpetologists from all around the world. For further information on the assessment process see the Amphibian Assessment Forum.

Use the search tool at the top of the page to search for amphibians in the IUCN Red List database by name, taxonomy, country, region, habitat type, threat type, or IUCN Red List status.

Assessment process

The information below refers to the Amphibian Assessment Process up until 2008; this process has since changed, so for more recent updates on the process itself please refer to the IUCN SSC Amphibian Red List Authority Wiki Site.

The 2008 IUCN Red List contains information on the conservation status of the world's 6,260 known amphibian species, as assessed against the IUCN Red List Categories and Criteria. Almost 650 scientists from more than 60 countries have now contributed to these assessments. Since the first comprehensive assessment of all amphibians was completed and included in the IUCN Red List in 2004 (as part of the IUCN-led Global Amphibian Assessment), the data have been continually updated and revised. In particular, newly described species have been added and new information has been incorporated. The first update was included in the IUCN Red List in 2006, and the second and most recent update to the data is included in the most recent IUCN Red List in 2008.

Partners

In order to conduct IUCN Red List assessments across the globe, IUCN relies heavily on the support of many key institutional partners, without which the progress made to date on expanding the content on the IUCN Red List would not have been possible. In the case of amphibians, the assessment process represents a long-term collaboration between IUCN, Conservation International, and NatureServe.

The Central Coordinating Team

The central coordination for amphibians is carried out by the IUCN/SSC - CI/CABS Biodiversity Assessment Unit based at the Center for Applied Biodiversity Science at Conservation International (CI/CABS). The four members of the unit currently working on amphibians are Ariadne Angulo, Janice Chanson, Neil Cox and Michael Hoffmann, with administrative support from Edward Lohnes. Bruce Young of NatureServe has served as a fifth member of the coordinating team, with particular responsibilities for coordination of work in the Americas, especially North America and Mesoamerica. Simon Stuart currently serves as a consultant advisor to the team. This small team is dependent on the expertise of the world's amphibian experts for the success of the amphibian assessment. A full listing of all the participants in the assessment can be found in the Acknowledgements.

The IUCN/SSC – CI/CABS Biodiversity Assessment Unit

In 2001, the Species Survival Commission (SSC) of the International Union for Conservation of Nature (IUCN) and the Center for Applied Biodiversity Science (CABS) at Conservation International established

the Biodiversity Assessment Unit, with the aim of rapidly expanding the geographic and taxonomic coverage of the IUCN Red List.

Amphibians were the first major taxon to be assessed, and a complete reassessment of mammals has just been completed. A global, comprehensive assessment of all reptiles is currently underway, and indeed already complete in some regions. IUCN/SSC and CI/CABS are also collaborating with other partners to expand the coverage of the IUCN Red List into the marine realm (the 2008 IUCN Red List includes the first major results of this work), in freshwater, as well as on selected plant taxa (e.g., cycads and cacti). The goals for each species group assessment are the same: to map the distribution and assess the conservation status of each species in order to establish global baselines for biodiversity monitoring. The Unit also provides advice on guidance on the use of these data for conservation planning, management, monitoring and decision making.

An Introduction to Amphibians

Amphibians are a class of vertebrates that include frogs, toads, salamanders, newts and caecilians. All amphibians are cold-blooded, and most lay eggs. The majority of species undergo metamorphosis, moving from a larval stage (usually aquatic) through the development of limbs and lungs to become terrestrial adults. However, a significant minority of the species develop directly from eggs, usually laid on land, without a larval stage. There are also a few viviparous species that give birth to young, without laying eggs.

Almost all species are dependent on moist conditions, and many require freshwater habitats in which to breed. The greatest diversity occurs in tropical forests, with species richness generally lower in temperate and arid regions. Amphibians are entirely absent from marine environments.

Amphibians are excellent indicators of the quality of the overall environment, as they are very sensitive to perturbations in ecosystems. Additional general information about amphibians can be found on AmphibiaWeb.

Assessment methods

The first comprehensive assessment of the conservation status of all amphibians was completed as the Global Amphibian Assessment (GAA) in 2004, one of several global initiatives led by IUCN and partners to rapidly expand the geographic and taxonomic coverage of the IUCN Red List. Since 2004, the data have been updated in 2006 and again in 2008 to include new information and to take account of taxonomic changes and newly described or revalidated species.

This first assessment was implemented in three main stages:

1. Data Collection
2. Data Review
3. Data Consolidation

Since the first assessment there have been two updates of the data.

The 2006 update

The 2008 update

Keeping the amphibian data accurate and up-to-date is an ongoing process that relies on the expertise of hundreds of herpetologists from all around the world. Almost 650 experts from over 60 countries have so far contributed to the assessment.

1. Data Collection

For every amphibian species currently known, the following data were collected (see Description of Data for further information):

- Species classification
- Geographic range (including a distribution map)
- Red List Category and Criteria
- Population information
- Habitat preferences
- Major threats
- Conservation measures
- Species Utilisation
- Other General Information
- Key literature references

The task of collecting the initial data at the very beginning of the assessment process was divided into 33 geographic regions that were defined to cover the global distribution of all amphibians. Regional coordinators were then appointed the responsibility of collecting data on all the amphibians in their region. Initial data collection began in most regions in 2001. See Table 1 for a list of the regions and the corresponding coordinator and number of species.

Region	Coordinator	Number of species
Africa	Alan Channing and Simon Stuart	683
Amazonian Brazil	Claudia Azevedo-Ramos	179
Atlantic Forest-Cerrado-Caatinga	Debora Silvano	469
Australia	Jean-Marc Hero	212
Bolivia	Claudia Cortez	43
Borneo	Robert Inger	141
Caribbean	Blair Hedges	170
Chile	Alberto Veloso	49
China and the Koreas	Michael Wai Nang Lau	317

Colombia	Wilmar Bolivar and Fernando Castro	407
Costa Rica	Bruce Young	179
Ecuador	Santiago Ron and Luis Coloma	424
Europe	Simon Stuart and Neil Cox	82
Guatemala	Bruce Young	47
Honduras	Gustavo Cruz	48
Japan	Yoshio Kaneko	59
Madagascar and Seychelles	Ron Nussbaum	222
Mainland Southeast Asia	Peter Paul van Dijk	232
Mexico	Georgina Santos	298
New Zealand	Ben Bell	7
North America	Geoffrey Hammerson	261
Northern Eurasia	Sergius Kuzmin	48
Panama	Frank Solis	185
Papuan Region	Steve Richards	305
Paraguay	Lucy Aquino	33
Peru	Javier Icochea, Lily Rodriguez and Ariadne Angulo	294
Philippines	Arvin Diesmos	100
South Asia	Sushil Dutta	311
Southern Cone of Argentina	Esteban Lavilla and Carmen Ubeda	108
Sumatra, Java and Sulawesi	Djoko Iskandar	144
The Guianas	Bob Reynolds	63
Venezuela	Enrique La Marca	294
West Asia	Theodore Papenfuss	44

Table 1. The regional coordinators for the initial data collection.

Definitions for the more complex regions listed in Table 1 are as follows:

- *Africa* includes all countries in Africa except Madagascar and the Seychelles.
- *Atlantic Forest-Cerrado-Caatinga* includes all of Brazil, except the Amazon Basin.
- *Borneo* includes Brunei, Kalimantan (Indonesia) and Sabah and Sarawak (Malaysia).
- *Caribbean* includes Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Bermuda, Cayman Islands, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Netherlands Antilles, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Turks and Caicos Islands, British and U.S. Virgin Islands.
- *China and the Koreas* includes China, North Korea and South Korea.
- *Europe* includes Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Greenland, Hungary, Iceland, Ireland, Italy, Luxembourg, Macedonia, Netherlands, Norway, Poland, Portugal, Romania, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.
- *Northern Eurasia* includes Russia, Ukraine, Belarus, Lithuania, Latvia, Estonia, Georgia, Azerbaijan, Armenia, Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, Moldova, Tajikistan and Mongolia.
- *South Asia* includes India, Pakistan, Nepal, Bangladesh, Bhutan and Sri Lanka.
- *Mainland Southeast Asia* includes Myanmar, Thailand, Laos, Cambodia, Vietnam, Peninsular Malaysia and Singapore.
- *North America* includes the United States of America and Canada.
- *Papuan Region* includes the Solomon Islands, Papua New Guinea, Indonesia (only Papua and the Maluku Islands (including Halmahera, Ceram, Obi, Misool, Aru, Ambon, Buru and Kai)), Fiji and Palau.
- *Sumatra, Java and Sulawesi* includes Sumatra, Java, Sulawesi, the Sula Islands, and the Lesser Sunda Islands (east to Tanimbar, and including East Timor).
- *West Asia* includes Afghanistan, Iran, Turkey, Syria, Iraq, Lebanon, Israel, Jordan, Kuwait, Saudi Arabia, Oman, Yemen, Qatar, Bahrain and the United Arab Emirates.

The data that was collected was entered into the SIS Data Entry Module database by each coordinator and then sent back to the central coordinating team for review.

2. Data Review

All the data collected in the initial stage of the assessment was subject to peer review. For most regions this was done through expert workshops, and in a small number of regions it was completed through individual reviews of the data by leading herpetologists in the region.

There were 14 workshops held in various countries to review the data. At each workshop amphibian experts for the region were invited to participate and contribute their knowledge as well as to comment on the data already compiled by the regional coordinators.

Each workshop is listed below with a photograph of the participants where available.

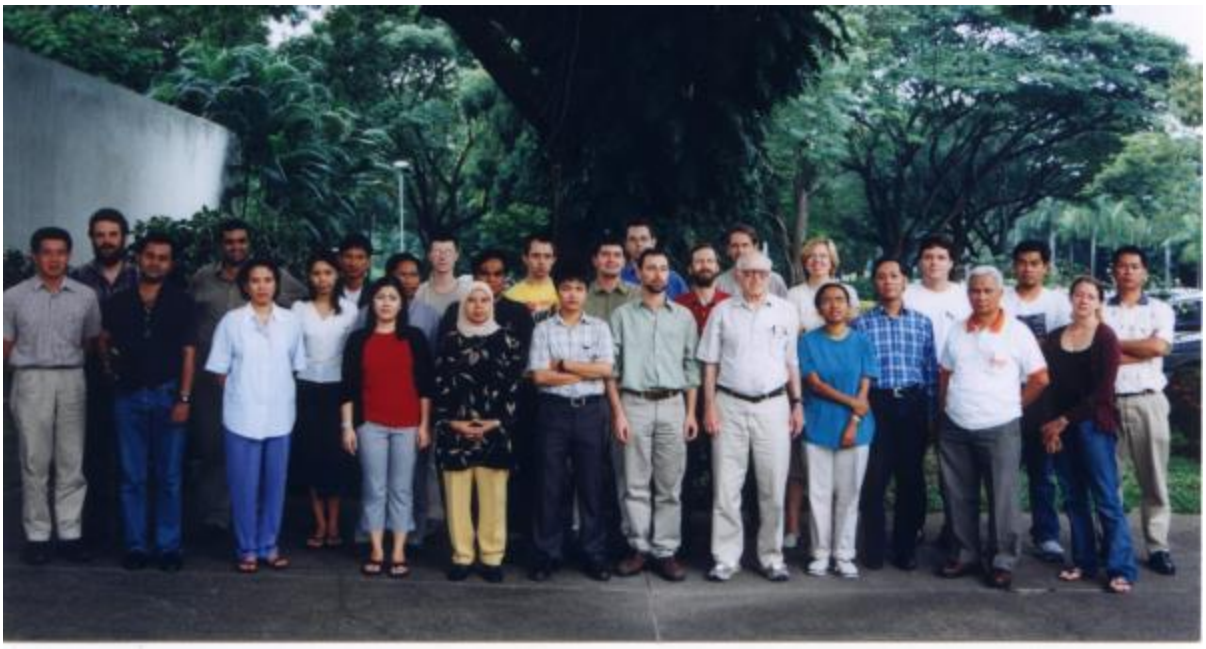
Australia: Hobart, Tasmania, 6-8 February 2001
Host: World Wide Fund for Nature – Australia

China and the Koreas: Chengdu, China, 18-21 March 2002
Host: Chengdu Institute of Biology at the Chinese Academy of Sciences

Africa: Watamu, Kenya, 16-18 April 2002

South Asia: Coimbatore, India, 1-5 July 2002
Host: The Zoo Outreach Organisation and the Wildlife Information Liaison Development Society (a joint workshop with the CBSG CAMP process).

Southeast Asia *(merging the Mainland Southeast Asia, Borneo, Sumatra, Java, Sulawesi and Philippines regions)*: Bangkok, Thailand, 30 September - 4 October 2002
Host: IUCN Regional Office for Asia.



Meso America *(merging the Mexico, Guatemala, Honduras, Costa Rica and Panama regions)*: La Selva, Costa Rica, 11-15 November 2002
Host: IUCN Regional Office for Mesoamerica.

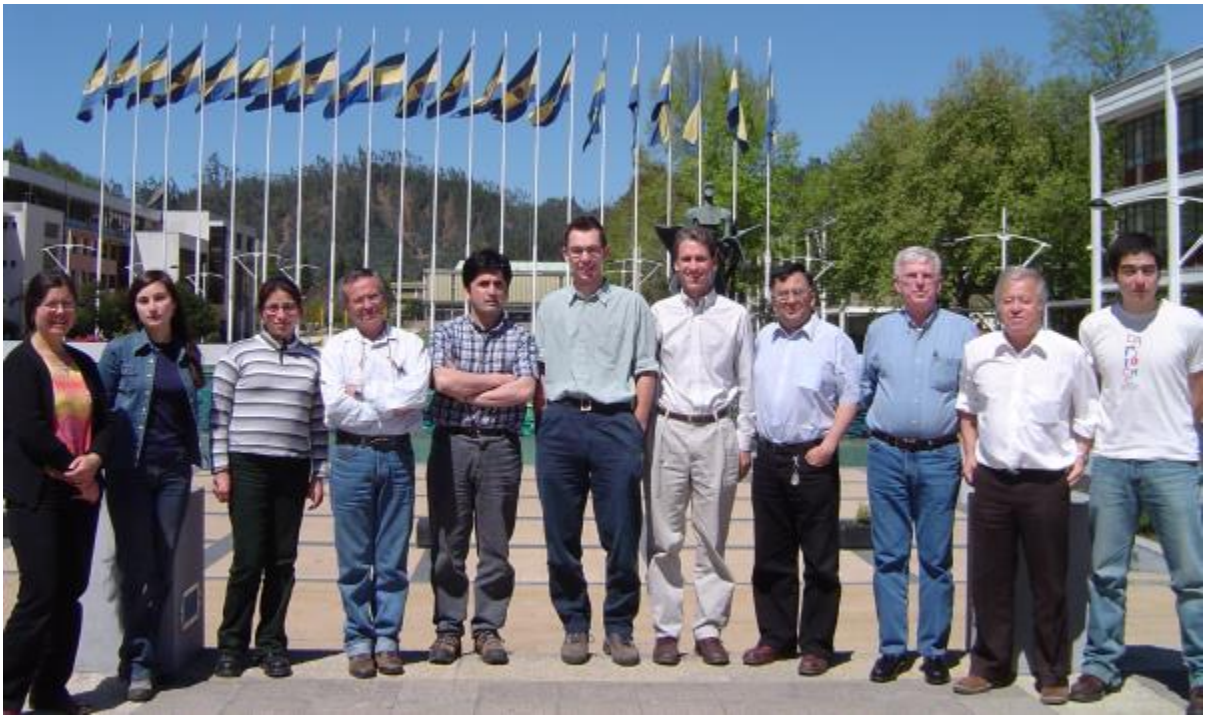
Papuan Region: Hawaii, United States, 24-27 February 2003
Host: The Bishop Museum in Honolulu.

Tropical South America East of the Andes (merging the Amazonian Brazil, Atlantic Forest-Cerrado-Caatinga, Paraguay, and Guianas regions, and parts of the Colombia, Ecuador, Peru, Bolivia and Venezuela regions): Belo Horizonte, Brazil, 31 March - 4 April 2003
Host: Conservation International's Brazilian Center for Biodiversity Conservation.

Tropical Andes *(merging the remaining parts of the Colombia, Ecuador, Peru, and Bolivia regions)*: Tandayapa, Ecuador, 18-22 August 2003
Host: Conservation International's Andean Center for Biodiversity Conservation.

Madagascar: Gland, Switzerland, 22-25 September 2003
Host: IUCN.

Chile: Concepción, Chile, 3-4 October 2003
Host: Universidad de Concepción.



Argentina and Uruguay: Puerto Madryn, Argentina, 12-14 October 2003
Host: La Asociación Herpetológica Argentina.

Caecilians: London, United Kingdom, 23-25 February 2004
Host: Natural History Museum.

Caribbean: Santo Domingo, Dominican Republic, 19-21 March 2004
Host: The United Nations office in the Dominican Republic.

There were some regions that for various reasons were reviewed by correspondence rather than a workshop. These regions are listed below:

- Northern Eurasia
- Seychelles

- Japan
- New Zealand
- West Asia
- North America

In Australia, the process involved both a workshop and a review by correspondence. For the 2004 release of the data, Mediterranean species were only reviewed by correspondence and then in December 2004 a workshop was held to further review these species and these edits were included in the 2006 update.

The data from North America was not reviewed in the same depth as that from the rest of the world, mainly because time did not permit consultations involving many of the very large number of experts who could potentially be involved. However, the data from this region was already very good, since so much prior work has been focused on amphibians in this region, and is readily available in the published literature.

3. Data Consolidation

As the review of data was completed, region by region, the information was consolidated by the central coordinating team at the Biodiversity Assessment Unit. Specific tasks that needed to be addressed included:

1. Ensuring consistency in the application of the Red List Categories and Criteria between regions and taxonomic groups.
2. Proof reading and correcting the text accounts for all species.
3. Final editing of maps to ensure that small islands near the coast were not incorrectly included in species distributions.
4. Final resolution of remaining outstanding issues, mainly to do with taxonomic problems.
5. Inclusion of newly described species, and other taxonomic changes.

The 2006 Update

Since the initial release of the data in 2004 there has been constant updating and upgrading of the information. Rather than being a systematic review of all species the 2006 update concentrated on:

- Adding new species described up to the end of 2005.
- Correcting any mistakes brought to our attention since the initial 2004 data release.
- Keeping up-to-date with current taxonomy.
- Correction of data on the basis of information not previously available to the assessment that was provided from herpetologists all around the world subsequent to the first release of the data.
- Further review of the data for the Mediterranean region was completed at a joint reptile and amphibian workshop in Malaga, Spain from the 13-17 December 2004. It was hosted by the IUCN Centre for Mediterranean Cooperation.
- Inclusion of any new information that was sent from herpetologists around the world, in particular new publications as well as new information regarding genuine changes in species' status.

The book *Threatened Amphibians of the World* published in 2008, includes an in-depth analysis of the 2006 updated data. The 2006 updated data was also included in the 2006 IUCN Red List and was made available on the GAA website accompanied by key findings and the updated searchable database (see the top of this page) providing detailed species-by-species information.

2008 Update

Following on from the 2006 update, further updates were made to the amphibian data up until the end of August 2008. Although not a systematic review of all species there were some significant changes implemented in this update. The main changes were:

- Adding new species described up to the end of 2007.
- Correcting any mistakes brought to our attention.
- Keeping up-to-date with current taxonomy. In particular the new taxonomy of Frost *et al.* (2006) was adopted.
- Correction of data on the basis of information not previously available.
- Two workshops were held where species were reviewed and reassessed:
- a Salamander workshop was held at the Colegio de la Frontera Sur - San Cristóbal de Las Casas, in Mexico, from August 6-7, 2007.
- a Costa Rican workshop was hosted by the Universidad de Costa Rica, in San José, Costa Rica from August 10-12, 2007 (a joint workshop with the CBSG CAMP process).
- NatureServe completed a substantial update of the North American amphibian data, led by Geoff Hammerson of NatureServe.
- Inclusion of any new information that was sent from herpetologists around the world, in particular new publications as well as new information regarding genuine changes in species' status.

Unfortunately, due to time and funding constraints it has not been possible to update all of the information in the database every year. We sincerely apologise to those people who have sent us many helpful comments that have not yet been included, and promise that these will be our first priority for inclusion in the next update of the data. We also realise there are some newly described species that were inadvertently missed in each update and we endeavour to include these in the next update, as well as species that are no longer considered valid.

The 2008 updated data is incorporated within the 2008 IUCN Red List and is the most recent version of the data. You can search the database (see the top of this page) to see detailed species-by-species information, and also available on this website is the Analysis of Amphibians.

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Amphibian Conservation and the Amphibian Specialist Group

Our understanding of the world's amphibians is rapidly evolving. Prior to the comprehensive assessment of all amphibians completed in 2004, the conservation status of fewer than 1,000 species had been assessed, mainly in Australia, North America, and Europe. New species of amphibians are still being discovered at a rapid rate, and these are being incorporated in the regular updates of the amphibian data on the IUCN Red List.

The IUCN Species Survival Commission established a new Amphibian Specialist Group (ASG) in 2005. One of the ASG's first priorities was to convene the Amphibian Conservation Summit from September 17-19th 2005, which was hosted by IUCN and Conservation International in Washington DC. The summit concluded with proposals for a series of actions, including emergency responses to save species under the greatest threat. More than 60 specialists drafted the seven-page Amphibian Conservation Action Plan declaration which can be downloaded from the ASG website.

The action plan adopted at the summit addresses the key issues affecting the world's amphibians, and is divided into four key strategies:

1. Understanding the causes of declines and extinctions
2. Documenting amphibian diversity and how it is changing
3. Developing and implementing long-term conservation programs
4. Delivering emergency responses to crises

The plan calls for research into the control and elimination of the fungal disease in the wild, as well as greater habitat protection, to maintain or re-establish viable wild amphibian populations in the future. The action plan also proposes a major expansion of such captive breeding programs in countries where species are the most threatened by the disease.

The ASG has now appointed regional and national chairs. To find the Chair for your region please visit the ASG website.

Publications

Since the first comprehensive amphibian assessment was completed in 2004 the central coordinating team have published a number of reports, journal articles and most recently a book *Threatened Amphibians of the World*. Many of our collaborators have also made use of the data in their own publications.

We have tried to include as many of these publications as possible below, but if your publication using the amphibian data is missing from this list, please email us (redlist@iucn.org) and let us know so we can include it too. If you have a link or .PDF of the publication that we are able to include here that would also be great.

Publications from the Central Coordinating Team

Books and Reports

Cox, N., Chanson, J. and Stuart, S. 2006. *The Status and Distribution of Reptiles and Amphibians of the Mediterranean Basin*. IUCN, Gland, Switzerland and Cambridge, UK.

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Comments, Queries and Submissions:

The submission of comments, corrections and additional information on amphibians is most welcome and should be sent c/o the IUCN/SSC-CI/CABS Biodiversity Assessment Unit.

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Analysis of Data

Please note that the information presented below is based on an analysis of the data from the 2008 IUCN Red List. This was the last year that assessments for all described amphibian species were updated on the Red List. Since then, assessments of amphibian species have been ongoing, therefore the figures for threatened amphibian species have changed since this analysis. For the percentage of threatened amphibians on the current IUCN Red List, see Table 1 on the Summary Statistics page of the website.

Summary of Key Findings

The first comprehensive assessment of the conservation status of all amphibians was completed as the Global Amphibian Assessment (GAA) in 2004, and the results were included in the 2004 IUCN Red List. This initiative is one of several led by IUCN and partners with the aim of rapidly expanding the geographic and taxonomic coverage of the IUCN Red List.

Since 2004 there have been two updates of the data, one in 2006, and the most recent in 2008. The 2006 data were included in the recently published book *Threatened Amphibians of the World* which contains an in-depth analyses of the data as well as individual species accounts for all threatened and extinct species. The individual species accounts were also included in the 2006 and 2007 IUCN Red List of Threatened Species. A summary of the taxonomic changes made in this update are available here.

The key findings of the 2008 update are presented here and the individual species accounts are included in the 2008 IUCN Red List of Threatened Species. For a summary of the taxonomic changes made in the 2008 update click here.

Almost 650 experts from over 60 countries have so far contributed to the assessment. The study's results provide a baseline for global amphibian conservation, and are already being used to design strategies to save the world's rapidly declining amphibian populations.

Among the key findings in 2008 are:

- Nearly one-third (32 %) of the world's amphibian species are known to be threatened or extinct, 43 % are known to not be threatened, and 25 % have insufficient data to determine their threat status.
- As many as 159 amphibian species may already be extinct. At least 38 amphibian species are known to be Extinct; one is Extinct in the Wild; while at least another 120 species have not been found in recent years and are possibly extinct.
- At least 42 % of all species are declining in population, indicating that the number of threatened species can be expected to rise in the future. In contrast, less than one percent of species show population increases.
- The largest numbers of threatened species occur in Latin American countries such as Colombia (214), Mexico (211), and Ecuador (171). However, the highest levels of threat are in the Caribbean, where more than 80 % of amphibians are threatened or extinct in the Dominican Republic, Cuba, and Jamaica, and a staggering 92 % in Haiti.
- Although habitat loss clearly poses the greatest threat to amphibians, a newly recognized fungal disease is seriously affecting an increasing number of species. Perhaps most disturbing, many

species are declining for unknown reasons, complicating efforts to design and implement effective conservation strategies.

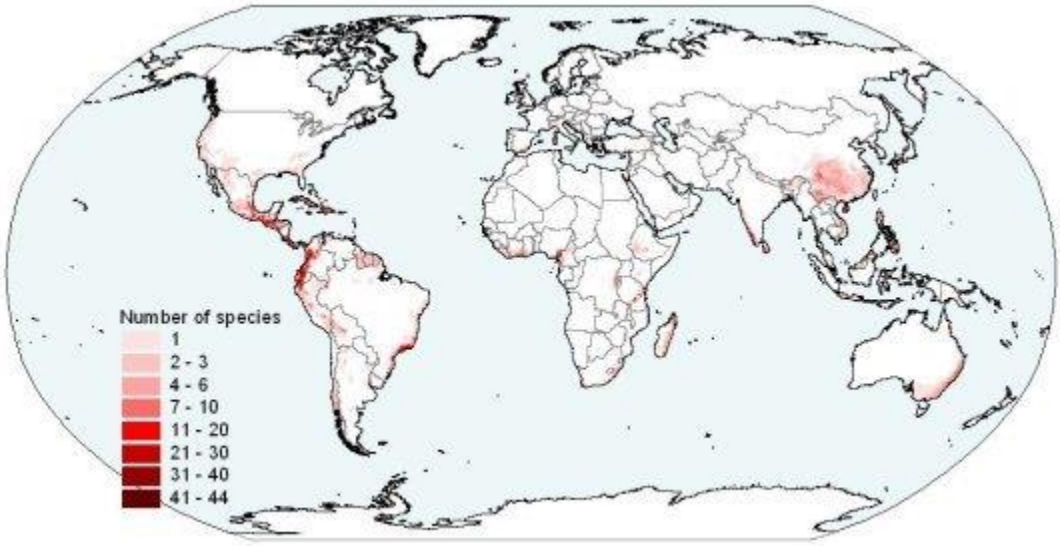

Figure 1. Map of threatened species worldwide.

Further details on the results of the 2008 amphibian data are presented below.

IUCN Red List Status

All known amphibian species have been assessed using the IUCN Red List categories and criteria. These categories provide an explicit framework for determining a species' conservation status, with an emphasis on identifying those at highest risk of global extinction. In this context, the term "Threatened" refers to those species classified under IUCN Red List categories of Vulnerable, Endangered, or Critically Endangered.

Of the 6,260 amphibian species assessed, nearly one-third of species (32.4 %) are globally threatened or extinct, representing 2,030 species (Figure 1). Thirty-eight of the 2,030 species are considered to be Extinct (EX), and one Extinct in the Wild (EW). Another 2,697 species are not considered to be threatened at present, being classified in the IUCN Categories of Near Threatened (NT) or Least Concern (LC), while sufficient information was not available to assess the status of an additional 1,533 species (IUCN Category Data Deficient (DD)). It is predicted that a significant proportion of these Data Deficient species are likely to be globally threatened.

Legend Key	Red List Category	Number of species	Percentage in category

	Extinct (EX)	38	0.6
	Extinct in the Wild (EW)	1	0.02
	Critically Endangered (CR)	489	7.8
	Endangered (EN)	787	12.6
	Vulnerable (VU)	715	11.4
	Near Threatened (NT)	381	6.1
	Least Concern (LC)	2,316	37.0
	Data Deficient (DD)	1,533	24.5
	TOTAL	6,260	

Table 1. Number and percentage of species in each IUCN Red List category for all amphibian species.

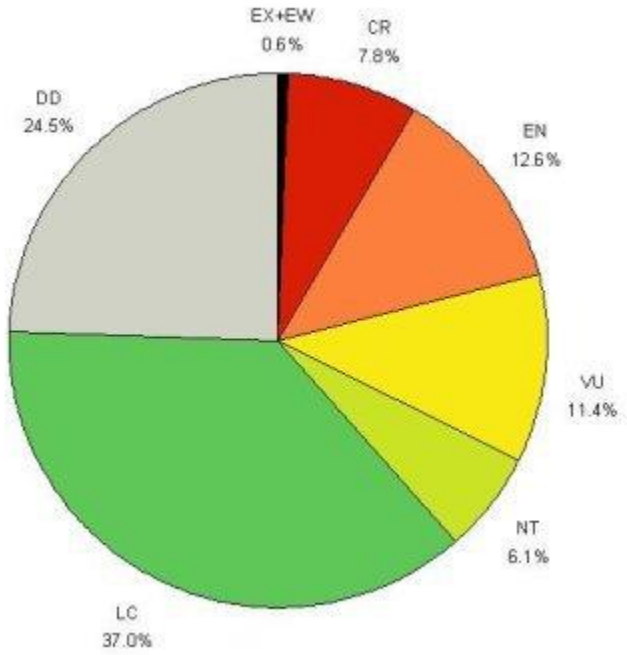

Figure 1. IUCN Red List assessment for all 6,260 known amphibian species.

Documenting population trends is a key to assessing species status, and a special effort was made to determine which species are declining, stable, or increasing. The assessment found declines to be widespread among amphibians, with 42.5 % of species reported to be in decline. In contrast, 26.6 % appear to be stable and just 0.5 % are increasing. Because trends information is not available for 30.4 % of species, however, the percentage of species in decline may actually be considerably higher.

Extinctions

Extinctions are often difficult to confirm. Using the most conservative approach to documenting extinctions, just 38 amphibians are known to have become extinct since the year 1500. Of greater concern, however, are the many amphibians that are missing and can no longer be found. Until exhaustive surveys probing their disappearance can be carried out, these species cannot be classified in the IUCN Red List category of Extinct, but rather are flagged as "possibly extinct" within the Critically Endangered category. The assessment documents 120 such possibly extinct species.

Unfortunately, there is strong evidence that the pace of extinctions is increasing. Of the 38 known extinctions, 9 have occurred since 1980, including such species as the golden toad (*Bufo periglenes*) of Monteverde, Costa Rica. Among those amphibians regarded as "possibly extinct", most have disappeared and not been seen since 1980. Fortunately, a few amphibians that previously were thought to be extinct have been rediscovered. For example, *Atelopus cruciger* was not seen in its native Venezuela after 1986, until a tiny population was found in 2003.

Status by Taxonomic Group

Amphibians comprise three major groups, or taxonomic orders: Anura (frogs and toads), Caudata (salamanders and newts), and Gymnophiona (caecilians). Significant differences exist among these groups in both species numbers as well as threatened status. For instance, there is an order of magnitude more frogs and toads than salamanders and newts, and even fewer caecilians are known. Frogs and toads, with 5,532 species very much drive the average threat level for amphibians as a whole with 31.6% (1,749 species) either threatened or extinct. However, salamanders and newts show significantly higher threat levels, with 49.8% (275 species) of their species threatened or extinct. Caecilians, in contrast, appear to be relatively secure with just 3.4 % (6 species) threatened. However, two-thirds (67 %) of caecilians are so poorly known that they have been assessed as Data Deficient.

ORDER	TOTAL	EX	EW	CR	EN	VU	NT	LC	DD	% Threatened or Extinct
Anura Frogs & Toads	5,532	36	1	412	682	618	320	2,105	1,358	31.6
Caudata Salamanders & Newts	552	2	0	76	104	93	61	159	57	49.8
Gymnophiona Caecilians	176	0	0	1	1	4	0	52	118	3.4
TOTAL	6,260	38	1	489	787	715	381	2,316	1,533	32.4

Table 2. IUCN Red List assessment by taxonomic order.

Significant difference in threat levels is also exhibited at the level of taxonomic Family, as shown in Table 3. Since the assessment was first completed in 2004 there has been a major revision of amphibian families following the taxonomic changes proposed by Frost *et al.* 2006, and these taxonomic changes were adopted in the 2008 update. In the table below the threat levels are shown in the new arrangement of families.

Diverse families of frogs and toads (more than 100 species) that are more threatened than the global average include the Bufonidae, Craugastoridae, Eleutherodactylidae, Rhacophoridae, and Strabomantidae. Very diverse families (more than 200 species) that are less threatened than the global average include Microhylidae, Hyperoliidae, Hylidae and Ranidae. Among larger salamander families, Hynobiidae and Plethodontidae exhibit much higher levels of threat than Salamandridae.

All four species of the newly established family Calyptocephalellidae are threatened. All four species are endemic to Chile and are highly aquatic larval developers. The only other family with all species threatened is Sooglossidae, which was previously considered endemic to the Seychelles. Under the new taxonomic arrangement, the family Nasikabatrachidae with its one species found in the Western Ghats of southern India is also now included in the Sooglossidae. The previously recognized Australian endemic family Rheobatrachidae (the gastric-brooding frogs), with only two species and both now Extinct, is now included in the family Myobatrachidae under the new taxonomic arrangement. Also under the new arrangement the family Leiopelmatidae, previously endemic to New Zealand, now includes two species previously in the no longer recognized family Ascaphidae. The four original species of Leiopelmatidae, the only amphibians native to New Zealand, are all still considered threatened.

Nasikabatrachus sahyadrensis (a frog), India. Photo © S.D. Biju.

Chinese Giant Salamander (*Andrias davidianus*), China. Photo © Michael Lau - Kadoorie Farm and Botanic Garden.

FAMILY	TOTAL	EX	EW	CR	EN	VU	NT	LC	DD	% Threatened or Extinct
ANURA										
Alytidae	12	1	0	0	0	2	4	5	0	25
Amphignathodontidae	61	0	0	2	15	8	2	17	17	41
Aromobatidae	93	0	0	10	16	9	3	15	40	37.6
Arthroleptidae	133	0	0	5	23	17	10	50	28	33.8
Bombinatoridae	10	0	0	0	1	4	0	5	0	50
Brachycephalidae	41	0	0	0	4	5	2	11	19	22
Brevicipitidae	25	0	0	0	4	7	0	12	2	44
Bufonidae	508	6	1	90	73	54	27	178	79	44.1
Calyptocephalellidae	4	0	0	1	1	2	0	0	0	100
Centrolenidae	149	0	0	7	16	31	7	33	55	36.2
Ceratobatrachidae	79	0	0	1	11	14	3	28	22	32.9
Ceratophryidae	85	0	0	10	25	17	6	11	16	61.2
Craugastoridae	112	3	0	27	22	13	7	23	17	58
Cryptobatrachidae	21	0	0	1	1	6	1	4	8	38.1

Cycloramphidae	99	0	0	10	11	16	6	25	31	37.4
Dendrobatidae	157	0	0	12	16	9	13	47	60	23.6
Dicroglossidae	163	1	0	3	14	21	18	61	45	23.9
Eleutherodactylidae	186	0	0	64	56	21	6	29	10	75.8
Heleophrynidae	6	0	0	2	0	0	0	4	0	33.3
Hemiphractidae	6	0	0	0	1	0	2	3	0	16.7
Hemisotidae	9	0	0	0	0	1	0	4	4	11.1
Hylidae	854	1	0	77	63	44	28	449	192	21.7
Hylodidae	39	0	0	1	5	5	2	7	19	28.2
Hyperoliidae	210	0	0	2	19	22	12	107	48	20.5
Leiopelmatidae	6	0	0	1	1	2	0	2	0	66.7
Leiuperidae	78	0	0	2	4	2	2	51	17	10.3
Leptodactylidae	93	0	0	6	1	5	2	68	11	12.9
Limnodynastidae	44	0	0	1	5	1	1	35	1	15.9
Mantellidae	169	0	0	5	17	20	14	79	34	24.9
Megophryidae	138	0	0	3	14	27	14	41	39	31.9
Micrixalidae	11	0	0	1	1	3	1	0	5	45.5
Microhylidae	434	0	0	6	26	35	19	170	178	15.4
Myobatrachidae	82	3	0	6	4	5	3	53	8	22
Nyctibatrachidae	15	0	0	0	6	3	0	2	4	60
Pelobatidae	4	0	0	0	1	0	1	2	0	25
Pelodytidae	3	0	0	0	0	0	0	3	0	0
Petropedetidae	16	0	0	2	5	2	3	4	0	56.3
Phrynobatrachidae	74	0	0	0	6	7	4	32	25	17.6
Pipidae	31	0	0	1	2	0	1	22	5	9.7

Ptychadenidae	51	0	0	0	2	0	3	34	12	3.9
Pyxicephalidae	66	0	0	2	6	5	4	32	17	19.7
Ranidae	319	1	0	11	26	36	31	153	61	23.2
Ranixalidae	10	0	0	2	3	1	0	2	2	60
Rhacophoridae	294	20	0	17	52	35	27	65	78	42.2
Rhinophrynidae	1	0	0	0	0	0	0	1	0	0
Scaphiopodidae	7	0	0	0	0	0	1	6	0	0
Sooglossidae	5	0	0	0	1	4	0	0	0	100
Strabomantidae	519	0	0	21	102	97	30	120	149	42.4
CAUDATA										
Ambystomatidae	35	0	0	9	2	3	2	16	3	40
Amphiumidae	3	0	0	0	0	0	1	2	0	0
Cryptobranchidae	3	0	0	1	0	0	2	0	0	33.3
Hynobiidae	50	0	0	5	11	13	2	11	8	58
Plethodontidae	372	1	0	57	76	63	39	92	44	53
Proteidae	6	0	0	0	1	1	1	3	0	33.3
Rhyacotritonidae	4	0	0	0	0	1	2	1	0	25
Salamandridae	75	1	0	4	14	12	12	30	2	41.3
Sirenidae	4	0	0	0	0	0	0	4	0	0
GYMNOPHIONA										
Caeciliidae	121	0	0	1	1	2	0	43	74	3.3
Ichthyophiidae	46	0	0	0	0	2	0	5	39	4.3
Rhinatrematidae	9	0	0	0	0	0	0	4	5	0

Table 3. IUCN Red List assessment by family.

The number of species in each IUCN Red List category in each of the hundreds of amphibian genera can be accessed here.

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Geographic patterns

Diversity

Global patterns of amphibian diversity are shown in Figure 2. This diversity map clearly shows certain areas of high global diversity, including tropical South America and tropical West Africa. In contrast to the usual pattern of high species diversity occurring in the tropics, the southeastern United States is a global center for amphibian diversity, being particularly rich in salamanders. However, the problem of uneven survey efforts around the world complicates interpretation of this map. Regions such as Indonesia, New Guinea and the Congo Basin are especially likely to be under represented on this map due to lack of adequate surveys.

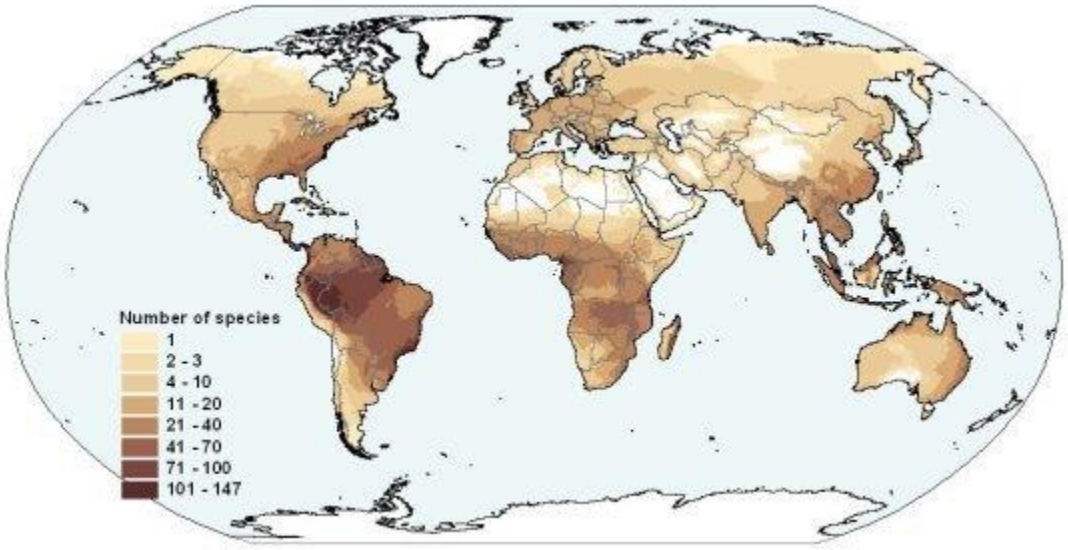

Figure 2. Global diversity of amphibian species.

Looking at amphibian diversity from a country perspective, Brazil, with at least 798 species, has the greatest number of amphibians of any country on Earth, followed by Colombia. Table 3 lists the 20 most diverse countries and reveals some interesting findings, although, these results must be considered in relation to the level of survey effort. Both Colombia and Brazil have received extensive survey efforts in recent decades, and although both countries can be expected to add significantly to their totals, the level of increase is likely to be less than in some of the other highly diverse countries. In South America, Peru in particular is relatively poorly sampled and is almost certain to rise very substantially in its species total, and can be predicted to pass the level of Ecuador before too long. However, the diversity in Ecuador is remarkable for such a small country.

RANK	COUNTRY	TOTAL SPECIES
1	Brazil	798
2	Colombia	714
3	Ecuador	467
4	Peru	461
5	Mexico	364
6	Indonesia	363
7	China[1]	333
8	Venezuela	311
9	United States	272
10	Papua New Guinea	376
11	India	252
12	Madagascar	242
13	Bolivia	230
14	Australia	223
15	Congo, D.R.	215
16	Malaysia	212
17	Cameron	199

18	Panama	197
19	Costa Rica	186
20	Tanzania	178

[1]The numbers given here for China include the provinces of Hong Kong and Macau, but do not include the province of Taiwan which is listed separately due to its geographic separation from the mainland.

Table 3. Countries with most amphibian species.

Among the Old World countries, the level of survey effort is often much lower than in the Americas. Indonesia can be predicted to be the richest country outside the Americas, but it is doubtful if even half of its species are yet known. It may end up with a level of diversity comparable with Brazil and Colombia. Very large increases in species totals can also be predicted for Papua New Guinea and the Democratic Republic of Congo, the latter country having received almost no amphibian survey work in the last 40 years.

Countries that are not far behind that are set to pass the 200 species mark include Cameroon, Panama, Costa Rica and Tanzania. The United States of America and Australia can be predicted to fall down the ranking over time, though the former will remain the most important country for salamanders, with the possible exception of Mexico.

To view a summary of the data for all countries click here.

Geography of Threatened Species

A map showing the global distribution of threatened amphibians (Figure 3) reveals patterns very different from depictions of overall species diversity. The greatest concentration of such species – including well over half of the currently known threatened amphibians—is in a relatively limited area running from southern Mexico south to Ecuador and Venezuela, and in the Greater Antilles (details in Figure 4). This region is dominated by species with small ranges, often living in montane areas. Many of these species have been subjected to severe habitat loss, and exposure to the fungal disease chytridiomycosis.

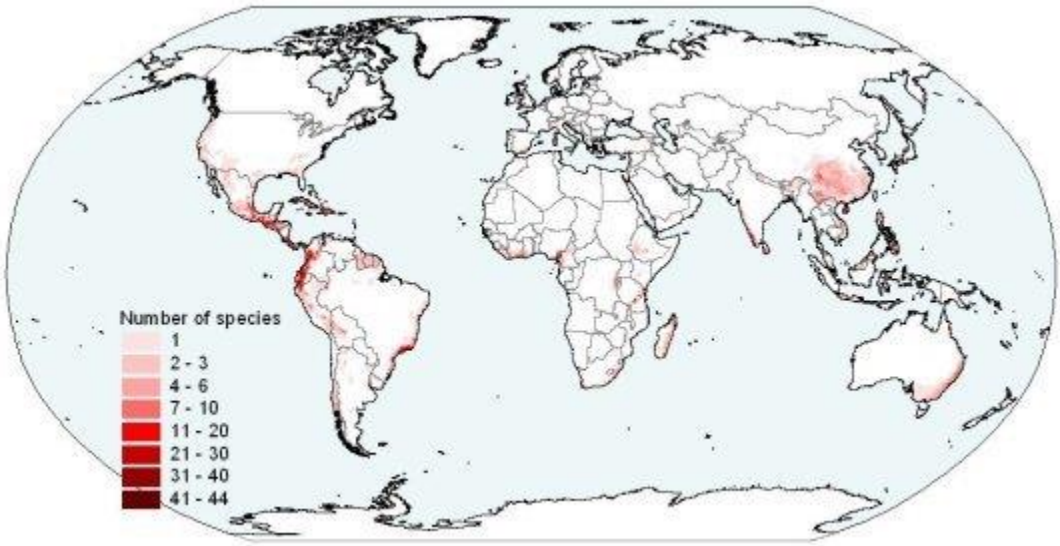

Figure 3. Global distribution of threatened amphibians.

Other important concentrations of threatened species are in the Atlantic Forests of southern Brazil (Figure 5), the Upper Guinea forests of western Africa, the forests of western Cameroon and eastern Nigeria (Figure 6), the Albertine Rift of eastern central Africa, the Eastern Arc Mountains of Tanzania (Figure 7), Madagascar (details shown in Figure 7), the Western Ghats of India, Sri Lanka (Figure 8), central and southern China, Borneo (Figure 9), the Philippines (Figure 9) and eastern Australia.

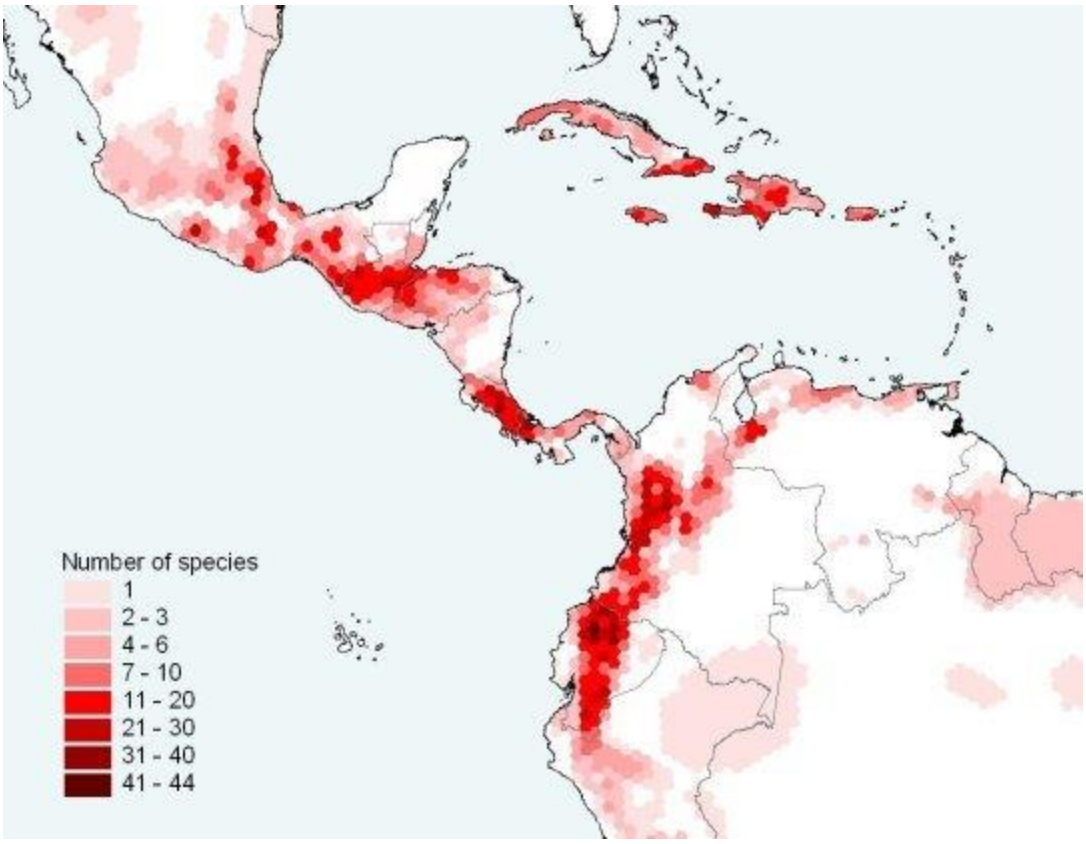

Figure 4. Distribution of threatened amphibians in Central America, northern South America, and the Caribbean.

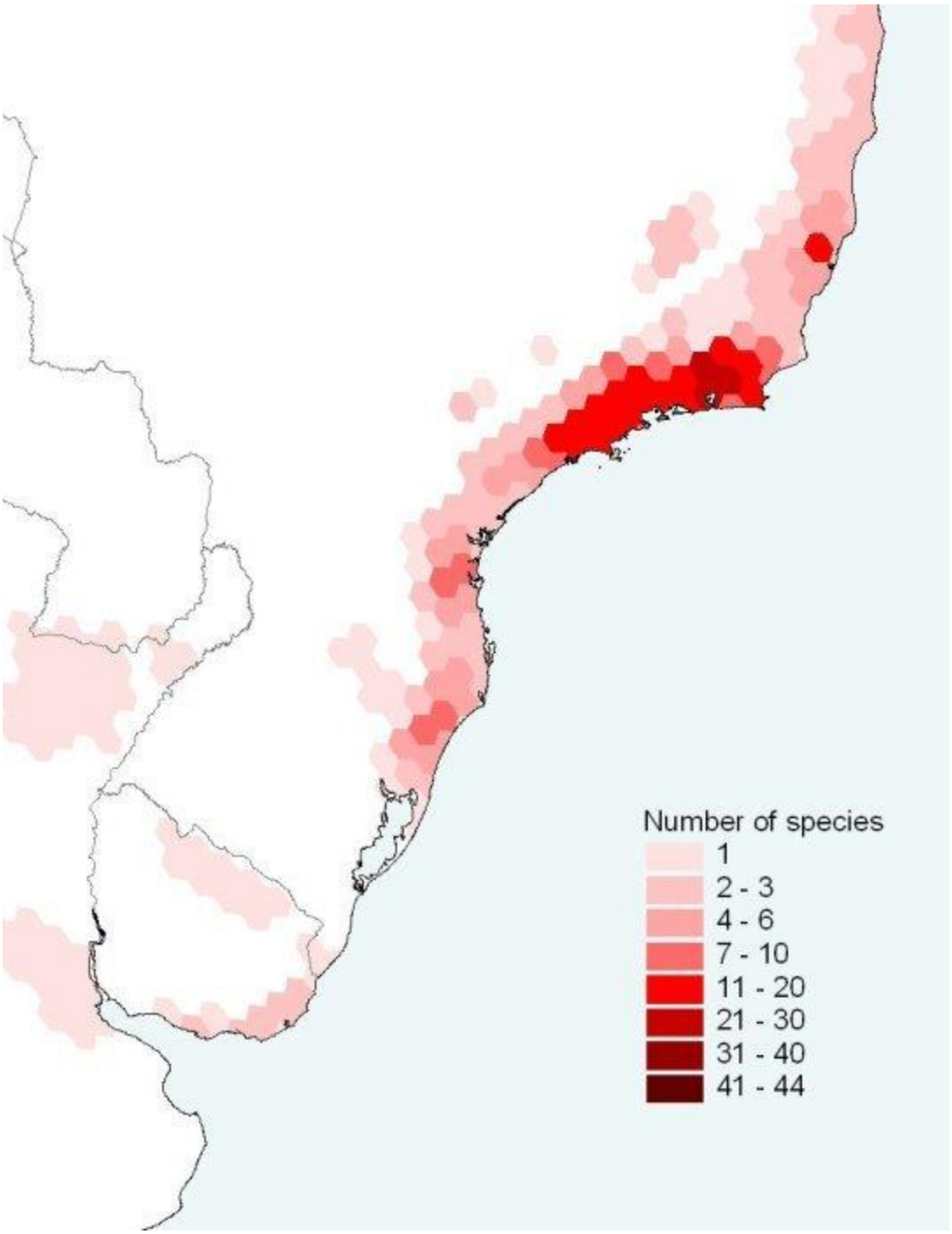

Figure 5. Distribution of threatened amphibians in the Atlantic Forest of Brazil.

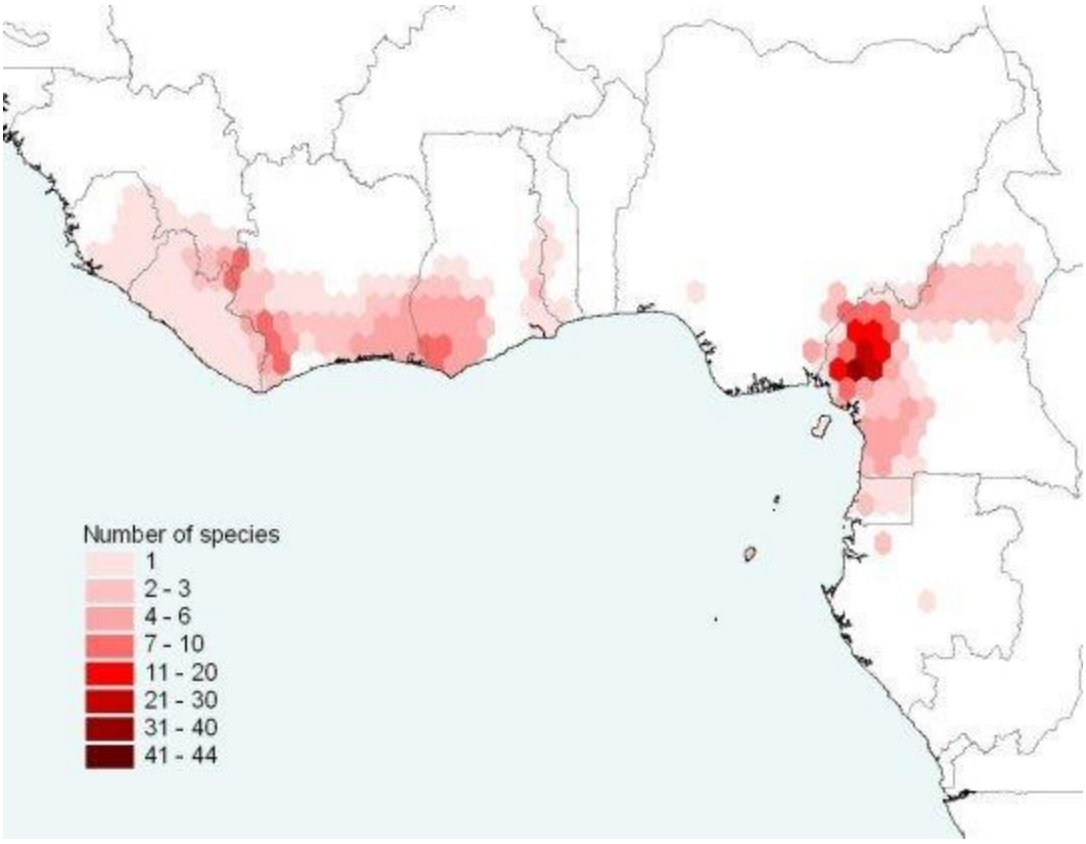

Figure 6. Distribution of threatened amphibians in Cameroon and West Africa.

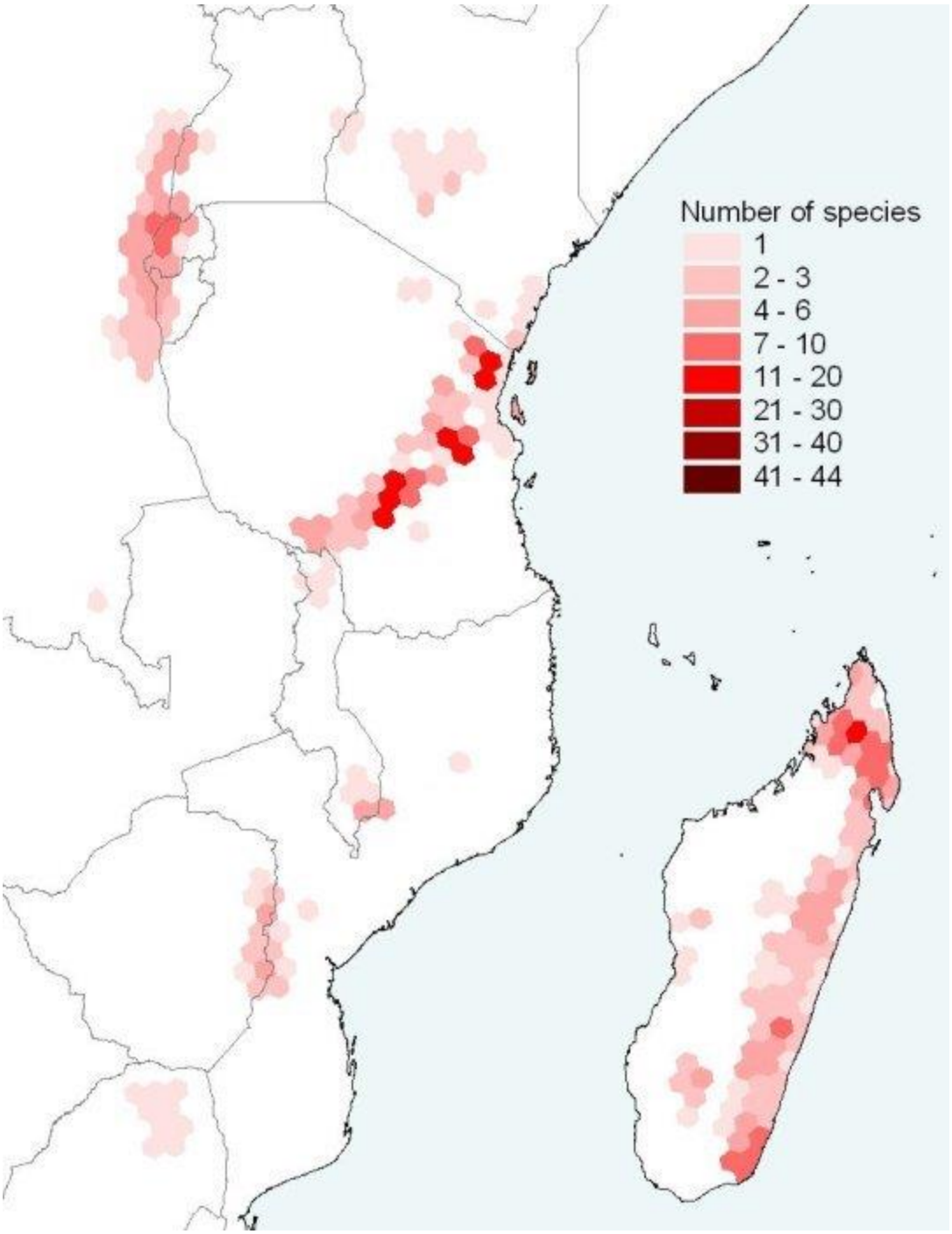

Figure 7. Distribution of threatened amphibians in Madagascar and eastern Africa.

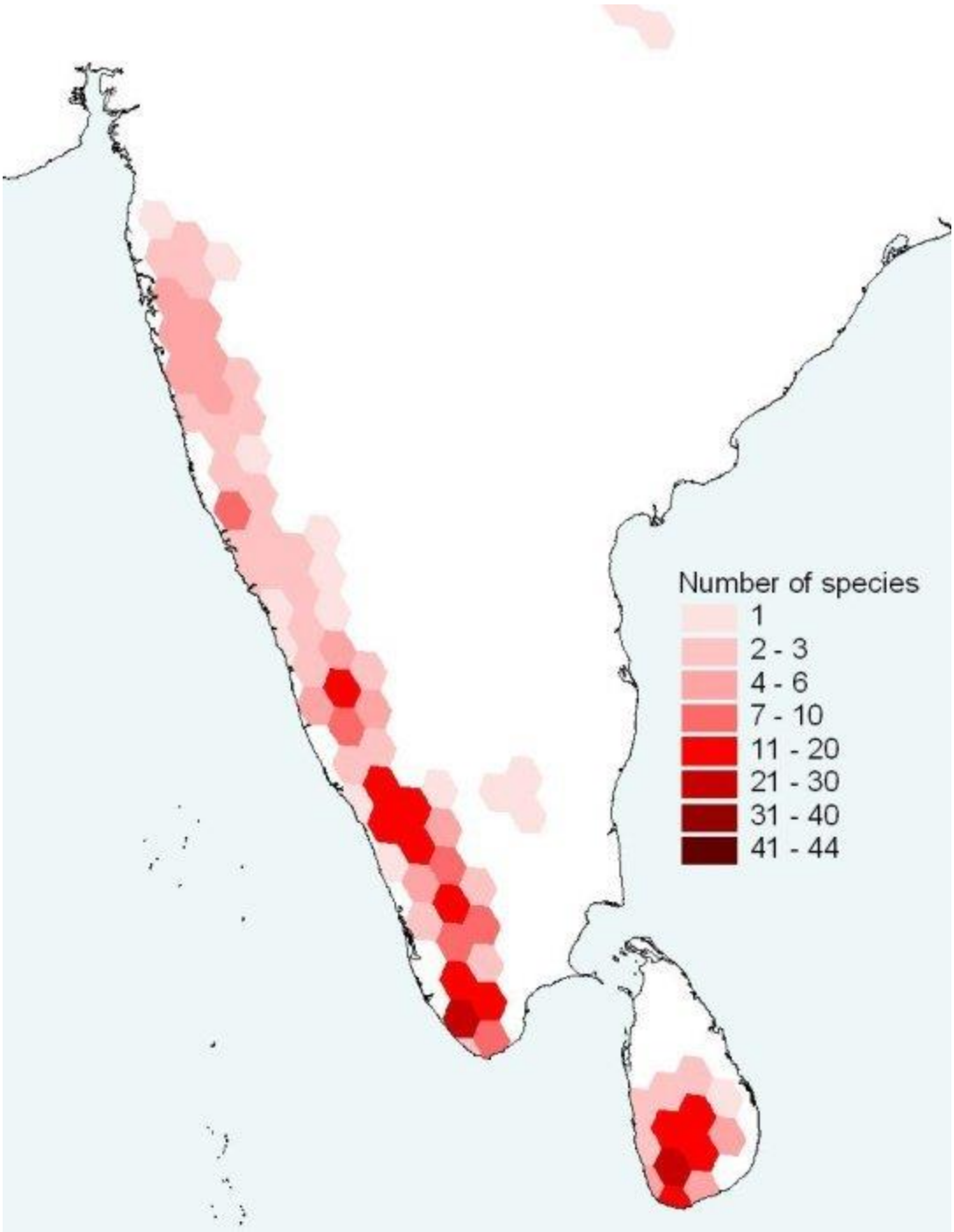

Figure 8. The distribution of threatened amphibians in southern India and Sri Lanka.

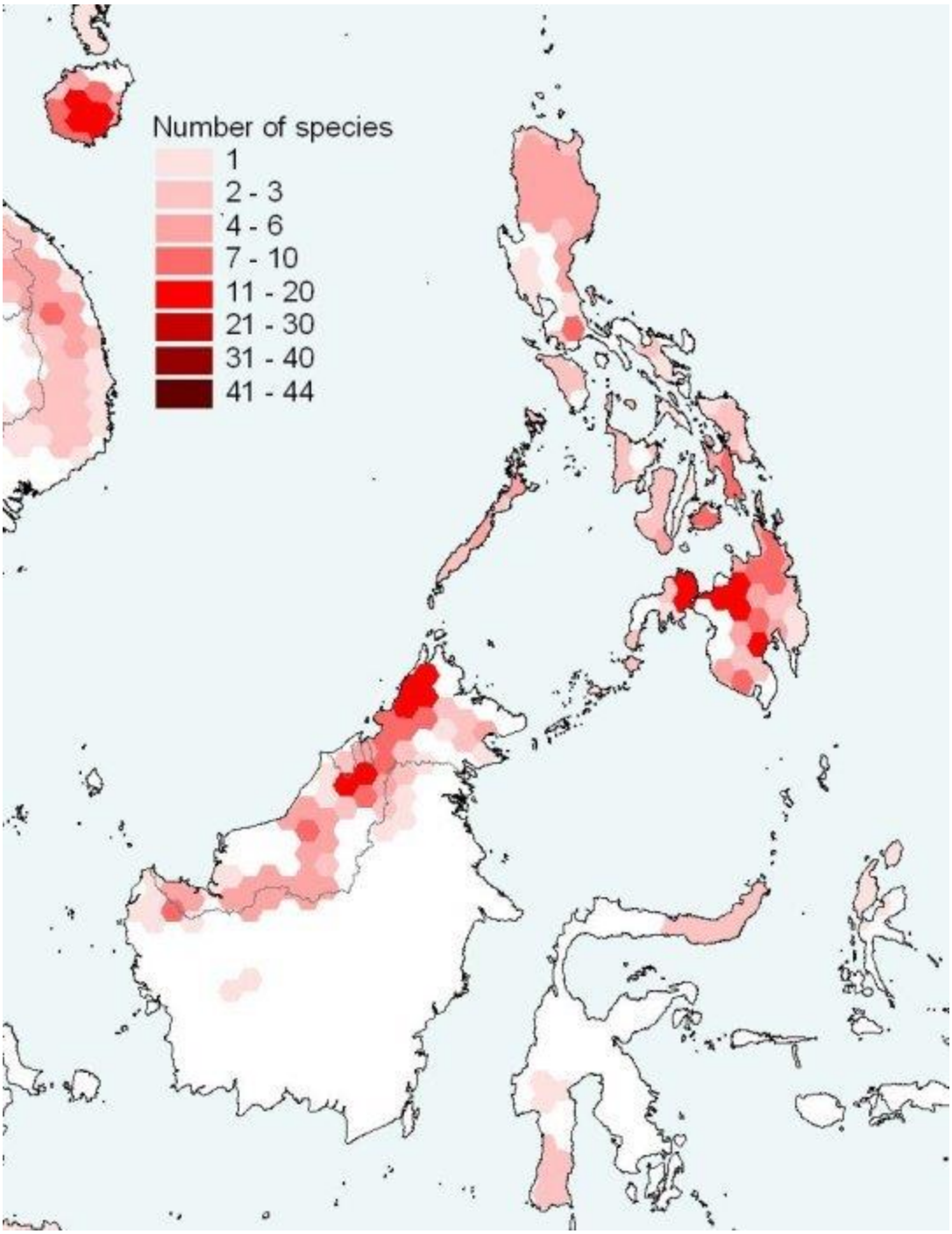

Figure 9. The distribution of threatened amphibians in Borneo and the Philippines.

Table 4 lists the 20 countries with the highest number of threatened amphibians. These countries are in many cases different to those listed in Table 3, suggesting that either amphibians in some countries are more susceptible to threats, that threats vary between countries, or that there are other factors influencing the distribution of threatened species.

RANK	COUNTRY	TOTAL SPECIES
1	Colombia	214
2	Mexico	211
3	Ecuador	171
4	Brazil*	116
5	Peru	96
6	China[1]	92
7	Guatemala	80
8	Venezuela	72
9	India	65
10	Madagascar	64
11	Costa Rica	59
11	Honduras	59
13	United States of America	56
14	Cameroon	53
14	Sri Lanka	53
16	Tanzania	50
17	Panama	49
17	Cuba	49
19	Australia	48
19	Philippines	48

[1]The numbers given here for China include the provinces of Hong Kong and Macau, but do not include the province of Taiwan which is listed separately due to its geographic separation from the mainland.

Table 4. Countries with most threatened amphibians.

The countries listed in Table 4 have a particularly great responsibility for protecting the world's threatened amphibians. Colombia, the second most diverse country, has the highest number of threatened species. The major threats to amphibians in Colombia are habitat loss although there have been many as yet unexplained declines also occurring, and the dramatic topography of the Andes means that many of the amphibians have very restricted ranges making them more vulnerable to threatening processes. Brazil, the most diverse country, is ranked only fourth for number of species threatened, most of which are in the Atlantic Forest region, and has a significantly lower percentage of its amphibians threatened than the global average * (see note below).

In the above table only the number of threatened species is given, and the number of extinct species has been excluded. This is to highlight those countries that currently have the greatest responsibility towards protecting threatened species. If we also take in to consideration extinct species, Sri Lanka, with 21 Extinct species, would jump from being 14thon the list to 8th, behind only countries with much greater amphibian diversity. Sri Lanka is only the 28th most diverse country for amphibians.

Considering the percentage of a country's amphibian fauna that is threatened or extinct provides a stark contrast to the previous table, which focuses on the number of threatened species. Table 5 lists the countries with the highest percentage of threatened or extinct amphibians.

RANK	COUNTRY	% THREATENED OR EXTINCT
1	Haiti	92.0
2	Dominican Republic	83.3
3	Jamaica	81.0
4	Cuba	80.3
5	Puerto Rico	73.7
6	Sri Lanka	70.5
7	Mexico	58.0
8	Guatemala	57.1
9	Seychelles	54.5
10	Honduras	48.8
11	Philippines	48.0
12	Ecuador	37.0
13	Chile	36.2
14	japan	35.7

15	Turkey	34.5
16	Costa Rica	33.3
17	El Salvador	31.3
18	Colombia	30.0
19	Taiwan, Province of China	29.4
20	Tanzania	28.1
Note: only countries with 10 or more species are included.		

Table 5. Countries with the highest percentage of threatened (including extinct) amphibians.

The top five countries are all in the Caribbean, and at least 70% of all the amphibians in these countries are threatened (no species are listed as Extinct for these five countries at present). Compared with other regions, the Caribbean stands out with by far the highest percentage of threatened or extinct species. This is mostly a result of extensive habitat loss as well as some incidents of disease, in particular in Puerto Rico.

In Mexico, ranked fifth for diversity, but second for the number of threatened species, more than 50% of amphibians are threatened (no species are considered Extinct at present). Severe habitat loss as well as disease outbreak in some regions are the main threats. Most of the other countries in Table 5 are in Central or South America. The main causes of threat here also being disease and habitat loss.

Sri Lanka is the highest ranked country outside of Central or South America with over 70% of species in this country either threatened or extinct. Habitat loss is the primary cause and has already resulted in the extinction of 21 species, the highest number recorded for any country.

To view a summary of the data for all countries click here.

** It should be noted that for certain species endemic to Brazil, it has not yet been possible to reach agreement on the IUCN Red List Categories between the Coordinating Team for amphibians, and the experts on the species in Brazil. The IUCN Red List Categories displayed for individual species 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 these were found to be inconsistent with the approach adopted elsewhere in the world. Under the notes on IUCN Red Listing for each species, the likely consistent IUCN Red List Category is given for these species, and it is these consistent IUCN Red List Categories that are used in the analyses presented here.*

Patterns of Endemism

The number and percentage of endemic amphibians by country shows some important patterns. Table 6 lists the 20 countries with the largest numbers of endemic species (i.e., occurring in no other countries), while Table 7 lists the twenty countries with the highest percentage of endemism.

RANK	COUNTRY	COUNTRY ENDEMICS
1	Brazil	534
2	Colombia	349
3	Mexico	246
4	Madagascar	241
5	Peru	224
6	China[1]	217
7	Australia	209
8	United States of America	190
9	Papua New Guinea	187
10	Indonesia	175
11	Venezuela	172
12	Ecuador	171
13	India	167
14	Sri Lanka	89
15	Philippines	79
16	Tanzania	78
17	Bolivia	72
18	Malaysia	63
19	Cuba	59
20	Cameroon	58

[1]The numbers given here for China include the provinces of Hong Kong and Macau, but do not include the province of Taiwan which is listed separately due to its geographic separation from the mainland.

Table 6. Countries with the most endemics.

RANK	COUNTRY	% ENDEMICS
1	Jamaica	100.0
2	Seychelles	100.0
3	São Tomé and Príncipe	100.0
4	New Zealand	100.0
5	Fiji	100.0
6	Palau	100.0
7	Madagascar	99.6
8	Cuba	96.7
9	Australia	93.7
10	Sri Lanka	84.8
11	Japan	80.4
12	Philippines	79.0
13	Puerto Rico	78.9
14	Chile	70.7
15	Papua New Guinea	70.3
16	United States of America	69.9
17	Mexico	67.6
18	Brazil	66.9
19	India	66.3
20	China[1]	65.2

[1]The numbers given here for China include the provinces of Hong Kong and Macau, but do not include the province of Taiwan which is listed separately due to its geographic separation from the mainland.

Table 7. Countries with the highest percentage of endemics.

To a considerable extent, the countries with the largest number of endemic species (Table 6) match those with the largest total diversity of species (Table 3), which is not surprising. However, it is noteworthy that several island countries that do not appear in Table 3 do appear in Table 6: Sri Lanka; the Philippines; and Cuba. Brazil and Colombia have many more endemics than any other countries, with Mexico, Madagascar, Peru, China and Australia each having 200 or more endemics.

The percentage of endemism (Table 7) shows a very different pattern, with six island countries each having 100% endemism (none of these with very diverse amphibian faunas). Of the countries with high amphibian diversity (Table 3), Madagascar and Australia (both essentially very large islands) stand out with by far the highest levels of endemism.

To view a summary of the data for all countries click here.

In Figure 10 a preliminary look at Endemic Amphibian Areas is provided. This map is based on the same approach adopted by BirdLife International in defining Endemic Bird Areas (EBAs). We define an Endemic Amphibian Area as any place where at least two species with ranges of less than 50,000 km^2 overlap. About 65% of amphibians have ranges of less than 50,000 km^2.

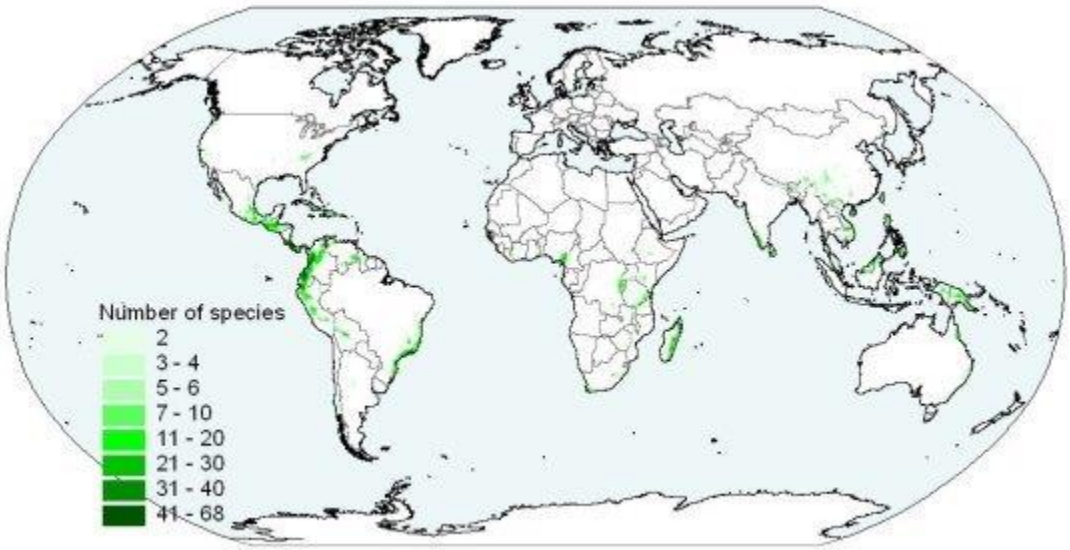

Figure 10. Endemic Amphibian Areas.

Figure 10 looks remarkably similar to the global map of Endemic Bird Areas (and shows a high degree of congruence with other priority-setting mechanisms such as Conservation International's Hotspots). Clearly, amphibians with small ranges are concentrated in generally the same areas as birds. These fundamental patterns are key to guiding the development of conservation strategies in the future. A few differences are apparent, though, the most notable being the Appalachian Mountains in the eastern United States of America, which are the world's center of salamander diversity and endemism, and are also extremely rich in other aquatic life forms, such as freshwater fishes, turtles, mussels, and crayfishes.

Our analysis of Endemic Amphibian Areas includes Data Deficient species, which arguably should have been omitted, since these include a number of species currently known only from their type localities, but

which may be more widespread. We suspect that if these Data Deficient species are removed, some of the Endemic Amphibian Areas in places such as the Amazon and Congo basins would disappear, resulting in a map even more similar to that of Endemic Bird Areas.

Major threats

A variety of threats are impacting amphibian species around the world, causing the massive declines documented here. To better understand the leading threats to amphibians, the assessment recorded known threats to each amphibian species using a standardized list (IUCN Threats Classification Scheme) of major threats. A summary of the number of species affected by each threatening process is shown in Figure 11.

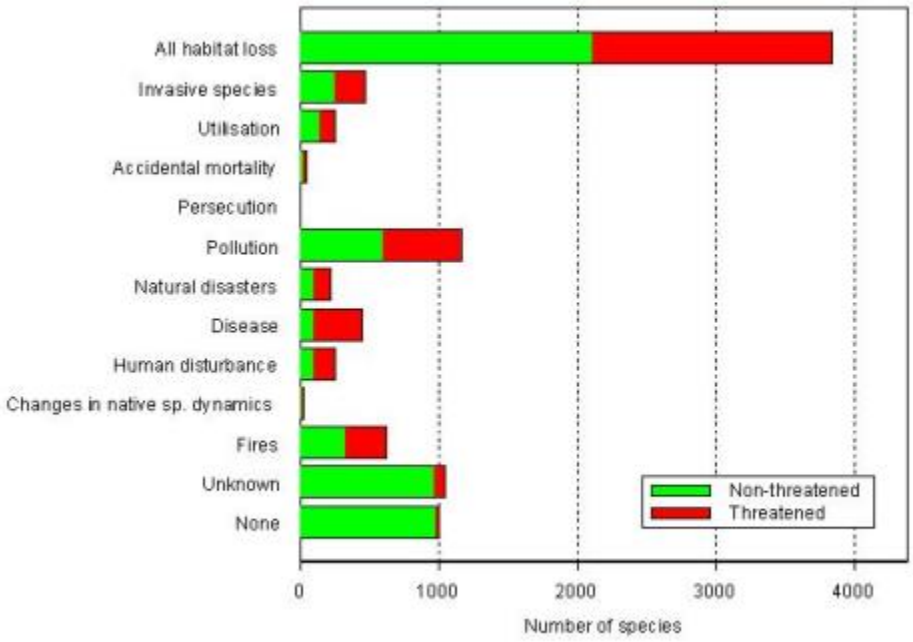

Figure 11. Major threats to amphibians.

Habitat loss and degradation are by far the greatest threat to amphibians at present, affecting nearly 4,000 species. The number of species impacted by habitat loss and degradation is almost four times greater than the next most common threat, pollution. Although disease appears to be a relatively less significant threat for amphibians, for those species affected, it can cause sudden and dramatic population declines resulting in very rapid extinction. In comparison, although habitat loss and degradation affect a much greater number of species, the rate at which a species declines is usually much slower, and there are a number of strategies, such as the creation of protected areas, to counter this threat.

Information has not been collected during the assessment on the relative importance of one threat compared with another for a particular species. Development of such information in the future is a priority and will enable a more complete analysis of significant threats to amphibians.

Habitat preferences

Habitat preferences for each amphibian species were recorded during the assessment using a standardized list (IUCN Habitats Classification Scheme) of major habitats. A summary of the most important habitats for amphibians is shown in Figure 12.

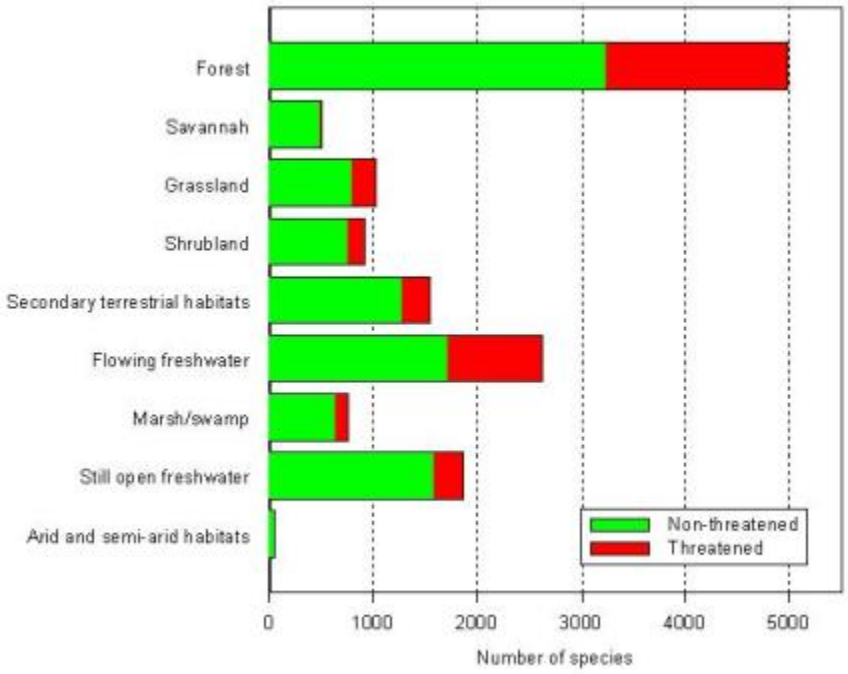

Figure 12. Major habitat preferences of amphibians.

The vast majority of amphibians – almost 5,000 – depend on forests. Other terrestrial habitats are much less preferred by amphibians, in particular the drier habitats, such as savannahs and deserts. These results are not surprising, as amphibians are well known for their preference for moist habitats.

Perhaps a more surprising result is that only 4,224 amphibians depend on freshwater during some stage of their life cycle. Amphibians are renowned for their dual lifestyle, starting off as youngsters in aquatic habitats then undergoing a metamorphosis to become terrestrial adults. However, although this is the most common life history strategy for amphibians, there are also many species that develop directly from eggs without a larval stage (and a few live-bearing species). Many of these species do not rely on freshwater habitats at any stage of their lives.

The freshwater habitats preferred by amphibians have been split depending on whether they are still or flowing, or swamp/marsh. Flowing freshwater habitats for amphibians are usually streams. Still freshwater habitats are often temporary rain pools or other small pools of freshwater. This distinction between freshwater habitats has a major influence on the likelihood that a species is threatened. Species that are associated with flowing water have a much higher likelihood of being threatened than those that use still water.

2006 Update

New additions in the 2006 update

There were 179 species added to the database in the 2006 update. In 2004 there were 5,743 species listed, and in 2006 this increased to 5,918. Not all of these additional species were new species descriptions; a few were sub-species recently elevated to species status, or species removed from synonymy. See Table 1 for a summary of these additions.

Origin of additional species	Number of species
New species description	160
Removed from synonymy	13
Elevated from subspecies status	6

Table 1. Summary of new species additions in the 2006 update.

Not surprisingly, most of these additional species are considered Data Deficient, as there is not enough information currently known to make an assessment of their conservation status. A summary of the IUCN Red List categories assigned to the 179 additional species is given in Table 2 and Figure 1.

Legend Key	Red List Category	Number of species	Percentage in category
	Extinct (EX)	0	0.0
	Extinct in the Wild (EW)	0	0.0
	Critically Endangered (CR)	9	5.0
	Endangered (EN)	17	9.5
	Vulnerable (VU)	12	6.7
	Near Threatened (NT)	5	2.8
	Least Concern (LC)	29	16.2
	Data Deficient (DD)	107	59.8
	TOTAL	179	

Table 2. Summary of IUCN Red List categories for new species additions in the 2006 update.

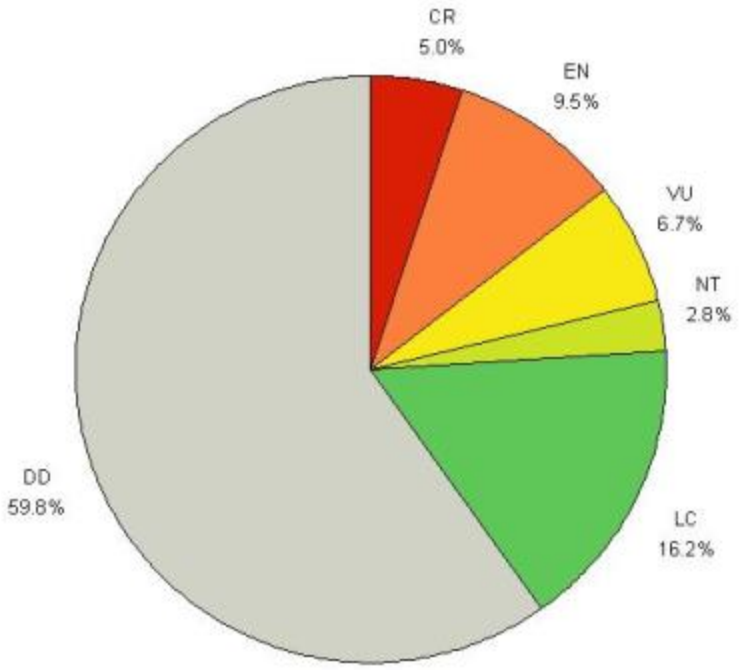

Figure 1. Summary of IUCN Red List categories for new species additions in the 2006 update.

Species that were no longer included

Three species were synonymised in the 2006 update that were previously listed in 2004.

Scinax trachythorax (Müller and Hellmich, 1936) and *S. megapodius* (Miranda-Ribeiro, 1926) are treated as separate species by some authors, but the most recent review of Hylidae considers them both to be a synonym of *S. fuscovarius* (Faivovich, *et al.*, 2005), and the assessment adopted this new taxonomic assignment.

Phrynobatrachus tokba was known only from the type locality, but the more widespread *Phrynobatrachus alticola* (Guibé and Lamotte, 1962) was recently determined to be a synonym (Rödel *et al.*, 2005). The type specimen of *P. alticola* has been lost, hence the synonymy had previously been difficult to confirm.

One species was relegated to subspecies status from species status. *Rana holtzi* Werner, 1898 is now regarded a subspecies of *Rana macrocnemis* according to Veith *et al.*, 2003.

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2008 Update

New additions in the 2008 update

There were 366 species added to the database in the 2008 update. In 2004 there were 5,743 species listed, in 2006 this increased to 5,918, and in 2008 there are now 6,260 species listed. Not all of these additional species were new species descriptions; a few were subspecies recently elevated to species status, or species removed from synonymy. See Table 1 for a summary of these additions.

Origin of additional species	Number of species
New species descriptions (2005, 2006 and 2007)	294
New species descriptions (earlier than 2005 that had previously been missed)	8
Elevated from subspecies status or removed from synonymy	64

Table 1. Summary of new species additions in the 2008 update.

Not surprisingly, most of these additional species are considered Data Deficient, as there is not enough information currently known to make an assessment of their conservation status. A summary of the IUCN Red List categories assigned to the 366 additional species is given in Table 2 and Figure 1.

Legend Key	Red List Category	Number of species	Percentage in category
	Extinct (EX)	2	0.6
	Extinct in the Wild (EW)	0	0.0
	Critically Endangered (CR)	21	5.7
	Endangered (EN)	21	5.7
	Vulnerable (VU)	42	11.5
	Near Threatened (NT)	12	3.3
	Least Concern (LC)	77	21.0
	Data Deficient (DD)	191	52.2
	TOTAL	366	

Table 2. Summary of IUCN Red List categories for new species additions in the 2008 update.

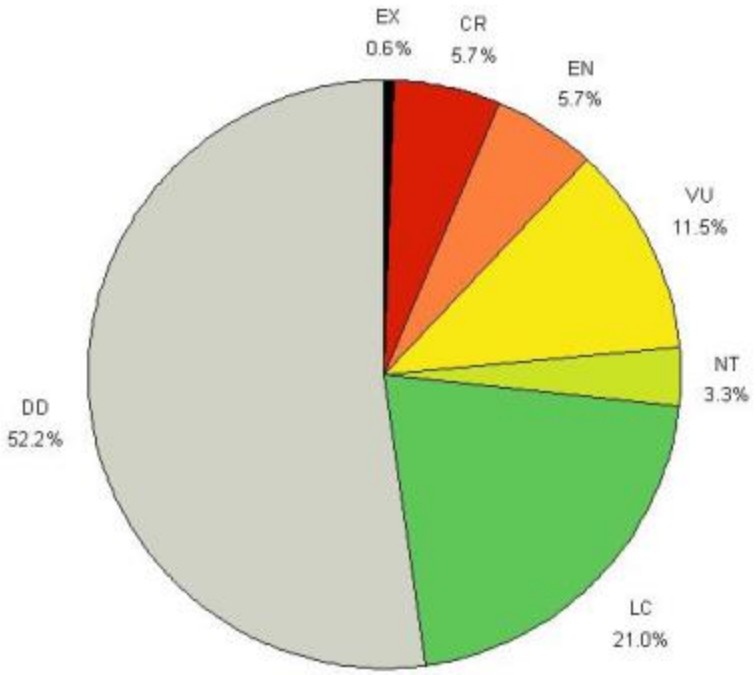

Figure 1. Summary of IUCN Red List categories for new species additions in the 2008 update.

Although we have tried our best to include all newly described species in the 2008 update, it is always difficult to keep up-to-date with the latest taxonomy. Already we are aware of a number of newly described species that still need to be added, and these species will be a priority for inclusion in the next update of the data. To help us keep up-to-date it is a great help if new species descriptions are sent to us for inclusion. The address to send all new species information, as well as any other information for inclusion in the assessment, is redlist@iucn.org.

Species that were no longer included

Twenty-four species were removed in the 2008 update. These are listed below.

- *Cochranella ametarsia* Ruiz-Carranza and Lynch, 1991 was synonymised with *C. oyampiensis* (Lescure, 1975) following Guayasamin, J.M., Cisneros-Heredia, D.F., Castroviejo-Fisher, S. (2008).
- *Cochranella petersi* Ruiz-Carranza and Lynch, 1998 was synonymized under *Cochranella pulverata* (Peters, 1873) following Guayasamin, J.M., Cisneros-Heredia, D.F., Castroviejo-Fisher, S. (2008).
- *Colostethus alagoanus* (Bokermann, 1967), *C. capixaba* (Bokermann, 1967) and *C. carioca* (Bokermann, 1967) were synonymised with *Allobates olfersioides* (A. Lutz, 1925) following Verdade and Rodrigues (2007).
- *Dendrobates azureus* Hoogmoed, 1969 was synonymised with *Dendrobates tinctorius* (Schneider, 1799) following Wollenberg *et al*. (2006).

- *Eleutherodactylus andicola* (Boettger, 1891) was synonymised with *Gastrotheca marsupiata* (Dumeril and Bibron, 1841).
- *Leptodactylus dominicensis* Cochran, 1923 is now considered to be a junior synonym of *Leptodactylus albilabris* Gunther, 1859 following Hedges and Heinicke (2007).
- *Phrynopus laplacai* (Cei, 1968) is now considered a synonym of *Phrynopus wettsteini* (Parker, 1932) following Lehr (2006).
- *Phrynopus spectabilis* Duellman, 2000 is now considered a synonym of *Pleurodema marmoratum* (Dumeril and Bibron, 1841) following Lehr (2006).
- *Chaparana yei* (Chen, Qu and Jiang, 2002) was synonymised with *Yerana yei* (formerly *Paa yei*). This is just one species that was in the past mistakenly included twice under two different genera.
- *Chaparana taihangnicus* (Chen and Jiang, 2002) was synonymised with *Nanorana taihangnica* (formerly *Paa taihangnica*). This is just one species that was in the past mistakenly included twice under two different genera.
- *Rana bannanica* Rao and Yang, 1997 was synonymised with H*ylarana milleti* (Smith, 1921) following Ohler (2007).
- *Rana daorum* Bain, Lathrop, Murphy, Orlov and Ho Thu Cuc, 2003 was synonymised with *Amolops mengyangensis* Wu and Tian, 1995 following Ohler (2007).
- *Rana megatympanum* Bain, Lathrop, Murphy, Orlov and Cuc, 2003 and *R. heatwolei* Stuart and Bain, 2005 were synonymised with *Odorrana tiannanensis* (Yang and Li, 1980) following Ohler (2007).
- *Rana hmongorum* Bain, Lathrop, Murphy, Orlov and Ho Thu Cuc, 2003 was synonymised with *Odorrana jingdongensis* Fei, Ye and Li, 2001 following Ohler (2007).
- *Rana nigrolineata* Liu and Hu, 1959 was synonymised with *Pelophylax lateralis* (Boulenger, 1887) following Ohler (2007).
- *Rana nigrotympanica* Dubois, 1992 was synonymised with *Hylarana cubitalis* (Smith, 1917) following Ohler (2007).
- *Rhacophorus htunwini* Wilkinson, Thin, Lwin and Shein, 2005 was synonymised with *Rhacophorus bipunctatus* Ahl, 1927 following Bordoloi *et al*. (2007).
- *Rhacophorus namdaphaensis* Sarkar and Sanyal, 1985 was synonymised with *Rhacophorus rhodopus* Liu and Hu, 1959 following Bordoloi *et al*. (2007).
- The "in press" species *Philautus "Tholpetti Forest"* was deleted from the database, as it had mistakenly been included twice. It had already been described and included in the assessment as *P. luteolus* Kuramoto and Joshy, 2003.
- The "in press" species *Philautus "Munnar 2"* was deleted from the database, as it had mistakenly been included twice. It had already been described and included in the assessment as *P. griet* Bossuyt, 2003.
- The "in press" species *Philautus "Athirimala"* was deleted from the database. It is still considered a good species, but it is not in press and not likely to be published soon. It will hopefully be included in a future update once it has been described.

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Description of Data

The IUCN Red List includes data on each of the 6,260 amphibian species currently known to science (as of the end of 2007). The types of data included in this database are described below. The process of collecting and reviewing the data and making the assessments is described in detail in the amphibian assessment process.

Data Types

What data are available from the searchable online database?

The following data are provided for each species in the online searchable database:

1.1.1. Systematics

Species, genus, family, order, taxonomic authority, commonly-used synonyms, English and other common names (if any), and taxonomic notes (if needed, normally used to clarify difficult or confusing issues). The default taxonomy for amphibians on the IUCN Red List is Amphibian Species of the World, and only departs from this in well-justified circumstances.

1.1.2. General Information

General text information on: geographic range, population (usually a subjective assessment of abundance in the absence of quantitative information), habitat and ecology (including both breeding and non-breeding habitats, and breeding strategy [i.e., larval development, direct development, viviparous]), major threats and conservation measures (in particular noting occurrence in protected areas).

1.1.3. Red List Assessment

Based on the information above, the following is determined: IUCN Red List Category, IUCN Red List Criteria, Rationale for the Red List assessment, reason for any change from previous assessments (i.e., genuine change in status of species, new or better information available, incorrect information used previously, taxonomic change affecting the species, previously incorrect application of the Red List Criteria), current population trend (i.e., increasing, decreasing, stable, unknown), date of assessment, names of assessors, and any notes relating to Red Listing (e.g., any important issues in deciding the Category). It should be noted that for certain species endemic to Brazil, there was not time to reach agreement on the Red List Categories between the Amphibian Coordinating Team, and the experts on the species in Brazil. The Red List Categories displayed are those that were agreed at the GAA Brazil workshop in April 2003. However, in the subsequent consistency check conducted by the Amphibian Coordinating Team, many of these were found to be inconsistent with the approach adopted elsewhere in the world. Under the notes on Red Listing, the likely consistent Red List Category is given for these species, and it is these consistent Red List Categories that are used in the Analysis of Amphibians on the 2008 IUCN Red List presented here.

1.1.4. Distribution Map

A geographic distribution map of the Extent of Occurrence for each species. The IUCN Red List includes distribution maps for 6,157 of the 6,260 amphibian species. Maps are missing for species that are known

only from non-specific type localities. The maps are in the form of polygons that join known locations. A species' distribution map can consist of more than one polygon where there is an obvious discontinuity in suitable habitat.

As well as the map included with each individual species account, the individual shapefiles (.shp) are also available for download in batches by Order.

A list of countries of occurrence is given, noting whether it is native extant, extinct, introduced and/or re-introduced.

1.1.5. Habitat Preferences

Each species is coded against a standardized list of habitats, the IUCN Habitats Classification Scheme, and coded for suitability and relative importance.

1.1.6. Major Threats

Each species is coded against a standardized list of threats, the IUCN Threats Classification Scheme, and coded for whether the threat is acting in the past, present or future, or is an ongoing threat.

1.1.7. Conservation Actions

Each species is coded against a standardized list of conservation actions, the IUCN Conservation Actions Classification Scheme, and coded for whether this measure is "In Place" or "Needed".

1.1.8. Utilisation

Each species is coded against the IUCN Utilisation Authority File (focusing on the purpose/type of use, the primary forms removed from the wild, and the source of specimens in commercial trade).

1.1.9. Bibliography

A listing of important references for each species.

Limitations of the Data

The IUCN Red list includes all known amphibian species. However, there are limitations to the data, due mainly to incomplete knowledge of amphibians. The following details should be noted:

1.2.1. Missing species

The rate of amphibian discovery remains very high, and the naming of new amphibian species continues at a rate of at least 50 species per year. Some parts of the world remain very poorly known in terms of their amphibian faunas, examples including the Guianas, Peru, Bolivia, West Africa, most of Central Africa, Angola, much of South and Southeast Asia (in particular the Western Ghats, Sri Lanka, the Himalayas, Myanmar, Laos, Cambodia, Vietnam, the Philippines, Sumatra, Kalimantan, Sulawesi, and the Maluku Islands), and New Guinea. In addition, many species names, especially in the tropics, actually represent complexes of several species that have not yet been disaggregated. In the IUCN Red List, these are treated as single species, pending resolution of their taxonomic status. With every update the intention is to include all newly described species, however this is not always possible due to time and funding constraints, access to literature, and not being able to keep up to date with the very latest descriptions.

1.2.2. Missing ranges

Because of the conservative approach taken to mapping species, the ranges for many species are likely to be minimum estimates. A rule was followed allowing interpolation of occurrence between known locations if the ecological conditions seem appropriate, but not permitting extrapolation beyond known locations. Some species are therefore almost certain to occur much more widely than has been mapped. Because of this, some regions are recorded as having much lower amphibian diversity than will eventually prove to be the case.

1.2.3. Threats

The information on the relative importance of different threatening processes to amphibian species is incomplete. In the amphibian assessments, we coded all threats that seemed to be having an important impact, but not the relative importance of such threats. For example, many species are known to have declined catastrophically in suitable habitats, but these are in most cases also subject to some sort of habitat loss. However, for these species, habitat loss appears at the moment to be a secondary threat, and the factors causing very rapid disappearance of populations, even in suitable habitats, appear to constitute the driving threats. Likewise, many species that have declined seriously because of over-harvesting are also subject to habitat loss, though over-harvesting is probably the dominant current threat.

1.2.4. Data Deficient species

In 2008 24.5% of amphibians were considered Data Deficient (DD). Because many DD species are likely to have small distributions or populations, or both, they are intrinsically likely to be threatened. Although the percentage of globally threatened or extinct amphibian species is already very high (32.4%), it is almost certainly an under-estimate of the real number. The data in the IUCN Red List, and the analyses resulting from it, therefore tend to under-estimate threat levels, probably very significantly. The results presented here are therefore the best estimates and predictions that can be made, based on incomplete information. Future updates of the data will almost certainly reveal higher levels of threat, and more serious declines.

Glossary

Authority: The taxonomic authority is the name of the person or people who published the original description for a particular scientific name, followed by the year of publication. If the name is in parentheses, this indicates that the genus name now used is different from the one used in the original description.

Biogeographic Realms: The major biogeogeographic regions in which a species occurs. Values include: Australasia; Afrotropical; Indomalayan; Nearctic; Neotropical; Oceanic; and Palearctic. For a definition, see Udvardy, M.D.F. (1975). A classification of the biogeographical provinces of the world. IUCN Occasional Paper No. 18. Morges, Switzerland.

Biomes: Whether the species occurs in terrestrial, marine and/or freshwater habitats.

Common Name: The common name of a species is the vernacular name used to refer to a species. Some species have several common names, often in different languages.

Conservation Measures: Standard terms used to describe the conservation actions required for a species. The classification scheme with all of the terms can be found at Conservation Actions Classification Scheme (Version 2.0).

CR: IUCN Red List Categories, Critically Endangered: A taxon is Critically Endangered when the best available evidence (severe population decline, very small population, very small geographic area occupied, or if the calculated probability of extinction during the next 10 years of >50%) indicates that it is facing an extremely high risk of extinction in the wild. See 2001 IUCN Red List Categories and Criteria version 3.1.

Date of Assessment: Date when the Red List assessment was completed.

DD: IUCN Red List Categories, Data Deficient: A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. See 2001 IUCN Red List Categories and Criteria version 3.1.

EN: IUCN Red List Categories, Endangered: A taxon is Endangered when the best available evidence (large population decline, small population, small geographic area occupied, or if the calculated probability of extinction during the next 20 years is >20%) indicates that it is considered to be facing a very high risk of extinction in the wild. See 2001 IUCN Red List Categories and Criteria version 3.1.

English Common Name: The common name of a species is the vernacular name used to refer to a species. Some species have several common names, often in different languages.

EW: IUCN Red List Categories, Extinct in the Wild: A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form. See 2001 IUCN Red List Categories and Criteria version 3.1.

EX: IUCN Red List Categories, Extinct: A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times, throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form. See 2001 IUCN Red List Categories and Criteria version 3.1.

Family: A Family is a level in the taxonomic hierarchy below Order, but above Genus.

Genus: Taxonomic Genus.

GIS: Geographic Information System.

Habitat Name: Standard terms used to describe the major habitat/s in which the species occurs. The classification scheme with all of the terms can be found on the IUCN Red List website.

In Place: Specifies whether the conservation action recommended is already occurring (In Place) or requires implementation (Needed).

Introduced: Introduced species are those occurring outside their natural range (past or present) and dispersal potential (i.e. outside the range they occupy naturally or could not occupy without direct or indirect introduction or care by humans).

IUCN Red List Assessor(s): The individuals who provided input into the assessment for a particular species. These scientists do not necessarily endorse the final Red List Category assigned to the species.

IUCN Red List Category Rationale: Justification for the listing including any numerical data used, or inferences made, that relate to the thresholds in the criteria.

IUCN Red List Category: Code for the Threatened Status of a species determined using the 2001 IUCN Red List Categories and Criteria version 3.1. Values include: EX = Extinct, EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient.

IUCN Red List Criteria: Codes referring to the specific Red List Criteria that apply to the species and justify its inclusion in its assigned Red List Category. Only the criteria which were met for the highest category to which the species can be assigned are specified. For an explanation of the codes, see 2001 IUCN Red List Categories and Criteria version 3.1.

IUCN Red List Evaluators: In the case of amphibians, the Evaluators are the members of the amphibian central coordinating team who take responsibility for the final data presented, and the final red List Category assigned to the species.

Kingdom: Taxonomic Kingdom

LC: IUCN Red List Categories, Least Concern: A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

Native: Native species are those currently occurring within their natural range (past or present) and dispersal potential (i.e. within the range they occupy naturally or could occupy without direct or indirect introduction or care by humans).

Needed: Specifies whether the conservation action recommended is already occurring (In Place) or requires implementation (Needed).

Notes on Red Listing: Any further explanatory text needed to justify the Red List assessment of the species. This also includes information on how the final Red List Category might have changed from the one originally agreed by the Assessors as a result of the consistency check of all species carried out by the central coordinating team.

NT: IUCN Red List Categories, Near Threatened: A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future. See 2001 IUCN Red List Categories and Criteria version 3.1.

Order: An Order is a level in the taxonomic hierarchy below Class, but above Family.

Population Trend: This is an indication of the current population trend of the species. Values include: increasing; decreasing; stable; and unknown.

Population: This is usually a subjective assessment of abundance; population numbers are given where available.

Range Comments: General information on the geographic distribution of the species, including elevation if known, origin (for example native or introduced), and type locality if a restricted range species.

Reintroduced: Re-introduced species are those that have been successfully established by humans in an area which was once part of their historic range, but from which they had been extirpated or become extinct.

Scientific Name: The scientific name for an amphibian, the first word being the name of the genus, and the second word being the name of the species. The IUCN Red List uses Amphibian Species of the World as its default amphibian taxonomy, and only departs from this in well-justified circumstances.

Specific Threats: Standard terms used to describe the major threats to the species. The classification scheme with all of the terms can be found on the IUCN Red List website.

Taxonomic Comments: Pertinent information regarding questions or controversies concerning the validity, taxonomic distinctness, or generic placement of the species. It may also provide information about the scientific name or its spelling. It may include discussion of differing taxonomic or nomenclatural usage by various experts.

Threat Information: A discussion of the threatening processes impacting the species in the past, present or future.

Type of Use: Information on six aspects of utilization: a) the purpose for which a species is being utilized (for example, for food, medicine or the pet trade); the primary forms removed from the wild (for example adult animals, eggs, etc.); the source of specimens in commercial trade (for example wild, captive, ranched, etc.); the trend in the level of wild harvest in relation to population numbers; the trend in the amount of harvest from non-wild sources; and the list of the species on the Appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) - see http://www.cites.org/.

VU: IUCN Red List Categories, Vulnerable: A taxon is Vulnerable when the best available evidence (large population decline, small population, small geographic area occupied, or if the calculated probability of extinction during the next 20 years is at least 10%) indicates that it is considered to be facing a very high risk of extinction in the wild. See 2001 IUCN Red List Categories and Criteria version 3.1.

Download GIS data

The 2009 IUCN Red List of Threatened Species contains assessments for 49,000 species of which spatial data exists for about 25,000 species, including all amphibians. Some species listed as Data Deficient are not mapped. These data are made freely available to the public to help inform conservation planning and

other decision making processes. Detailed information on the assessment process is available on the IUCN Red List website.

The data are held in shapefiles, the ESRI native format and contain the known range of each species. Ranges are depicted as polygons. DBF files accompanying each polygon contain taxonomic information, and contain information on distribution status, sources and other details about the maps (see metadata document).

The data is available both in ESRI File Geodatabase format and the ESRI Shapefile format and is held in geographical coordinates. Please note that the files are large, and download times could be quite lengthy.

To download the amphibian range data that was used for the spatial analysis, please visit the Spatial Data Download page in the Technical Documents section of this website.

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Thomas Uzzell	Thomas Ziegler	Tibor Kovács	Tim Davenport
Tim Halliday	Tom Mann	Travis Ryan	Trent Garner
Trevor Beebee	Tuba Kiliç	Ulisses Caramaschi	Ulisses Galatti
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Varol Tok	Victor Luna-Mora	Víctor R. Morales	Victorino Molina
Vidana Arachchilage Samarawickrama	Vilma Rivalta	Vladimir Ischenko	Wang Xiuling
Wang Yuezhao	Wenhua Lu	Wichase Khonsue	Wieslaw Babik
Wilfredo Arizabal	Will Osborne	William E. Duellman	Wilmar Bolivar
Wolfgang Böhme	Wu Guanfu	Xie Feng	Yang Datong
Ye Changyuan	Yehudah. L. Werner	Yodchaiy Chuaynkern	Yolanda Matamorros
Yoshio Kaneko	Yuan Zhigang	Zhao Ermi	Zhao Wenge
Zheng Zhonghua			

Links

Institutional Websites

http://www.iucn.org - IUCN, International Union for the Conservation of Nature website.

http://www.conservation.org - Conservation International website.

http://www.natureserve.org - NatureServe website.

General Amphibian Websites

http://www.amphibians.org/ - Amphibian Specialist Group: Global network dedicated to the conservation of amphibians and their habitats around the world.

http://research.amnh.org/herpetology/amphibia/index.php - Amphibian Species of the World: An Online Reference: Provides systematic information on all amphibian species.

http://www.amphibiaweb.org/ - AmphibiaWeb: Provides information for all amphibians on conservation, population declines, as well as images and other information about many amphibian species.

http://www.open.ac.uk/daptf/index.htm - IUCN/SSC Declining Amphibian Population Task Force - The Mission of the DAPTF is to determine the nature, extent and causes of declines of amphibians throughout the world, and to promote means by which declines can be halted or reversed.

http://www.ssarherps.org/default.htm - Society for the Study of Amphibians and Reptiles: An organization established to advance research, conservation, and education about amphibians and reptiles. Publications include the Journal of Herpetology and Herpetological Review.

http://www.inhs.uiuc.edu/cbd/HL/HL.html - The Herpetologists' League: An international organization devoted to studying the biology of amphibians and reptiles. Publications include the journal Herpetologica and Herpetological Monographs.

http://www.frogs.org/ - Amphibian Conservation Alliance: nonprofit organization working to protect amphibian wildlife.

http://www.jcu.edu.au/school/phtm/PHTM/frogs/ampdis.htm - Amphibian Diseases Home Page: Provides information on diseases of amphibians.

http://www.herpnet.org/ - HERPNET: A collaborative effort by natural history museums to establish a global network of herpetological collections data.

http://www.savethefrogs.com/ - SAVE THE FROGS!: A non-profit organization dedicated to amphibian conservation.

http://www.caudata.org/ - The Newt and Salamander Portal: facilitates the sharing of accurate information about newts and salamanders, with an emphasis on their maintenance in captivity.

http://www.gymnophiona.org/ - Gymnophiona.org: a site intended to provide accurate information on caecilians and create an online community of caecilian enthusiasts.

http://www.livingunderworld.org/ - Livingunderworld.org: an ongoing web project dedicated to the preservation of wild and captive amphibians.

Regional Amphibian Websites

Africa

http://www.afriherp.org/ - Afriherp.org - a resource centre for the exchange of information on the herpetofauna of Africa.

http://www.wits.ac.za/haa/ - Herpetological Association of Africa: dedicated to the study and conservation of reptiles and amphibians, particularly those of Africa. Publishes the African Journal of Herpetology.

Australia and New Zealand

http://www.jcu.edu.au/school/tbiol/zoology/herp/decline/decl.shtml - Amphibian declines in Australia: includes information on frog declines in Australia and current research in to these declines.

http://www.jcu.edu.au/school/tbiol/zoology/herp/herp2.shtml - Australian Herpetological Directory: A repository for information on Australian herpetofauna managed by James Cook University.

http://www.frogs.org.au/ - Amphibian Research Centre: a centre dedicated to research and conservation of Australia's unique frogs providing expertise in all areas of frog knowledge including captive breeding and research and education.

http://www.nzfrogs.org/ - NZFROG: Information and resources on frog conservation on New Zealand.

Europe

http://www.club100.net/ - club100.net: a meeting place for European field herpetology enthusiasts, with many photographs of European amphibians and reptiles.

http://www.gli.cas.cz/SEH/ - Societas Europaea Herpetologica (SEH) - is a specialist society presently made up by nearly 500 members from most of the European countries as well as from elsewhere in the world.

http://www.herpconstrust.org.uk/ - The Herpetological Conservation Trust: a European charitable trust dedicated to the conservation of reptiles and amphibians.

http://waterfrogs.csit.fsu.edu/ - Western Palearctic Water Frogs and Water Frog Information Pool: Detailed website on Western Palearctic Water frogs.

http://www.whose-tadpole.net/ - Whose tadpole is it?: A guide to the tadpole identification for Central European Amphibians.

Austria

http://www.herpetofauna.at/ - Amphibien and Reptilien Österreichs: Herpetofauna of Austria

http://www.nhm-wien.ac.at/nhm/herpet/index.htm - Austrian Herpetological Society (Österreichische Gesellschaft für Herpetologie (ÖGH)): public non-profit organization dedicated to the promotion of all aspects of herpetology. Publications include the journal Herpetozoa.

Cyprus

http://bornova.ege.edu.tr/~bgocmen/home12.html - Amphibians and Reptiles of Northern Cyprus: Details of the amphibians and reptiles in Northern Cyprus.

Finland

http://www.herpetomania.fi/ - The Herpetological Society of Finland: Promotes the research, protection, keeping and breeding of reptiles and amphibians. Publishes the journal Herpetomania.

France

http://www.societeherpetologiquedefrance.asso.fr/ - La Société Herpétologique de France : French herpetological society.

Greece

http://www.nhmc.uoc.gr:9091/homeENG.htm - Societas Hellenica Herpetologica: Concerning the study and protection of the Greek reptile and amphibian species and their habitat.

Italy

http://www.aes-web.it/home.htm - Associazione Erpetologica Siciliana: The herpetofauna of Sicily, Italy.

http://www.unipv.it/webshi/ - La Societas Herpetologica Italica (S.H.I.): The Italian herpetofauna society.

Spain

http://www.mma.es/conserv_nat/inventarios/inv_biodiversidad/html/anfibios_reptiles/anfibios.htm- Ministerio de Medio Ambiente, Spain: Government website with detailed species accounts for the amphibians of Spain.

http://www.herpetologica.org/index.asp - Asociación Sociación Herpetológica Española: Spanish Herpetological Association whose publications include the Revista Española de Herpetología and the Boletín de la Asociación Herpetológica Española.

United Kingdom

http://www.thebhs.org/ - The British Herpetological Society

North America

http://www.cnah.org/index.asp - The Center for North American Herpetology: Joseph T. Collins' website, a good place to start to access much herpetological information, particularly with reference to the United States.

http://www.frogweb.gov/ - Amphibian declines and deformities: Information on declines and deformities in North American species.

http://www.asih.org/ - American Society of Ichthyologists and Herpetologists: dedicated to the scientific study of fishes, amphibians and reptiles. Publishes the journal Copeia.

http://www.parcplace.org/ - Partners in Amphibian and Reptile Conservation: partnership dedicated to the conservation of herpetofauna and their habitats in the United States.

http://armi.usgs.gov/ - Amphibian and Reptile Monitoring Initiative (ARMI) - national program of amphibian monitoring, research, and conservation.

http://www.pwrc.usgs.gov/armiatlas/ - ARMI National Atlas of Amphibian Distributions.

http://www.carcnet.ca/ - Canadian Amphibian and Reptile Conservation Network: dedicated to conserving Canada's native species of amphibians and reptiles.

http://www.torontozoo.com/adoptapond/ - Adopt-a-Pond Wetland Conservation Programme: This programme provides teachers, students and community groups with information resources and educational opportunities to conserve, restore and create wetland habitats.

http://www.naturewatch.ca/english/frogwatch/on/intro.html - Frog Watch Ontario: Anuran monitoring programme in Ontario, Canada.

South America

http://rana.biologia.ucr.ac.cr - The Research and Analysis Network for Neotropical Amphibians.

http://www.natureserve.org/aboutUs/latinamerica/maps_amphibians.jsp - NatureServe Andes Amazon Project Distribution Maps of Endemic Amphibians: Provides distribution maps for endemic amphibians of the tropical Andes.

Argentina

http://www.portal-aha.com.ar/ - Asociación Herpetológica Argentina: An organization dedicated to the herpetology of Argentina.

Brazil

http://www.sbherpetologia.org.br/ - Sociedade Brasileira de Herpetologia: Brazilian Herpetological Society.

Bolivia

http://www.herpetology-bolivia.com/englishstart2.htm - Herpetology of Bolivia: Details and photographs of the herpetofauna of Bolivia.

Ecuador

http://www.puce.edu.ec/zoologia/vertebrados/amphibiawebec/index.html -AmphibiaWebEcuador: Information on the amphibians of Ecuador processed at the Museo de Zoología del Centro de Biodiversidad y Ambiente (Escuela de Biología) de la Pontificia Universidad Católica del Ecuador.

Central America

Caribbean

http://evo.bio.psu.edu/caribherp/lists/wi-list.htm - Caribherp: checklist of West Indian amphibians and reptiles.

Guatemala

http://uta.edu/biology/campbell/guatemala - Guide to the Reptiles and Amphibians of Guatemala.

Mexico

http://www.sociedadherpetologicamexicana.com/ - Sociedad Herpetológica Mexicana A.C.: a non-governmental herpetological organization. Publishes the jounal Boletín de la Sociedad Herpetológica Mexicana.

http://www.mexico-herps.com/ - Mexico Herps: Website dedicated to Mexican herps.

Panama

http://home.earthlink.net/~itec/Amphibian.html - Amphibians of Panama: checklist of species as well as other useful information and photos for each species.

Asia

India

http://www.zooreach.org/ - ZOO (Zoo Outreach Organisation): conservation, education, research and animal welfare Society for South Asia.

Japan

http://zoo.zool.kyoto-u.ac.jp/herp/ - The Herpetological Society of Japan: Publishes the journals Current Herpetology and Bulletin of the Herpetological Society of Japan.

http://www3.ocn.ne.jp/~herpsgh/amphibians.html - Amphibians of Hiroshima: Data including photographs of the 19 amphibians in Hiroshima Prefecture, Japan.

Malaysia

http://www.frogweb.org/ - Frogs of the Malay Peninsula: an in-depth look at the frogs and toads of the Malay Peninsula.

Pakistan

http://wildlifeofpakistan.com/AmphibiansofPakistan/amphibiansofPakistanmain.htm - Wildlife of Pakistan: Species accounts and list for the amphibians of Pakistan.

Philippines

http://www.herpwatch.org/ - Herpwatch Philippines: a guide to the diversity and natural history of the reptiles and amphibians of the Philippines.

Sri Lanka

http://www.wht.org/New-08-99/Amph-general.htm - Wildlife Heritage Trust of Sri Lanka: Information on the amphibians of Sri Lanka.

Bibliographic websites

http://www.herpetofauna.org/ - Amphibian and Reptile Conservation.

http://www.herplit.com/ - The Herplit Database consists of approximately 50,000 citations dating from 1586 to the present.

General Biodiversity

http://iucnredlist.org - IUCN Red List of Threatened Species: contains the IUCN Red List assessments for thousands of species, including all amphibians.

http://www.natureserve.org/explorer - NatureServe Explorer: (data on plants, animals, and ecological communities of the US and Canada).

http://www.natureserve.org/infonatura - InfoNatura: data on birds, mammals, and amphibians of Latin America and the Caribbean.

http://www.zeroextinction.org/ - Alliance for Zero Extinction: Website dedicated to the identification of key sites and species flagged as imperiled by extinction.

http://www.worldwildlife.org/wildfinder/ - WWF's Wildfinder: map-driven, searchable database of more than 26,000 species worldwide.