EXECUTIVE SUMMARY

Introduction

The Biodiversity Conservation Prioritisation Project, India undertook a prioritisation exercise for species, sites and strategies for conservation. The Endangered Species Subgroup selected the Conservation Assessment and Management Plan Workshop Process and the IUCN Red List Criteria (Revised, 1994) for assessing conservation status of species.

A Conservation Assessment and Management Plan (C.A.M.P.) Workshop was conducted for all Indian amphibians to assess their status in the wild. The Workshop took place from 22 to 26 April, 1997, hosted by Utkal University, Department of Zoology, Bhubaneswar. Other local collaborators were the Forest Department of Orissa and the Declining Amphibian Populations Task Force South Asia. The Workshop was attended by 29 participants from 25 institutes with expertise ranging from field biology to forest management.

All Indian amphibians were assessed at the workshop as listed in the checklist of amphibians of south Asia by Indraneil Das. The checklist was further scrutinised at the workshop and only those species that were known to have occurred or occuring in India were evaluated. In total 205 taxa (including species and subspecies) were evaluated at the workshop. The selection of species for assessment was not aproblem in the case of amphibians because the plan of action involved firstly assessment of all endemic taxa followed by the assessment of non-endemic taxa, depending on availability of time. The workshop was a great success in that the participants assessed all the amphibian taxa occuring in India in the stipulated 5 days.

The expertise available at the workshop included reputed field biologists with years of field study in various areas as well as those currently conducting studies. Participants worked in four working groups for five days and assessed 202 taxa. Information for every taxa was entered on "Taxon Data Sheets" in which details of the taxon distribution, population numbers, habitat structure, threats affecting the taxa, population decline and the quality of data provided for the taxa are given here. This information was used to assess the status of the taxon and assign a category of threat according to the IUCN Red List categories. Taxon specific recommendations were also made after categorisation for use in conservation action planning.

CAMP methodology

The Conservation Assessment and Management Plan process is a methodology for rapid assessment of taxa in the wild. This methodology is a rational and objective method of assigning threat categories and deriving recommendations for conservation action plans through participatory group inputs from many stakeholders. A CAMP process is a platform for a congregation of 10 to 40 experts from related fields such as field biologists, ecologists, habitat experts, wildlife managers, forest officials, captive managers, university researchers, academicians, non-governmental organisations, policy makers and other relevant stakeholders. The CAMP Workshop is organised and conducted by objective facilitators who do not have a professional or personal stake in the outcome of the assessments.

The assessment is also followed by research and conservation recommendations for every taxon. CAMPs provide a rational and comprehensive means of assessing priorities for intensive management within the context of the broader conservation needs of threatened taxa.

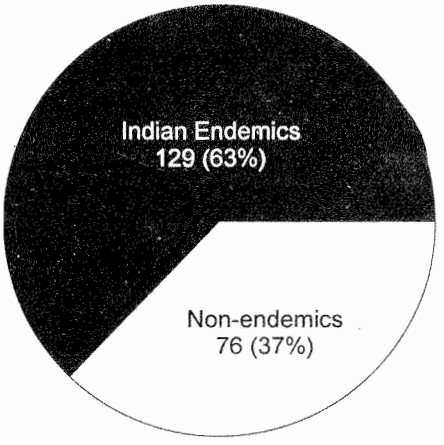
The Conservation Breeding Specialist Group developed the CAMP process methodology first for identifying priorities in captive management planning for the global zoo community, which needed to know the in situ conservation status of species in their care. The methodology, however, has proved so effective for assessing status in the wild that it has been recognised by IUCN SSC Specialist Groups, governmental and non-governmental agencies, conservation action planners and policy makers all over the world. The CAMP methodology is emerging as an effective means of conducting biodiversity inventory, identification and monitoring, thus satisfying Agenda Item 7 in the Conservation on Biological Diversity.

The CAMP process is a flexible process that allows much need-based variations to be incorporated in its conduct. For the first time, preliminary Taxon Data Sheets called "Biological Information Sheet" was sent in advance to all known amphibian researchers in India and all other people listed in the invitee list. Along with the Biological Information Sheet was also mailed the CAMP Manual to help the respondants in understanding the concept and objective of the workshop and the IUCN categories. The Biological Information Sheet is a modified Taxon Data Sheet that is more self-explanatory and does not require the help of an interpretive manual to be filled. This exercise helped in gathering information from different areas about different taxa before hand and the sheets were also utilised extensively at the workshop by participants for information that was not available within the context of the workshop. The sheets therefore provided the means of representation for participants who could not attend the workshop for some reason.

Results

Indian amphibians, which are about 205 taxa in number (when the work was conducted) have a very high representation of endemics. Nearly sixty-three percent (63%) of the amphibians are endemic to India. Western Ghats is the richest region in India in terms of amphibian endemicity. Ninety-three taxa are endemic to this biogeographic region with 2 more taxa sharing their distribution with adjacent areas. Northeastern India, which has a very high diversity among amphibians does not have many endemics within the Indian context because of the jagged political boundary of the country. Though restricted in their distribution in this region, locations of many amphibians are found outside India thereby making them Indian political non-endemics.

Amphibians of India



Number of Indian amphibians = 205

The case is similar in northern and northwestern India with many species ranging across neighbouring countries such as Pakistan, Nepal, Afghanistan and Tibet. A graph depicting amphibian distribution is given in the main report.

Eighty-seven endemic taxa are threatened according to the assessment at the workshop, based on the 1994 IUCN Red list categories. The high percentage of endemic taxa being threatened is due to restricted distribution of these taxa along with other man-induced threats to their wellbeing. Amphibian studies in India is still at its infancy stage since much more information regarding distribution, population dynamics and threats are required. The reasons for global declines in amphibians due to exessive UV radiation and fungi are yet to be determined among amphibians in India. Their decline (if any) due to these factors has not yet been established in India. Threats perceived to Indian amphibians are more physical in nature, such as those by habitat destruction, fragmentation, agricultural practices, pollution, pesticides and other kinds of human interference.

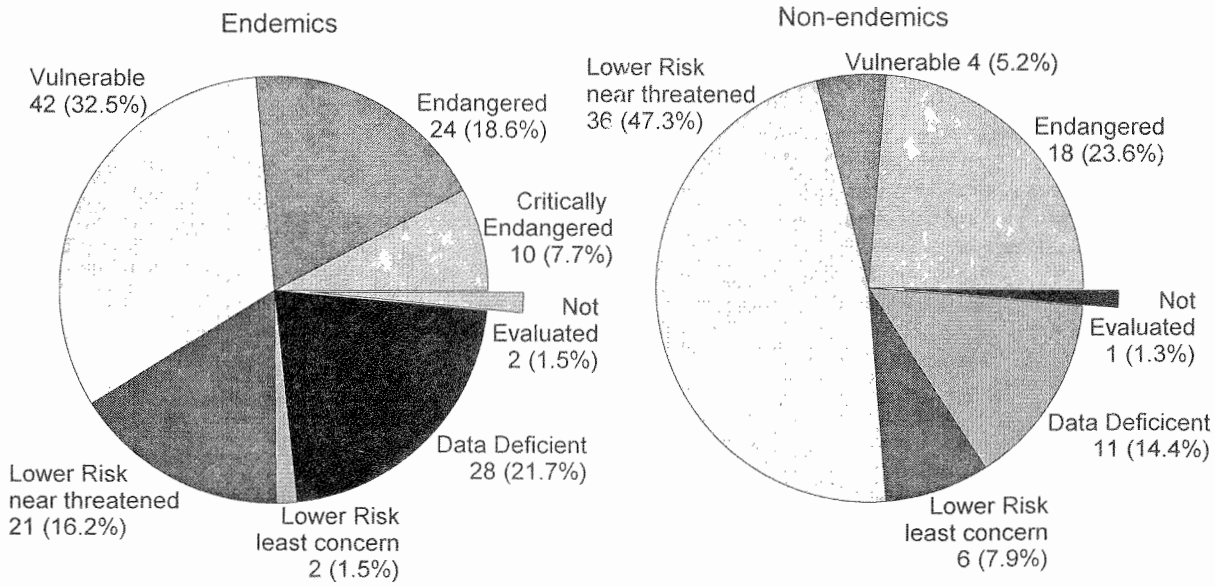
Categorisation of taxa was done according to the 1994 IUCN Red List categories. For a taxon to be threatened, any one of the five criteria within the categories has to be satisfied. These criteria or factors that are used in a categorisation of threat are 1. Population reduction; 2. Restricted distribution; 3. Population size; 4. Number of mature individuals and 5 Probability of extinction. The degree of threat depending on each or any of these five criteria determines the threat category.

One of the major outcomes of this workshop was the post-assessment research and management recommendations for every taxon. Participants identified lacunae areas that need prioritisation and this is indicated in the recommendation section. Survey and monitoring are the most frequently recommended research and management tools for understanding distribution and trends of amphibian populations. The workshop was also an ideal forum to discuss controversial issues such as taxonomy and nomenclature of Indian amphibians. In the recent years, a few taxonomists have suggested frequent changes in generic names of some amphibians in India, which has led to confusion among field biologists. This issue was sorted during the workshop in a special issue working group. Other issues which were discussed separately include education and awareness, research priorities and captive breeding. The reports of each of these special issue working group is included in the main report.

Table 1. Status of assessed Amphibians in India

Category	Endemic	Non Endemic
Extinct (EX)	0	0
Extinct in the Wild (EW)	0	0
Critically Endangered (CR)	10	0
Endangered (EN)	24	18
Vulnerable (VU)	42	4
Lower Risk – near threatened (LR-nt)	21	36
Lower Risk – least concern (LR-lc)	2	6
Lower Risk – conservation dependent (LR-cd)	0	0
Date Deficient (DD)	28	11
Total evaluated at this workshop	127	75

Status of amphibians of India



Number of Indian endemics = 129
IUCN Assessment = Global

Number of non-endemics = 76
IUCN Assessment = National

Table 2. Alphabetical list of Amphibian taxa assessed.

Species	Family	IUCN	Criteria
AMPHIBIANS ENDEMIC TO INDIA			
Ansonia kamblei Ravichandan & Pillai	Bufonidae	DD	--
Ansonia ornata Günther	Bufonidae	EN	(B1, 2c)
Ansonia rubigina Pillai & Pattabhiraman	Bufonidae	EN	(B1, 2c, 3b)
Bufo abatus Ahl	Bufonidae	DD	--
Bufo beddomii Günther	Bufonidae	LRlc	--
Bufo brevirostrisRao	Bufonidae	DD	--
Bufo camortensis Mansukhani & Sarkar	Bufonidae	VU	(D2)
Bufo hololius (Günther)	Bufonidae	LR-nt	--
Bufo koynayensis Soman	Bufonidae	EN	(B1, 2c)
Bufo parietalis Boulenger	Bufonidae	LRnt	--
Bufo silentvalleyensis Pillai	Bufonidae	VU	(D2)
Bufoides meghalayanus (Yazdani & Chanda)	Bufonidae	CR	(B1, 2abc)
Chirixalus dudhwaensis Ray	Rhacophoridae	VU	(D2)
Euphlyctis ghoshi (Chanda)	Ranidae	EN	(B1, 2abc)
Gegeneophis carnosus (Beddome)	Caeciliidae	VU	(B1, 2c)
Gegeneophis fulleri (Alcock)	Caeciliidae	VU	(B1, 2ac)
Gegeneophis ramaswamii Taylor	Caeciliidae	EN	(B1, 2c)
Ichthyophis beddomei Peters	Ichthyophiidae	VU	(A1ac; B1, 2c)
Ichthyophis bombayensis Taylor	Ichthyophiidae	EN	(B1, 2c)
Ichthyophis longicephalus Pillai	Ichthyophiidae	VU	(B1, 2c)
Ichthyophis malabarensis Taylor	Ichthyophiidae	VU	(B1, 2c)
Ichthyophis peninsularis Taylor	Ichthyophiidae	VU	(B1, 2c; D2)
Ichthyophis sikkimensis (Taylor)	Ichthyophiidae	VU	(B1, 2c)
Ichthyophis subterrestris Taylor	Ichthyophiidae	VU	(B1, 2c)
Ichthyophis tricolor Taylor	Ichthyophiidae	EN	(B1, 2c)
Indirana beddomii Günther	Ranidae	VU	(A1ac)
Indirana brachytarsus (Günther)	Ranidae	VU	(B1, 2b)
Indirana diplostictus (Günther)	Ranidae	VU	(B1, 2c)
Indirana gundia Dubois	Ranidae	DD	--
Indirana leithii (Boulenger)	Ranidae	LR-nt	--
Indirana leptodactylus (Boulenger)	Ranidae	VU	(B1, 2c)
Indirana semipalmatus (Boulenger)	Ranidae	VU	(A1ac; B1, 2c)
Indirana tenuilingua (Rao)	Ranidae	DD	--
Indotyphlus battersbyi Taylor	Caeciliidae	CR	(B1, 2bc)
Kaloula baleata ghoshi Cherchi	Microhylidae	VU	(D2)
Limnonectes andamanensis (Stoliczka)	Ranidae	LR-lc	--
Limnonectes brevipalmatas (Peters)	Ranidae	LR-nt	--
Limnonectes keralensis (Dubois)	Ranidae	LR-nt	--
Limnonectes khasiensis (Anderxon)	Ranidae	DD	--
Limnonectes mawlyndipi (Chanda)	Rhacophoridae	CR	(B1, 2ac)
Limnonectes mawphlangensis (Pillai & Chanda)	Ranidae	CR	(B1, 2ac)
Limnonectes murthii Pillai	Ranidae	EN	(B1, 2c)
Limnonectes mysorensis Rao	Ranidae	CR	(B1, 2c)
Limnonectes nilagirica (Jerdon)	Ranidae	EN	(B1, 2c)
Limnonectes sauriceps (Rao)	Ranidae	DD	--
Limnonectes shompenorum Das	Ranidae	EN	(B1, 2abc)
Megophrys robusta (Boulenger)	Pelobatidae	EN	(B1, 2c)
Melanobatrachus indicus Beddome	Microhylidae	VU	(B1, 2c, 3c; D2)
Micrixalus fuscus (Boulenger)	Ranidae	LR-nt	--
Micrixalus gadgili Pillai & Pattabiraman	Ranidae	EN	(B1, 2c)
Micrixalus nudis Pillai	Ranidae	VU	(B1, 2c)
Micrixalus phyllophilus (Jerdon)	Ranidae	VU	(B1, 2c)
Micrixalus saxicola (Jerdon)	Ranidae	LR-nt	--
Micrixalus silvaticus (Boulenger)	Ranidae	VU	(B1, 2c)
Micrixalus thampii Pillai	Ranidae	EN	(B1, 2c)
Microhyla chakrapani Pillai	Microhylidae	VU	(D2)
Nyctibatrachus aliciae Inger, Shaffer, Koshy & Bakde	Ranidae	VU	(B1, 2c)
Nyctibatrachus beddomii (Boulenger)	Ranidae	LR-nt	--
Nyctibatrachus deccanensis Dubois	Ranidae	VU	(B1, 2c)
Nyctibatrachus humayuni Bhaduri & Kripalani	Ranidae	EN	(B1, 2c)

Species	Family	IUCN	Criteria
Uraeotyphlus malabaricus (Beddome)	Uraeotyphlidae	EN	(B1, 2c)
Uraeotyphlus menoni Annandale	Uraeotyphlidae	VU	(B1, 2c; D2)
Uraeotyphlus narayani Seshachar	Uraeotyphlidae	VU	(B1, 2c)
Uraeotyphlus oxyurus (Dumeril & Bibron)	Uraeotyphlidae	VU	(B1, 2c)
AMPHIBIANS OCCURING IN INDIA BUT NOT ENDEMIC			
Amolops afghanus (Günther)	Ranidae	LR-nt	--
Amolops formosus (Günther)	Ranidae	LR-nt	--
Amolops gerbillus (Annandale)	Ranidae	LR-nt	--
Amolops monticola (Anderson)	Ranidae	EN	(B1, 2bc)
Bufo fergusonii (Boulenger)	Bufonidae	LR-lc	--
Bufo himalayanus (Günther)	Bufonidae	LR-nt	--
Bufo latastii (Boulenger)	Bufonidae	LR-lc	--
Bufo melanostictus (Schneider)	Bufonidae	VU	(A1acd)
Bufo microtympanum (Boulenger)	Bufonidae	LR-nt	--
Bufo stomaticus Lütken	Bufonidae	LR-nt	--
Bufo stuarti (Smith)	Bufonidae	LR-nt	--
Bufo viridis Laurenti	Bufonidae	DD	--
Chaparana sikimensis (Jerdon)	Ranidae	LR-nt	--
Chirixalus doriae Boulenger	Rhacophoridae	EN	(B1, 2c)
Chirixalus simus Annandale	Rhacophoridae	EN	(B1, 2abc)
Chirixalus vittatus (Boulenger)	Rhacophoridae	EN	(B1, 2c)
Euphlyctis cyanophlyctis (Schneider)	Ranidae	LR-nt	--
Euphlyctis hexadactylus (Lesson)	Ranidae	LR-nt	--
Hoplobatrachus crassus (Jerdon)	Ranidae	LR-nt	--
Hoplobatrachus tigerinus (Daudin)	Ranidae	VU	(A1d)
Hyla annectans Jerdon	Hylidae	LR-nt	--
Kaloula taprobanica (Parker)	Microhylidae	LR-nt	--
Leptobrachium hasseltii Tschudii	Pelobatidae	EN	(B1, 2abc)
Limnonectes cancrivorus (Gravenhorst)	Ranidae	LR-lc	--
Limnonectes doriae (Boulenger)	Ranidae	VU	(D2)
Limnonectes limnocharis (Gravenhorst)	Ranidae	VU	(A1ac)
Limnonectes syhadrensis (Annandale)	Ranidae	LR-nt	--
Megophrys boettgeri (Boulenger)	Pelobatidae	LR-nt	
Megophrys kempii (Annandale)	Pelobatidae	EN	(B1, 2abc)
Megophrys lateralis (Anderson)	Pelobatidae	DD	--
Megophrys montana (Kuhl & van Hasselt)	Pelobatidae	EN	(B1, 2abc)
Megophrys parva (Boulenger)	Pelobatidae	LR-nt	--
Microhyla berdmorei (Blyth)	Microhylidae	LR-nt	--
Microhyla heymonsi Vogt	Microhylidae	EN	(B1, 2abc)
Microhyla ornata (Deumeril & Bibron)	Microhylidae	LR-lc	--
Microhyla rubra Jerdon	Microhylidae	LR-nt	--
Micryletta inornata (Boulenger)	Microhylidae	EN	(B1, 2abc)
Nytixalus moloch (Annandale)	Rhacophoridae	EN	(B1, 2abc)
Occidozyga lima (Gravenhorst)	Ranidae	DD	--
Paa annandalii (Boulenger)	Ranidae	EN	(B1, 2abc)
Paa blanfordii (Boulenger)	Ranidae	LR-nt	--
Paa hazarensis (Dubois & Khan)	Ranidae	DD	--
Paa liebigii (Günther)	Ranidae	LR-nt	--
Paa minica (Dubois)	Ranidae	DD	--
Paa sternostignata (Murray)	Ranidae	DD	--
Paa vicina (Stoliczka)	Ranidae	DD	--
Philautus andersonii (Ahl)	Rhacophoridae	EN	(B1, 2abc)
Philautus annandalii (Boulenger)	Rhacophoridae	LR-nt	--
Pleurodeles verrucossus (Anderson)	Salamandridae	EN	(A1ac)
Polypedates leucomystax (Gravenhrst)	Rhacophoridae	LR-lc	--
Polypedates maculatus himalayensis (Annandale)	Rhacophoridae	EN	(B1, 2abc)
Polypedates maculatus maculatus (Gray)	Rhacophoridae	LR-lc	--
Ramanella variegata (Stoliczka)	Microhylidae	LR-nt	--
Rana alticola (Boulenger)	Ranidae	LR-nt	--
Rana assamensis (Sclater)	Ranidae	LR-nt	--
Rana chalconota (Schlegel)	Ranidae	EN	(B1, 2abc)
Rana erythraea (Schlegel)	Ranidae	LR-nt	--
Rana leptoglossa (Cope, 1868)	Ranidae	EN	(B1, 2abc)

Species	Family	IUCN	Criteria
Nyctibatrachus kempholeyensis (Rao)	Ranidae	DD	--
Nyctibatrachus major Boulenger	Ranidae	LR-nt	--
Nyctibatrachus minor Inger, Shaffer, Koshy & Bakde	Ranidae	VU	(B1, 2c; D2)
Nyctibatrachus sanctipalustris Rao	Ranidae	EN	(B1, 2c)
Nyctibatrachus sylvaticus Rao	Ranidae	DD	--
Pedostibes kempi (Boulenger)	Bufonidae	CR	(B1, 2abc)
Pedostibes tuberculosus Günther	Bufonidae	VU	(B1, 2c)
Philautus beddomii (Günther)	Rhacophoridae	VU	(B1, 2c)
Philautus bombayensis (Annandale)	Rhacophoridae	EN	(B1, 2c)
Philautus chalazodes Günther	Rhacophoridae	VU	(B1, 2c; D2)
Philautus charius Rao	Rhacophoridae	LR-nt	--
Philautus cherrapunjiae Roonwall & Kripalani	Rhacophoridae	EN	(B1, 2ac)
Philautus crnri Dutta	Rhacophoridae	DD	--
Philautus elegans Rao	Rhacophoridae	DD	--
Philautus flaviventris (Boulenger)	Rhacophoridae	DD	--
Philautus garo (Boulenger)	Rhacophoridae	CR	(B1, 2bc)
Philautus glandulosus (Jerdon)	Rhacophoridae	VU	(B1, 2c)
Philautus hassanensis Dutta	Rhacophoridae	DD	--
Philautus kempiae (Boulenger)	Rhacophoridae	CR	(B1, 2abc)
Philautus kottigeharensis Rao	Rhacophoridae	DD	--
Philautus leucorhinus (Lichtenstein & Martens)	Rhacophoridae	LR-nt	--
Philautus melanensis Rao	Rhacophoridae	DD	--
Philautus namdaphaensis Sarkar & Sanyal	Rhacophoridae	VU	(B1, 2c; D2)
Philautus narainensis Rao	Rhacophoridae	DD	--
Philautus nobeli (Ahl)	Rhacophoridae	DD	--
Philautus parkeri (Ahl)	Rhacophoridae	DD	--
Philautus pulcherimus (Ahl)	Rhacophoridae	VU	(B1, 2c)
Philautus shillongensis Pillai & Chanda	Rhacophoridae	CR	(B1, 2abc)
Philautus shyamrupus Chanda & Ghosh	Rhacophoridae	VU	(B1, 2c; D2)
Philautus signatus (Boulenger)	Rhacophoridae	VU	(B1, 2c)
Philautus swamianus Rao	Rhacophoridae	DD	--
Philautus temporalis Günther	Rhacophoridae	EN	(B1, 2c)
Philautus travancoricus (Boulenger)	Rhacophoridae	DD	--
Philautus variabilis (Günther)	Rhacophoridae	LR-nt	--
Phrynoglossus borealis (Annandale)	Ranidae	EN	(B1, 2c)
Polypedates cruciger (Blyth)	Rhacophoridae	VU	(B1, 2c; D2)
Polypedates insularis Das	Rhacophoridae	EN	(B1, 2abc)
Ramanella anamalaiensis Rao	Microhylidae	DD	--
Ramanella minor Rao	Microhylidae	DD	--
Ramanella montana Jerdon	Microhylidae	LRnt	--
Ramanella mormorata Rao	Microhylidae	VU	(B1, 2bc; D2)
Ramanella triangularis (Günther)	Microhylidae	VU	(B1, 2c; D2)
Rana aurantiaca (Boulenger)	Ranidae	LR-nt	--
Rana curtipes Jerdon	Ranidae	LR-nt	--
Rana danieli Pillai & Chanda	Ranidae	LR-nt	--
Rana garoensis Boulenger	Ranidae	EN	(B1, 2abc)
Rana khare (Kiyasetuo & Khare)	Ranidae	EN	(B1, 2c)
Rana malabarica Tschudi	Ranidae	LR-nt	--
Rana senchalensis Chanda	Ranidae	CR	(B1, 2abc)
Rana travancorica Annandale	Ranidae	DD	--
Rhacophorus calcadensis Ahl	Rhacophoridae	DD	--
Rhacophorus jerdonii (Günther)	Rhacophoridae	VU	(B1, 2c; D2)
Rhacophorus lateralis Boulenger	Rhacophoridae	EN	(B1, 2c)
Rhacophorus malabaricus Jerdon	Rhacophoridae	LR-nt	--
Rhacophorus namdaphaensis Sarkar & Sanyal	Rhacophoridae	VU	(B1, 2c; D2)
Rhacophorus naso Annandale	Rhacophoridae	DD	--
Rhacophorus pleurostictus (Günther)	Rhacophoridae	VU	(B1, 2c)
Rhacophorus taeniatus Boulenger	Rhacophoridae	LR-nt	--
Rhacophorus tuberculatus (Anderson)	Rhacophoridae	LRnt	--
Scutiger occidentalis Dubois	Pelobatidae	DD	--
Tomopterna leucorhynchus Rao	Ranidae	DD	--
Tomopterna parambikulamana Rao	Ranidae	DD	--
Tomopterna rufescens (Jerdon)	Ranidae	LR-nt	--

Species	Family	IUCN	Criteria
Rana livida (Blyth)	Ranidae	LR-nt	--
Rana nicobarensis (Stoliczka)	Ranidae	LR-nt	--
Rana nigrovittata (Blyth)	Ranidae	EN	(B1, 2bc)
Rana taipehensis Van Denburg	Ranidae	LR-nt	--
Rhacophorus appendiculatus (Günther)	Rhacophoridae	DD	--
Rhacophorus bipunctatus Ahl	Rhacophoridae	LR-nt	--
Rhacophorus bisacculus Taylor, E.H.	Rhacophoridae	EN	(B1, 2abc)
Rhacophorus maximus (Günther)	Rhacophoridae	LR-nt	--
Rhacophorus nigropalmatus Boulenger	Rhacophoridae	DD	--
Rhacophorus reinwardtii Kuhl & van Hasselt	Rhacophoridae	LR-nt	--
Scutiger nyingchinesis (Fei)	Pelabatidae	LR-nt	--
Scutiger sikimmensis (Blyth)	Pelobatidae	LR-nt	--
Taylorana hascheana Stoliczka	Ranidae	DD	--
Theloderma asper (Boulenger)	Rhacophoridae	DD	--
Tomopterna rolandae (Dubois)	Ranidae	LR-nt	--
Uperodon globulosus (Günther)	Microhylidae	LR-nt	--
Uperodon systoma (Schneider)	Microhylidae	LR-nt	--

IUCN Red List Categories and Criteria explained in brief below

*** IUCN Red List *Categories:***

CR – Critically endangered -- a taxon is Critically endangered when it is facing an extremely high risk of extinction in the wild in the immediate future as defined by the criteria.

EN – Endangered -- a taxon is Endangered when it is not Critically endangered but is facing a very high risk of extinction in the wild in the near future as defined by the criteria.

VU – Vulnerable -- a taxon is Vulnerable when it is not Critically endangered or Endangered but is facing a high risk of extinction in the wild in the medium term future as defined by the criteria.

LR – Lower risk – a taxon is Low Risk when it has been evaluated and does not qualify for any of the threatened categories, Critically endangered, Endangered, Vulnerable, or Data Deficient. (LR-nt – near threatened, LR-lc –least concern, LR-cd – conservation dependent.

DD – 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.

NE – Not evaluated – A taxon is Not Evaluated when it has not yet been assessed against the criteria.

**** IUCN Red List *Criteria***

A – Population reduction – (1) observed, infered, suspected or estimated reduction, or **(2)** projected or predicted reduction of at least 20% (VU), or 50% (EN), or 80% (CR) in 10 years or 3 generations whichever is longer based on **(a)** Direct observation; **(b)** index of abundance appropriate for the taxon; **(c)** decline in areas of occupancy, extent of occurrence and/or quality of habitat; **(d)** actual or potential levels of exploitation; **(e)** effects of introduced taxa, hybridisation, pathogens, pollutants, competitors, or parasites.

B – Restricted distribution -- Extent of occurrence estimated to be less than 20,000 sq km. (VU), or 5,000 sq km (EN) or 100 sq km (CR) and/or area of occupancy estimated to be less than 2000 sq.km. (VU), or 500 sq km (EN), or 10 sq km (CR), and qualifying for any two of the following : **(1)** severely fragmented, or known to exist in not more than 10 locations (VU), or 5 locations (EN), or single location (CR); **(2)** continuing decline, observed, inferred, projected in any **(a)** extent of occurance, **(b)** area of occupancy; **(c)** area, extent and/or quality of habitat; **(d)** number of locations or subpopulations; **(e)** number of mature individuals; **(3)** extreme fluctuation in either **(a)** extent of occurance, **(b)** area of occupancy, **(c)** number of populations or subpopulations, **(d)** number of mature individuals.

C – Population estimates – population estimated to number less than 10,000 (VU), or 2,500 (EN), or 250 (CR) mature individuals and either **(1)** estimated, continuing decline of at least 10% in 10 years or 3 generations or whichever is longer (VU), or 20% in 5 years or 2 generations, whichever is longer (EN), or 25% in 3 years or 1 generation whichever is longer (CR) OR in **(2)** continuing decline, observed, projected, inferred, number of mature individuals and population structure in the form of either **(a)** severely fragmented [no subpopulation estimated to contain more than 1000 (VU), or 250 (EN), or 50 (CR) mature individuals] ; **(b)** all individuals are in a single subpopulation.

D – Restricted populations – (1) Population estimated to number less than 1000 (VU), or 250 (EN), or 50 (CR) mature individuals; **(2)** Population restricted in area of occupancy of less than 100 sq km or less than 5 locations (VU).

E – Probability of extinction – quantative analysis showing the probability of extinction in the wild is at least 10% in 100 years (VU), or 20% in 20 years or 5 generations, whichever is longer (EN), or 50% in 10 years or 3 generations, whichever is longer (CR).