

Potential flagship species for improving support and garnering attention towards amphibian conservation in the Western Ghats, India

Abstract

Amphibians are the most threatened vertebrate group in the world as a result of habitat loss, disease, and climate change. In the Western Ghats region, part of the Western Ghats – Sri Lanka biodiversity hotspot in India, amphibians exhibit the highest endemism and are one of the most imperilled vertebrate groups. However, amphibians receive very little conservation attention since the official focus has been on conserving charismatic mega-fauna. To improve this issue of neglect and garner support for amphibian conservation, we initiated the identification of 'flagship' amphibian species which would appeal to stakeholders (local communities, conservation practitioners and tourists) and initiate positive conservation action. By using different levels of eight criteria, viz, recognition, status, distribution, visibility, appearance, unique characteristics, local significance, and media coverage, we identified 46 potential flagship species from the 229 amphibians known from the Western Ghats region. Of the 46 species: *Rhacophorus pseudomalabaricus*, *Nasikabatrachus sahyadrensis*, *Rhacophorus lateralis*, *Xanthophryne tigerina*, *Ghatixalus variabilis* and *Raorchestes chlorosomma* were potential flagships for stakeholders. We recommend piloting the potential flagship species on the ground to ascertain their effectiveness before their use in conservation programs and campaigns.

Introduction

Amphibians are one of the most threatened vertebrate groups with close to a third of the species facing a heightened risk of extinction (Hoffman et al. 2010; IUCN 2017; Stuart et al. 2004). As a group, they face severe population declines, ongoing local extirpations and global extinctions due to a wide array of threats ranging from climate change, habitat loss, and disease (Pounds et al. 2006; Skerratt et al. 2007; Sodhi et al. 2008).

Among vertebrates in the Western Ghats, amphibians exhibit the highest endemism (Myers et al. 2000). As of January 2017, 229 species of amphibians are known from the Western Ghats, of which 62 are threatened (IUCN 2017; Appendix 1). Amphibians in the Western Ghats region of the Western Ghats - Sri Lanka biodiversity hotspot face challenges similar to amphibians on the

Key words: *anurans, caecilians, conservation practitioner, frogs, local communities, marketing, stakeholders, tourist, Western Ghats - Sri Lanka Biodiversity Hotspot*

Melanobatrachus indicus Black Narrow Mouth Frog, Kalakad Mundanthurai Tiger Reserve. Photo Credit: Varun Kher

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global scale -habitat loss and deterioration, habitat fragmentation, dams, and chemical pollution (Daniels 1991; Gurushankara et al. 2007; Kumar et al. 2002; Naniwadekar & Vasudevan 2014). In addition, frog meat is also consumed locally and is used in traditional medicine (Kanagavel et al. 2016; Thomas & Biju 2016). Local myths about amphibians have led to reduced local support for amphibian conservation and at times results in their culling (Harpalani et al. 2015; Kanagavel et al. 2017; Kotharambath et al. 2013). Despite these threats and high endemism, amphibians receive very little conservation attention from local and national stakeholders. This is especially true since the 'official focus' is on charismatic large mammals like the Bengal tiger (*Panthera tigris tigris*) and Asian elephant (*Elephas maximus*; WII-ENVIS 2017). There is an urgent need to initiate on-ground conservation initiatives at least for highly threatened and endemic amphibians, since unlike mammals they mostly cannot disperse over large distances, are extremely sensitive to climate/habitat change, and occupy highly restricted ranges (Smith & Green 2005; Sodhi et al. 2008).

To highlight the case of amphibians in the Western Ghats, representatives from the 229 species need to be carefully selected, to serve as 'flagships' for the entire group and positively influence stakeholders. A flagship

species is "a species used as the focus of a broader conservation marketing campaign based on its possession of one or more traits that appeal to the target audience" which can vary depending on the conservation issue to be mitigated (Verissimo et al. 2011). This study aims to identify potential flagship amphibian species in the Western Ghats of India that would help in building appreciation towards this vertebrate group, improve local support, and focus on-ground conservation.

Methods

A list of amphibian species (anurans and caecilians) from the Western Ghats of India was compiled from existing checklists (Dinesh et al. 2015) and with new species described until January 2017 (Appendix 1). As per Verissimo et al.'s (2011) marketing approach to selecting flagship species, we first identified lack of conservation attention, support, and appreciation as the conservation problems to be tackled. The target audiences selected were three different stakeholders: local communities, tourists, and conservation practitioners. In this study, local communities refer to those individuals living in and around the habitats of amphibians. Tourists refer to those individuals who not only visit forested areas for recreation but also individuals in urban settlements far away from the amphibian

Figure 1: Anamalai gliding frog *Rhacophorus pseudomalabaricus*
Photo Credit: Sandeep Das



habitats. Conservation practitioners include forest department officials, related government institutions, non-governmental organizations, and researchers. Different flagship species were identified for different stakeholders, as they are known to have different preferences with respect to the conservation issue to be mitigated and, campaigns including the selection of flagship species need to be formulated accordingly (Kanagavel et al. 2014; Verissimo et al. 2011).

In accordance to the next step of the marketing approach, we identified eight criteria from the existing literature on flagship species to assist in identifying potential flagship amphibians in the Western Ghats. These criteria were selected based on data availability, and our perception of whether it was applicable for amphibians in the Western Ghats taking in to consideration the different stakeholders (Bowen-Jones & Entwistle 2002; Smith et al. 2012; Verissimo et al. 2009, 2014). Recognition or distinctiveness (Bowen-Jones & Entwistle 2002) was chosen as a criterion so that the flagship species chosen are easily distinguishable and not confused with other species in the locality by the stakeholders. The IUCN threat status was chosen as a criterion specifically for conservation practitioners as they are more concerned about threatened species (Home et al. 2009). The Wildlife Protection Act, 1972 was not considered for this criterion as it provides an insufficient list of amphibian species (WPA 1972). Currently, it only mentions "Fresh Water Frogs (*Rana* spp.)" under Schedule IV, which is inappropriate since nearly all amphibians are freshwater species and the taxonomy of this vertebrate group has changed vastly during the last 40 years. Sodhi et al. (2008) recommended that species with restricted ranges should be of higher conservation priority, because of which distribution was chosen as a criterion for conservation practitioners as their objective is to conserve biodiversity. Tourists also tend to prefer endemic species over widespread ones (Verissimo et al. 2009). Visibility, which refers to the possibility of spotting the species in the field (Verissimo et al. 2009, 2014) was chosen for both tourists and local communities, since if the stakeholders were unable to see the species

even after multiple visits to the field, they would lose interest in the species. Appearance was selected as a criterion for local communities and tourists, as they prefer species that are attractive (see Kanagavel et al. 2014; Verissimo et al. 2009, 2014). This was not used for conservation practitioners, as it is counter-intuitive to their objective of protecting biodiversity biased by appearance. Unique characteristics (e.g. foot flagging behaviour of *Micrixalus* sp. (Biju et al. 2014); parental care in caecilians and *Nyctibatrachus* sp. (Biju et al. 2011; Measey et al. 2003); bird-like call of *Ghatixalus* sp.) for the species was chosen specifically for tourists, as such traits would invoke greater interest in the specific species (Verissimo et al. 2009). Whether a species was locally significant or not, was selected solely for local communities, since it meant that the species would be locally identifiable (Bowen-Jones & Entwistle 2002). This criterion was a combination of various local community related criteria listed by Bowen-Jones & Entwistle (2002), as there is very little information and/or local associations with amphibians in the Western Ghats. Irrespective of whether the local significance of the species was positive or negative, we considered it significant, as 'any publicity is good publicity'. Amphibians are largely 'unknown products' in the Indian biodiversity scenario in comparison to 'established products' like the Bengal tiger and Asian elephant (Sorensen & Rasmussen 2004). Due to the increased 'product' awareness available through negative associations, such species provide an opportunity to engage with local communities, modify their negative associations into positive relationships through conservation initiatives and thereby improve local support for the species and the group. Media coverage was perceived by us to be an important criterion specifically for tourists, as the 'product' if already 'visible' amongst this stakeholder group makes it relatable and cost-effective in garnering greater attention towards the species. Information on these eight criteria detailed in Table 1 were collated from available literature, personal observations of the authors and their colleagues, and the IUCN Red List (IUCN 2017; Table 1).

Table 1: Description of criteria based on which potential amphibian species were identified

Criteria	Description & grouping	Source
Recognition	Whether the species is distinct and can be easily distinguished from other species in the locality	Existing literature, authors personal observations, KV Gururaja (pers. comm.)
Status	Threat status as per IUCN Red List	IUCN 2017
Distribution	Distribution range; classified as point endemic, state endemic or occurring in more than one state. Point endemic includes species, which occupy restricted ranges across adjacent states and a single hill range	IUCN 2017, existing literature, authors personal observations, KV Gururaja (pers. comm.)
Visibility	Refers to the possibility of spotting the species in the field under the assumption that the visit is undertaken during the appropriate season, weather conditions and time period; classified into 25% chance of seeing it during a field visit, 50% or 75%	Existing literature, authors personal observations, KV Gururaja (pers. comm.)
Appearance	Whether the species is visually attractive or not	The perceptions of five different volunteers were averaged to determine whether the species was attractive or not.
Unique characteristics	Whether the species exhibits unique behavioural, ecological, reproductive or vocal characteristics	Existing literature, authors personal observations
Local significance	Whether the species is locally utilised, has local beliefs attached to it or is distinctly recognised by communities	Existing literature, authors personal observations, KV Gururaja (pers. comm.)
Media coverage	Whether the species has been significantly mentioned (beyond the mention of species name and location) in newspapers, local magazines and online news portals.	Online searches, newspapers and magazines

Data analysis

Only species that were morphologically distinct were selected to avoid any confusion with other species in the same locality. Potential flagship species were then chosen based on criteria appropriate for each stakeholder as previously detailed. The species that performed the best among the chosen criteria were ranked and selected as potential flagship species. For local communities, those species that either fulfilled all the criteria (appearance = attractive, local significance = yes, visibility = 75/50; Ranking = 1) or all but one criteria (only 75% visibility was applicable; Ranking = 2) were selected. For tourists, the species that either fulfilled all the criteria (distribution = point endemic/state endemic, appearance = attractive, media coverage = yes, unique characteristics = yes, visibility = 75/50; Ranking = 1), or all but one criteria whose visibility was 75% (Ranking = 2), or all but one criteria whose visibility was 50% (Ranking = 3), or all but two criteria (only 75% visibility was

applicable; Ranking = 4) were chosen. For conservation practitioners, the species that were Critically Endangered and were designated point endemics (Ranking = 1) or those that were Endangered and point/state endemics (Ranking = 2) were chosen. This selection process was designed as such to select the best potential flagship species. The lower the ranking the higher is the potential of the species to perform well as a flagship. We did not ground-truth the effectiveness of the identified flagship species on the ground as per the final step of the marketing approach to select such species. Due to this we term the species identified in this manner as potential flagship species.

Results and Discussion

While there has always been interest in the conservation of charismatic mega-fauna in India, smaller vertebrates like amphibians and freshwater fish are yet to receive their fair share of attention (Robin & Nandini 2012). A total of 46 amphibians including a caecilian species were identified as



potential flagship species in building appreciation towards amphibians, improving local support, and increasing on-ground conservation in the Western Ghats (Table 2). Nineteen flagship species were identified for local communities, 29 for tourists, and 23 for conservation practitioners (Table 2). Six species, *Rhacophorus pseudomalabaricus* (Fig. 1), *Nasikabatrachus sahyadrensis* (Fig. 2), *R. lateralis* (Fig. 3), *Xanthophryne tigerina* (Fig. 4), *Ghatixalus variabilis* (Fig. 5), and *Raorchestes chlorosomma* (Fig. 6) were potential flagships for all the stakeholders. *N. sahyadrensis* can be considered as the species which stimulated and inspired amphibian-related research in India, discovery of which received global coverage and attention (Aggarwal 2004). The species is also one of the few that is well known by local communities (Aggarwal 2004; Thomas & Biju 2016). *Rhacophorus pseudomalabaricus* is the only amphibian in recent times to be featured on a postage stamp issued by India and is also locally well known (Harpalani et al. 2015). The other four of the highest performing flagship species are novel and have not been used as flagship species in the past.

We would like to caution conservation practitioners about the existing flux in

anuran taxonomy across the Western Ghats. We recommend that this list be used as a baseline because of the fast pace at which taxonomic revisions are occurring and new species/genera are being described. Even with the current flux in anuran taxonomy, given the high rates of endemism and the threatened status of amphibians in the Western Ghats, it is pertinent to identify flagship species to initiate suitable species-specific and stakeholder-specific conservation programs. The potential flagship species need to be piloted to check whether they are effective for conservation programs and for the target audience before their long-term use in any program/campaign (Verissimo et al. 2011). Moreover, if the scale of the program is changed, to include the entire Indian sub-continent or to focus on a small town in the Western Ghats, flagship species would need to be selected from the amphibian assemblages occurring in the locality.

We present a list of criteria relevant for the amphibians of the Western Ghats region of India, that can be used to determine flagship species for different stakeholders. These selection criteria can be changed based on the conservation issue being mitigated and the characteristics of the audience group. While collating data for the different criteria, we realised that the IUCN

Figure 2: Purple frog
Nasikabatrachus sahyadrensis
Photo Credit: Sandeep Das



Figure 3: Boulenger's Tree Frog
Rhacophorus lateralis
Photo Credit: Sandeep Das

Red List assessment needed to be updated for numerous species based on current scientific literature, and assessments needed to be undertaken for several newly described species. The resulting flagship species for conservation practitioners would be different if the assessments were up to date. We suggest that a quicker online channel be setup for researchers to modify or add new IUCN Red List assessments in collaboration with the regional chair of the IUCN SSC Amphibian Specialist Group. The schedules of Wildlife Protection Act, 1972 must be updated, reflecting the current taxonomic status, threat status and trade of amphibians, which would not only be an invaluable source for such prioritizations but also for enhancing amphibian conservation in India. When new species are being described, we suggest that species association with local communities also be investigated and mentioned in research literature. Field studies could also collect such information from local communities as there is a severe lack of information regarding the local significance/ associations with amphibians. If investigated, it could reveal species with local significance (Harpalani et al. 2015; Kanagavel et al. 2017, Turvey et al. 2015), which will be effective for conservation programs with local communities. We also observed an exceptional rise in media coverage for recently discovered species and suggest that these articles include more

about the species beyond mentioning its name and locality. Official nature-based tourism organized by the Forest Department does not integrate amphibians as it mainly involves mammals and birds, especially since access to forest areas is allowed only between 06:00 to 18:00 hr. Official programs that provide an opportunity to observe and research the appropriate flagship species in the wild could improve appreciation of amphibians among urban communities, generate financial support for the Forest Department to improve amphibian conservation and support local livelihoods if designed as a community-based initiative. This effort to identify appropriate flagship amphibian species is only the beginning and we encourage the community to help make it more informative and updated.

Figure 4: Amboli Toad
Xanthophryne tigerina
Photo Credit: Varad B. Giri





Figure 5: Star-eyed Tree Frog
Ghatixalus variabilis
Photo Credit: Sandeep Das



Figure 6: Green-eyed Bush Frog
Raorchestes chlorosomma
Photo Credit: Sandeep Das

Table 2: Potential flagship amphibians of the Western Ghats

	Scientific Name	Local Community*	Tourist*	Conservation Practitioner*
1	<i>Rhacophorus pseudomalabaricus</i>	1	1	1
2	<i>Nasikabatrachus sahyadrensis</i>	1	1	2
3	<i>Rhacophorus lateralis</i>	1	2	2
4	<i>Xanthophryne tigerina</i>	2	2	1
5	<i>Ghatixalus variabilis</i>	2	2	2
6	<i>Raorchestes chlorosomma</i>	2	4	1
7	<i>Raorchestes chalazodes</i>	-	1	1
8	<i>Rhacophorus malabaricus</i>	1	2	-
9	<i>Beddomixalus bijui</i>	2	2	-
10	<i>Ghatixalus asterops</i>	2	2	-
11	<i>Raorchestes resplendens</i>	-	3	1
12	<i>Uperodon taprobanica</i>	1	4	-
13	<i>Micrixalus adonis</i>	3	2	-
14	<i>Raorchestes nerostagona</i>	-	3	2
15	<i>Raorchestes travancoricus</i>	-	3	2
16	<i>Duttaphrynus beddomii</i>	-	4	2
17	<i>Raorchestes luteolus</i>	2	4	-
18	<i>Xanthophryne koynayensis</i>	-	4	2
19	<i>Sallywalkerana diplosticta</i>	-	4	2
20	<i>Ichthyophis bombayensis</i>	1	-	-
21	<i>Clinotarsus curtipes</i>	1	-	-
22	<i>Raorchestes ponmudi</i>	-	-	1
23	<i>Duttaphrynus parietalis</i>	2	-	-
24	<i>Ghatophryne ornata</i>	-	-	2
25	<i>Pedostibes tuberculosus</i>	-	-	2
26	<i>Euphlyctis hexadactylus</i>	1	-	-
27	<i>Hoplobatrachus tigerinus</i>	2	-	-
28	<i>Minervarya sahyadris</i>	-	-	2
29	<i>Micrixalus gadgili</i>	-	-	2
30	<i>Melanobatrachus indicus</i>	-	-	2
31	<i>Microhyla rubra</i>	2	-	-
32	<i>Microhyla sholigari</i>	-	-	2
33	<i>Uperodon variegata</i>	2	-	-
34	<i>Raorchestes signatus</i>	-	-	2
35	<i>Raorchestes tinniens</i>	-	-	2
36	<i>Rhacophorus calcadensis</i>	-	-	2
37	<i>Raorchestes manohari</i>	-	3	-
38	<i>Raorchestes ochlandrae</i>	-	3	-
39	<i>Raorchestes uthamani</i>	-	3	-
40	<i>Micrixalus phyllophilus</i>	-	4	-
41	<i>Micrixalus thampii</i>	-	4	-
42	<i>Nyctibatrachus grandis</i>	-	4	-
43	<i>Nyctibatrachus minimus</i>	-	4	-
44	<i>Indirana bhadrai</i>	-	4	-
45	<i>Mercurana myristicapalustris</i>	-	4	-
46	<i>Raorchestes flaviocularis</i>	-	4	-

*Refer to the analysis section for an understanding of the ranking scheme followed for each stakeholder. The lower the ranking, the higher is the flagship potential of the species. This '-' means that the species is not a flagship for the associated stakeholder



Koyana Wildlife Sanctuary, northern western ghats, a key site for amphibian conservation. Photo Credit: Preeti Sharma

Acknowledgements

We would like to thank KV Gururaja for sharing species information for the different criteria, Varad B Giri for sharing species photographs, KA Sreejith and PS Easa for their support and, Rajeev Raghavan and Benjamin Tapley for their suggestions that vastly improved the manuscript. Arun Kanagavel was financially supported by the Conservation Leadership Program (03234915), *Rufford* Small Grants Program (17771-2), Idea Wild and Ocean Park *Conservation* Foundation, Hong Kong (OPCFHK; FH03-1516). Sethu Parvathy was supported by the Inlaks Ravi Sankaran *Fellowship* Program - Small Grants Project - 2017 and the *Rufford* Foundation (23036-1). Lilly Margaret Eluvathingal was supported by a Research Assistantship from Florida International University. Ramachandran Kotharambath was financially supported by Kerala State Council for Science, Technology and Environment, Govt. of Kerala (SPYTiS programme), Madras Crocodile Bank (Herpetology Conservation Research Award) and Dept. of Higher Education, Govt. of Kerala (Fostering Linkages in Higher Education and Research programme). Sandeep Das is supported by the Zoological Society of London's EDGE Fellowship 2017.

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Appendix 1. Detailed characteristics of the amphibians of Western Ghats based on the eight criteria used to identify potential flagship species (see Table 1 for further details on the eight criteria)

	<i>Species</i>	<i>Recognition</i>	<i>Status^a</i>	<i>Distribution^b</i>
Family: Bufonidae				
1	<i>Duttaphrynus beddomii</i> *	Yes	EN	PE
2	<i>Duttaphrynus brevirostris</i>	No	DD	PE
3	<i>Duttaphrynus melanostictus</i>	No	LC	MS
4	<i>Duttaphrynus microtypanum</i>	Yes	VU	MS
5	<i>Duttaphrynus parietalis</i> *	Yes	NT	MS
6	<i>Duttaphrynus scaber</i>	Yes	LC	MS
7	<i>Duttaphrynus silentvalleyensis</i>	No	DD	PE
8	<i>Duttaphrynus stomaticus</i>	No	LC	MS
9	<i>Ghatophryne ornata</i> *	Yes	EN	PE
10	<i>Ghatophryne rubigina</i>	Yes	VU	PE
11	<i>Pedostibes tuberculosus</i> *	Yes	EN	PE
12	<i>Xanthophryne koynayensis</i> *	Yes	EN	PE
13	<i>Xanthophryne tigerina</i> **	Yes	CR	PE
Family: Dicroglossidae				
14	<i>Euphlyctis mudigere</i>	No	NE	PE
15	<i>Euphlyctis aloysii</i>	Yes	NE	MS
16	<i>Euphlyctis cyanophlyctis</i>	Yes	LC	MS
17	<i>Euphlyctis hexadactylus</i> *	Yes	LC	MS
18	<i>Hoplobatrachus crassus</i>	Yes	LC	MS
19	<i>Hoplobatrachus tigerinus</i> *	Yes	LC	MS
20	<i>Sphaerotheca breviceps</i>	No	LC	MS
21	<i>Sphaerotheca dobsonii</i>	No	LC	MS
22	<i>Sphaerotheca leucorhynchus</i>	No	DD	PE
23	<i>Sphaerotheca rolandae</i>	No	LC	MS
24	<i>Fejervarya brevipalmata</i>	No	DD	MS
25	<i>Fejervarya caperata</i>	No	NE	PE
26	<i>Fejervarya gomantaki</i>	No	NE	PE
27	<i>Fejervarya granosa</i>	No	NE	MS
28	<i>Fejervarya keralensis</i>	Yes	LC	MS
29	<i>Fejervarya kudremukhensis</i>	No	NE	SE
30	<i>Fejervarya modestus</i>	No	NE	PE
31	<i>Fejervarya mudduraja</i>	No	NE	PE
32	<i>Fejervarya murthii</i>	No	CR	SE
33	<i>Fejervarya mysorensis</i>	No	DD	PE
34	<i>Fejervarya nilagirica</i>	No	EN	PE
35	<i>Fejervarya parambikulamana</i>	No	DD	PE
36	<i>Fejervarya rufescens</i>	Yes	LC	MS
37	<i>Minervarya sahyadris</i> *	Yes	EN	PE
38	<i>Fejervarya sauriceps</i>	Yes	DD	PE
39	<i>Fejervarya syhadrensis</i>	No	LC	MS
Family: Micrixalidae				
40	<i>Micrixalus adonis</i> *	Yes	NE	PE
41	<i>Micrixalus candidus</i>	Yes	NE	PE
42	<i>Micrixalus elegans</i>	Yes	DD	PE
43	<i>Micrixalus frigidus</i>	No	NE	PE

<i>Visibility</i>	<i>Appearance</i>	<i>Unique characteristics</i>	<i>Local significance</i>	<i>Media coverage</i>
75	No	No	No	Yes
75	No	No	Yes	No
75	No	No	Yes	Yes
50	No	No	Yes	No
75	No	No	Yes	No
50	No	No	Yes	No
50	No	No	No	No
50	No	No	No	No
50	Yes	No	No	No
25	Yes	No	No	No
50	No	Yes	No	Yes
75	No	Yes	No	No
75	Yes	Yes	No	No
75	No	No	No	Yes
75	No	No	No	Yes
75	No	No	No	No
75	Yes	No	Yes	No
50	No	Yes	Yes	Yes
75	No	No	Yes	Yes
50	No	No	No	No
50	No	No	No	No
50	No	No	No	No
50	No	No	No	No
50	No	No	No	No
50	No	No	No	No
25	No	No	No	No
75	No	No	No	No
25	No	No	No	No
25	No	No	No	No
50	No	No	No	No
50	No	No	No	No
25	No	No	No	No
50	No	No	No	No
25	No	No	No	No
75	No	No	No	No
50	No	No	No	No
75	No	No	No	No
25	No	No	No	No
75	Yes	Yes	No	No
50	No	Yes	No	No
50	No	Yes	No	No
75	No	Yes	No	No

	Species	Recognition	Status ^a	Distribution ^b
Family: Bufonidae				
44	<i>Micrixalus fuscus</i>	No	NT	PE
45	<i>Micrixalus gadgili</i> *	Yes	EN	PE
46	<i>Micrixalus herrei</i>	Yes	NE	MS
47	<i>Micrixalus kodayari</i>	No	NE	PE
48	<i>Micrixalus kottigeharensis</i>	No	CR	PE
49	<i>Micrixalus kurichiyari</i>	No	NE	PE
50	<i>Micrixalus mallani</i>	No	NE	PE
51	<i>Micrixalus neliyampathi</i>	No	NE	PE
52	<i>Micrixalus nigraventris</i>	No	NE	PE
53	<i>Micrixalus niluvasei</i>	No	NE	PE
54	<i>Micrixalus nudis</i>	Yes	VU	PE
55	<i>Micrixalus phyllophilus</i> *	Yes	VU	PE
56	<i>Micrixalus sairandhri</i>	No	NE	PE
57	<i>Micrixalus sali</i>	Yes	NE	PE
58	<i>Micrixalus saxicola</i>	No	NE	MS
59	<i>Micrixalus silvaticus</i>	No	DD	PE
60	<i>Micrixalus specca</i>	No	NE	PE
61	<i>Micrixalus spelunca</i>	No	NE	PE
62	<i>Micrixalus thampii</i> *	Yes	DD	PE
63	<i>Micrixalus uttaraghaati</i>	Yes	NE	MS
Family: Microhylidae				
64	<i>Melanobatrachus indicus</i> *	Yes	EN	PE
65	<i>Microhyla ornata</i>	No	LC	MS
66	<i>Microhyla rubra</i> *	Yes	LC	MS
67	<i>Microhyla sholigari</i> *	Yes	EN	PE
68	<i>Uperodon anamalaiensis</i>	Yes	DD	PE
69	<i>Uperodon minor</i>	No	DD	PE
70	<i>Uperodon montana</i>	No	NT	MS
71	<i>Uperodon marmorata</i>	No	EN	MS
72	<i>Uperodon taprobanica</i> *	Yes	LC	MS
73	<i>Uperodon triangularis</i>	Yes	VU	MS
74	<i>Uperodon variegata</i> *	Yes	LC	MS
75	<i>Uperodon globulosus</i>	Yes	LC	MS
76	<i>Uperodon systoma</i>	Yes	LC	MS
Family: Nasikabatrachidae				
77	<i>Nasikabatrachus sahyadrensis</i> **	Yes	EN	SE
Family: Nyctibatrachidae				
78	<i>Nyctibatrachus acanthodermis</i>	Yes	NE	PE
79	<i>Nyctibatrachus aliciae</i>	No	EN	PE
80	<i>Nyctibatrachus anamallaiensis</i>	No	NE	PE
81	<i>Nyctibatrachus beddomii</i>	No	EN	PE
82	<i>Nyctibatrachus danieli</i>	No	NE	PE
83	<i>Nyctibatrachus dattatreyaensis</i>	No	CR	PE
84	<i>Nyctibatrachus deccanensis</i>	No	VU	PE
85	<i>Nyctibatrachus deveni</i>	No	NE	PE
86	<i>Nyctibatrachus gavi</i>	Yes	NE	PE
87	<i>Nyctibatrachus grandis</i> *	Yes	NE	PE
88	<i>Nyctibatrachus humayuni</i>	No	VU	SE

<i>Visibility</i>	<i>Appearance</i>	<i>Unique characteristics</i>	<i>Local significance</i>	<i>Media coverage</i>
75	No	Yes	No	No
50	No	No	No	No
50	No	Yes	No	Yes
50	No	Yes	No	No
75	No	Yes	No	No
50	No	Yes	No	No
50	No	Yes	No	No
75	Yes	Yes	No	No
75	No	No	No	No
50	No	Yes	No	No
50	No	No	No	No
75	No	Yes	No	No
50	No	Yes	No	No
50	No	No	No	No
75	Yes	Yes	No	Yes
75	No	Yes	No	No
50	Yes	Yes	No	No
50	No	No	No	No
75	No	Yes	No	No
50	No	Yes	No	No
25	Yes	No	No	No
75	No	No	No	No
75	Yes	No	No	No
75	No	No	No	No
50	No	Yes	No	No
25	No	Yes	No	No
75	No	Yes	No	No
50	No	Yes	No	No
75	Yes	Yes	Yes	No
50	Yes	Yes	No	No
75	Yes	No	No	No
75	No	No	No	No
75	No	No	No	No
50	Yes	Yes	Yes	Yes
50	No	Yes	No	No
50	No	Yes	No	No
75	No	Yes	No	No
75	No	Yes	No	No
50	No	No	No	No
75	No	No	No	No
75	No	No	No	No
75	No	No	No	No
50	No	No	No	No
75	No	Yes	No	No
75	No	Yes	No	Yes

	<i>Species</i>	<i>Recognition</i>	<i>Status^a</i>	<i>Distribution^b</i>
	Family: Bufonidae			
89	<i>Nyctibatrachus indraneili</i>	Yes	NE	PE
90	<i>Nyctibatrachus jog</i>	No	NE	PE
91	<i>Nyctibatrachus karnatakaensis</i>	No	EN	PE
92	<i>Nyctibatrachus kempholeyensis</i>	No	DD	PE
93	<i>Nyctibatrachus kumbara</i>	No	NE	PE
94	<i>Nyctibatrachus major</i>	No	VU	MS
95	<i>Nyctibatrachus minimus*</i>	Yes	DD	PE
96	<i>Nyctibatrachus minor</i>	No	EN	PE
97	<i>Nyctibatrachus periyar</i>	No	NE	PE
98	<i>Nyctibatrachus petraeus</i>	No	LC	MS
99	<i>Nyctibatrachus pillaii</i>	No	NE	PE
100	<i>Nyctibatrachus poocha</i>	No	NE	PE
101	<i>Nyctibatrachus sanctipalustris</i>	No	EN	PE
102	<i>Nyctibatrachus shiradi</i>	No	NE	PE
103	<i>Nyctibatrachus sylvaticus</i>	No	DD	PE
104	<i>Nyctibatrachus vasanthi</i>	No	EN	PE
105	<i>Nyctibatrachus vrijeuni</i>	No	NE	PE
	Family: Ranidae			
106	<i>Clinotarsus curtipes*</i>	Yes	NT	MS
107	<i>Hydrophylax bahuvistara</i>	Yes	NE	MS
108	<i>Hydrophylax malabarica</i>	Yes	LC	MS
109	<i>Indosylvirana aurantiaca</i>	Yes	VU	PE
110	<i>Indosylvirana caesari</i>	Yes	NE	PE
111	<i>Indosylvirana doni</i>	Yes	NE	SE
112	<i>Indosylvirana flavescens</i>	Yes	NE	PE
113	<i>Indosylvirana indica</i>	No	NE	PE
114	<i>Indosylvirana intermedius</i>	No	NE	PE
115	<i>Indosylvirana magna</i>	Yes	NE	PE
116	<i>Indosylvirana montanus</i>	Yes	NE	SE
117	<i>Indosylvirana sreeni</i>	Yes	NE	MS
118	<i>Indosylvirana urbis</i>	Yes	NE	PE
	Family: Ranixalidae			
119	<i>Indirana beddomii</i>	Yes	LC	MS
120	<i>Indirana bhadrai*</i>	Yes	NE	PE
121	<i>Indirana brachytarsus</i>	No	EN	MS
122	<i>Indirana chiravasi</i>	Yes	NE	PE
123	<i>Indirana duboisi</i>	Yes	NE	PE
124	<i>Indirana gundia</i>	No	CR	PE
125	<i>Indirana leithii</i>	Yes	VU	PE
126	<i>Indirana paramakri</i>	No	NE	PE
127	<i>Indirana salelkari</i>	No	NE	PE
128	<i>Indirana sarojamma</i>	No	NE	PE
129	<i>Indirana semipalmata</i>	No	LC	MS
130	<i>Indirana tysoni</i>	No	NE	MS
131	<i>Indirana yadera</i>	No	NE	PE
132	<i>Sallywalkerana diplosticta*</i>	Yes	EN	PE
133	<i>Sallywalkerana leptodactyla</i>	No	EN	PE
134	<i>Sallywalkerana phrynoderma</i>	No	CR	PE
	Family: Rhacophoridae			
135	<i>Beddomixalus bijui*</i>	Yes	NE	PE

<i>Visibility</i>	<i>Appearance</i>	<i>Unique characteristics</i>	<i>Local significance</i>	<i>Media coverage</i>
50	No	No	No	No
50	No	Yes	No	No
75	No	No	No	No
75	No	No	No	No
50	No	Yes	No	No
75	No	Yes	No	No
75	No	Yes	No	No
50	No	No	No	Yes
50	No	Yes	No	No
50	No	Yes	No	No
50	No	No	No	No
75	No	Yes	No	No
50	No	No	No	No
25	No	No	No	No
25	No	No	No	No
50	No	No	No	No
75	No	Yes	No	No
75	Yes	No	Yes	No
75	No	No	No	No
75	No	No	No	No
75	No	No	No	No
25	No	No	No	No
50	No	No	No	No
50	No	No	No	No
75	No	No	No	No
50	No	No	No	No
50	No	No	No	No
50	No	No	No	No
75	No	No	No	No
75	No	No	No	No
75	No	Yes	No	No
25	No	Yes	No	Yes
50	No	Yes	No	No
50	No	Yes	No	No
25	No	Yes	No	No
50	No	Yes	No	No
25	No	Yes	No	No
50	No	Yes	No	Yes
25	No	Yes	No	No
50	No	Yes	No	No
75	No	Yes	No	No
50	No	Yes	No	No
50	No	Yes	No	No
75	No	Yes	No	No
50	No	Yes	No	No
50	No	Yes	No	Yes
75	Yes	No	No	Yes

	<i>Species</i>	<i>Recognition</i>	<i>Status^a</i>	<i>Distribution^b</i>
	Family: Bufonidae			
136	<i>Ghatixalus asterops</i> *	Yes	DD	PE
137	<i>Ghatixalus magnus</i>	Yes	NE	PE
138	<i>Ghatixalus variabilis</i> **	Yes	EN	PE
139	<i>Mercurana myristicapalustris</i> *	Yes	NE	PE
140	<i>Polypedates maculatus</i>	Yes	LC	MS
141	<i>Polypedates occidentalis</i>	No	DD	PE
142	<i>Polypedates pseudocruciger</i>	No	LC	MS
143	<i>Pseudophilautus amboli</i>	Yes	CR	MS
144	<i>Pseudophilautus kani</i>	No	LC	PE
145	<i>Pseudophilautus wynaadensis</i>	No	EN	PE
146	<i>Raorchestes agasthyaensis</i>	Yes	NE	PE
147	<i>Raorchestes akroparallagi</i>	No	LC	PE
148	<i>Raorchestes anili</i>	No	LC	PE
149	<i>Raorchestes archaeos</i>	No	NE	PE
150	<i>Raorchestes aureus</i>	No	NE	PE
151	<i>Raorchestes beddomii</i>	No	NT	PE
152	<i>Raorchestes blandus</i>	No	NE	PE
153	<i>Raorchestes bobingeri</i>	Yes	VU	PE
154	<i>Raorchestes bombayensis</i>	Yes	VU	PE
155	<i>Raorchestes chalazodes</i> *	Yes	CR	PE
156	<i>Raorchestes charius</i>	No	EN	PE
157	<i>Raorchestes chlorosomma</i> **	Yes	CR	PE
158	<i>Raorchestes chotta</i>	No	DD	PE
159	<i>Raorchestes chromasynchysi</i>	No	VU	PE
160	<i>Raorchestes coonoorensis</i>	No	LC	PE
161	<i>Raorchestes crustai</i>	No	NE	PE
162	<i>Raorchestes dubois</i>	Yes	VU	PE
163	<i>Raorchestes echinatus</i>	No	NE	PE
164	<i>Raorchestes flaviocularis</i> *	Yes	NE	PE
165	<i>Raorchestes flaviventris</i>	Yes	DD	PE
166	<i>Raorchestes ghatei</i>	Yes	NE	PE
167	<i>Raorchestes glandulosus</i>	No	VU	PE
168	<i>Raorchestes graminirupes</i>	No	VU	PE
169	<i>Raorchestes griet</i>	No	CR	PE
170	<i>Raorchestes hassanensis</i>	Yes	NE	PE
171	<i>Raorchestes honnametti</i>	Yes	NE	PE
172	<i>Raorchestes indigo</i>	Yes	NE	PE
173	<i>Raorchestes jayarami</i>	No	NE	PE
174	<i>Raorchestes johnceei</i>	No	NE	PE
175	<i>Raorchestes kadalarensis</i>	Yes	NE	PE
176	<i>Raorchestes kaikatti</i>	No	CR	PE
177	<i>Raorchestes kakachi</i>	No	NE	PE
178	<i>Raorchestes lechiya</i>	Yes	NE	PE
179	<i>Raorchestes leucolatus</i>	No	NE	PE
180	<i>Raorchestes luteolus</i> *	Yes	DD	PE
181	<i>Raorchestes manohari</i> *	Yes	NE	PE
182	<i>Raorchestes marki</i>	No	CR	PE
183	<i>Raorchestes montanus</i>	Yes	NE	PE
184	<i>Raorchestes munnarensis</i>	No	CR	PE
185	<i>Raorchestes nerostagona</i> *	Yes	EN	PE

<i>Visibility</i>	<i>Appearance</i>	<i>Unique characteristics</i>	<i>Local significance</i>	<i>Media coverage</i>
75	Yes	Yes	No	No
50	Yes	No	No	No
75	Yes	Yes	No	No
75	No	No	No	Yes
75	No	No	No	No
75	No	No	No	No
50	No	No	No	No
75	No	No	No	No
75	No	No	No	No
75	No	No	No	No
75	No	No	No	No
75	Yes	No	No	No
75	No	No	No	No
50	No	No	No	No
50	No	No	No	No
75	Yes	No	No	No
50	No	No	No	No
50	Yes	No	No	No
75	No	No	No	No
50	Yes	Yes	No	Yes
75	No	No	No	No
75	Yes	No	No	No
50	No	No	No	No
75	Yes	No	No	No
50	No	No	No	No
50	Yes	Yes	No	No
75	No	No	No	No
50	No	No	No	No
25	Yes	Yes	No	No
50	Yes	No	No	No
50	No	No	No	Yes
75	Yes	No	No	No
75	No	No	No	No
75	No	No	No	No
25	No	No	No	No
50	No	No	No	No
50	Yes	No	No	No
75	Yes	No	No	No
50	No	No	No	No
50	No	No	No	No
50	No	No	No	No
50	No	No	No	Yes
50	No	No	No	No
50	No	No	No	No
75	Yes	No	No	No
50	Yes	Yes	No	No
50	No	No	No	No
50	No	No	No	No
50	No	No	No	No
50	No	No	No	No
75	Yes	No	No	No
50	Yes	Yes	No	No
50	No	No	No	No
50	No	No	No	No
50	No	No	No	No
50	Yes	Yes	No	No

	<i>Species</i>	<i>Recognition</i>	<i>Status</i> ^a	<i>Distribution</i> ^b
Family: Bufonidae				
186	<i>Raorchestes ochlandrae</i> *	Yes	DD	PE
187	<i>Raorchestes ponmudi</i> *	Yes	CR	PE
188	<i>Raorchestes primarrumpfi</i>	Yes	NE	PE
189	<i>Raorchestes ravii</i>	No	NE	PE
190	<i>Raorchestes resplendens</i> *	Yes	CR	PE
191	<i>Raorchestes signatus</i> *	Yes	EN	PE
192	<i>Raorchestes silentvalley</i>	Yes	NE	PE
193	<i>Raorchestes sushili</i>	No	CR	PE
194	<i>Raorchestes theuerkaufi</i>	No	NE	PE
195	<i>Raorchestes thodai</i>	No	NE	PE
196	<i>Raorchestes tinniens</i> *	Yes	EN	PE
197	<i>Raorchestes travancoricus</i> *	Yes	EN	PE
198	<i>Raorchestes tuberochumerus</i>	Yes	DD	PE
199	<i>Raorchestes uthamani</i> *	Yes	NE	PE
200	<i>Rhacophorus calcadensis</i> *	Yes	EN	PE
201	<i>Rhacophorus lateralis</i> **	Yes	EN	PE
202	<i>Rhacophorus malabaricus</i> *	Yes	LC	MS
203	<i>Rhacophorus pseudomalabaricus</i> **	Yes	CR	PE
Family: Ichthyophidae				
204	<i>Ichthyophis beddomei</i>	Yes	LC	MS
205	<i>Ichthyophis bombayensis</i> *	Yes	LC	MS
206	<i>Ichthyophis davidi</i>	No	NE	MS
207	<i>Ichthyophis kodaguensis</i>	No	DD	PE
208	<i>Ichthyophis longicephalus</i>	No	DD	MS
209	<i>Ichthyophis tricolor</i>	No	LC	PE
210	<i>Uraeotyphlus gansi</i>	Yes	DD	PE
211	<i>Uraeotyphlus interruptus</i>	No	DD	PE
212	<i>Uraeotyphlus malabaricus</i>	No	DD	PE
213	<i>Uraeotyphlus menoni</i>	No	DD	PE
214	<i>Uraeotyphlus narayani</i>	No	DD	SE
215	<i>Uraeotyphlus oommeni</i>	No	DD	PE
216	<i>Uraeotyphlus oxyurus</i>	No	DD	PE
Family: Indotyphlidae				
217	<i>Gegeneophis carnosus</i>	No	DD	PE
218	<i>Gegeneophis danieli</i>	No	DD	MS
219	<i>Gegeneophis goaensis</i>	No	DD	MS
220	<i>Gegeneophis krishni</i>	No	DD	PE
221	<i>Gegeneophis madhavai</i>	No	DD	PE
222	<i>Gegeneophis mhadeiensis</i>	No	DD	MS
223	<i>Gegeneophis pareshi</i>	No	NE	PE
224	<i>Gegeneophis primus</i>	No	NE	PE
225	<i>Gegeneophis ramaswamii</i>	Yes	LC	SE
226	<i>Gegeneophis seshachari</i>	No	DD	SE
227	<i>Gegeneophis tejaswini</i>	No	NE	PE
228	<i>Indotyphlus battersbyi</i>	No	DD	SE
229	<i>Indotyphlus maharashtraensis</i>	No	DD	PE

[†] Potential flagship species applicable for one or two stakeholders

^{**} Potential flagship species applicable for the three stakeholders

^a CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated

^b PE = Point endemic, SE = State endemic, MS = More than 1 state.

<i>Visibility</i>	<i>Appearance</i>	<i>Unique characteristics</i>	<i>Local significance</i>	<i>Media coverage</i>
50	Yes	Yes	No	No
75	No	No	No	No
25	No	No	No	No
50	No	No	No	No
50	Yes	No	No	Yes
50	Yes	No	No	No
50	Yes	No	No	No
50	No	No	No	No
50	No	No	No	No
50	No	No	No	No
75	No	No	No	No
50	Yes	No	No	Yes
75	No	No	No	No
50	Yes	Yes	No	No
50	No	Yes	No	No
75	Yes	Yes	Yes	No
75	Yes	Yes	Yes	Yes
75	Yes	Yes	Yes	Yes
25	Yes	Yes	No	No
25	Yes	Yes	Yes	No
25	Yes	No	No	Yes
25	Yes	No	No	No
25	Yes	No	No	Yes
50	No	Yes	Yes	No
25	Yes	No	No	No
25	No	No	No	No
25	No	No	No	No
25	No	No	No	No
25	Yes	No	No	No
25	No	No	No	No
25	Yes	No	No	No
25	No	No	No	No
25	No	No	No	No
25	No	No	No	No
25	No	No	No	No
25	No	No	No	No
25	No	No	No	No
25	No	No	No	Yes
50	No	Yes	No	No
50	No	Yes	No	Yes
25	Yes	No	No	Yes
25	No	No	No	No
25	No	No	No	No