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# Distribution, Status, and Threats to Reptile and Amphibian Species in the Vicinity of Pakistan's Ramsar

**Saira Batool[1*], Muhammad Altaf[1], Muhammad Junaid[2] and Muhammad Samar Hussain Khan[3]**

1. Institute of Forest Sciences, The Islamia University of Bahawalpur, Pakistan
2. Department of Zoology, Wildlife and Fisheries, PMAS, University Arid Agriculture Rawalpindi, Pakistan
3. Ministry of Climate Change and Environmental Coordination, Pakistan

***Corresponding author e-mail:** saira.batool1233@gmail.com

**SUMMARY**

Wetlands in Pakistan cover an area of 1,711153 hectares. Notably, freshwater account for 73.9% of this wetland area, while coastal wetlands make up 26.1%. Pakistan is home to 19 Ramsar Sites. This review aims to document the distribution, status and threats in reptile and amphibian species in the vicinity of Ramsar sites. Data were collected from various sources, including articles, field guides, books, reports, and websites. The documentation revealed that 133 reptile species and 10 amphibian species have been recorded by herpetologists in Pakistan's Ramsar sites. Of these, 98 reptile species are classified as Least Concern (LC), indicating stable populations, while 10 species of reptile are classified as Data Deficient (DD). Furthermore, 6 reptile species are categorized as Near Threatened (NT), 10 as Vulnerable (VU), and 7 as Endangered (EN). Alarmingly, two reptile species, *Eretmochelys imbricata* and *Gavialis gangeticus*, are listed as Critically Endangered (CR) by IUCN. In contrast, all 10 amphibian species are classified as Least Concern (LC). The survey documented 133 reptile species, showcasing significant variation in their frequency of occurrence. Among these, the Yellow-bellied House Gecko, Indian Fringe-fingered Lizard, and Smooth Spectacled Lacerta were the most widely distributed, each observed at 19 Ramsar sites. Similarly, all 10 amphibian species were recorded across these sites, with varying frequencies. Notably, the Indus Valley Toad and Skipper Frog were the most prevalent, each found at all 19 Ramsar sites, indicating their broad distribution and adaptability.

**Keywords**: Reptiles, Amphibians, Ramsar sites, Critically Endangered, IUCN

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## INTRODUCTION

### TOPOGRAPHY OF PAKISTAN

The topography of Pakistan comprises a diverse range of landscapes, including mountains (Rasul and Hussain, 2015), deserts (Abd El-Ghani et al., 2017), wetlands (Khan and Arshad, 2014), and forests (Altaf, 2016; Altaf, 2010; Bhatti, 2011). In northern Pakistan, three major mountain ranges converge; the Karakoram, the Himalayas, and the Hindu Kush. The Himalayas, often regarded

as the "Roof of the World" by the people of Central and South Asia, extend approximately 2,500 kilometers from east to west. This range is bordered to the northwest by the Hindu Kush and to the north by the Karakoram. The geological contrasts among these ranges present a fascinating area of study (Rasul and Hussain, 2015).

Pakistan's deserts span 11 million hectares, accounting for 13.82 percent of the country's total area, primarily located in the central and southern regions. The dunes in these areas can reach heights of up to 150 meters and vary in elevation from 100 to 1000 meters above sea level. These deserts rely on the monsoon season for moisture and rainfall. The major deserts of Pakistan include the Thal Desert, Cholistan Desert, Nara Desert, Tharparkar Desert, and Kharan Desert (Abd El-Ghani et al., 2017).

Pakistan, which is recognized as an arid region, nevertheless has more than 1,711153 hectares of wetlands. These include 225 important wetlands, 19 of which are recognized as Ramsar Sites (Ahmad et al., 2019). Wetlands of international importance under the Ramsar Convention on Wetlands. The types of wetlands illustrate the course of the Indus River from glaciers and high alpine lakes, through riverine and freshwater lakes, to the coastal wetlands of the Indus Delta. The wetlands offer unappreciated benefits and services, which include provisioning: the production of food and fiber, water balance, groundwater recharge, and flood and storm mitigation as well as cultural and social functions which include sacred and religious importance, tourism and recreation, and supporting functions like soil formation and sediment retention (Altaf et al., 2014a).

Pakistan faces significant challenges in maintaining its forest cover, which constitutes less than 4.68% of its total land area, due to dry and semi-arid conditions and human-induced issues. Illegal logging, timber harvesting, and small-scale farming contribute to the annual degradation of these forests. The country's diverse ecosystems, including alpine and subtropical forests, mangroves, and deserts, encounter distinct problems. The mangrove forests of the Indus Delta play a vital role in coastal protection and marine biodiversity. Addressing deforestation requires coordinated efforts to preserve and sustainably manage Pakistan's varied forest ecosystems (Bhatti, 2011).

Species of Amphibian and Reptile of Pakistan, a work by Khan (2006a), is the most reliable source of information on the herpetofauna of Pakistan and represents a systematized document of the same. It is a wide-ranging monograph that includes descriptions of the taxonomy, morphology, distribution, ecology, and conservation of 24 amphibian and over 195 reptilian species recorded in the country. The paper emphasizes that Pakistan is located in a special biogeographical zone between the Palearctic, Oriental, and Ethiopian realms, thus leading to the formation of a rich and diverse assemblage of herpetofauna. Along with setting the stage for faunal catalogues and ecological investigations, the compilation by Khan also highlights the conservation issues affecting the taxa, including habitat loss, overexploitation, and anthropogenic pressures.

Like all species, reptile and amphibians serve as regulators of ecological balance by managing insect populations, being consumed by organisms within

higher trophic levels, and bioindicators for the health of ecosystems. Unfortunately, their ecological importance has been least appreciated within species of reptile and amphibian studies in Pakistan, particularly in regions encompassing the Ramsar Sites. In addition, the rapidly growing anthropogenic threats of habitat destruction, pollution, increasing overexploitation, and climate change have begun to impose chronic stress on the survival of these organisms. However, there have been rare studies regarding their extent, status, and the nature of threats in and around Ramsar Sites in Pakistan. The absence of these baseline data has resulted in challenges in effective management of these sites. It is, therefore, of vital importance to assess the reptile and amphibian species and the threats to their existence around these habitats in Pakistan to facilitate their site-specific conservation. The objectives of the study are as follows: to assess the distribution and diversity of reptile and amphibian species in and around the Ramsar Sites of Pakistan, to determine the population status of documented species, and to recognize and evaluate the primary threats impacting these reptile and amphibian species within the region.

## METHODOLOGY

Data were collected through Books (Khan, 2006a, 2021), Field guide (Khan, 2002a; Zahid, 2025), research articles (Khan, 2002b; Khan, 2006b; Noureen et al., 2012; Sarwar et al., 2016), reports (MFF, 2018), websites i.e. IUCN (https://www.iucnredlist.org/), and GBIF (https://www.gbif.org/). The study was descriptive and exploratory in order to establish understanding of Reptile and Amphibian diversity associated with Ramsar Sites of Pakistan. The data were examined with Microsoft Excel, which enabled effective organization, tabulation, and initial statistical evaluation. OriginPro statistical software was utilized for graphical representation to create precise and high-quality graphs, facilitating accurate visualization and effective interpretation of the results.

## RAMSAR SITES

Ramsar Sites, are internationally significant wetlands designated by the Ramsar Convention on Wetlands, an international treaty established at Ramsar, Iran, in 1971. Currently, there are over 2500 Ramsar Sites worldwide, covering an area greater than that of Mexico, totaling around 2.5 million square kilometers (https://www.ramsar.org).

### *Ramsar Sites of Pakistan*

In 1976 Pakistan joined the Ramsar Convention on Wetlands (Altaf et al., 2014b). There are 19 Ramsar Sites (Figure 1) with a total land area of 1,343,627 ha (https://www.ramsar.org). Out of the total 19 Ramsar Sites of the country 5 Ramsar sites are present in Balochistan i.e. Astola Island (Gwadar), Hub Dam (Lasbella), Jiwani Coastal (Gwadar), Miani Hor (Lasbella) and Ormara Turtle Beach (Gwadar); 2 Ramsar sites are present in Khyber Pakhtunkhwa i.e. Tanda Dam (Kohat) and Thanedar Wala (Bannu); 3 Ramsar Sites are present in Punjab i.e. Chashma Barrage (Mianwali), Taunsa Barrage (Muzaffargarh) and Uchhali Complex (Khushab); and 9 Ramsar sites are preset in Pakistan i.e. Deh Akro-II

(Nawabshah), Drigh Lake (Larkana), Haleji Lake (Thatta), Indus Delta (Badin and Thatta), Indus Dolphin Reserve (Thatta), Jubho lagoon (Thatta), Kinjhar (Kalri) Lake (Thatta), Nurri Lagoon (Badin) and Rann of Kutch (Badin) (WWF, 2024).

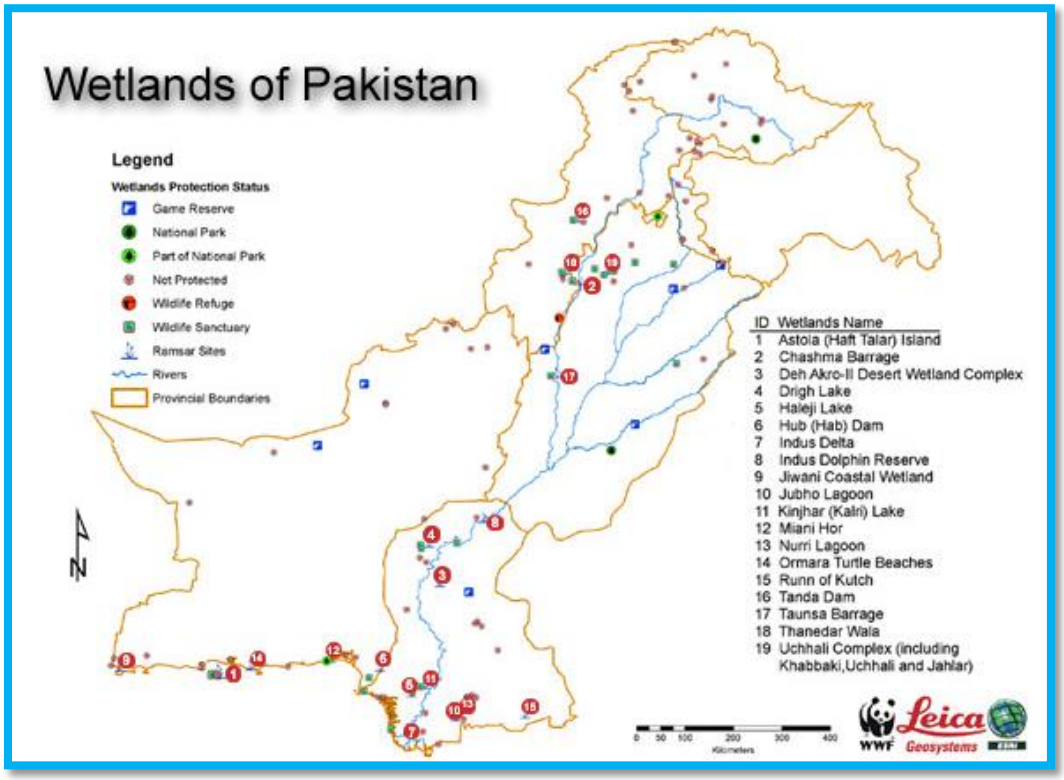


**Figure 1: List and distribution of Ramsar sites in Pakistan (WWF, 2024).**

## AMPHIBIAN AND REPTILE OF RAMSAR SITES OF PAKISTAN

During the analysis, it was noted that 133 reptilian species (i.e. *Geoclemys hamiltonii, Ablepharus grayanus, Ablepharus pannonicus, Acanthodactylus blanfordii, Acanthodactylus cantoris, Acanthodactylus micropholis, Agamura persica, Amphiesma stolatum, Argyrogena fasciolata, Aspideretes gangeticus, Astrotia stokesii, Asymblepharus himalayanus, Boiga, trigonata, Bungarus caeruleus, Bungarus sindanus, Bungarus sindanus razai, Bunopus tuberculatus, Calotes minor, Calotes versicolor, Calotes versicolor farooqi, Caretta caretta, Chalcides ocellatus, Chamaeleo zeylanicus, Chelonia mydas, Chitra indica, Crocodylus palustris, Crossobamon orientalis, Cyrtopodion agamuroides, Cyrtopodion indusoani, Cyrtopodion kachhense, Cyrtopodion kachhense ingoldbyi, Cyrtopodion kohsulaimanai, Cyrtopodion scabrum, Daboia russelii, Dermochelys coriacea, Echis carinatus, Echis carinatus astolae, Eirenis persicus, Enhydris pakistanicus, Eremias cholistanica, Eremias persica, Eretmochelys imbricate, Eryx conicus, Eryx johnii, Eublepharis macularius, Eurylepis taeniolatus, Eutropis dissimilis, Eutropis macularia, Fowlea piscator, Gavialis gangeticus, Geochelone elegans, Hardella thurjii, Hemidactylus brookii, Hemidactylus flaviviridis, Hemidactylus frenatus, Hemidactylus leschenaultia,*

*Hemidactylus persicus, Hemidactylus robustus, Hemidactylus triedrus, Hemidactylus turcicus, Hemorrhois ravergieri, Hydrophis schistose, Hydrophis caerulescens, Hydrophis cyanocinctus, Hydrophis fasciatus, Hydrophis lapemoides, Hydrophis mamillaris, Hydrophis ornatus, Hydrophis platurus, Hydrophis spiralis, Hydrophis viperinus, Indotyphlops braminus, Indotyphlops porrectus, Kachuga smithii, Lapemis curtus, Laudakia agrorensis, L. liratus, L. melanura, L. nupta, L. tuberculata, Lepidochelys olivacea, Lissemys punctate, Lycodon aulicus, L. striatus, Lygosoma punctate, Lytorhynchus paradoxus, L. ridgewayi, Mesalina brevirostris, Mesalina watsonana, Microcephalophis cantoris, Microcephalophis gracilis, Myriopholis blanfordii, Myriopholis macrorhyncha, Naja naja, Naja oxiana, Nilssonia hurum, Novoeumeces blythianus, Novoeumeces zarudnyi, Oligodon russelius, O. taeniolatus, Ophiomorus blanfordi, O. raithmai, O. tridactylus, Ophisops jerdonii, Pangshura tecta, Paralaudakia caucasia, Paralaudakia microlepis, Phrynocephalus ornatus, P. scutellatus, Platyceps rhodorachis, P. ventromaculatus, Psammophis condanarus, P. leithii, Psammophis schokari, Pseudocerastes persicus Ptyas mucosa, Ptyodactylus homolepis, Python molurus, Saara hardwickii, Spalerosophis arenarius, S. diadema, Telescopus rhinopoma, Teratolepis fasciata, Teratoscincus microlepis, Testudo horsfieldii, Trapelus agilis, T. megalonyx, T. rubrigularis, Tropiocolotes persicus, Varanus bengalensis, V. flavescens, V. griseus caspius* and *Xenochrophis cerasogaster*) are documented in the vicinity of Ramsar Sites (Table 1), belonging to 25 families (i.e. Gekkonidae, Elapidae, Agamidae, Colubridae, Scincidae, Lacertidae, Cheloniidae, Geoemydidae, Trionychidae, Viperidae, Natricidae, Psammophiidae, Varianidae, Erycidae, Leptotyphlopidae, Testudinidae, Typhlopidae, Chamaeleonidae, Crocodylidae, Dermochelyidae, Eublepharidae, Gavialidae, Homalopsidae, Pythonidae, Sphaerodactylidae) (Figure 2) and 3 orders (i.e. Testudines, Crocodylia and Squamata) (Figure 3).

A total of 133 species of reptile were recorded at the referred sites, exhibiting significant variation in their frequency of occurrence. Among these, the Yellow-bellied House Gecko, Indian Fringe-fingered Lizard, and Smooth Spectacled Lacerta were the most widely distributed, each observed at the 19 Ramsar Sites across Pakistan. Additionally, the Agilis Agama, Afghan Ground Agama, Changeable Lizard, Ribbon-sided Skink, Indian or Bengal Monitor Lizard, Brahminy Blind Snake, Hook-snouted Worm Snake, Forskål's Sand Snake, and Diadem Snake were also abundant, being recorded at 18 Ramsar sites. The Common Leopard Gecko, Persian Gecko, Punjab Snake-eyed Lacerta, and Red Sand Boa were found at 17 Ramsar Sites. In contrast, the Gharial, Nikolsky's Spider Gecko, Sulaiman Range Gecko, Mediterranean Gecko, Pakistan Fan-fingered Gecko, Soan Gecko, Small-scaled Wonder Gecko, Small-scaled Rock Agama, Kashmir Rock Agama, Northern Forest Lizard, Gray Toad-headed Agama, Asian Chameleon, Persian Racerunner, Cholistani Racerunner, Red-strip Skink, Spotted Whip Snake, Afghan Awl-headed Snake, Indian Desert Tiger Snake, Northern Punjab Krait, and Astola Saw-scaled Viper were each reported from only a single Ramsar Site. These species are less widely distributed in Pakistan (Figure 4).

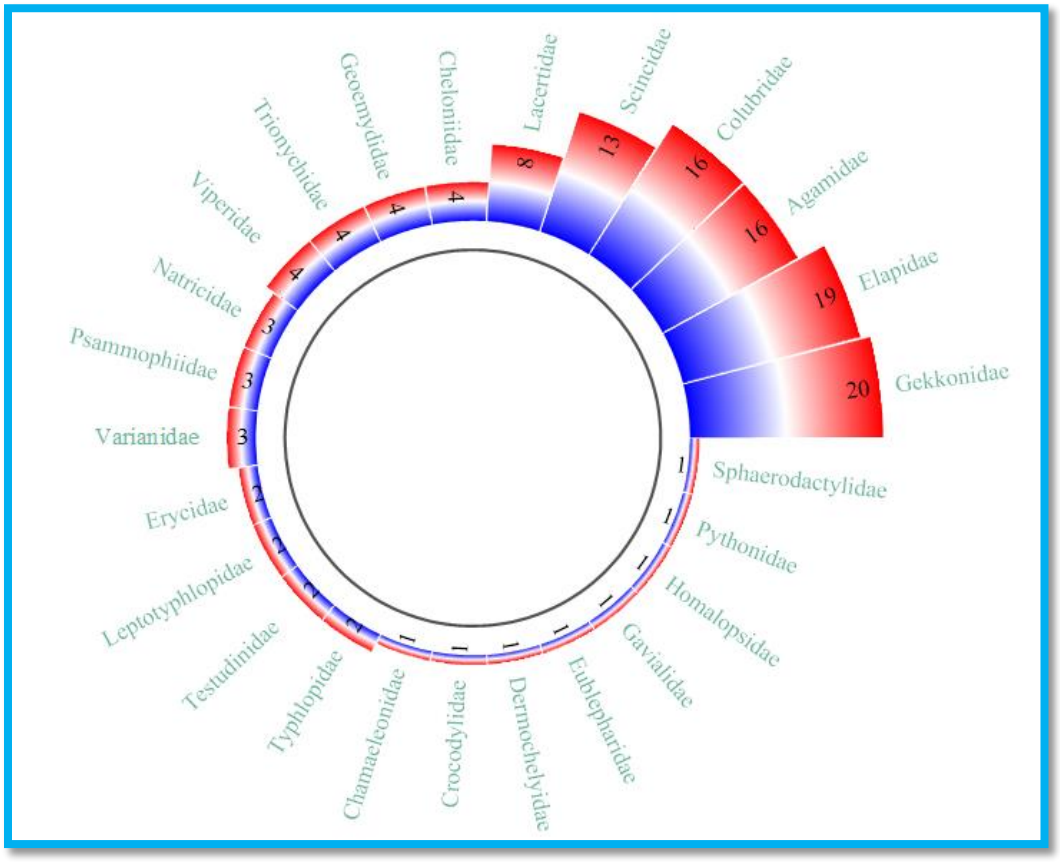


**Figure 2: Families of reptile in the study area.**

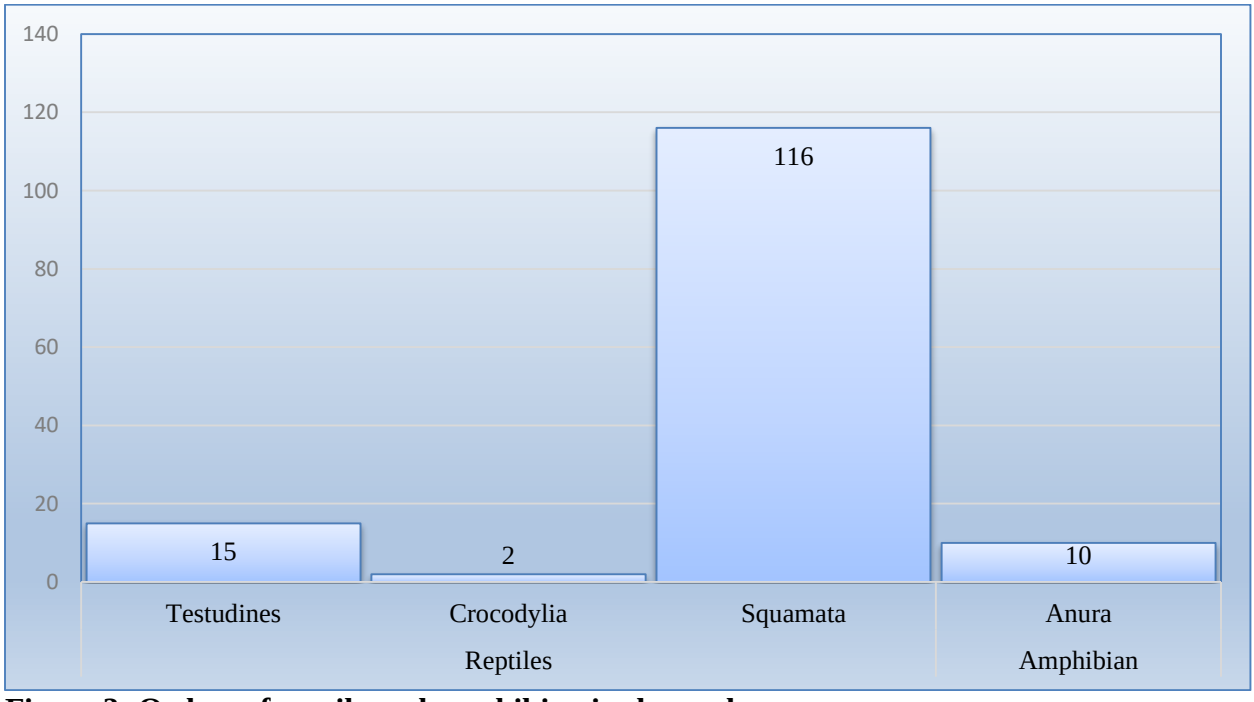


**Figure 3: Orders of reptile and amphibian in the study area.**

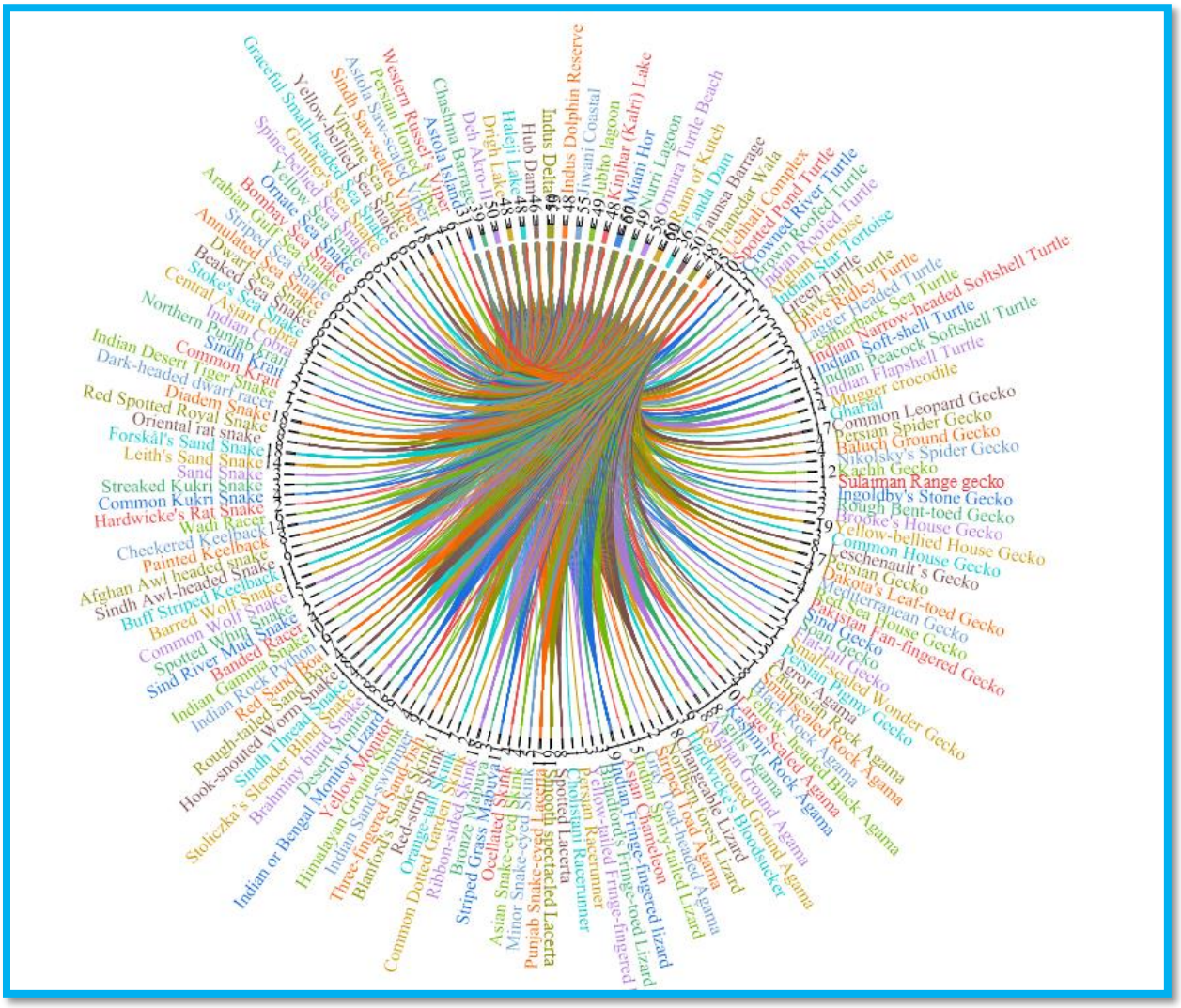


**Figure 4: Chord diagram of Reptilians' species in Ramsar sites of Pakistan.**

The current study revealed significant variation in the total number of reptile species across the 19 Ramsar Sites. The highest species richness was found at the Indus Delta, which hosted 73 species, followed by Miani Hor with 67 species and the Rann of Kutch with 62 species of reptile, highlighting these areas as particularly rich in species of reptile. Ormara Turtle Beach and Jiwani Coastal also supported a relatively high number of species, with 58 and 55 species of reptile, respectively. Moderate species abundance was documented at several Ramsar Sites, including Deh Akro-II and Taunsa Barrage, each with 50 species, and Jubho Lagoon and Nurri Lagoon, and each with 49 species. Drigh Lake, Haleji Lake, Indus Dolphin Reserve, and Kinjhar (Kalri) Lake each hosted 48 species, while Thanedar Wala also supported 48 species, indicating consistent population levels across these locations. Slightly lower species richness was observed at Hub Dam with 46 species and Uchhali Complex with 45 species. Chashma Barrage and Tanda Dam had comparatively fewer species, with 39 and

36, respectively. The lowest richness was recorded at Astola Island, which had only 31 species of reptile (Figure 5).

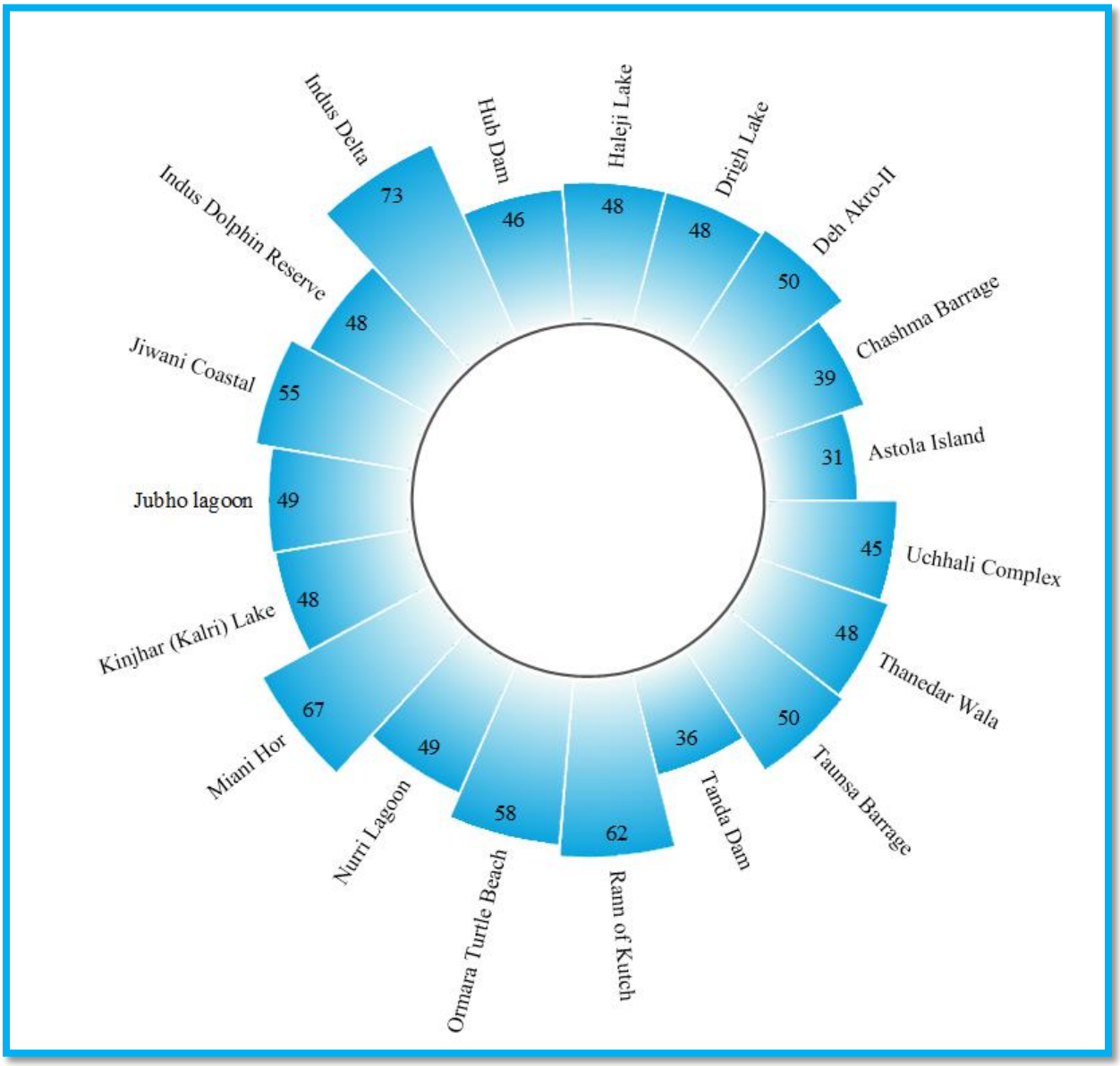


**Figure 5: Distribution of species of reptile in the vicinity of Ramsar sites of Pakistan.**

During the analysis, it was noted that 10 amphibian species (i.e. *Chrysopaa sternosignata, Duttaphrynus olivaceus, Duttaphrynus stomaticus, Euphlyctis cyanophlyctis, Fejervarya limnocharis, Hoplobatrachus tigerinus, Microhyla ornate, Minervarya syhadrensis, Pseudepidalea pseudoraddei* and *Sphaerotheca breviceps*) were documented in the vicinity of Ramsar Sites (Table 2), belonging to 25 families (i.e. Ranidae, Bufonidae and Microhylidae) (Figure 6) and 1 order (i.e. Anura) (Figure 3).

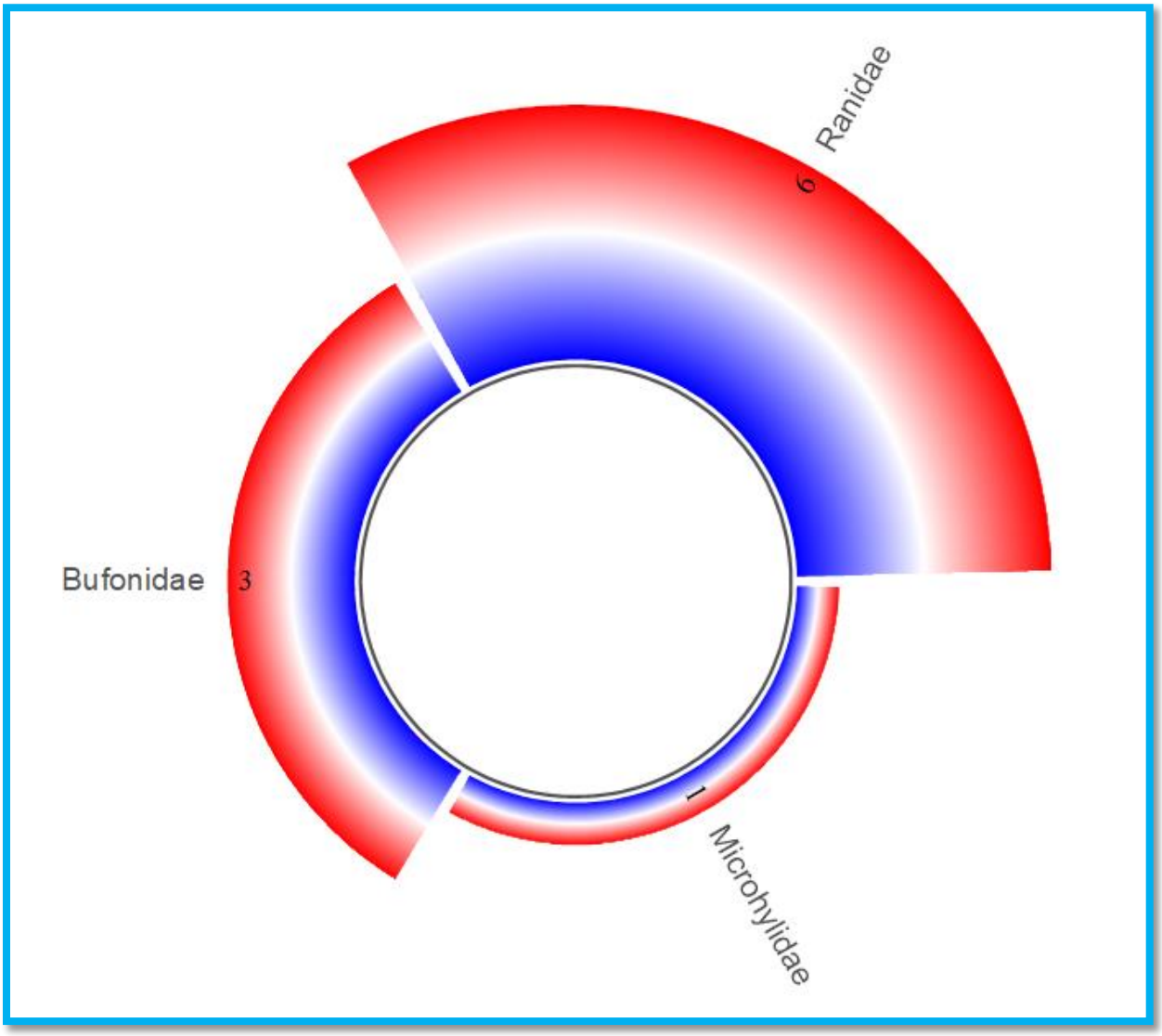


**Figure 6: Families of amphibian in the study area.**

All species of amphibian were recorded across 19 Ramsar sites, with varying frequencies of occurrence. The Indus Valley Toad and Skipper Frog were the most prevalent, each observed at all 19 Ramsar sites in Pakistan, indicating their wide distribution and adaptability. The Indian Burrowing Frog and Indian Bullfrog were were relatively common, with 13 and 12 Ramsar sites in Pakistan, respectively. Moderate occurrences were noted for the Bombay Wart Frog (reported from 6 Ramsar sites in Pakistan) and Olive Toad (reported from 4 Ramsar sites in Pakistan). In contrast, the Ant Frog and Boie's Wart Frog were less frequently observed, each reported from only 3 Ramsar sites in Pakistan. Murray's Frog was recorded just twice, while the Swat Green Toad was the rarest, with only a single record. This pattern suggests that while a few species are abundant and widely distributed, several others have limited occurrences and may require targeted conservation efforts (Figure 7).

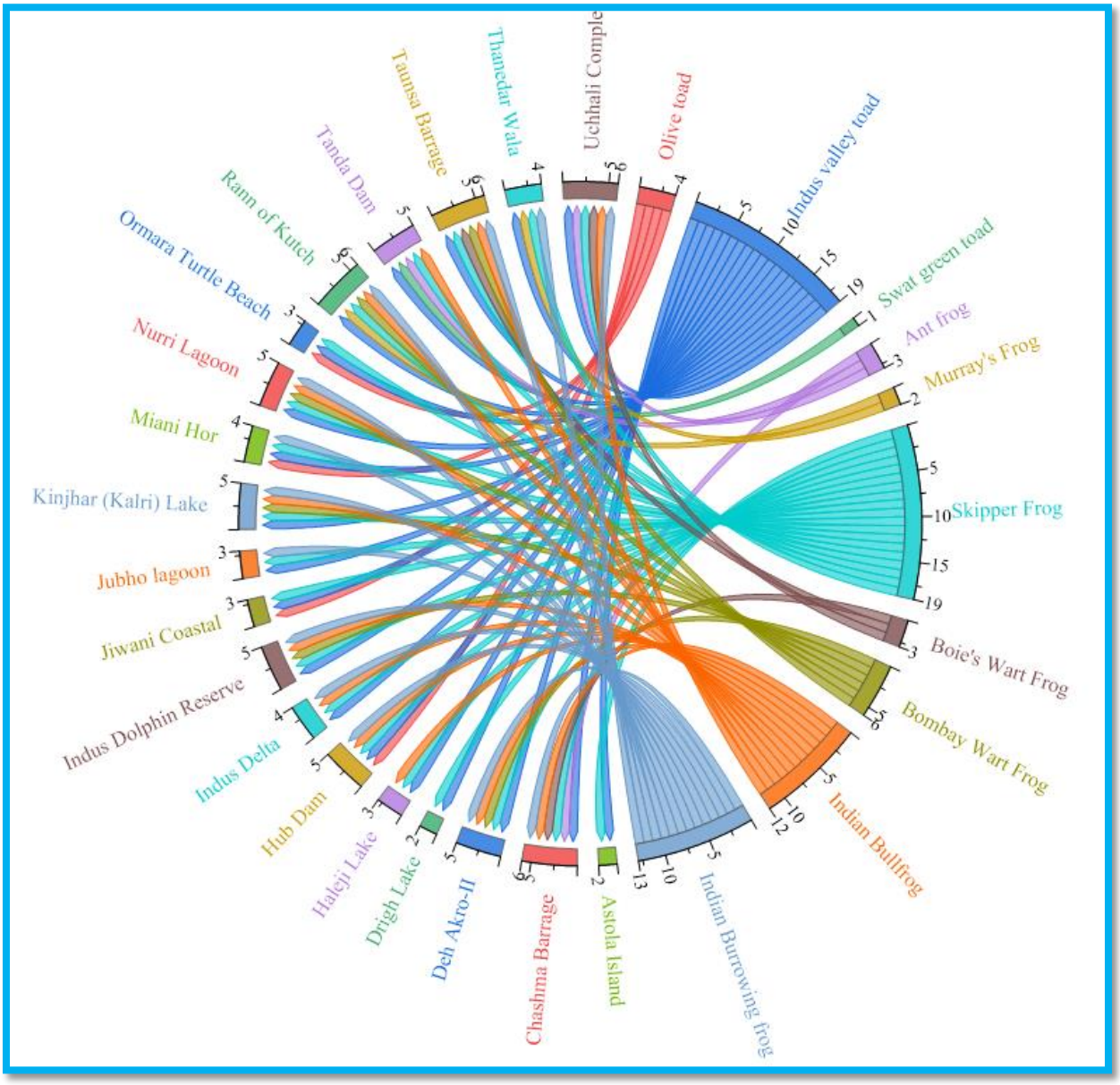


**Figure 7: Chord diagram of amphibian species in Ramsar sites of Pakistan.**

During the present study, amphibian species were recorded from all 19 Ramsar sites in Pakistan, showing variation in their species richness. The highest number of amphibian species (6 each) was observed at Chashma Barrage, Rann of Kutch, Taunsa Barrage, and Uchhali Complex, indicating these Ramsar sites as comparatively more diverse habitats. Moderate species were documented at several sites, such as Deh Akro-II, Hub Dam, Indus Dolphin Reserve, Kinjhar (Kalri) Lake, Nurri Lagoon, and Tanda Dam, each with 5 species of amphibian, while Indus Delta, Miani Hor, and Thanedar Wala supported 4 amphibian species each. Lower richness was recorded at Haleji Lake, Jiwani Coastal, Jubho Lagoon, and Ormara Turtle Beach with 3 species of amphibian, whereas the least diverse

Ramsar sites were Astola Island and Drigh Lake, each having only 2 species (Figure 8).

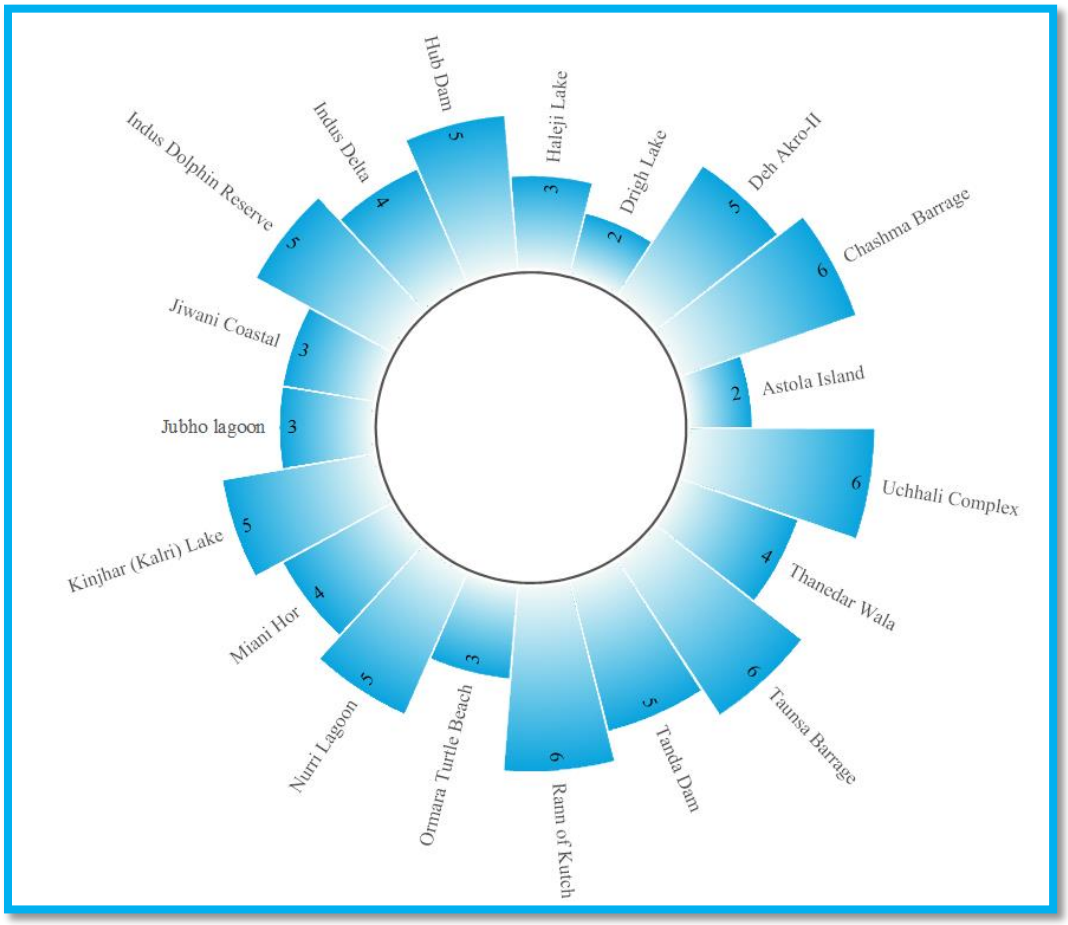


**Figure 8: Distribution of species of reptile in the vicinity of Ramsar sites of Pakistan.**

A total of 98 reptile species (i.e. *Eublepharis macularius, Agamura persica, Bunopus tuberculatus, Cyrtopodion agamuroides, C. kachhense, C. kohsulaimanai, C. kachhense ingoldbyi, C. scabrum, Hemidactylus brookii, H. flaviviridis, H. frenatus, Hemidactylus leschenaultia, H. persicus, H. triedrus, H. turcicus, H. robustus, Crossobamon orientalis, Cyrtopodion indusoani, Teratoscincus microlepis, Tropiocolotes persicus, Laudakia agrorensis, Paralaudakia caucasia, Paralaudakia microlepis, Laudakia melanura, Laudakia liratus, Laudakia nupta, Laudakia tuberculata, Trapelus agilis, Trapelus megalonyx, Calotes minor, Calotes versicolor, Phrynocephalus ornatus, Phrynocephalus scutellatus, Chamaeleo zeylanicus, Acanthodactylus cantori, A. blanfordii, A. micropholis, Eremias persica, Mesalina brevirostri, Mesalina watsonana, Ophisops jerdonii, Ablepharus grayanus, Ablepharus pannonicus, Chalcides ocellatus, Eutropis dissimilis, Eutropis macularia, Eurylepis taeniolatus, Lygosoma punctate, Novoeumeces blythianus, Ophiomorus blanfordi, Ophiomorus raithmai, Ophiomorus tridactylus, Asymblepharus himalayanus,*

*Varanus griseus caspius, Indotyphlops braminus, Indotyphlops porrectus, Myriopholis macrorhyncha, Boiga trigonata, Argyrogena fasciolata, Enhydris pakistanicus, Hemorrhois ravergieri, Lycodon aulicus, Lycodon striatus, Amphiesma stolatum, Lytorhynchus paradoxus, Lytorhynchus ridgewayi , Fowlea piscator, Platyceps rhodorachis, Platyceps ventromaculatus, Oligodon russelius, Oligodon taeniolatus, Psammophis condanarus, Psammophis leithii, Psammophis schokari, Ptyas mucosa, Spalerosophis arenarius, Spalerosophis diadema, Eirenis persicus, Bungarus caeruleus, Bungarus sindanus, Bungarus sindanus razai, Naja naja, Astrotia stokesii, H. schistose, H. caerulescens, H. cyanocinctus, H. fasciatus, H. lapemoides, Hydrophis ornatus, Hydrophis spiralis, Lapemis curtus, Microcephalophis gracilis, Hydrophis platurus, Hydrophis viperinus, Echis carinatus, Echis carinatus astolae, Pseudocerastes persicus* and *Daboia russelii*) are classified as Least Concern (LC) indicating stable populations, while ten species of reptile (i.e. *Ptyodactylus homolepis, Teratolepis fasciata, Trapelus rubrigularis, Calotes versicolor farooqi, Eremias cholistanica, Novoeumeces zarudnyi, Myriopholis blanfordii, Telescopus rhinopoma, Hydrophis mamillaris* and *Microcephalophis cantoris*) are classified as Data Deficient (DD). Six reptile species (i.e. *Kachuga smithii, Varanus bengalensis, Eryx conicus, Eryx johnii, Python molurus* and *Naja oxiana*) are categorized as Near Threatened (NT), while ten are classified as Vulnerable (VU). Additionally, seven reptile species (i.e. *Geoclemys hamiltonii, Hardella thurjii, Chelonia mydas, Chitra indica, Aspideretes gangeticus, Nilssonia* hurum and Varanus *flavescens*) are considered Endangered (EN). Alarmingly, two reptile species (i.e. *Eretmochelys imbricata* and *Gavialis gangeticus*) are listed as Critically Endangered (CR) (Figure 9 and Table 1). While all 10 species of amphibians are classified as Least Concern (LC), i.e. *Duttaphrynus olivaceus, Duttaphrynus stomaticus, Pseudepidalea pseudoraddei, Microhyla ornate, Chrysopaa sternosignata, Euphlyctis cyanophlyctis, Fejervarya limnocharis, Minervarya syhadrensis, Hoplobatrachus* tigerinus, and *Sphaerotheca breviceps* (Figure 9 and Table 2).

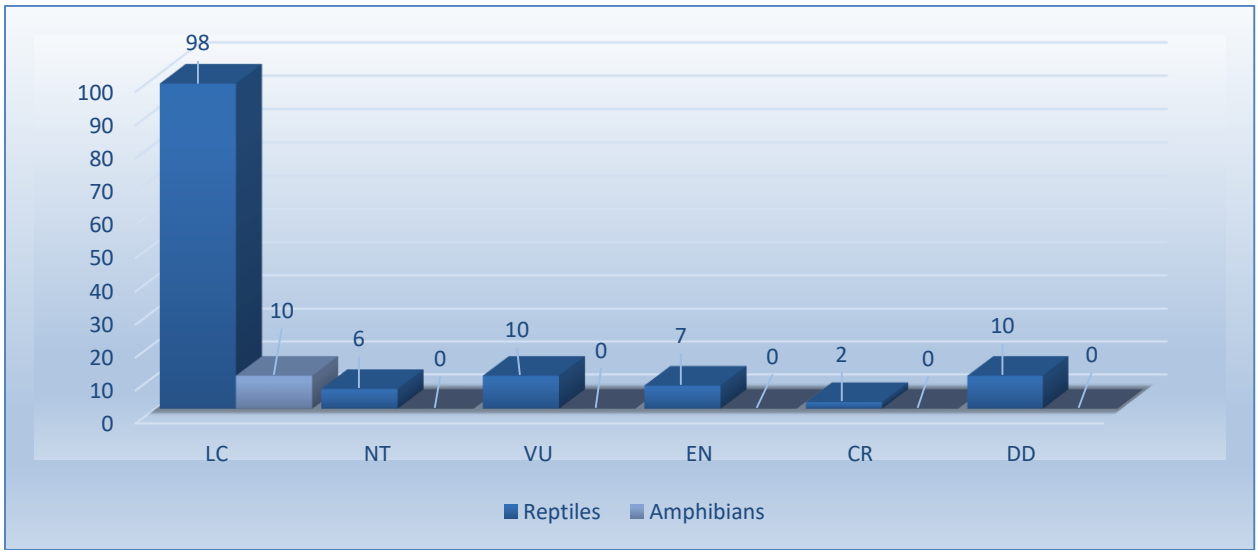


**Figure 9: Status of retiles and amphibian species in the vicinity of Ramsar Sites of Pakistan.**

## THREATS

The following species of reptile are facing high level of threats:

### Hawksbill turtles *Eretmochelys imbricata*

The Hawksbill Turtle was last evaluated for The IUCN Red List of Threatened Species in 2008. *E. imbricata* is categorized as Critically Endangered (CR) based on criteria A2bd (Mortimer and Donnelly, 2008). Key threats to Hawksbill turtles include the tortoiseshell trade, egg collection, and habitat destruction. The tortoiseshell trade has significantly impacted Hawksbill populations worldwide, with historical trade statistics highlighting the severity of the issue (Meylan and Donnelly, 1999).

Egg collection remains a big concern, particularly in Southeast Asia, where utilization is approaching 100% in some locations. Hawksbills are also taken for meat; fisherman frequently use them as bait or accidently catch them while fishing. The degradation of nesting grounds owing to tourism as well as coastal development has a significant impact on Hawksbill nesting, especially in areas like as the Western Indian Ocean, where human interference can disrupt nesting patterns (Shanker and Pilcher, 2003).

Additionally, Hawksbills depend on coral reefs for foraging, and climate-induced coral bleaching poses a severe danger to these habitats. In some areas, low Hawksbill populations lead to hybridization with other sea turtle species, thereby affecting genetic diversity. Turtles are at significant risk of becoming entangled in fishing gear, with juveniles regularly found in derelict nets and detritus (León and Bjorndal, 2002). Oil pollution also harms Hawksbills, especially in oil-rich locations such as the Middle East (Pashaei et al., 2015).

Tortoiseshell has been a valuable product since prehistoric times. Its trade flourished for centuries, particularly due to European colonial activities and later Japanese craftsmanship. By the mid-twentieth century, Japan became the leading importer of tortoiseshell, significantly contributing to the decline of Hawksbill turtle populations. The detrimental impact of this trade on these turtles has sparked urgent conservation concerns, highlighting the need for continuous protective measures and increased awareness to ensure the species' survival amid ongoing threats from illegal trade and habitat destruction (Mortimer and Donnelly, 2008).

### Spotted Pond Turtle *Geoclemys hamiltonii*

This species was assessed for the IUCN Red List of Threatened Species in 2018. *G. hamiltonii* is classified as Endangered (EN) under the criterion A2cd+4cd. This turtle was widely collected for subsistence and commerce until the early 1990s, when visible trade was discontinued. By the late 1990s, it had resurfaced in the East Asian culinary market. Since 2006, the species has been popular in the East and Southeast Asian pet trade, resulting in widespread illegal trading. Human agricultural land use pressures, unintentional capture in fishing nets, and habitat degradation have all had a substantial influence on the species, as documented in numerous studies and workshops (Praschag et al., 2019).

**Gharial *Gavialis gangeticus***

In 2017, the IUCN Red List of Threatened Species evaluated the Gharial (*G. gangeticus*) and classified it as Critically Endangered (CR) under category A2bce. Dams, barrages, and other water control systems have led to significant habitat fragmentation and degradation, adversely affecting gharial populations across various river systems. Future construction of more dams and barrages in strategically important habitats, such as the upper Brahmaputra and its tributaries, is predicted to harm local fish stocks that are crucial for the survival of gharials. A notable example of this threat is the rapid decline of the gharial in the Indus River, exacerbated by constructions like the Lloyd Barrage. Similarly, damming on rivers such as the Ramganga, Narayani-Gandak, and Betwa has resulted in drastic declines and local extinctions of the gharial species. Irrigation and hydro projects have also contributed to the gharial's decline by altering hydrology, as seen in the Kosi River, where restoration attempts have only further diminished the gharial population. The removal of water activities, particularly lift stations along the Chambal River, exacerbates the situation by reducing river connectivity, thus increasing risks for gharials, despite the illegality of water diversion. Gharial habitats are likely to face even greater pressures from management programs and proposed upstream projects, underscoring the urgent need for better-informed water management strategies to protect this endangered species (Lang et al., 2019).

**Crowned River Turtle *Hardella thurjii***

The Crowned River Turtle was last assessed for *the IUCN Red List of Threatened Species* in 2018 and is classified as Endangered (EN) under criteria A2bcd+4bcd (Ahmed et al., 2021b). This species has been heavily and extensively harvested for the consumption trade in India, linked to vigorous fishing activities. Similarly, it has been gathered for both consumption and trade export in Bangladesh. No data on its trade is available for Pakistan. There have been instances of trading juveniles as pets. Habitat loss has occurred due to the transformation of wetlands into agricultural land, along with the effects of industrial and agricultural contaminants (fertilizer runoff, sediment buildup), especially impacting marginal regions. Fishing nets pose a danger, particularly to the larger females (Ahmed et al., 2021b; Dutta et al., 2020).

**Green Turtle *Chelonia mydas***

The Green Turtle (*Chelonia mydas*) was last assessed for *The IUCN Red List of Threatened Species* in 2004, where it was classified as Endangered (EN) under criteria A2bd (Seminoff, 2023). Green turtles are particularly vulnerable to population declines due to a range of human-induced threats throughout their life stages. Key risks include the legal harvesting of eggs and adults from nesting beaches, as well as juveniles from foraging grounds, with some countries allowing this practice despite declining subpopulations. Additional incidental threats involve bycatch in fisheries, habitat degradation, and disease. Entanglement in fishing gear, such as drift nets and trawls, is a significant cause of mortality. Habitat degradation impacts both nesting and marine environments,

driven by construction, beach armoring, and sand extraction, resulting in reduced nesting areas and altered animal behavior. Artificial lighting on nesting beaches further disrupts nesting adults and can disorient hatchlings. In marine habitats, pollution from coastal development and increased boat traffic deteriorates ecosystem health, exacerbating issues like Fibropapilloma disease among green turtles. Together, these threats considerably jeopardize the sustainability of green turtle populations (Kasparek et al., 2001; Restrepo et al., 2023; Seminoff, 2023).

**Indian Narrow-headed Softshell Turtle *Chitra indica***

This species was last evaluated for the IUCN Red List of Threatened Species in 2000. *Chitra indica* is classified as Endangered (EN) under criteria A1cd+2cd. Turtles are often caught by humans, both intentionally and as bycatch, as their meat and eggs are regarded as delicacies (IUCN, 2000).

**Indian Soft-shell Turtle *Aspideretes gangeticus***

This species was last evaluated for the IUCN Red List of Threatened Species in 2018, where it was classified as Endangered (EN) under criteria A2d+4d (Ahmed et al., 2021a). This species is heavily exploited for local, regional, and global trade, with significant increases in demand since the late 1990s. The focus of trade has shifted from live specimens to processed meat, particularly 'calipee,' a dried cartilaginous part of the carapace. Between 2000 and 2015, nearly 16,400 live specimens were seized in illegal trade, making it the fourth most confiscated CITES-listed turtle species. Many large shipments of calipee are often not identified by species. Additionally, in regions like the Indus basin, fishermen target this turtle as a perceived trouble, a problem further worsened by habitat destruction in critical areas such as the Ganga and Mahanadi rivers (Ahmed et al., 2021a; Lamichhane and Khadka, 2020; Vyas, 2015).

**Indian Peacock Softshell Turtle *Nilssonia hurum***

This species was most recently evaluated in 2018 for The IUCN Red List of Threatened Species. It is listed as Endangered (EN) under criteria A2d+4d (Das et al., 2021b). There is heavy exploitation of *N. hurum* for local consumption and illegal international trade, especially to East Asia, where trade reached its peak in the late 1990s at 60-80 tons per week. More recently, trends have indicated a shift from live specimens to calipee, which means dried cartilage from the carapace. Illegal trade incidents include confiscations of live specimens and large calipee shipments, although species identification is often lacking in these cases. The volumes of trade in Bangladesh peaked in the late 1980s and early 1990s, amounting to nearly 10,000 metric tons per year. Besides exploitation, threats include habitat destruction in the Ganga, water pollution, and entanglement in fishing nets, requiring continued monitoring and recording of such adverse factors affecting the species (Das et al., 2021b; Ramya Roopa et al., 2024).

**Yellow Monitor *Varanus flavescens***

The Yellow Monitor, scientifically known as *Varanus flavescens*, was last evaluated for inclusion in the IUCN Red List of Threatened Species in 2019 (Das

et al., 2021a). It is categorized as Endangered (EN) according to criteria A2cd. The Gangetic River basin, which is home to a species at risk, is characterized by high human population densities in India, Nepal, and Bangladesh. This species is extensively hunted for its skin and meat and is subject to persecution and recreational killing, especially in India and Nepal. Hunting practices often involve the use of dogs, while young ones fall prey to domestic cats, and their eggs are frequently consumed. During hunting festivals in West Bengal, the species is also targeted. Agricultural activities pose a threat to subpopulations, as mechanized farming methods degrade breeding habitats, particularly in Bangladesh. Habitat encroachment, landfilling, and pollution add further stress to their marshy and wetland environments. In Nepal, poaching and persecution have confined the species to small habitat patches, leading to a population decline. Additionally, roadkills contribute to the species' mortality, exacerbating the threats it faces throughout its range (Das et al., 2021a; Ramya Roopa et al., 2024).

## OVERALL THREATS TO REPTILE

Research shows that biodiversity threats significantly impact terrestrial species of reptile, correlating these threats with their extinction risk. Agriculture, urbanization, and hunting are identified as the most significant threats, consistent with earlier studies. Hunting primarily involves the collection of wild reptile species for food, traditional medicine (Adil et al., 2022; Altaf et al., 2018; Faiz et al., 2022; Khan et al., 2024), and the pet trade. Additionally, unintentional by-catch, dislike, fear (Altaf, 2022) and road mortality pose further risks (Ali et al., 2023). Expert assessments agree that land use change and human population growth are the main drivers of reptile decline (Tsianou et al., 2021).

The median likelihood of impact was high in agriculture, which showed a negative correlation with threatened species overall. Logging, while having a low probability of threat, was strongly associated with threatened species. Southeast Asia, Oceania, and South America faced severe impacts from hunting, influenced by factors such as trade and persecution. Additionally, antagonistic associations between the probability of impact and the presence of threatened species were observed, especially in the Caribbean, indicating past extirpations. In Europe, weak associations were noted amid significant pressures from agriculture, pollution, and urbanization (Farooq et al., 2024; Tsianou et al., 2021).

## CONCLUSION

The study concludes that various types of wetlands are located in Pakistan, which support diverse species of amphibians and reptiles. These species play an important role in maintaining ecological balance and are considered indicators of healthy ecosystems. Despite their important ecological role, amphibian and reptile species are not considered as priority species for conservation in-general. These species are under threat due to various factors requiring attention for their long-term conservation so that they may continue to play their ecological role. Detailed studies may be undertaken to establish a baseline for these species, which may help to improve conservation efforts for the species and their habitats.

Effective enforcement of relevant laws is crucial to address illegal harvesting and trade in these species.

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**Table 1: Species of reptiles in Ramsar sites of Pakistan.**

| Sr. | Common Name | Scientific name | Species authority | Family | Order | Status |
|---|---|---|---|---|---|---|
| 1 | Mugger crocodile | *Crocodylus palustris* | Lesson, 1831 | Crocodylidae | Crocodylia | VU |
| 2 | Gharial | *Gavialis gangeticus* | Gmelin, 1789 | Gavialidae | Crocodylia | CR |
| 3 | Agror Agama | *Laudakia agrorensis* | Stoliczka, 1872 | Agamidae | Squamata | LC |
| 4 | Caucasian Rock Agama | *Paralaudakia caucasia* | Eichwald, 1831 | Agamidae | Squamata | LC |
| 5 | Smalls-caled Rock Agama | *Paralaudakia microlepis* | Blanford, 1874 | Agamidae | Squamata | LC |
| 6 | Black Rock Agama | *Laudakia melanura* | Blyth, 1854 | Agamidae | Squamata | LC |
| 7 | Yellow- headed Black Agama | *Laudakia liratus* | Blanford, 1874 | Agamidae | Squamata | LC |
| 8 | Large Scaled Agama | *Laudakia nupta* | de Filippi, 1843 | Agamidae | Squamata | LC |
| 9 | Kashmir Rock Agama | *Laudakia tuberculata* | Gray, 1827 | Agamidae | Squamata | LC |
| 10 | Agilis Agama | *Trapelus agilis* | Olivier, 1804 | Agamidae | Squamata | LC |
| 11 | Afghan Ground Agama | *Trapelus megalonyx* | Günther, 1864 | Agamidae | Squamata | LC |
| 12 | Red throated Ground Agama | *Trapelus rubrigularis* | Blanford, 1876 | Agamidae | Squamata | DD |
| 13 | Hardwicke's Bloodsucker | *Calotes minor* | Hardwicke and Gray, 1827 | Agamidae | Squamata | LC |
| 14 | Changeable Lizard | *Calotes versicolor* | Daudin, 1802 | Agamidae | Squamata | LC |
| 15 | Northern forest Lizard | *Calotes versicolor farooqi* | Auffenberg and Rehman, 1995 | Agamidae | Squamata | DD |
| 16 | Striped Toad Agama | *Phrynocephalus ornatus* | Boulenger, 1887 | Agamidae | Squamata | LC |
| 17 | Gray Toad-headed Agama | *Phrynocephalus scutellatus* | Olivier, 1807 | Agamidae | Squamata | LC |
| 18 | Indian Spiny-tailed Lizard | *Saara hardwickii* | Gray, 1827 | Agamidae | Squamata | VU |
| 19 | Asian Chameleon | *Chamaeleo zeylanicus* | Laurenti, 1768 | Chamaeleonidae | Squamata | LC |
| 20 | Indian Gamma Snake | *Boiga trigonata* | Schneider, 1802 | Colubridae | Squamata | LC |
| 21 | Banded Racer | *Argyrogena fasciolata* | Shaw, 1802 | Colubridae | Squamata | LC |
| 22 | Spotted Whip Snake | *Hemorrhois ravergieri* | Ménétriés, 1832 | Colubridae | Squamata | LC |
| 23 | Common Wolf Snake | *Lycodon aulicus* | Linnaeus, 1758 | Colubridae | Squamata | LC |
| 24 | Barred Wolf Snake | *Lycodon striatus* | Shaw, 1802 | Colubridae | Squamata | LC |
| 25 | Sindh Awl-headed Snake | *Lytorhynchus paradoxus* | Günther, 1875 | Colubridae | Squamata | LC |
| 26 | Afghan Awl headed snake | *Lytorhynchus ridgewayi* | Boulenger, 1887 | Colubridae | Squamata | LC |
| 27 | Wadi Racer | *Platyceps rhodorachis* | Jan, 1865 | Colubridae | Squamata | LC |
| 28 | Hardwicke's Rat Snake | *Platyceps ventromaculatus* | Gray, 1834 | Colubridae | Squamata | LC |
| 29 | Common Kukri Snake | *Oligodon russelius* | Shaw, 1802 | Colubridae | Squamata | LC |

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|---|---|---|---|---|---|---|
| 30 | Streaked Kukri Snake | *Oligodon taeniolatus* | Jerdon, 1853 | Colubridae | Squamata | LC |
| 31 | Oriental rat snake | *Ptyas mucosa* | Linnaeus 1758 | Colubridae | Squamata | LC |
| 32 | Red Spotted Royal Snake | *Spalerosophis arenarius* | Boulenger, 1890 | Colubridae | Squamata | LC |
| 33 | Diadem Snake | *Spalerosophis diadema* | Schlegel, 1837 | Colubridae | Squamata | LC |
| 34 | Dark-headed dwarf racer | *Eirenis persicus* | Anderson, 1872 | Colubridae | Squamata | LC |
| 35 | Indian Desert Tiger Snake | *Telescopus rhinopoma* | Blanford, 1874 | Colubridae | Squamata | DD |
| 36 | Common Krait | *Bungarus caeruleus* | (Schneider, 1801) | Elapidae | Squamata | LC |
| 37 | Sindh Krait | *Bungarus sindanus* | Boulenger, 1847 | Elapidae | Squamata | LC |
| 38 | Northern Punjab krait | *Bungarus sindanus razai* | Khan, 1985 | Elapidae | Squamata | LC |
| 39 | Indian Cobra | *Naja naja* | Linnaeus, 1758 | Elapidae | Squamata | LC |
| 40 | Central Asian Cobra | *Naja oxiana* | Eichwald, 1831 | Elapidae | Squamata | NT |
| 41 | Stoke's Sea Snake | *Astrotia stokesii* | Gray, 1846 | Elapidae | Squamata | LC |
| 42 | Beaked Sea Snake | *Hydrophis schistosa* | Daudin, 1803 | Elapidae | Squamata | LC |
| 43 | Dwarf Sea Snake | *Hydrophis caerulescens* | Shaw, 1802 | Elapidae | Squamata | LC |
| 44 | Annulated Sea Snake | *Hydrophis cyanocinctus* | Daudin, 1803 | Elapidae | Squamata | LC |
| 45 | Striped Sea Snake | *Hydrophis fasciatus* | Schneider, 1799 | Elapidae | Squamata | LC |
| 46 | Arabian Gulf Sea Snake | *Hydrophis lapemoides* | Gray, 1849 | Elapidae | Squamata | LC |
| 47 | Bombay Sea Snake | *Hydrophis mamillaris* | Daudin, 1803 | Elapidae | Squamata | DD |
| 48 | Ornate Sea Snake | *Hydrophis ornatus* | Gray, 1842 | Elapidae | Squamata | LC |
| 49 | Yellow Sea Snake | *Hydrophis spiralis* | Shaw, 1802 | Elapidae | Squamata | LC |
| 50 | Spine-bellied Sea Snake | *Lapemis curtus* | Shaw, 1802 | Elapidae | Squamata | LC |
| 51 | Gunther's Sea Snake | *Microcephalophis cantoris* | Günther, 1864 | Elapidae | Squamata | DD |
| 52 | Graceful Small-headed Sea Snake | *Microcephalophis gracilis* | Shaw, 1802 | Elapidae | Squamata | LC |
| 53 | Yellow-bellied Sea Snake | *Hydrophis platurus* | Linnaeus, 1766 | Elapidae | Squamata | LC |
| 54 | Viperine Sea Snake | *Hydrophis viperinus* | Schmidt, 1852 | Elapidae | Squamata | LC |
| 55 | Rough-tailed Sand Boa | *Eryx conicus* | Schneider, 1801 | Erycidae | Squamata | NT |
| 56 | Red Sand Boa | *Eryx johnii* | Russell, 1801 | Erycidae | Squamata | NT |
| 57 | Common Leopard Gecko | *Eublepharis macularius* | Blyth, 1854 | Eublepharidae | Squamata | LC |
| 58 | Persian Spider Gecko | *Agamura persica* | Duméril, 1856 | Gekkonidae | Squamata | LC |
| 59 | Baluch Ground Gecko | *Bunopus tuberculatus* | Blanford, 1874 | Gekkonidae | Squamata | LC |
| 60 | Nikolsky's Spider Gecko | *Cyrtopodion agamuroides* | Nikolsky, 1900 | Gekkonidae | Squamata | LC |

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|---|---|---|---|---|---|---|
| 61 | Kachh Gecko | *Cyrtopodion kachhense* | Stoliczka, 1872 | Gekkonidae | Squamata | LC |
| 62 | Sulaiman Range gecko | *Cyrtopodion kohsulaimanai* | Khan, 1991 | Gekkonidae | Squamata | LC |
| 63 | Ingoldby's Stone Gecko | *Cyrtopodion kachhense ingoldbyi* | Khan, 1997 | Gekkonidae | Squamata | LC |
| 64 | Rough Bent-toed Gecko | *Cyrtopodion scabrum* | Heyden, 1827 | Gekkonidae | Squamata | LC |
| 65 | Brooke's House Gecko | *Hemidactylus brookii* | Gray, 1845 | Gekkonidae | Squamata | LC |
| 66 | Yellow-bellied House Gecko | *Hemidactylus flaviviridis* | Rüppell, 1835 | Gekkonidae | Squamata | LC |
| 67 | Common House Gecko | *Hemidactylus frenatus* | Dumeril & Bibron, 1836 | Gekkonidae | Squamata | LC |
| 68 | Leschenault's Gecko | *Hemidactylus leschenaultii* | Duméril and Bibron, 1836 | Gekkonidae | Squamata | LC |
| 69 | Persian Gecko | *Hemidactylus persicus* | Anderson, 1872 | Gekkonidae | Squamata | LC |
| 70 | Dakota's Leaf-toed Gecko | *Hemidactylus triedrus* | Daudin, 1802 | Gekkonidae | Squamata | LC |
| 71 | Mediterranean Gecko | *Hemidactylus turcicus* | Linnaeus, 1758 | Gekkonidae | Squamata | LC |
| 72 | Red Sea House Gecko | *Hemidactylus robustus* | Heyden 1827 | Gekkonidae | Squamata | LC |
| 73 | Pakistan Fan-fingered Gecko | *Ptyodactylus homolepis* | Heyden 1827 | Gekkonidae | Squamata | DD |
| 74 | Sind Gecko | *Crossobamon orientalis* | Blanford, 1876 | Gekkonidae | Squamata | LC |
| 75 | Soan Gecko | *Cyrtopodion indusoani* | Khan, 1988 | Gekkonidae | Squamata | LC |
| 76 | Flat-tail Gecko | *Teratolepis fasciata* | Blyth, 1853 | Gekkonidae | Squamata | DD |
| 77 | Persian Pigmy Gecko | *Tropiocolotes persicus* | (Nikolsky, 1903) | Gekkonidae | Squamata | LC |
| 78 | Sind River Mud Snake | *Enhydris pakistanicus* | Mertens, 1959 | homalopsidae | Squamata | LC |
| 79 | Indian Fringe-fingered lizard | *Acanthodactylus cantoris* | Günther, 1864 | Lacertidae | Squamata | LC |
| 80 | Blandford's Fringe-toed Lizard | *Acanthodactylus blanfordii* | Boulenger, 1918 | Lacertidae | Squamata | LC |
| 81 | Yellow-tailed Fringe-fingered Lizard | *Acanthodactylus micropholis* | Blanford, 1874 | Lacertidae | Squamata | LC |
| 82 | Persian Racerunner | *Eremias persica* | Blanford, 1874 | Lacertidae | Squamata | LC |
| 83 | Cholistani Racerunner | *Eremias cholistanica* | Baig and Masroor 2006 | Lacertidae | Squamata | DD |
| 84 | Spotted Lacerta | *Mesalina brevirostris* | Blanford, 1874 | Lacertidae | Squamata | LC |
| 85 | Smooth spectacled Lacerta | *Mesalina watsonana* | Stoliczka, 1872 | Lacertidae | Squamata | LC |
| 86 | Punjab Snake-eyed Lacerta | *Ophisops jerdonii* | Blyth, 1853 | Lacertidae | Squamata | LC |
| 87 | Sindh Thread Snake | *Myriopholis blanfordii* | Boulenger, 1890 | Leptotyphlopidae | Squamata | DD |
| 88 | Hook-snouted Worm Snake | *Myriopholis macrorhyncha* | Jan, 1862 | Leptotyphlopidae | Squamata | LC |
| 89 | Buff Striped Keelback | *Amphiesma stolatum* | Linnaeus, 1758 | Natricidae | Squamata | LC |
| 90 | Painted Keelback | *Xenochrophis cerasogaster* | Cantor, 1839 | Natricidae | Squamata | VU |
| 91 | Checkered Keelback | *Fowlea piscator* | Schneider, 1799 | Natricidae | Squamata | LC |

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|---|---|---|---|---|---|---|
| 92 | Sand Snake | *Psammophis condanarus* | Merrem, 1820 | Psammophiidae | Squamata | LC |
| 93 | Leith's Sand Snake | *Psammophis leithii* | Günther, 1869 | Psammophiidae | Squamata | LC |
| 94 | Forskål's Sand Snake | *Psammophis schokari* | Forskål, 1775 | Psammophiidae | Squamata | LC |
| 95 | Indian Rock Python | *Python molurus* | Linnaeus, 1758 | Pythonidae | Squamata | NT |
| 96 | Minor Snake-eyed Skink | *Ablepharus grayanus* | Stoliczka, 1872 | Scincidae | Squamata | LC |
| 97 | Asian Snake-eyed Skink | *Ablepharus pannonicus* | Fitzinger, 1823 | Scincidae | Squamata | LC |
| 98 | Ocellated Skink | *Chalcides ocellatus* | Forskål, 1775 | Scincidae | Squamata | LC |
| 99 | Striped Grass Mabuya | *Eutropis dissimilis* | Hallowell, 1860 | Scincidae | Squamata | LC |
| 100 | Bronze Mabuya | *Eutropis macularia* | Blyth, 1853 | Scincidae | Squamata | LC |
| 101 | Ribbon-sided Skink | *Eurylepis taeniolatus* | Blyth, 1854 | Scincidae | Squamata | LC |
| 102 | Common Dotted Garden Skink | *Lygosoma punctata* | Linnaeus, 1766 | Scincidae | Squamata | LC |
| 103 | Orange-tail Skink | *Novoeumeces blythianus* | Anderson, 1871 | Scincidae | Squamata | LC |
| 104 | Red-strip Skink | *Novoeumeces zarudnyi* | Nikolsky, 1900 | Scincidae | Squamata | DD |
| 105 | Blanford's Snake Skink | *Ophiomorus blanfordi* | Boulenger, 1887 | Scincidae | Squamata | LC |
| 106 | Three-fingered Sand-fish | *Ophiomorus raithmai* | Anderson and Leviton, 1966 | Scincidae | Squamata | LC |
| 107 | Indian Sand-swimmer | *Ophiomorus tridactylus* | (Blyth, 1853) | Scincidae | Squamata | LC |
| 108 | Himalayan Ground Skink | *Asymblepharus himalayanus* | (Günther, 1864) | Scincidae | Squamata | LC |
| 109 | Small-scaled Wonder Gecko | *Teratoscincus microlepis* | Nokolsky, 1899 | Sphaerodactylidae | Squamata | LC |
| 110 | Brahminy blind Snake | *Indotyphlops braminus* | Daudin, 1803 | Typhlopidae | Squamata | LC |
| 111 | Stoliczka’s Slender Blind Snake | *Indotyphlops porrectus* | Stoliczka, 1871 | Typhlopidae | Squamata | LC |
| 112 | Yellow Monitor | *Varanus flavescens* | (Hardwicke and Gray, 1827) | Varianidae | Squamata | EN |
| 113 | Indian or Bengal Monitor Lizard | *Varanus bengalensis* | Daudin, 1802 | Varianidae | Squamata | NT |
| 114 | Desert Monitor | *Varanus griseus caspius* | Eichwald, 1831 | Varianidae | Squamata | LC |
| 115 | Sindh Saw-scaled Viper | *Echis carinatus* | Stemmler, 1964 | Viperidae | Squamata | LC |
| 116 | Astola Saw-scaled Viper | *Echis carinatus astolae* | Mertens, 1969 | Viperidae | Squamata | LC |
| 117 | Persian Horned Viper | *Pseudocerastes persicus* | Duméril, 1854 | Viperidae | Squamata | LC |
| 118 | Western Russel’s Viper | *Daboia russelii* | Shaw & Nodder, 1797 | Viperidae | Squamata | LC |
| 119 | Green Turtle | *Chelonia mydas* | Linnaeus, 1758 | Cheloniidae | Testudines | EN |
| 120 | Hawksbill Turtle | *Eretmochelys imbricata* | Linnaeus, 1766 | Cheloniidae | Testudines | CR |
| 121 | Olive Ridley Turtle | *Lepidochelys olivacea* | Eschscholtz, 1824 | Cheloniidae | Testudines | VU |
| 122 | Lagger Headed Turtle | *Caretta caretta* | Linnaeus, 1758 | Cheloniidae | Testudines | VU |

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|---|---|---|---|---|---|---|
| 123 | Leatherback Sea Turtle | *Dermochelys coriacea* | Vandelli, 1761 | Dermochelyidae | Testudines | VU |
| 124 | Spotted Pond Turtle | *Geoclemys hamiltonii* | Gray, 1831 | Geoemydidae | Testudines | EN |
| 125 | Crowned River Turtle | *Hardella thurjii* | Gray, 1870 | Geoemydidae | Testudines | EN |
| 126 | Brown Roofed Turtle | *Kachuga smithii* | Gray, 1863 | Geoemydidae | Testudines | NT |
| 127 | Indian Roofed Turtle | *Pangshura tecta* | Gray, 1831 | Geoemydidae | Testudines | VU |
| 128 | Afghan Tortoise | *Testudo horsfieldii* | Gray, 1844 | Testudinidae | Testudines | VU |
| 129 | Indian Star Tortoise | *Geochelone elegans* | Schopff, 1795 | Testudinidae | Testudines | VU |
| 130 | Indian Narrow-headed Softshell Turtle | *Chitra indica* | Gray, 1831 | Trionychidae | Testudines | EN |
| 131 | Indian Soft-shell Turtle | *Aspideretes gangeticus* | Cuvier, 1825 | Trionychidae | Testudines | EN |
| 132 | Indian Peacock Softshell Turtle | *Nilssonia hurum* | Gray, 1831 | Trionychidae | Testudines | EN |
| 133 | Indian Flapshell Turtle | *Lissemys punctata* | Lacepede, 1788 | Trionychidae | Testudines | VU |

**Table 2: Amphibian species in Ramsar sites of Pakistan.**

| Sr. | Common Name | Scientific name | Species authority | Family | Order | Status |
|---|---|---|---|---|---|---|
| 1 | Olive toad | *Duttaphrynus olivaceus* | Blanford, 1874 | Bufonidae | Anura | LC |
| 2 | Indus valley toad | *Duttaphrynus stomaticus* | Lütkin, 1863 | Bufonidae | Anura | LC |
| 3 | Swat green toad | *Pseudepidalea pseudoraddei* | Mertens, 1971 | Bufonidae | Anura | LC |
| 4 | Ant frog | *Microhyla ornata* | Dúmeril and Bibron, 1841 | Microhylidae | Anura | LC |
| 5 | Murray's Frog | *Chrysopaa sternosignata* | Murray, 1885 | Ranidae | Anura | LC |
| 6 | Skipper Frog | *Euphlyctis cyanophlyctis* | Schneider, 1799 | Ranidae | Anura | LC |
| 7 | Boie's Wart Frog | *Fejervarya limnocharis* | Dubois, 1987 | Ranidae | Anura | LC |
| 8 | Bombay Wart Frog | *Minervarya syhadrensis* | Annandale, 1919 | Ranidae | Anura | LC |
| 9 | Indian Bullfrog | *Hoplobatrachus tigerinus* | Daudin, 1802 | Ranidae | Anura | LC |
| 10 | Indian Burrowing frog | *Sphaerotheca breviceps* | Schneider, 1799 | Ranidae | Anura | LC |