

Herpetofaunal Diversity of Gandhisagar Wildlife Sanctuary, Madhya Pradesh

Shehla Ishaque¹ and Anil Sarsavan^{2*}^{1,2*}Govt. Madhav Science PG College, Ujjain (M.P.)Available online at www.isroset.org

Received: 10 Mar 2014

Revised: 22 Mar 2014

Accepted: 08 May 2014

Published: 31 Aug 2014

ABSTRACT- Herpetofaunal communities of the Gandhisagar Wildlife Sanctuary (GWS) are diverse and poorly described. The paper gives an overview of the herpetofauna in the Gandhisagar Wildlife Sanctuary; based on the results of survey carried out in the July to August 2013 time period. We spent 17 field days to rapidly assess the present distribution and status of the herpetofaunistic species. Data collection will be carried out by using different method like visual encounter survey, call survey for frogs & toads; active night search and road kill survey. A total of 9 species of amphibians cover the one order Anura (4 families and 9 Genus) and 37 species of reptiles include the order Crocodylia (2 families 2 Genus), order Testudines (2 families 2 Genus), order Squamata included suborder sauria (4 families 7 Genus) and suborder serpents (6 families 20 Genus) have been recorded from the study area. The most diverse herpetofaunal community occurs in Gandhisagar Dam catchment area.

KEYWORDS: - Herpetofaunal Diversity, Gandhisagar Wildlife Sanctuary, Madhya Pradesh

INTRODUCTION

The state of Madhya Pradesh is located on the Biogeographic zone of the Deccan Plateau of Peninsular India. It is bestowed with a variety of habitats and ecotones, and is arbitrarily divided into Malwa, Bundelkhand, Baghelkhand, Vindhyan, With varied topography and environmental conditions, Madhya Pradesh harbours rich and unique herpetofaunal diversity. Present herpetofaunal composition of Madhya Pradesh contains 18 species of amphibians under 13 genera of 4 families and 77 species and subspecies of reptiles under 50 genera of 17 families (Chandra et al. 2005, Ingle, 2010).

The many literature reveals that a few workers, e.g. Ingle (1995, 2012) and Vyas et al. (2004) have attempted the study of amphibians and reptiles at Gandhisagar reservoir, but none of them thoroughly or extensively explored the entire sanctuary for the herpetofauna. Therefore, this survey was conducted to prepare an inventory of reptiles and amphibians found in and around Gandhisagar Wildlife Sanctuary from July -August, 2013.

Gandhisagar wildlife sanctuary (GWS) is located in Malwa plateau between the parallels of latitude 23^o45' 50"- 25^o 2' 55" North, and between the meridians of longitude 74^o 42' 30"- 75^o 50' 20" East of North-western part of Madhya Pradesh state. It covers a geographical area of 368.62 sq. Km. Falling in Mandsaur and Nimach districts adjoining Rajasthan state. The Chambal River passes through the sanctuary and divides it into two parts; the western part of the sanctuary is in Nimach district and eastern part in Mandsaur district. According to Champion and Seth (1968) these forests are classified

as Biogeographic zone IV-the semi-arid zone and are considered as IV (b).

The Sanctuary have "Northern tropical dry deciduous forest, dry mixed deciduous forest, and Dry deciduous scrub", further identified into the following important habitats. These identified habitats and particular forest pocket habitats were selected for the extensive fieldwork and they were repeatedly explored during the study for measuring the herpetofaunal diversity. Within the sanctuary area, there is no stagnant water wetland mighty Chambal river with its full flow with a few river pools Gandhisagar reservoir.

METHODS

Field techniques.—we used five different field techniques:

- Visual Encounter Surveys: The most effective method of surveying turtles various riverine habitats, amphibians along wetlands, and to survey xeric habitats for diurnal, non-fossorial lizards. Occasionally, diurnal snakes were encountered using this technique. (Heyer et al, 1994).
- Amphibian Call Surveys: This is an excellent way to determine the presence of frogs and toads. Some anurans species rarely seen but are easily identified via call surveys. (Pellet, J. and Schmidt, B.R., 2005).
- Road surveys: Road surveys were absolutely necessary for identifying the presence of many snake species expected to be found in the Sanctuary.
- Opportunistic surveys: Opportunistic diurnal and nocturnal searches along paths in forest and open areas.

Corresponding Author: A Sarsavan

- Intensive crevice examination: under rocks, tree-bark, fallen logs, and inside vegetation.

DATA COLLECTION:

Table-1: Data collection from different parts of Madhya Pradesh

S.No.	Common name	Scientific name	IUCN status
CLASS: Ambhibia			
Order: Anura			
Family: Bufonidae Gray, 1825			
1.	Common Asian Toad	<i>Duttaphrynus melanostictus</i> (Schneider,1799)	LC
2.	Marbled Toad	<i>Duttaphrynus stomaticus</i> (Lutken,1864)	LC
Family: Dicroglossidae Anderson, 1871			
3.	Indian Skipping Frog	<i>Euphlyctis cyanophlyctis</i> (Schneider,1799)	LC
4.	Indian Bull Frog	<i>Hoplobatrachus tigerinus</i> (Daudin, 1803)	LC
5.	Short-headed Burrowing Frog	<i>Sphaerotheca breviceps</i> (Schneider, 1799)	LC
6.	Roland's Burrowing Frog	<i>Sphaerotheca rolandea</i> (Dubois, 1983)	LC
Family: Microhylidae Gunther, 1858			
7.	Ornate Narrow-mouthed Frog	<i>Microhyla ornata</i> (Dumeril & Bibron, 1841)	LC
8.	Marble Balloon Frog	<i>Uperodon globulosus</i> (Gunther, 1858)	LC
Family: Rhacophiridae Hoffman, 1932			
9.	Indian Tree Frog	<i>Polypedates maculatus</i> (Gray, 1834)	LC
CLASS: REPTILIA			
ORDER : TESTUDINES			
Family: Trionychidae Bell, 1828			
10.	Indian flapshell turtle	<i>Lissemys punctata punctata</i> (Bonnaterre, 1789)	LC
Family: Testudinidae Batsch, 1788			
11.	Indian Star Tortoise	<i>Geochelone elegans</i> (Schoepff, 1795)	LC
CLASS: REPTILIA			
ORDER: CROCODYLIA			
Family: Crocodylidae Gray, 1825			
12.	Mugger Crocodile	<i>Crocodylus palustris</i> (Lesson, 1834)	VU
Family: Gavialidae Adams, 1854			
13.	Gharial	<i>Gavialis gangeticus</i> (Gmelin,1789)	EN
ORDER : SQUAMATA			
Suborder : Sauria			
Family: Agamidae Gray, 1825			
14.	Indian Garden Lizard	<i>Calotes versicolor</i> (Daudin, 1802)	LC
15.	Blanford's Rock Agama	<i>Psammophilus blanfordanus</i> (Stoliczka, 1871)	LC
16.	Fan-throated Lizard	<i>Sitana ponticeriana</i> (Cuvier, 1844)	LC
Family: Gekkonidae Gray, 1825			
17.	Kollegal Ground Gecko	<i>Geckoella kollegalensis</i> (Beddome, 1870)	LC
18.	Brook's House Gecko	<i>Hemidactylus brookii</i> (Gray,1854)	NE
19.	Yellow-Green House Gecko	<i>Hemidactylus flaviviridis</i> (Ruppell, 1835)	NE
20.	Asian House Gecko	<i>Hemidactylus frenatus</i> (Duméril & Bibron, 1836)	LC
21.	Indian Termite Hill Gecko	<i>Hemidactylus triedrus</i> (Daudin, 1837)	NE
Family: Scincidae Gray, 1825			
22.	White-spotted Supple Skink	<i>Lygosoma albopunctata</i> (Gray,1846)	NE
23.	Spotted Supple Skink	<i>Lygosoma punctata</i> (Gmelin,1799)	LC

24.	Keeled Grass Skink	<i>Eutropis carinata</i> (Schneider, 1801)	LC
25.	Bronze Grass Skink	<i>Eutropis macularia</i> (Blyth, 1853)	NE
Family: Varanidae Gray, 1827			
26.	Bengal Monitor	<i>Varanus bengalensis</i> (Daudin, 1802)	LC
ORDER : SQUAMATA			
Suborder : Serpents			
Family: Typhlopidae (Merrem, 1820)			
27.	Brahminy Worm Snake	<i>Ramphotyphlops braminus</i> (Daudin, 1803)	NE
28.	Beaked Worm Snake	<i>Grypotyphlops acutus</i> (Dumeril, 1844)	LC
Family: Boidae (Gray, 1825)			
29.	Red Sand Boa	<i>Eryx johnii</i> (Russell, 1801)	NE
30.	Common Sand Boa	<i>Gongylophis conicus</i> (Schneider, 1801)	NE
Family: Pythonidae (Fitzinger, 1826)			
31.	Indian Rock Python	<i>Python molurus</i> (Linnaeus, 1758)	NT
Family: Colubridae (Oppel, 1811)			
32.	Common Vine Snake	<i>Ahaetulla nasutus</i> (Andersson, 1898)	NE
33.	Buff-striped Keelback	<i>Amphiesma stolatum</i> (Linnaeus, 1758)	NE
34.	Banded Racer	<i>Argyrogena fasciolata</i> (Shaw, 1802)	NE
35.	Common Indian Cat Snake	<i>Boiga trigonata</i> (Bechstein, 1802)	LC
36.	Common Trinket Snake	<i>Coelognathus helena</i> (Daudin, 1803)	NE
37.	Common Wolf Snake	<i>Lycodon aulicus</i> (Linnaeus, 1758)	NE
38.	Checkered keelback	<i>Xenochrophis piscator</i> (Schneider, 1799)	NE
39.	Green Keelback	<i>Macropisthodon plumbicolor</i> (Cantor, 1839)	NE
40.	Banded Kukri Snake	<i>Oligodon arnensis</i> (Shaw, 1802)	NE
41.	Indian Rat Snake	<i>Ptyas mucosa</i> (Linnaeus, 1758)	NE
42.	Black-Headed Snake	<i>Sibynophis subpunctatus</i> (Dumeril & Bibron, 1854)	NE
Family: Elapidae (Boie, 1827)			
43.	Common Indian Krait	<i>Bungarus caeruleus</i> (Schneider, 1801)	NE
44.	Spectacled Cobra	<i>Naja naja</i> (Linnaeus, 1758)	NE
Family: Viperidae (Boie, 1827)			
45.	Indian Saw-scaled Viper	<i>Echis carinatus</i> (Schneider, 1801)	NE
46.	Russell's Viper	<i>Daboia russelii</i> (Shaw & Nodder, 1797)	LC

NT =Near Threatened; LC = Least Concern; VU = Vulnerable; EN= Endangered
NE = Not Evaluated

RESULT AND DISCUSSION:

In the July-August month study period we found 46 species of herpetofauna which included 9 amphibians and 37 reptile species. The identified herpetofaunistic species of GWS were categorized according to the IUCN Red list of threatened species. Total 9 amphibian species are listed as Least Concern (LC). Among the 37 species of reptiles evaluated, one is listed as one as Endangered (EN), one as Vulnerable (VU), one as Near Threatened (NT) and twenty one as Not Evaluated (NE); the rest thirteen are considered to be Least Concern (LC).

The overall a statue of identified species is Least Concern; 48%, Endangered; 2%, Vulnerable; 2%, Near Threatened; 2% and 46% species are Not Evaluated. Some species like *Duttaphrynus melanostictus*, *Hoplobatrachus tigerinus*, *Euphlyctis cyanophlyctis*, *Microhyla ornata* and *Fejervarya limnocharis* were the

most common amphibian species and were spotted frequently almost throughout the study period. *Naja naja*, *Ptyas mucosa*, *Lycodon aulicus*, *Xenochrophis piscator* were commonly encountered. *Calotes versicolor*, *Hemidactylus brookii*, *Hemidactylus flaviviridis*, were found in elsewhere in the forest and along with the near human habitation. During the study period we assess the *Geochelone elegans*, *Sibynophis subpunctatus* and *Python molurus* were very rare. This work is preliminary and more intensive & long term study was needed for this Sanctuary.

ACKNOWLEDGEMENTS

We would like to acknowledge Snake Research Organization for providing facility, and funding for this work. We wish to thank Madhya Pradesh Forest Department-Principal Chief Conservator of Forests (Wildlife), for granting permission to carry out this study and supporting staff for extending various help

during survey. We are thankful to all supporting staff of Snake Research Organization to help during the field work.

REFERENCES

- [1]. Agrawal, H.P. (1981). On a collection of reptiles from Madhya Pradesh, India. *The Indian Journal of Zootomy* **22(3)**: 203-206.
- [2]. Chandra, K. & P.U. Gajbe (2005). An Inventory of Herpetofauna of Madhya Pradesh and Chhattisgarh. *Zoos' Print Journal* **20(3)**: 1812-1819.
- [3]. Das, I. and S.K. Dutta (1998). Checklist of the amphibians of India, with English common names. *Hamadryad* **23**: 63-68.
- [4]. Dutta, S.K. (1992). Amphibians of India: Updated species list with distribution record. *Hamadryad* **17**: 1-13.
- [5]. IUCN (2014). IUCN Red List of Threatened species. Available at: <http://www.iucnredlist.org>. Accessed on: 22.05.2014.
- [6]. Ingle, M. (2001). Snakes of Madhya Pradesh, Ujjain & Malwa Region. *Cobra* **45**: July-Sept.
- [7]. Ingle, M. (2003). Ecology & Status of the Ophiofauna of Eight Districts of Malwa Region of Madhya Pradesh. *Cobra* **50**(Oct-Dec.): 1-17.
- [8]. Ingle, M. (2002). Ecology and status of the ophiofauna of eight districts of Malwa region of Madhya Pradesh. *Cobra* **50**: 1-17.
- [9]. Ingle, M. (2004). Ophiofauna of Ujjain & certain Areas of Malwa Region (Madhya Pradesh), *Records of the Zoological Survey of India*, 103 (part 1-2): 17-31.
- [10]. Ingle, M., Sarsavan, A., Verma, P. and Powar, P. (2012). Herpetofauna Inventory of Gandhisagar Wildlife Sanctuary Madhya Pradesh. *National seminar on Current Trend of Wildlife Research in India with Special Reference to Herpetology*, P. G. Dept. of Zoology, North Orissa University, Takatpur, Baripada, Odisha, pp 37.
- [11]. Heyer, W. R., M. A. Donnelly, R. W. McDiarmid, L. C. Hayek, and M. S. Foster (1994). *Measuring and Monitoring Biological Diversity: Standard Methods for Amphibians*. Smithsonian Institution Press, Washington D.C.
- [12]. Molur, S. and S. Walker (Editors) (1998a). Amphibians of India. Report on Biodiversity Conservation Prioritisation Project (BCPP) India Endangered Species Project, Conservation Assessment and Management Plant (C.A.M.P) Workshop. Zoo Outreach Organisation/Conservation Breeding Specialist Group, India, Coimbatore, 102pp.
- [13]. Molur, S. and S. Walker (Editors) (1998b). Reptiles of India. Report on Biodiversity Conservation Prioritisation Project (BCPP) India Endangered Species Project, Conservation Assessment and Management Plant (C.A.M.P) Workshop. Zoo Outreach Organisation/Conservation Breeding Specialist Group, India, Coimbatore, 175pp.
- [14]. Pellet, J. and Schmidt, B.R., (2005). Monitoring distributions using call surveys: estimating site occupancy, detection probabilities and inferring absence. *Biological Conservation* **123**: 27-35.
- [15]. Rao, R.J. (1998). Status of crocodiles and freshwater turtles in the Chambal River and Ganga river: a comparative analysis. *Cobra* **33**: 31-34.
- [16]. Saksena, D.N., A.K. Sarkar and K.K. Tewari (1988). Anuran fauna of Gwalior and Chambal divisions of Madhya Pradesh, India. *Journal of Hydrobiology* **4(1)**: 25-27.
- [17]. Saxena, R. (1993). Conservation status of Common Indian Monitor (*Varanus bengalensis*) in North Madhya Pradesh. *Cobra* **12**: 3-6.
- [18]. Sharma, R.C. (1976). Three new records of Reptiles from M.P. India. *Newsletter Zoological Survey of India* **2(3)**: 101-102.
- [19]. Smith, M.A. (1931). *The fauna of British India including Ceylon and Burma: Reptilia and Amphibia*. Vol.1.Loricata, Testudines Taylor and Francis, London. (Reprinted 1974, 1995 by Today and Tomorrow's Printers and Publishers, New Delhi).
- [20]. Smith, M.A. (1935). *Fauna of British India, Reptilia and Amphibia*, Vol. 2, Sauria. Taylor & Francis, London, iv+440pp.
- [21]. Smith, M.A. (1943). *Fauna of British India, Reptilia and Amphibia*, Vol. 3, Serpentes. Taylor & Francis, London, xii+584pp.
- [22]. Vyas, R. and H. Singh. (2004). Biodiversity survey of Gandhi Sagar Reservoir, Madhya Pradesh. *Zoos' Print J.* **19(7)**:1525-1529.
- [23]. Vyas, T.P. (1993). Indian wildlife in trade. *Cobra* **11**: 11-12.
- [24]. Whitaker, R. and Captain, A (2004). Snakes of India. The Field Guide. *Draco Books*.Chengalpattu, Tamil Nadu, xiv+479, pls, text-figs.