Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

Journal of Entomology and Zoology Studies

ISSN 2320-7078
JEZS 2014; 2 (2): 179-181

Received: 03-04-2014
Accepted: 12-05-2014

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Status, habitat and distribution pattern of the gangetic dolphin (*Platanista gangetica*) in national chambal sanctuary, Uttar Pradesh, India

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ABSTRACT
From November 2011 to March 2014 seven surveys were conducted in upstream and downstream to study the status, habitat and distribution pattern of Gangetic dolphin in National Chambal Sanctuary Covering length of about 180 km from Rea to Pachnada. A total of 44 dolphin sightings were observed. Fifteen pools with a good population of dolphins were identified. Other aquatic animals like Gharial (*Gavialis gangeticus*), Mugger (*Crocodylus palustris*), nine species of hard-shell and soft shell turtles, migratory birds along with some resident birds were observed. The invertebrates noticed were Dragon flies, Damsel flies, Bellostoma, Butter flies and ants as well as some Molluscs.

Keywords: Population, Habitat, Dolphin, Feeding, surfacing and Chambal

1. Introduction
The Gangetic dolphin (*Platanista gangetica)* is distributed in the Chambal river. It flourishes in the broad and deep sections of Ganga and Brahmputra river systems from the foot of the Himalayas to Tidal Zone (II) and also noted by Rao and Behera (VI) The Ganges river dolphin is mainly found in India, Nepal, Bangladesh and Bhutan (III) but occurrence of dolphin in China is doubtful at present (X). Investigation on the ecology and distribution have been made since the early 1970's by Pilleri. In the recent years studies have focused on the status of dolphins in various rivers and their tributaries. In this regard major contribution has been done by R.K. Sinha in eastern states (Bihar). Population, habitat and behavioral aspects of dolphin in the river Chambal has not yet been well comprehensively studied, so we carried out a comprehensive study on that aspect along with anthropology in the National Chambal Sanctuary that will help in conservation and management of this endangered species.

2. Study area
The present study was carried out between Reha to Panchnada, covering stretch of about 180 km in Uttar Pradesh. This stretch is shallow with small stretches of deep zones. The banks of the entire river stretching up to Panchnada are muddy sandy, in some places rocky and rocky with raw stones. The climate of entire area is extreme during winter (end November to beginning March) and summer (April to June end) .South and west monsoon strikes at the end of June and lasts mid-September .Chambal river is unpolluted having its origin from Vindhya range Mahow district of Madhya Pradesh near Indore .Chambal is one of the tributaries of the Yamuna which confluences with it near Bhareh in Etawah district of Utter Pradesh .The entire study zone divided into six zones which are marked by I, II, III, IV,V, and VI th.

I. Pinahat to Nandgwan
II. Nandgwan to Gharaita
III. Gharaita to Udi
IV. Udi to Sahso Bridge
V .Sahso Bridge to Bhareh
VI. Bhareh to Panchnada

3. Methodology
The entire study area was surveyed by motor boat, raw boat, and motor cycle and on foot along the stretch to locate the dolphins by direct sightings. The information was gathered from local

people, cow herds and the forest department. The survey methods were followed according to Rao *et al*. (VII), Chaudhary (I) and Smith (IX). In this stretch a good population of dolphins was spotted during the surveys. The surveys were conducted every month in each zone. Surfacing of dolphins was observed on both sides. Feeding of dolphins was studied. The dolphins preying technique was observed on the population pools of the river by direct seeing method.

4. Results and discussion

4.1 Population

Table 1 shows the distribution pattern of dolphins in different zones. No dolphin was observed in zone I while 36 adults and 8 calves were found in other five zones. The highest population density was recorded in zone 5 with 15 adults and 4 calves.

Table 1: Census of Ganges dolphin in different zones.

Study zone	Population (adult)	Population (calves)	Total
I	-	-	-
II	10	3	13
III	3	1	4
IV	6	-	6
V	15	4	19
VI	2	-	2

4.2 Habitat

The primary habitats of dolphins were surveyed. No pool was found in zone I However, zone II, III.IV, V and VI were found with 3, 2, 4, 5, and 1 primary habitat pools. The river bank condition in most of the study zone was muddy- sandy with rocky stretches. The highest pool depth was recorded at Baba sidh pool near Sahso bridge and lowest pool depth at Khera Ajab Singh pool (table 2). The following species (table 2) were recorded in the surveyed zones. *Gavialis gangeticus, Crocodylus palustris*, hard and soft shell turtles, and several species of birds.

Table 2: showing habitat characteristics

Habitat	zone	River bank condition	Mean depth (m)	Mean width (m)	Other Aquatic biota	Anthropogenic activities
A Baba sidha kund	V	Muddy sandy	25	250	Gharil, Mugger, softand hard shell turtles, dragon flies birds	Fish anglers, cremation activities
B Mahua sunda kund	V	Sandy	18	170	Gharial, Mugger, soft and hard shell turtles ,birds	Sand mining seasonal cultivation ferry boats
C Panchnanada	VI	Sandy-Rocky Muddy	23	490	Gharial, Mugger, soft and hard shell turtles, birds, dragon flies	---------
D Khera a Ajab singh	V	muddy sandy	12.33	182	Gharial, Mugger, soft and hard shell turtles, birds, dragon flies	----------

4.3 Surfacing behaviour

During the study period (from Nov. 2011 to March 2014) we recorded surface jumps of dolphins in 105 sightings in different zones. The adults appeared partly out of water during surfacing whereas the calves jumped completely out of the surface making U- turns in the air. Surfacing frequency of adults was higher than calves which appeared almost every 10 seconds, while calves had a gap of about 150 seconds in between two surfacing.

4.4 Feeding behaviour

A detailed study of feeding behavior of dolphins was done during low water conditions. We observed that the dolphin adults usually caught hold the fishes in their beak having an average size of 3 to 5 inches long. Due to small size of beak and teeth it is operant that dolphins feed on small fishes .To get sufficient energy , the animal has to feed on a large quantity of fish .so it always follows the shoals of a fish available in shallow zones. Dolphins also chases small fishes into shallow waters to catch them easily.

4.5 Seasonal migration

The dolphin exhibits seasonal migration during monsoon. It moves down stream in Chambal River up to the point of confluence with Yamuna. However, the Gangetic dolphins restrict their movement in the river Chambal and avoid the river Yamuna due to high pollution. The range of migratory movements as observed was found to be within 2-3 km.

4.6 Coexistence with other aquatic animals

In the study area dolphins were found living with, *C. palustris*, soft and hard shell turtles along with fifty species of migratory birds. One of the local birds river tern (*Sterna aurantia)* was found following dolphins which appears to be in the search of fish fragments and other left over of dolphin prey.

5. Acknowledgements
We are highly thankful to forest department U.P. for permitting us to work in the Sanctuary. We are also grateful to the Principal Janta Mahavidyalaya Ajitmal for providing facilities for completing this work. We also thank Dr. Rajeev Chauhan secretary general society for Conservation of Nature Etawah UP, for his valuable suggestions and field guidance. Last but not the least we thank to motor boat drivers Jai Krishna Nibbu lal and Pankaj babu for their rigorous support during survey. We are also indebt to Dr Shailendra singh Director TSA and Mr Aushutosh Tirpathi Field coordinator TSA and Sanjeev Yadav WWF INDIA for logistic support in this study.

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