



Original research article

A study of the winter congregation sites of the Gangetic River Dolphin in southern Assam, India, with reference to conservation



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ABSTRACT

The Gangetic River Dolphin (*Platanista gangetica gangetica*) is an exclusive river dolphin subspecies and inhabits the freshwater river systems of India, Nepal and Bangladesh. This cetacean is primarily piscivorous and strictly inhabits the freshwater ecosystems, chiefly rivers. They generally wander to different parts of the river in the monsoon, but congregate at meander bends in the river course where an eddy counter-current is prevalent and there are greater water depths during winter months. These meander bends are locally called 'Dhar' in the Barak river of southern Assam. The dolphin population in this river and its tributaries and distributaries has declined steeply in the recent past. Although certain factors have been identified, reports on these dolphins are extremely limited. The present study was carried out at the reported and possible winter aggregation sites in the Barak river, its tributaries and one of the distributaries, the Kushiya river, to find the present status of the dolphin and its habitats, along with prey fish abundance, threats and possible conservation strategies. We also conducted a survey on the responses of the local people, generally the fisher-folks, towards different dolphin conservation issues.

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1. Introduction

The Gangetic River Dolphin, locally called 'Phoo', 'Susu', 'Sishu' in southern Assam and first described by Roxburgh (1801), is distributed in the Ganga–Brahmaputra–Megna river systems of India, Bangladesh and Nepal (Choudhury, 1997; Moreno, 2003; Nowak, 1999, 2003; Kasuya and Haque, 1972; Shrestha, 1989; Reeves et al., 1993a,b). Choudhury (1997, 2013) and others (Biswas, 1995; Biswas and Boruah, 2000; Ahmed, 1992; Singha, 2000) mentioned the distribution of the Gangetic River Dolphin in both the Brahmaputra and Barak river systems of Assam. It is the top predator of the river ecosystem and consumes a variety of fishes like *Wallago attu*, *Eutropiichthys vacha*, *Mystus seenghala*, *Labeo rohita*, *Ompok pabo*, *Notopterus notopterus*, *Mystus aor*, *Cirrhinus reba*, *Mastacembellus armatus*, *Hilsa ilisha* and other catfishes, as well as crabs, etc. (Reeves and Brownell, 1989). They generally prefer deeper waters in the rivers and 50% of dolphin sightings in the Ganges were recorded at river confluences (Bashir, 2010).

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Unfortunately, this dolphin is on the verge of extinction in all its habitats due to poaching for oils and meat (Mohan and Kunhi, 1996; Choudhury, 2013), a decrease in prey fishes due to intense fishing (Bashir et al., 2010; Mohan et al., 1997; Biswas et al., 1997), a decrease in river depth due to deposition of sediments at the river beds owing to high embankments (Smith et al., 1998), habitat fragmentation due to construction of dams and barrages, accidental entanglements in fishing nets (Bashir, 2010), habitat destruction, extraction of water from rivers for human use (Reeves et al., 1991), sand mining, siltation and large scale hydrological changes (Dudgeon, 2000). Jones (1982) estimated the population to be around 4000–5000 individuals, which declined to 2000 individuals (Mohan, 1989), and the current global population is hardly 1200 individuals (Smith and Braulik, 2012). It is listed by the IUCN as endangered (Smith et al., 2012) and included in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In India, it has been placed in Schedule-I of the Wildlife (Protection) Act, 1972 and it was declared the National Aquatic Animal in 2009.

The Barak river, the second largest river system of north-eastern India, has been among the most important habitats for the dolphin. Although the status (Singha et al., 2007, 2010, 2013) and distribution (Choudhury, 2013) of the dolphin in this river have been reported, it is among the least studied species. During the monsoons, the dolphins migrate (Moreno, 2003) to different tributaries of the Barak–Kushiyara river, while in winter they congregate at Dhars (meander bends), which usually have greater depths and eddy counter currents, as well as greater fish abundance (Biswas et al., 2007; Singha et al., 2007, 2010; Choudhury, 2013), where the fishes become disoriented and easy prey for the dolphins (Singha et al., 2010, 2013). In the 1970s–1980s, it was a common sighting in the Barak river, its tributaries and distributaries (Singha et al., 2007; Biswas et al., 2007). However, the population declined gradually and recent reports suggest that there are hardly a dozen animals that congregate in the winter season (Singha et al., 2007), while the dolphin is locally extinct from many of the tributaries, such as the Dhaleswari river (Choudhury, 2013).

The present study has been conducted to elucidate the physicochemical water parameters, organic load, prey fish abundance, threats and conservation of the Gangetic River Dolphin in the Barak river system (the Barak river including its tributaries and one distributary—the Kushiyara river).

2. Methodology

2.1. Study area

The Barak river originates in the state of Manipur and flows through the plains of the Cachar, Hailakandi and Karimganj Districts of southern Assam. The major tributaries of the river include Jiri, Chiri, Badrinala, Jatinga, Madhura and Marang on the north bank, and Ghagra, Sonai (with Rukni), Katakhal and Dhaleswari on the south bank. The Barak river bifurcates at the India–Bangladesh border, near Rosulpur and Notunbasti of Karimganj district, producing two distributaries: the Surma and Kushiyara. The Surma flows directly into Bangladesh while the Kushiyara runs along the border through Karimganj before entering Bangladesh. The point of bifurcation is known as Tinganga (Fig. 1). Singla river and Longai river flow through Karimganj district and confluences with the Kushiyara river.

From the available literature as well as interactions with local people, 13 sites where dolphins are or were reported to congregate were selected for the study (Table 1; Fig. 1). Out of these sites, 1–10 are on the Barak river, 11 and 12 on the Kushiyara river, and 13 on the Longai river. Confluences were selected for study as they are among the major congregation points (Choudhury, 2013), while the Dhars were surveyed based on the earlier reports (Singha et al., 2010, 2013).

2.2. Duration and time of study

The study was conducted for a period of 3 months (January–March, 2014) when the animals are easily sighted (Wakid, 2009) as well as due to the objective of the study to elucidate the wintering grounds. Since dolphins are generally more active and easy to identify during the early morning and late afternoon hours, the surveys were conducted between 5:00 AM–11 AM and 3:00 PM–5:00 PM (Indian Standard Time).

2.3. Quantitative study of physicochemical parameters of water

Physicochemical parameters of water of any aquatic ecosystem are indications of the aquatic health and productivity which in turn determines the biodiversity of the system. The tested parameters include quantitative estimation of pH, Total Hardness and concentrations of Iron, Nitrate and Chloride. The tests were performed using commercially available kits (TRANSCHEM Agritech Ltd, Vadodara, India) following the protocols mentioned in the user manual. Turbidity interferes with penetration of light in water bodies and therefore determines productivity. It was measured using a Digital Turbidity meter (NAVYUG, India) which detects Brownian motion.

2.4. Qualitative bacteriological test to determine organic load

A bacteriological test was performed to estimate the presence of coliform bacterial species, which indirectly signifies the organic load. The test was performed using the kit 'Blue Bacta Vial' following manufacturer's protocol.

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