WWF

REPORT

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2017

Signs of Hope

for the endemic and

endangered Bhulan

Comprehensive population assessment of the Indus River dolphin (*Platanista gangetica minor*) in the Indus River - 2017

Preliminary Results Report

Cover photo credit: WWF-Pakistan

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1. Introduction

The Indus River dolphin (*Platanista gangetica minor*) or blind dolphin is an obligate freshwater cetacean, endemic to the Indus River in Pakistan (Braulik *et al.* 2015a). The Indus River dolphin is classified as *endangered* on the International Union for Conservation of Nature (IUCN) Red List of threatened species due to an 80% decline in its distribution range and a habitat severely fragmented by dams and depleted by water diversions (Braulik *et al.* 2015a). It is the second most endangered obligate freshwater dolphin species in the world, the first being the 'functionally extinct' Yangtze River dolphin. It is also listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and legally protected under all wildlife protection legislations of Pakistan.

Indus dolphins persist in five sub-populations in the Indus River's mainstem, each separated by irrigation barrages. A small isolated population of 18 to 35 individuals of the Indus River dolphin also exist in Beas River, India (Khan 2016). The entire Indus subspecies is estimated to number approximately 1,452 individuals according to a comprehensive population assessment conducted in 2011 (Noureen 2015). The largest concentration of Indus River dolphins (estimated as 701 (CV = 9.63%)) individuals in 2011) is found in a 200 km stretch of the river between Guddu (N 28 25.276 E 69 42.432) and Sukkur (N 27 41.033 E 68 51.271) barrages; in the lower reaches of the Indus Basin (Figure 1). The Sindh Wildlife Department declared a 200 km stretch of the river, between Guddu and Sukkur barrages, the 'Indus Dolphin Reserve' in 1974, and dolphin hunting and consumption were banned around the same time.

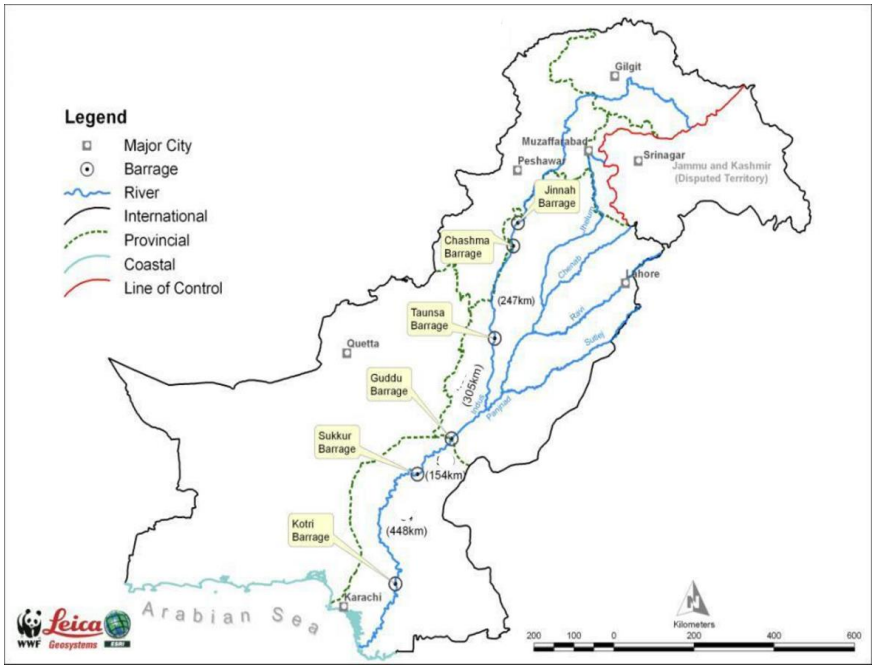

Figure 1: *Current population distribution range of the Indus River dolphin covering a 100 km stretch of the Indus River from Jinnah to Kotri barrages.*

2. Key threats to the survival of the Indus River dolphin

Barrages across the Indus River hold running water and divert it into an extensive network of irrigation canals emerging from each barrage to fulfil the need of water for agriculture. Indus dolphins tend to move to irrigation canals through flow regulator gates, adjacent to barrages, throughout the year. When closed for canal maintenance, dolphins are stranded due to sudden water shortage in canals (Khan *et al.* 2010; Braulik *et al.* 2014b). Intensive fishing in the core habitat of the Indus dolphin is one of the key threats to its population, with high probability of dolphin mortality from entanglement in fishing nets, especially when they move into easily accessible and heavily fished irrigation canals.

Habitat fragmentation and degradation due to extraction of water in the dry season and pollution are amongst the prime threats faced by the Indus River dolphin (Braulik *et al.* 2015a). Since the 1870s the range of the Indus River dolphin has been reduced to one-fifth of its historical range, primarily due to shortage of water as a result of water extraction at barrages. This water shortage has arisen mainly because of agricultural demands and removal of water from the river to supply the extensive irrigation system in Pakistan. The construction of numerous dams and barrages across the Indus River has led to the fragmentation of the Indus River dolphin population into isolated sub-populations, many of which have been extirpated especially from the upstream reaches of the river (Braulik *et al.* 2014a).

3. Comprehensive population assessment 2017

Estimating the population of the Indus River dolphin is of great importance to evaluate the effectiveness of conservation management initiatives. A dolphin population assessment following the same methodology has been carried out every five years since 2001. This information has been key in understanding the population trend of this species, and the health of its habitat in order to adapt our species management initiatives accordingly. WWF-Pakistan has conducted three comprehensive surveys in 2001, 2006 and in 2011 (Braulik et al. 2012, Braulik 2006; Noureen 2013). The fourth comprehensive survey was conducted from 20 March 2017 to 13 April 2017 covering the three sections of the river with the largest number of dolphins (Chashma to Sukkur barrages).

3.1 Survey methodology

The survey was planned for the low water season when dolphins are most concentrated and easiest to count. Data was recorded by three forward facing and one rear facing observer watching from viewing platforms in two oar-powered boats that travelled downstream in tandem. The tandem vessels were

separated by 1.5 km. Dolphin groups were detected by visual observers and group size was recorded with a best, high and low estimate of numbers.

All previous surveys have generated dolphin direct counts (minimum abundance estimates) and have also used capture-recapture models on tandem vessel data to generate an estimate of Indus River dolphin abundance that corrects for individuals that were missed and provides an estimate of precision with the abundance estimate. The modelled abundance estimates are higher than direct counts and are likely to be a more accurate estimate of absolute abundance than direct count, which is a minimum count. The results of the more complex modelling analysis will be presented in a separate publication in future, while the results of the direct dolphin counts are presented here. These are useful because direct counts have been conducted using the same methods over decades and counts can therefore reveal information about trends in the abundance of the Indus River dolphin over time. Direct dolphin counts were calculated from the sum of best estimates of group size for the first boat (Braulik et al. 2012, Braulik 2006).

4. Results[1]

This assessment includes dolphin count data collected from the three largest sub-populations of dolphins: Chasham-Taunsa, Taunsa-Guddu and Guddu-Sukkur. It does not include two small populations between Jinnah-Chashma and Sukkur-Kotri barrages. A total of 808 km of survey effort was conducted in the main channel of the Indus River during the current survey. Dolphin sightings were made under excellent weather condition as over 90 per cent of the survey effort was conducted in the river surface state 0 (water like a mirror) to 1 (tiny ripples) and 100 per cent clear visibility.

4.1 Total Population Estimate (Chashma - Sukkur)

A total of 1,816 dolphins were sighted during the assessment. This is based on the sum of the estimated best (B) group size estimation, following Braulik 2006. The sum of the direct counts of the three sub-populations surveyed between Chashma and Taunsa barrages was 170 (0.58 dolphins/ km), between Taunsa and Guddu was 571 (1.62 dolphins/ km) and between Guddu and Sukkur barrages was 1,075 (161.62 dolphins/ km). A summary of the survey results for each of the surveyed sub-population of the Indus River Dolphin is included in Table 1. The dolphin encounter rate (dolphins/linear km of river) increased dramatically as the survey proceeded downstream with the highest encounter rates between Guddu and Sukkur barrages.

[1] These survey results are based on direct counts of a single boat and are therefore a minimum abundance estimate. The final results based on mark and recapture analysis will provide a larger abundance estimate that includes an estimate of the number of individuals missed and a measure of precision that is a more accurate estimate of population absolute abundance.

River section	Abundance (counts)	Distance surveyed (km)	Dolphins/ km	Mean group size	% of population
Chashma-Taunsa	170	293.1	0.58	2.8	9
Taunsa-Guddu	571	353.3	1.62	3.0	32
Guddu-Sukkur	1075	161.6	6.65	7.1	59
Total	1816	808	-	-	100

Table 1: *Summary results of the Indus River dolphin population assessment 2017*

4.2 Group Encounter Frequency

The sum of the lowest and highest estimates of group size estimated during the study were 1,758 and 2,030 individuals respectively. A total of 402 dolphin groups were recorded during the survey. Group size ranged from 1 to 28 individuals (Figure 2). An increase in dolphin group sizes was observed as the survey continued downstream. With the increasing dolphin encounter rate and abundance of sub-population a corresponding increase in the group size was recorded (Braulik 2006).

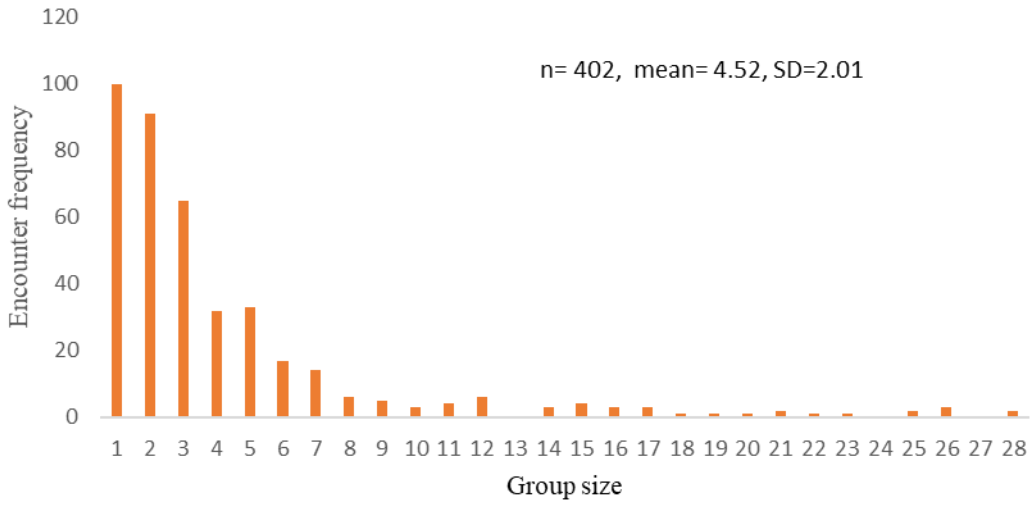

Figure 2: *Size of Indus River dolphin groups encountered in the Indus River. March-April 2017*

The number of dolphins/group recorded between Chashma and Taunsa were 2.79 (SD=0.86), the number of dolphins per group increased to 3.02 (SD=0.83) for the sub-population between Taunsa-Guddu barrages and the largest average size of the group was recorded from the sub-population between Guddu-Sukkur barrages 7.07 (SD=2.73). The dolphin encounter rate between Guddu and

Sukkur barrages was extremely high and dolphins were distributed continuously along the river channel.

River section	Mean number of dolphins/ km (2017)	Number of groups sighted
Chashma-Taunsa	0.58	61
Taunsa-Guddu	1.62	189
Guddu-Sukkur	6.65	152

Table 2: *Indus River dolphin encounter rates in the Indus River – 2017*

4.3 Population abundance

Overall, direct counts based abundance estimation of this survey suggests that the population may well be increasing, with approximately 965 individuals estimated in 2001 rising to 1,410 in 2006; 1,312 in 2011 and 1,816 in 2017. Direct count results for the sub-population between Chashma-Taunsa barrages were 170. Similarly, abundance estimations based on direct counts were 571 between Taunsa and Guddu barrages. The last sub-population surveyed between Guddu-Sukkurr barrages, which historically hosted the highest population of the Indus River dolphin also indicted a similar significant increase in the population. Direct count based estimation of the sub-population between Guddu and Sukkur barrages was 1,075 in 2017.

5. Discussion

The survey results consistently indicate that the population of this endangered species has been steadily rising since at least the year 2001 and probably since the 1970s when hunting was banned (Braulik et al. 2012). Importantly, the current survey also recorded higher counts, suggestive of an increasing dolphin abundance between Chasma-Taunsa barrages, which is an area where the dolphin population previously appeared to be stable. Direct count results for the sub-population between Chashma-Taunsa barrages were 84, 82, 87 and 170 for the year 2001, 2006, 2011 and 2017 respectively. Between Taunsa and Guddu, similarly, direct counts have been steadily rising from 259 in 2001, to 465 in 2011 and 571 in 2017. The last sub-population surveyed between Guddu-Sukkurr barrages, which historically hosted the highest population of the Indus River dolphin also indicated a similar significant increase in the population from 602 in 2001 to 1,075 in 2017.

WWF-Pakistan has been working towards the conservation of this endangered and endemic species following a participatory approach. The organization's conservation work integrates research, effective law enforcement, and stakeholder and community engagement. A dolphin rescue programme has been in place since 1992 jointly led by WWF-Pakistan and the Sindh Wildlife Department to rescue any stranded dolphins from canals and safely release them back into the main river channel. Out of a total 147 dolphins reported trapped in canals between 1992 to 2017, 131 dolphins were rescued successfully and released into the river while only one individual died during the rescue operation. Thirty-three dolphins could not be rescued and died as a result (Braulik et al. 2015b). Additionally, WWF-Pakistan and the Sindh Wildlife Department have established a dolphin monitoring network in collaboration with relevant stakeholders and local communities to monitor the Indus River as well as its adjacent canals and tributaries to rescue any stranded dolphins. The monitoring teams of this network have conducted over 100 monitoring surveys since 2015 to stop illegal fishing and to rescue stranded dolphins with 12 successful rescues during 2016. Additionally, a 24-hour phone helpline has been set up to report any incidences of stranded river dolphins; so far 200 calls have been received reporting sightings of dolphins in irrigation canals and the main river channel leading to one successful rescue of a stranded dolphin in 2016. The observed increase in the population may also be an outcome of these concrete and continuous efforts.

6. Conclusion

Based on the recent survey, and in light of previous studies, it can be concluded that the population of the Indus River dolphin is increasing. However, there is a need to further study and understand other factors, in addition to current conservation efforts, which may be influencing this ascending trend.

While strengthening conservation efforts, there is a need to explore avenues of new research and conservation opportunities to enhance understanding about the Indus River dolphin and associated threats for better conservation management.

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ENDANGERED

The Indus River dolphin is an endangered freshwater cetacean endemic to the Indus River in Pakistan.

2001

The first dolphin population survey was carried out in 2001, and is repeated every five years.

SPECIES MANAGEMENT

Survey information is key in understanding the population trend of the dolphin and the health of its habitat in order to adapt species management initiatives.

INDUS DOLPHINS RIVER

Indus dolphins persist in five sub-populations in the Indus River's mainstem, each separated by irrigation barrages.