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BIOSTATUS OF *PLATANISTA MINOR* OWEN (INDUS RIVER DOLPHIN) IN KHYBER PAKHTUNKHWA RANGE, PAKISTAN

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ABSTRACT

To evaluate the status, distribution and threats to *Platanista minor* (the Indus River dolphin), in its range in Khyber Pakhtunkhwa, a survey was undertaken in the month of March, 2019. The study comprised of main Indus River and its various channels. An abundance estimate of 43 dolphins was obtained from the aggregate of best group estimates. Around 51.2% dolphins population (0.81 dolphin/km) was found in 27 km of the river from Miran to Ramak, 39.5% dolphins population (0.37 dolphin/km) in 46 km of the river from the Bridge to Miran in the Indus River and 9.3% dolphin population (0.13 dolphin/km) was found in 30.5 km of river from Saggu to the Bridge. In the Indus River, the most noteworthy dolphin's population was between the Miran and Ramak. An increment in dolphin experience rate and plenitude was seen a downstream way. Threats to dolphins are multifold - vessel movement, aggravation from the duck and crane hunters, large amounts of anthropogenic risks and no successful prevention. River dolphins are especially helpless against the exercises of people in their limited natural surroundings. The threats vary topographically in their significance but generally include coincidental murdering during fishing operations, territory misfortune and population discontinuity.

Key words: Indus River, *Platanista minor* Owen, Khyber Pakhtunkhwa, Status

INTRODUCTION

Platanista gangetica minor (the Indus River dolphin) or blind dolphin is an obligate freshwater cetacean, endemic to the Indus River in Pakistan. It is classified on the International union for Conservation of Nature (IUCN) Red List of threatened species as endangered due to an 80% decline in its distribution range and a habitat severely fragmented by dams and depleted by water diversions (Braulik *et al.,* 2015). It is the 2nd most endangered obligate fresh water dolphin species. The first which is functionally extinct is the Yangtze River dolphin (Khan, 2016).

It is one of the World's rarest well evolved creature, and the second most jeopardized cetacean on the planet and was recorded as 'Imperiled' in 2004 IUCN red list. The Indus River dolphin is fresh water vertebrate: they inhale air, warm-blooded, suckle their young, and an infant dolphin is breast fed by its mom for as long as a year, and has hair before birth. It demonstrates side swimming, echolocation and carting away its posterity's on its back - unique amongst freshwater types of dolphin (Urooj *et al.,* 2016).

Currently, in the genus *Platanista,* there are two subspecies of Dolphin, *Platanista gangetica minor* (the Indus River Dolphin) ordinarily called Blind Dolphin, and *Platanista gangetica gangetica* (the Ganges River Dolphin) (Kasuya, 1972). The Indus River Dolphin is endemic to Pakistan and discovered just in Indus River, and chronicled records demonstrate that they were found in whole Indus River, yet now Indus Dolphin covers one-fifth of its past range (Reeves *et al.,* 1991; Awan and Shah, 2012). Up till 1998, Indus River Dolphin and the Ganges River Dolphin were viewed as independent species. In 1998, their order was changed from two separate species to subspecies of a single species (Noureen, 2013).

Verifiable records found that Indus Dolphin was available in whole Indus River in past, however now because of natural surroundings fracture, its population is isolated into different subpopulations based on Indus River tributaries. Presently, Indus Dolphin is existing within 1000 km segment of the Indus River (Urooj *et al.,* 2016). The development of the Indus Basin Irrigation System (IBIS) divided the Indus River Dolphin population.

Low levels of waters and unlawful chasing have demolished and wiped-out the dolphin in numerous parts of its previous range (Khan and Niazi, 1989). The entire Indus subspecies is estimated to number approximately 1,452 individuals according to a comprehensive population assessment conducted in 2011 (Noureen, 2013). There are numerous dangers to their survival. Reckless and extensive fishing that lessens their prey accessibility is an extensive factor. Additionally, they are in some cases coincidentally entrapped in the fishing nets which can cause fatalities. In past, the Indus River fundamental channel was not seriously fished, and rather, fishing concentrated on

side channels and nearby pools that are once in a while utilized by dolphins. Since 2010 in Sindh area changing fishing rehearses have prompted an expansion in Dolphin mortality and recorded numerous more instances of Dolphins coincidental catch in fishing gear (Braulik *et al.,* 2014).

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*., 2015). Fishing gear-incited mortalities as a result to the unplanned snare in fishing gears is one of the key dangers to the greater part of the cetaceans (Aisha *et al.,* 2017). Viewing the discussed facts, the present research was conducted with aim to know about the biological position and current distribution of the Indus River Dolphin (*Platanista gangetica minor*) in Dera Ismail Khan Range Khyber Pakhtunkhwa, Pakistan, to analyze the threats to the lives of Indus River Dolphin and to suggest the possible solutions for conservation and protection of endangered Indus River Dolphins.

MATERIALS AND METHODS

The present research work was conducted by surveying the area of 103.5 km of the Indus River from Saggu (close to Meetapur town) (N32° 01.7; E71° 02.7) to Ramak (a place close to Indus River) (N31° 19.4; E70° 47.3). This region was chosen for the overview because it incorporated the area of all affirmed blind dolphin sightings since 1980. Late winter is the ideal time to lead a plenitude review as Indus release is at its yearly least and dolphins are moved into a smaller channel and are, in this way, less demanding totally. This particular research work was performed during a period of extended drought in Pakistan, and dry season river discharge was, therefore, lower than average.

The large number of dolphins seen near the approach point in Khyber Pakhtunkhwa, the eagerness of neighborhood wild life office staff, the wellbeing of the zone, and want to build the profile of the dolphins present in Khyber Pakhtunkhwa area being chosen. A camp was built up beside a river bank. It was a decent territory for launching the vessel, flat for camping and was easily accessible by vehicle. There were regular visitors to the area in the morning due to the ferry crossing and some local fishermen were camped nearby. The camp was situated at N31° 25.858 E70° 46.674.

The strategies for conducting research were essentially the same as practiced by Smith and Reeves (2000) for Asian waterway dolphins in wide-channel living space. Eyewitnesses, comprising of D.I. Khan Wildlife Department staff were prepared in dolphin review methods preceding the overview. The study was led by paddle controlled wooden watercraft going at 5-7 km/h in a downriver course. The boat studied a solitary transect, following the most profound channel and moved from bank to bank as the channel wandered. Eyewitnesses reviewed with the stripped eye and Nikon 7 × 50 binoculars from a survey stage around 3 m over the water surface. Studies were led utilizing three forward eyewitnesses, one back onlooker, and an information recorder. The back eyewitness was in charge of recognizing creatures missed by the essential perception group and furthermore helped the essential group in group tracking and group size estimation. Colleagues pivoted positions each 30 min and got a rest period to look after sharpness.

Collection of data

The Survey Data Form was utilized for group information on review exertion. All boxes on each line were filled on the arrangement following timings: this frame was additionally used to gather data on the climate conditions and territory. Towards the start and end of every time of looking over, the ecological conditions were recorded when eyewitnesses pivoted positions and when conditions changed. The impact of a twist on the waterway surface was assessed by the accompanying scale.

Sightings

When a dolphin was located at the point, the vessel kept moving downriver yet dynamic looking over for new dolphin group was incidentally suspended while eyewitnesses concentrated on getting a precise group size estimate. The sightings were all affirmed by a second eyewitness. Similarly, the group sizes were assessed with a best, low and high estimate of numbers to represent the degree of uncertainty. Dolphins no more than 500m apart, were characterized a dolphin group inside a territory of comparable hydrological attributes (Braulik, 2006) as dolphins are much of the time saw in free accumulations with a minimal evident association between individuals. The best and low estimate of zero was utilized if the locating was unsubstantiated or if there was a plausibility that the dolphin was following the vessel and might have already been counted (Smith *et al.,* 1994). Great coordination between every one of the eyewitnesses, particularly forward and rear was basic to get a precise estimate of group size as the vessel moved downriver through the group.

Dolphin groups were for the most part located downstream of the overview vessel. At the point when a group was located, the 'recognition' area was recorded through GPS, a second 'correct' area was recorded when the vessel was situated inside or at right edges to the group. Due to their movement from surveyed to the un-surveyed, the probability reaches overnight was considered to be balanced by the probability that an equal number of dolphins were missed due to their movements in the opposite direction.

Identification of Threats

For identification of threats to Indus River Dolphin we followed questionnaire, informal discussion, and discussion with nomads near the catchment area, interviews, and personal observations.

Data analysis

The Dolphin abundance was calculated by summing of the best group size estimates. Similarly, low and high estimates of group size were totaled to give low and high estimates of overall abundance. Unless stated otherwise, reported abundance always refers to the sum of best group estimates. Statistical Package for Social Sciences (SPSS), version 22 for windows was used for the analysis of data. To determine the number of dolphins/kilometer, mean and standard deviation, the accompanying formula was utilized:

$$\text{Number of dolphin/km} = \frac{\text{Total Number of Dolphins sightings}}{\text{Total Distance covered of the River (Km)}}$$

RESULTS

Distribution and abundance

An aggregate of 103.5 km of overview exertion was directed, comprising of an area of 30.5 km of the Indus River from Saggu close to Meetapur town to D.I. Khan Bridge, 46 km of Indus River from D.I. Khan Bridge to Miran (close to Indus River), and 27 km of the Indus River from Miran to Ramak. Dolphin sightings were made under excellent weather condition as over 90 percent of the survey effort was conducted in the river non-turbulent surface state - (water like a mirror) to 1 (tiny ripples) and 100 percent clear visibility. Territories of all dolphins were reviewed, including principal and optional channels. Dolphins were seen in roughly 64.4 km of the River Indus and were available in three zones, isolated from each other by the unsettling influences of such a large number of vessels activity of the crane and duck seekers. Dolphin population of around 53.7% happened in an area of 27 km of waterway length from Miran onwards to Ramak in the Indus River, 38.9% of the dolphin population happened in 46 km of river length from D.I. Khan Bridge to Miran in the Indus River and 7.4% of the dolphin population happened in 30.5 km of waterway length from Saggu, to D.I. Khan Bridge (Table 1). No dolphins were found in the Indus River close to the camp on the Miran Spur close Indus River. Dolphins were once in a while located in optional channels; in any case, for the most part, the rates were particularly lower than those in the primary channel. In the most elevated estimate roughly half of the dolphin population was found in 27 km of river from Miran onwards to Ramak in the Indus River, 42.2% of the dolphin population in 46 km of waterway from D.I. Khan Bridge to Miran in the Indus River and 7.8% of the population in 30.5 km of river length from Saggu to D.I. Khan Bridge.

Table 1. Summary of blind dolphin, survey results (Best estimate of group size). * Located areas near Indus River; ** SD: standard deviation

Section of the Indus River	Abundance	Distance surveyed (km)	Dolphin/km	Mean group size ± SD** (group size range)	% of total population
Saggu-D.I. Khan Bridge*	4	30.5	0.13	-	9.3
D.I. Khan Bridge-Miran*	17	46	0.37	2.83 ± 0.69 (2-4)	39.5
Miran-Ramak*	22	27	0.81	2.75 ± 2.11 (1-8)	51.2
Total for Indus River in Khyber	43	103.5	-	2.86 ± 1.64 (1-8)	100

In all, 43 dolphins were ascertained from the best group size estimate. Experience rates expanded as the work continued downriver to Ramak (Table 1). Between Saggu and D.I.Khan Bridge, the aggregate of least group size estimates was 04 dolphins (0.13 dolphins/km), between D.I. Khan Bridge to Miran, 17 (0.37 dolphins/km) and between Miran and Ramak, 22 dolphins (0.81 dolphins / km) were recorded.

The best group size

The best group size extended from 01 to 08 animals with two and three creatures the most regularly experienced. As dolphin experience rate and population abundance expanded, there was a comparing increment in mean group size. Between D.I. Khan Bridge and Miran 2.83 $\pm$ 0.69 dolphin/bunch were recorded and the biggest mean group size, 2.75 $\pm$ 2.11, were recorded between Miran and Ramak, in the Indus River (Table 1). The biggest dolphin group, which involved 08 dolphins, was situated in the Indus River, exceptionally far from our camp quickly downstream of Ramak.

DISCUSSION

Indus River dolphin has been classified most endangered species in Pakistan since 1976 under the index 1 of CITIES and lawfully ensured under all Wildlife insurance representation of Pakistan (Urooj *et al.,* 2016). On the planet, the Indus River Dolphin is the most imperative species. Because of the blend of human-made boundaries, for example, dams and barrages, chasing, and a restricted normal range have brought about a perilously low aggregate population of just a few hundred individual. Since the 1970's, these dolphins are delegated jeopardized. The dolphins amazingly low population size may likewise confine their gene pool, thus they might have many problems associated with low genetic variation within a population (Reeves and Chaudhry, 1998). In Pakistan the recent flood in 2010 has extremely influenced the financial state of indigenous communities, therefore, heightening their reliance on normal assets for their feasible survival (Waqas *et al*., 2012). The history reveals that the blind dolphin was found in wealth in the Indus River and its channels, chiefly from the Himalayan lower region (Khyber Pakhtunkhwa) to Delta district (Sindh). Approximately 100 years ago, the range of Indus River estimated by Anderson (1879) was around 3400 km from upriver Attock to downriver Delta region and Chenab, Ravi, Sutlej and the River Jhelum. Currently, the possibly accessible environment has contracted to 1000 km basically in the middle of Jinnah barrage and Sukkur barrage. The characteristic biodiversity of the Indus bowl has been changed by the development of barrages. Correspondingly, development of Barrages and Dams on waterway Indus have changed the conveyance and developments of Indus Dolphin and have separated the flow population of Indus Dolphin into four or five sub-populations in disconnected pockets in the middle of these barrages and dams (Gachal and Slater, 2004). At present situations the Dolphins possesses roughly $1/5^{th}$ of its previous range (Reeves *et al*., 1991), and in 2004 IUCN Red List, it was recorded as Jeopardized. In Pakistan, the vast majority of the immediate obligation regarding natural life preservation and ecological security is provincial. The conveyance of the Indus River dolphin falls completely inside three territories: Sindh, the Punjab, and Khyber Pakhtunkhwa. There is formation of the border between Khyber Pakhtunkhwa and Punjab due to the River Indus from about 31° 20 N to 32° 30 N, and again from 33° N to the Himalayan foothills. In the extreme north of the species range in Khyber Pakhtunkhwa jurisdiction, just around 150-200 km of the waterway there is shared with Punjab (Reeves *et al*., 1991; Urooj *et al*., 2016). WWF-Pakistan has been related to the protection of this species since 1999. Surveys to estimate abundance suggest that the population may well be increasing, with approximately 1,200 individuals estimated in 2001 rising to 1550-1750 in 2006 and 1,452 in 2011. A fourth comprehensive population assessment which was conducted during March-April 2017 and the preliminary population estimate are between 1800-1900 individuals (Aisha *et al*., 2017). A decrease in the Dolphin population during this survey was found when contrasted with the past overviews, locally led by the Wildlife Department of D.I. Khan. This implies Dolphin population consistently diminishes. It is a direct result of the broad obstruction of human exercises and catastrophic events, incorporating flood in 2010, which was in charge of a great deal of mortality of the Indus River Dolphin. While comparing the counts from a place with place, a school of 11 dolphins close to D.I. Khan Bridge (Chaudhry and Khalid, 1989) was missing. Correspondingly, close to the Miran Spur in the Indus River, no dolphin was watched yet as per the wildlife department of D.I. Khan and the crane seekers, there were schools of dolphin. Rest of the individuals was situated in the region of past areas, however not precisely in similar areas. The number of inhabitants in dolphins persistently increments from Chashma downstream (Chaudhry and Khalid, 1989). From Chashma to Taunsa just 15 dolphins were recorded, which is less, however, the increment from Chashma downriver was plainly seen in the present study on the grounds that from Saggu downriver, the population is persistently expanding towards the Ramak, close to the Punjab limit. This could be because of expanding frenzy of the Indus River or because of hotter temperature, greater efficiency, better sustenance accessibility, and more qualified environmental highlights. There is a fear that a few dolphins may have

not been watched. Some may have moved to little side rivers where the pontoon couldn't have run or some may have moved indefinitely because of the aggravation made by the excess of vessels activity of the crane and duck seekers. This could be reasonable as the dolphin; with the exceptionally created highly developed echo-location system could have detected the noise from far off distances and made obscure from the view. Chasing or poaching of dolphins inside the Khyber Pakhtunkhwa isn't known. A few migrants eat the dolphin meat even at this point. These come to be a portion of alternate reasons (dangers) of dolphin declining. With respect to the network of a fisherman, such an Act is obscure. If at all a dolphin is gotten in the fishing net, it is discharged back in the river. Waterway dolphins are especially helpless against the exercises of people as a result of the limited bounds of their natural surroundings. Regularly increasing human population, frequently living in impoverished conditions, make expanding requests on water and riparian assets. Individuals depend on rivers to give them nourishment, drinking water, and the way to wash and take care of their livestock. Also, water is required to irrigate crops and to supply industry. Residential and modern squanders are released into rivers. Rivers are altered for producing hydroelectric power, controlling surges, increasing navigation access, and for irrigation , local, and mechanical utilize, and for the areas of real water advancements influencing waterway dolphins. These exercises result in the debasement and loss of aquatic habitat.

Among the potential components which added to the range decay and extirpation of sub-populations in the upper spans of the Indus River, low release of the waterway amid the dry season was the principle supporter of its range decrease. Moreover, quick industrialization has fundamentally added to expanded surface water contamination in the country, as more than 90% of the modern and residential effluents advance toward the waterway untreated. The circumstance with the Indus tributaries which pass through the major industrial lands is most extreme and they convey considerably higher heaps of toxins than the principle Indus River itself (Braulik *et al*., 2014). The absence of occasional and legitimate systems of the water quality evaluation of the waterway additionally heightens the issue to distinguish those areas of the river which convey higher heaps of waste. Traces of usually utilized pesticides, for example, DDT, Cypermethrin, Deltamethrin, and Endosulfan, have been found in the tissue of dolphins which died in Sukkur in 2011 (WWF-Pakistan, 2011).

WWF-Pakistan has been working in the direction of the preservation of this jeopardized and endemic species following a participatory methodology. The association's protection work incorporates look into, compelling law authorization, and partner and network commitment. A dolphin save program has been set up since 1992 together driven by WWF-Pakistan and the Sindh Wildlife Department to safeguard any stranded dolphins from trenches and securely discharge them once again into the fundamental river channel. Out of an aggregate, 147 dolphins caught in waterways during 1992 to 2017-131 dolphins were safeguarded effectively, what's more discharged into the river while just a single individual kicked the bucket amid the protected activity. Furthermore, WWF-Pakistan and the Sindh Wildlife Department have set up a dolphin checking system in a joint effort with pertinent partners and nearby networks to screen the Indus River and additionally its neighboring channels and tributaries to save any stranded dolphins.

CONCLUSION

The population of Indus River Dolphin is decreasing continuously due to human intervention and random catastrophic events. It is undermined fresh water obligate species and will be close to eradication if legitimate administration and preservation acts were not taken. The expansive range decrease, population fracture, little size of a few population and proceeding with living space debasement, and additionally our poor comprehension of some potential dangers, make the future exceptionally unverifiable for the Indus River dolphin.

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