Pak. j. life soc. sci. (2003), 1(2): 137-140

Pakistan Journal of
Life and Social Sciences

Indus Dolphin Population Towards Increase in Punjab

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Abstract

Population of Indus dolphin *Platanista minor* was studied in the River Indus of Pakistan from Jinnah-Guddu Barrage during March 2001. Total 543.31 dolphins were estimated. At 154 different sites, 278 dolphins were observed with mean group size of 1.8. Results indicated that 70% dolphin population had surfacing-interval from 0 to 90 seconds and this population was observed 100% with probability 1.0 within distance from 0 to 300 meter from the observers. Twenty-four per cent population had surfacing-interval 91-180 seconds and was observed with probability 0.30 on surface of water within 301-600m sighting distance. Six per cent population of dolphin had surfacing-interval 181-270 seconds and was observed with probability 0.12 on surface of water within 601-900m sighting distance from observers. During the present study, sighting distance and surfacing-intervals were found important parameters in dolphin population estimation. With the increase in sighting distance and surfacing-interval, the probability of dolphin visibility on surface of water decreased and chances of missing dolphins increased.

Key words: Indus dolphin, Population, Punjab

Introduction

Blind Indus dolphin (Platanista minor Owen, 1853) locally called "Bhullan" is endemic in Pakistan. The animal is one of the least abundant and the most endangered cetacean species of the world. Anderson (1879) reported its presence in all rivers of the Punjab. Presently the population of Indus dolphin is confined to heavily turbid and silt laden water of the Indus from about 24km downstream of Jinnah Barrage to Kotri Barrage (Chaudhry and Chaudhry, 1988).

The Indus dolphin is an endangered fresh water dolphin and enlisted in International Union for Conservation of Nature Red Data Book since 1976. This species is included in Appendix-I of the convention on International Trade in Endangered species, therefore, wanted strict protection. The species is also protected under the Wildlife Act of Punjab, North West Frontier Province and Sindh.

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Conservation efforts for dolphin started in 1970, when the plight of Indus dolphin was high lighted by scientists especially from Switzerland and Spain (Pilleri, 1970 and Kasuya, 1975).

Racovita (1964) was the first biologist to call attention on the importance of surfacing-interval performed by the cetaceans. According to Pelleri (1980) dolphin exhibit longer surfacing-intervals during active swimming while chasing its prey. During this study surfacing-interval and sighting distance were considered for dolphin population estimation. Study was conducted to know the present population status for management planning in its natural habitat.

Materials and Methods

The study was conducted during March 2001. Two traditional wooden fishing unpowered vessels/boats were used for population estimation survey of Indus dolphin from Jinnah-Guddu Barrage. The survey team was divided into two equal groups and each group used a separate vessel. First vessel surveyed the main channel whereas, second vessel surveyed the side channel of the river. On each boat there were five research positions, serving as under:

1. Left observer-surveyed the water from in front of the vessel to 90 degrees from the vessel on the left side.
2. Central observer-surveyed the river directly in front of the vessel and 45 degrees on either side of the vessel.
3. Right observer-surveyed the water from in front of the vessel to 90 degrees from the vessel on the right side.
4. Rear observer-surveyed back side of the vessel and searched for dolphins missed by the main survey team.
5. Data recorder-was responsible for filling the data sheets and using Global Positioning system (G.P.S-Model III, German).

Survey data form was used to collect information daily. When a dolphin was sighted, its sighting position was immediately recorded with the help of G.P.S. Its sighting distance from observer was also recorded. The vessel was not stopped during sighting but active effort was suspended while the observers determined group size. Average speed of the vessels ranged 5-5.5 km/hour.

Population of dolphin was estimated by direct observation:

During survey dolphin sighting distance from observer, surfacing intervals and dolphin group size were recorded.

To compensate the missed dolphin population, correction factor (C.F.) was worked out through dividing the surfacing-interval probabilities by sighting distance probabilities (Maan and Chaudhry, 2000). Population and mean group size was calculated by applying following formulae (Maan and Chaudhry, 2000).

Estimated population = No. of dolphin sightings x Correction factor x Mean group size

$$\text{Mean group size} = \frac{\text{Total No. of dolphins observed}}{\text{Total No. of dolphin groups}}$$

Results and Discussion

Main stream and side channels of river Indus were surveyed from Jinnah – Guddu Barrage during which total 278 dolphins were observed at 154 different sites with mean group size of 1.8. Distribution of dolphin population and number of sightings are shown in Table 1. Population was estimated with the help of sighting distance and surfacing interval. Within distance ranging 0-300m from observer 108 dolphin groups were observed. Within distance ranging 301 – 600m and 601-900m, thirty-three and thirteen dolphin groups respectively were observed.

Table 1: Distribution of dolphin population from Jinnah-Guddu Barrage

S.No.	Location		Approximate length of river (km)	No. of sighting	No. of dolphins observed
	From	To			
1	N33°00′ E72° 65′	N32° 25′ E71° 22′	68.4	1	2
2	N32° 25′ E71° 22′	N31° 45.87′ E70° 56.30′	114.3	6	8
3	N31° 45.87′ E70° 56.30′	N31° 17.35′ E70° 48.04′	81.1	18	32
4	N31° 17.35′ E70° 48.04′	N30° 30.22′ E70° 51.30	111.3	20	35
5	N30° 30.22′ E70° 51.30′	N30° 01.89′ E70° 47.81′	86.2*	28	50
6	N30° 01.89′ E70° 47.81′	N29° 18.68′ E70° 42.71′	106.5	32	50
7	N29° 18.68′ E70° 42.71′	N28° 54.66′ E70° 27.90′	108.1*	23	41
8	N28° 54.66′ E70° 27.90′	N28° 25.93′ E69° 43.39′	153.5*	26	60
Total			829.4	154	278

*included side channel

Sighting probabilities were worked-out on the basis that all dolphins present within distance 0-300m from the observer were 100% visible on the surface of water and there were no chances of missing dolphins from sighting within this distance, therefore, have probability 1.0. With the increase in sighting distance probability of sighting dolphins on surface of water decreased. The dolphins observed within distance 301-600m from observer had sighting probability 0.30 whereas dolphins observed within distance 601-900m had probability 0.12 (Table 2).

Two hundred observations of surfacing intervals on different animals were recorded and classified into 0-90 seconds, 91-180 seconds and 181-270 seconds. In 140 observations, surfacing interval ranged 0-90 seconds, in 48 observations 91-180 seconds and in 12 observations 181-270 seconds. Visibility of 70% dolphin population on water surface ranged between 0-90 seconds, 24% population 91-180 seconds and 6% population 181-270 seconds. With the increase in surfacing interval, probability of visibility of dolphin on water surface decreased from 0.70 to 0.24 and 0.06 (Table 3).

Results indicated that 70% dolphin population had surfacing-interval 0-90 seconds and this population had sighting probability 1.0 within distance 0-300m from observer. 24% dolphin population had surfacing-interval 91-180 seconds and were observed with probability 0.30 within distance 301-600m from observer. 6% dolphin population had surfacing-interval 181-270 seconds and were observed with probability 0.12 within distance 601-900m from observer.

Total 543.31 dolphins were estimated with the help of correction factor, between Jinnah-Guddu Barrage of which 278 dolphins were actually observed. According

to estimates 265 dolphins could not be observed due to increase in sighting distance and surfacing-interval (Table 4).

It was noticed that the number of dolphin sightings recorded by each observer was highly dependent on his concentration, therefore, it was important that all observers remain fresh. Dolphin sighting is also dependent on the eye sight of the observer which may effect adversely in case of weak eye sight.

It was identified that sighting distance and surfacing-interval are very important in making accurate and precise estimates. Therefore, it depends upon the accuracy of correct recording of sighting distance and surfacing-interval. As distance between dolphin and observer increases the chances of sighting dolphins on water surface decreases. Same is the with surfacing-interval. When both these factors are increased, chances of sighting dolphins on water surface are decreased and chances of missing of animals from counting are increased.

Table 2: Distribution of dolphin population with respect to sighting distance

S.No.	Sighting Distance	No. of Dolphin Sighting	Sighting Probability
1	0-300	108	1.0
2	301-600	33	0.30
3	601-900	13	0.12
Total		154	

Table 3: Distribution of dolphin population with respect to surfacing interval

S. No.	Surfacing-Interval (Seconds)	No. of Observations	Percentage of Dolphin Population	Surfacing-Interval Probability
1	0-90	140	70.00	0.70
2	91-180	48	24.0	0.24
3	181-270	12	6.0	0.06
Total		200	100.00	

Many scientists tried to estimate the population of Indus dolphin in the past. Niazi (1985) estimated, 72 dolphins from Jinnah to Guddu Barrage in December 1972 at 15 unspecified location. It was not a complete and thorough survey. Roberts (1977) reported total population of Inuds dolphin below 200 in whole range. Pilleri and Bhatti (1980) counted only 36 dolphins between Taunsa and Guddu Barrage in April 1978 whereas, 109 dolphins were directly observed in the same area during present study. A good population of Indus dolphin was also reported by Niazi (1985, 86); Chaudhry and Chaudhry (1988); Niazi and Azam (1988) and Saif (1991) at Taunsa Barrage. They did not estimate the population in whole area of Punjab. They reported only the observed animals. On 27-28 January 1991, Reeves counted a minimum of 35 dolphins in the first 50km of river upstream from Guddu Barrage.

Maan and Chaudhry (2000) directly observed 129 and estimated 199 dolphins between Chashma and Guddu Barrage during April and December, 1997. They used one motor-boat and only main channel of the river Indus was surveyed, whereas, during present study the Indus river stretch from Jinnah to Guddu Barrage covering more area and two unpowered boats were used. One boat surveyed the main channel whereas, other was deployed in the side channel. Unpowered boats were used because powered boats are biased as dolphin may be disturbed with the noise of the engine. Due to these reasons the results of the present study were much better and the score of observed/ calculated population of dolphin was very high. Breeding of dolphin is another factor which may also increase the dolphin population because there is a gap of more than three years between these two studies.

It was concluded that Indus dolphin population is increasing day by day due to good breeding and conservation/ protection measures taken by the Punjab and N.W.F.P Wildlife Departments.

Table 4: Estimated population of Indus Dolphin from Jinnah-Guddu Barrage.

S.No.	Sighting Distance (m)	Dive time Interval (Seconds)	Sighting Distance Probability	Surfacing Interval Probability	Correction Factor	Mean Group Size	Extimated Population
1	0-300	0-90	1.00	0.70	0.70	278/154 = 1.8	154x1.8x1.96 = 543.31 dolphin
2	301-600	91-180	0.30	0.24	0.80		
3	601-900	181-270	0.13	0.06	0.46		
1.96							

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