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THE CAPTURE AND TRANSLOCATION OF INDUS RIVER DOLPHINS (*PLATANISTA MINOR*) FROM THE SUKKUR BARRAGE CANALS TO THE INDUS RIVER DOLPHIN RESERVE, SINDH, PAKISTAN

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Abstract

In November 1999 and January 2000, four out of five dolphins trapped in canals were successfully translocated from Sukkur Headwork right and left irrigation canals. Journey time from place of capture to the main reserve was 1-3 hours. Method used for capturing the dolphins proved satisfactory and the animals released in the Indus unharmed. The future of dwindling populations of dolphins lies in a complete survey of both, Sukkur and Guddu Barrage Canals and the subsequent safe translocation of trapped animals to the main reserve, as a significant but unidentified proportion of the river population gets trapped in the canal system.

Keywords: River dolphin, *Platanista minor,* Indus, translocation, canals

Introduction

Every year, a large number of dolphins are carried into the Sukkar and Guddu Barrage Canals by the force of the water current away from the main river. When the gates of the canals are shut for cleaning and desiltation, the dolphins are trapped and cannot swim back to the river. They can fall prey to predators (i.e. feral dogs, cats, etc) (Nazir pers. comm). The natural flood cycle of any river places animals at risk when they leave the main channel and disperse into seasonal streams and lakes during high water periods. Some Gangetic dolphins *Platanista gangetica* apparently manage to survive from year to year in ox- bow lakes in Assam (Pilleri, 1970; Roberts, 1977), but Indus dolphins that fail to return to the main channel and become trapped in floodplain lakes and streams, or irrigation canals, have almost no chance of surviving. However, the stranded animals are always confined in canal water pools. These pools are than auctioned by Sindh Fisheries Department to local fisherman. The unfortunate dolphins can then be trapped in the nets of the fishermen. There is no regular effort made in either Sindh or Punjab to document dolphin mortality (Reeves and Chaudhry, 1998). The vulnerability of all cetacean species to capture in passive fishing gear, especially gill nets, is well established (Perrin *et al.*, 1994). In the case of Indus dolphins, direct evidence of catching is scarce, but it does occur (Roberts, 1977; Reeves *et al.*, 1991). The main aim of this study was to capture and translocate the stranded dolphins from irrigation canals to the dolphin reserve.

Examples of the problems

On 13th January 2000 a dolphin was shot near Moenjodaro, 148 km away from the Indus River in the Dadu canal. In 1992 two dolphins drifted into the Ghotki feeder and Begari feeders from the Guddu Barrage (Shahzado pers. comm.). five dolphins were reported dead in 1999 in the left and right bank canals of the Suklar Head work. Carcasses collected by the Sindh Wildlife Department staff from 15th January 1999 to the time of writing are shown in table 1. Four live dolphins were translocated from canals to the main reserve on 11th January 2000

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(Abul Canal); 16th January 2000 (Khirthar Canal); 10th November 1999 (Rice Canal) and 20th January 2000 (Dadu Canal). One more live dolphin was reported in the Rice Canal below Channa Bridge, Dokri, 140 km from the main reserve.

Methods of Capture

Before 1960, dolphins were regularly captured in the Indus by local fishermen (Pilleri and Zbinden, 1974). Currently animals are occasionally but accidentally caught in fishing nets. Although river dolphin tends to avoid fast moving boats and local information suggests that they seem to be able to locate the fishing nets therefore delibrately catching them in nets for translocation can be difficult. Prior to each rescue operation, measurements of the water depth of each depression were taken in order to be able to move the dolphin to shallow water. The rescue party then board the boats in the canal and the fishermen pull the nets from both sides of the canal and a clicking sound is produced in water to move the dolphin to shallow water of not more then 70cm depth. The boats and fishermen move slowly and when the dolphin reaches the feet of the fishermen it is then captured. The rescue operation in each pool took 1 – 2 hours and great care was taken to avoid entanglement and drowning of the dolphin in the nets. For comparison with the main river physico- chemical parameters were used to evaluate the water quality of the canal depressions (Table: 2) and dive time of the dolphins was noted by using a stopwatch (Table: 4–7). It was accepted that these data might be some what atypical because the animal was about to be captured but the opportunity was taken, as close encounters with a known single dolphin are rare and such data otherwise difficult to obtain.

Handling

Dolphins captured on different dates from various canals appeared calm except for normal breathing noises and no obvious distress was observed.

Transportation

Transportation from the place of capture was done using a stretcher carried to a vehicle by two men. The animal's body was loosely wrapped with muslin cloth leaving the blow hole uncovered. Before wrapping the body of the animal, it was kept wet by sprinkling the water, so that the skin could be kept moist and cool. Sprinkling of water on the body of the animal was continued throughout the journey. Two animals were transported on 10th November 1999 and 16th January 2000 by vehicle from the canals to the Indus Dolphin Reserve in 55 and 100 minutes respectively. When animals were released in the Indus river, they actively swam away. On 11th and 20th January 2000 two animals were also captured and transported using the same methods from the Abul canal near Pirjo Goth, 30km from the Sukkur and Dadu Canal near Ruk Village, 40km from Sukkur. The distance from the place of capture to the Indus Dolphin Reserve was covered in 100 and 180 minutes respectively.

Results

Every year the Indus river faces floods ranging from 800, 000 metre /sec, to 100,000 metre / sec in the summer monsoon season (July and August); these discharges vary from year to year depending upon the rainfall in the catchment area. Highest floods have been reported in 1986, and 1988 and 1992 (Shaukat pers. comm. 1999), but 1999 was not a year of high flood flow. There may be local variations in channel

flows from month to month and year to year when water flow is reduced after the monsoons. Guddu and Sukkur barrages have been built to divert water into canals with strongest currents during different crop season. Dolphins tend to avoid the main current of the river and drift away into the canals when gates are opened to maintain the water level. However, five dolphin swept away from their main reserve to canals, were carefully watched by members of the Sindh Wildlife Department until the canals were shut for desiltation in January. Water quality of the canal depressions was not good as compared to the Indus river (Table : 2). Four out of five dolphins were successfully relocated to the Indus river using the above methodology. The fifth dolphin located below the Channa Bridge of the Rice Canal, Dokri, 140km away from Sukkur from 1999 to January 2000 was not recaptured. Five dolphins were accidentally trapped in fishing nets in canals suggesting that a small but significant part of the total population of the dolphins were in canals of the Sukkur Head works from 15.1. 1999 to 14. 1. 2000 (Table : 1). The physical dimensions of the pools vary considerably but the water quality parameters are quite comparable with the Indus, which suggests that at least these parameters vary little with distance from the river source. The average diving time, body measurements of each dolphin and water depth of each canal depression are noted in (Table:3). Dive time is an important parameter for counting the dolphins when they surface for air in the wild, therefore opportunity was taken to record this parameter from a known individual realizing the caveats noted earlier. Body length of the dolphins was measured from the tip of the upper jaw to the deepest part of fluke notch (Tables 1, 8) and recorded in centimeters. The dive time results show a considerable variation between individuals and in dive times for individuals, can not be related to body length of animals because calves appeared three times as often compared to females surfacing in the wild. The young may have proportionally smaller lungs or a higher metabolic rate than adults demanding more oxygen . This could have the effect of overestimating young animals in the main river. Although the data are not generally amenable to statistical analysis, the respiration rate, as measured by surfacing frequency, did not rise with capture efforts but in three of the four cases there was an atypically long dive time just prior to capture, possibly suggesting evasive behavior.

Discussion

On 13th January 2000 a mature dolphin was shot dead in Dadu canal and the carcass collected by Sindh Wildlife Department . Other animals have been incidentally trapped in fishing nets of the fishermen in the canals. As local funding for translocations is very limited, it suggests that rescue programmes should be set up at international level, covering both financial and technical aspects. With few resources, four immature dolphins out of five were translocated back to the dolphin reserve. Translocation can in part compensate for mortality, improve the demographic structure and add genetic vigour to isolated sub populations (Lande and Barrowclough, 1987; Maguire *et al.*, 1987). Reeves *et al.* (1991) suggested that no regular effort is made in either Punjab or Sindh to document dolphin mortality. In general terms translocation allows scientific management of populations to achieve conservation goals. Semi-natural reserves should be developed to promote survival and recovery of the endangered animal, and

eco-tourism would develop added value to dolphin conservation. Most of the animals swept to canals were juvenile males (Table : 1,8) but due to small numbers of dolphins the statistical meaning of this observation is unclear. Water quality of the canal depressions was not good, though comparable with the Indus river (Table:2), but would probably deteriorate during the dry season. Some canals are both wide and deep (Table : 3) providing large residual pools which might aid survival but often increasing the problems of capture. Each year dolphins are swept into the canals, from which they do not return, though their movements are often carefully watched by the Sindh Wildlife Department (Table : 1). At best, they are lost to the breeding population, but at worst they die as water levels subsides (Gachal and Slater, 2001).

It might be possible to construct gates to intercept dolphins as they move into canals but because of the high flow rates this could cause physical damage or even cause death to the dolphins because of the force of the water. It is possibly the most dolphin friendly policy to allow the animals unimpeded access to the canals during high flows and then relocate them during periods of low water. At some stage in the future it may be possible to use acoustic deterrents at the canal entrance to prevent them from leaving the river.

The reasons why they enter canals could be:

- an ancient behaviour pattern to move away from the river into the flood plain at time of high water in a way similar to the Amazon Dolphin.

- as many translocations are of younger animals they may simply follow the water flow into the canal as part of a dispersal mechanism.

- dolphins may simply be swept into the canals by the high flow rates.

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Table 1: Incidental killing of Indus dolphins due to fishing nets in canals of the Sukkur Barrage from 15th January 1999 onwards.

Date	Location	Length of animal	Location	Fate of Dolphin	Remarks
15.1.1999	Sukkur Barrage, Rice Canal (right bank)	190 cm	Peer Shez, near Naudero	Dead Male	Carcass collected by Sindh Wildlife Staff
20.9.1999	Main River	205 cm	Labe – Mehran, Sukkur Barrage	Dead Female	Carcass collected by Shahzado Bhayo, SWD.
28.10.1999	Khirthar Canal (right bank)	-	Near Sukkur Barrage	Driven back to main river	Shahzado Bhayo and Nazir Mallah
10.11.1999	Rice Canal (right bank)	105 cm	Near Bagerji, 17 km off Sukkur	Rescued Male	Dr.F.M. Slater, GSG, Dr. S.M.Yousuf and SWD staff
11.1.2000	Abul Canal (left bank)	102 cm	Near Piryalo, 26 km off Sukkur	Rescued Male	GSG and SWD staff
12.1.2000	Rohri Canal (right bank)	103 cm	Daraza Sharif, Khairpur, 80 km of Sukkur	Dead Male	Collected by Shahzado Bhayo and his staff
13.1.2000	Dadu Canal (right bank)	220 cm	Near Dokri, Larkana, 148 km off Sukkur	Dead Female (shot)	Collected by SWD staff
14.1.2000	Abul Canal (left bank)	106cm	Near Pirjo Goth, 30 km off Sukkur	Dead Male	Collected by SWD staff
16.1.2000	Khirthar Canal (right bank)	153 cm	Near Bagerji, 17 km off Sukkur	Rescued Male	GSG and SWD staff
20.1.2000	Dadu Canal (right bank)	109 cm	Ruk village, 40 km off Sukkur	Rescued Male	GSG and SWD staff

Total estimated population f Indus dolphin between the Sukkur and Gudu Barrage is 500.
SWD = Sindh Wildlife Department

Table 2: Physico-chemical parameters of the water depressions of canals from November 1999 to January 2000 for the dolphins and their prey.

Parameters	R	A	A	A	K	K	K	D	D
Date	10.11.99	11.10.99	10.12.99	11.1.00	10.11.99	8.12. 99	16.2.00	8.12. 99	20.1.2000
Time	10.00 am	11.20 am	12.00 noon	12.00 noon	10.00 am	10.10 am	10.30 am	8.00 am	2.00 pm
Air Temp (°C)	26	27	26	23	26	25	23	22	24
water Temp (°C)	21	21	20	19	21	20	19	18	18
Visibility	4 cm	4 cm	4 cm	4 cm	4 cm	3 cm	3 cm	4 cm	3 cm
pH	7.00	7.10	7.00	7.00	7.00	6.92	6.81	7.10	6.90

Key:

R = Rice Canal, K = Khirthar Canal, D = Dadu Canal., A = Abul Canal
For comparison Indus River Visibility is 4 cm and pH is 7.62.

Table 3: Measurements of the width and depth of the water depressions of the canals at the translocation sites of live dolphins.

	R	R (Bg)	R	R	A	A (Bg)	A	A	K	K (Bg)	K	K	D	D (Bg)	D	D
Width of Canal (m)	37	24	8	13	18	18	14	13	21	18	17	15	37	24	12	8
Depth of mid canal (m)	24	12	6	1	12	9	6	1	8	3	5	1	14	5	4	3
Depth of right side (m)	20	5	3	1	7	6	4	1	6	4	4	1	6	2	2	2
Depth of left side(m)	20	6	1	1	8	6	4	1	4	3	2	1	5	3	2	2

R = Rice Canal A = Abul Canal K = Khirthar Canal D = Dadu Canal.
Bg = Bridge site

Table 4: Dive time of Indus dolphin in Rice Canal for 20 minutes prior to capture

Specimen	Sex	Length	Dive Time (Seconds)		Average (Seconds)	Standard deviation
1.	Male	105cm	38	20	81.82	81.82 ± 135. 54
			63	70		
			25	42		
			134	16		
			66	80		
			25	55		
			104	30		
			40	60		
			33	37		
			20	157		
			35	50		

Table 5: Dive time of Indus dolphin in Abul Canal for 15 minutes prior to capture.

Specimen	Sex	Length	Dive Time (Seconds)		Average (Seconds)	Standard deviation
2.	Male	102cm	20	30	37 . 50	37.50 ± 23.494
			25	26		
			40	48		
			17	31		
			23	22		
			45	70		
			22	34		
			19	25		
			44	76		
			30	40		
			15	28		
			50	102		

Table 6: Dive time of Indus dolphin in Kirthar Canal for 15 minutes prior to capture.

Specimen	Sex	Length	Dive Time (Seconds)		Average (Seconds)	Standard deviation
3.	Male	153cm	30	104	52.94	52.94 ± 36.99
			25	40		
			63	27		
			28	100		
			20	100		
			80	34		
			39	-		
			15	-		
			134	-		
			42	-		
			17	-		

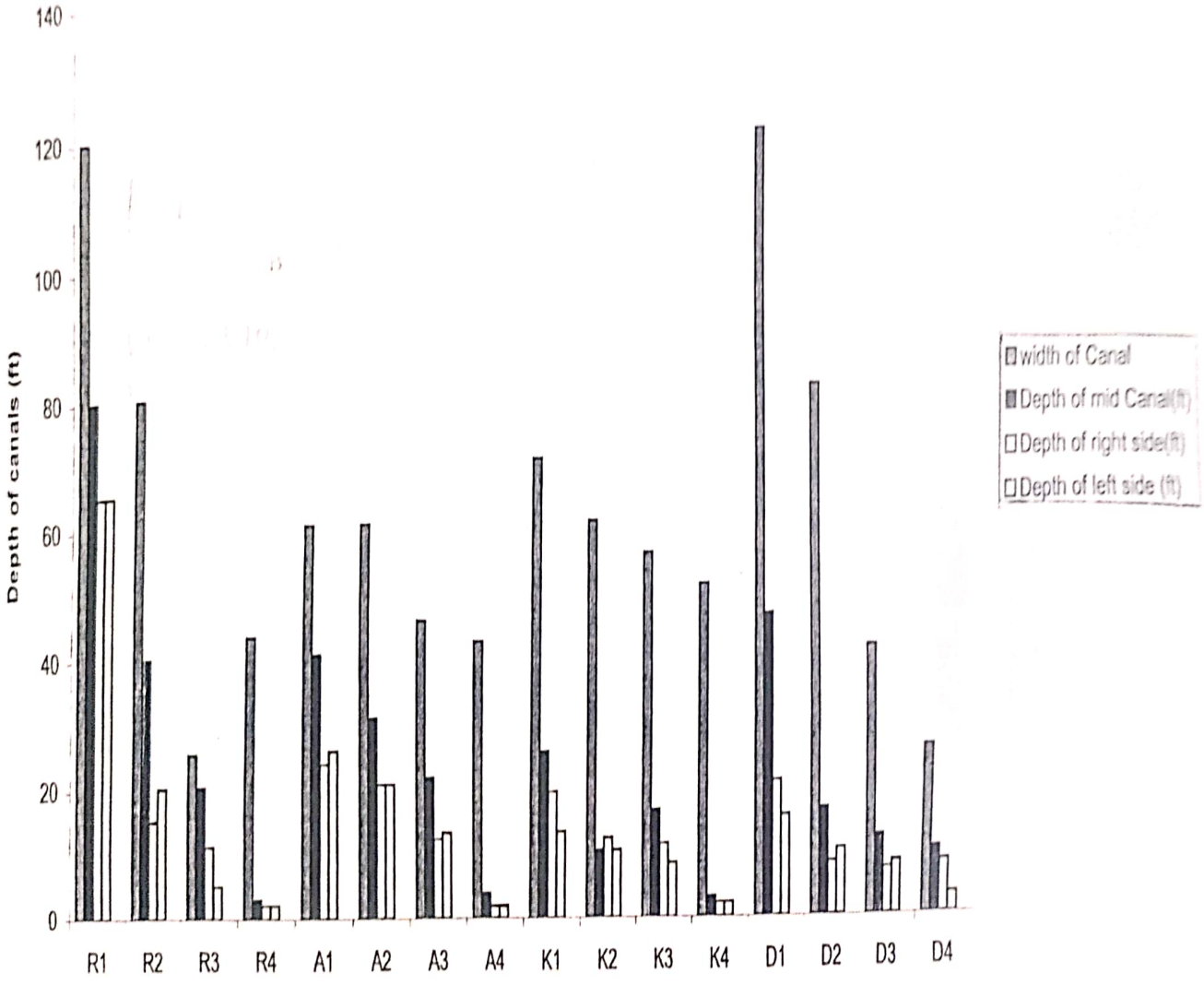
Table 7: Dive time of Indus dolphin in Dadu Canal for 15 minutes prior to capture

Specimen	Sex	Length	Dive Time (Seconds)		Average (Seconds)	Standard deviation
4.	Male	109 cm	45	17	40.91	40.91 ± 24.79
			15	42		
			42	22		
			47	20		
			20	70		
			24	43		
			85	26		
			25	80		
			22	40		
			40	30		
			35	110		

Table 8: Average dive time, sex and body length of dolphins noted during translocation.

	Rice Canal	Abul Canal	Khirthar Canal	Dadu Canal
Specimen	1	2	3	4
Sex	Male	Male	Male	Female
Length (cm)	105	102	153	109
Mean and standard deviation of dive time (sec)	81.82 ± 135.54 n = 22	37.50 ± 23.49 24	52.94 ± 36.99 17	40.91± 24.79 22

Note: Average dive time is taken over a 15 minute period except for specimen 1, measured over 20 minute



R = Rice canal A = Abul canal K = Kirthar canal D = Dadu canal

Fig. 5.1: Measurements of the width and depth of the water depressions of canals for translocation of live dolphins