

***The ecology and apparent threats to cetaceans
within the Arabian Sea region of the Indian
Ocean Sanctuary (IOS)***



Photo Credit: Wera Lujak

**Final report for The Rufford Small Grants for Nature
Conservation (reference: 21.09.06)**

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Nature Conservation
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Background

Based in Karachi, this project worked closely with members of several institutes and organisations. These included the University Marine Biological Field Station, Millport (UMBSM) – which is part of the Universities of London & Glasgow, The Centre of Excellence in Marine Biology (CEMB) & the Marine Resource & Reference Collection Centre (MRRC) – both of which are part of the University of Karachi, WWF-Pakistan (WWF-P), and the Zoological Survey Department of Pakistan (ZSD).

There were five Pakistani colleagues that were the foundation members of the field team; these were Shoaib Kiani (CEMB), Pervaiz Iqbal (CEMB), Babar Hussian (WWF-P), Umer Wagas (WWF-P), and Merban Ali (ZSD), led by Dr. Mauvis Gore (UMBSM) and assisted by Ross Culloch (UMBSM). On numerous occasions during the dedicated beach surveys the field team were also joined by other individuals named on the project proposal, these included Dr. Jamal Siddiqui (CEMB), and Qadeer Ali (MRRCC). Given the number of collaborators within the project, we decided that a name was needed to identify the research being carried out by a team comprising of individuals from several bodies, it was therefore decided that this research would be carried out under the name of ‘Cetacean Conservation Pakistan’ (CCP).

Capacity Building

Photo Credit: Ross Culloch



Picture 1: The CCP team practicing their response to re-floating a healthy cetacean

The capacity building element of this project gave detailed lectures in designing surveys and survey protocol, species identification, and an in-depth lecture on strandings. All these lectures were carried out in the Centre of Excellence in Marine Biology (CEMB), at Karachi University. These lectures were initially given to the five foundation members of the CCP field team; however, this

information was made available to all who were interested in the project. For the

strandings element of the capacity building, the field team had regular practical sessions on how to help a stranded cetacean; this included how to assess the health of a stranded cetacean and how to safely re-float a deemed to be healthy small cetacean. Therefore, the team were well trained and well prepared should they be called to a live cetacean stranding (see Picture 1).

In January 2007, CEMB organised the first Marine Mammal postgraduate module at Karachi University, under the auspices of a Darwin Initiative grant. I was invited by Dr. Jamal Siddiqui (CEMB) and Qadeer Ali (MRRCC) to give a lecture on species identification and strandings. This also involved leading a field course on beach surveys and strandings protocol, with over 30 students attending. During the field course we found a dead, stranded finless porpoise (see Picture 2). This made for an ideal opportunity to show the students how to assess a cetacean and how to take samples.

Fieldwork & Survey Effort

Photo Credit: CCP



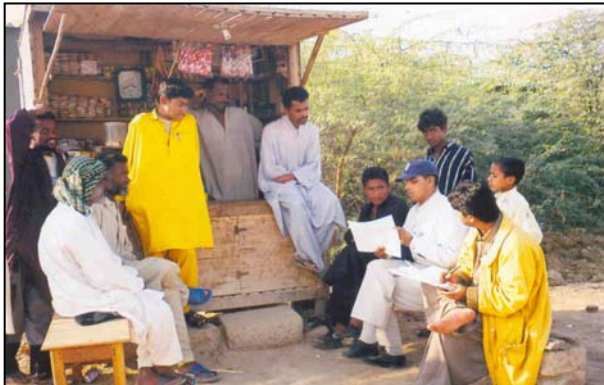
Picture 2: *The CCP team with students gathered around a finless porpoise carcass found during a routine beach survey*

This project aimed to survey the entire coast of Pakistan. There were areas that were not easy to survey, such as the mangroves within the Indus Delta (between Karachi and India) (see Figure 1), where there was little or no survey effort. In contrast, there were other areas that proved easier for surveys, such as the sections of coast around Karachi that were easily accessed and were already patrolled regularly by WWF-P for sea turtle hatchlings. In the

early part of the year the CCP team undertook a 3 week long field trip across the Balochistan province to carry out as many beach surveys as was possible in the given time. In total, the CCP team carried out beach surveys that have spanned 75km of the Pakistani coast, which is approximately 1000km in length. It is important to note that this is a significant amount of survey effort, baring in mind that there are

many areas that are not suitable for survey, e.g. steep cliff faces, mangroves, and areas controlled by the Navy that are not open to the public.

Photo Credit: WWF-P



Picture 3: The CCP team carrying out a community survey

During our community surveys the Pakistani members of the CCP field team spoke with key members of the coastal communities (see Picture 3). This included showing illustrations of cetacean species that are thought to occur in Pakistani waters. These surveys were used to help raise awareness and to construct a network of villages that would report

any strandings to the CCP team. Over the study period, the field team carried out over 100 community surveys across over 30 villages spanned over the majority of the Pakistani coast.

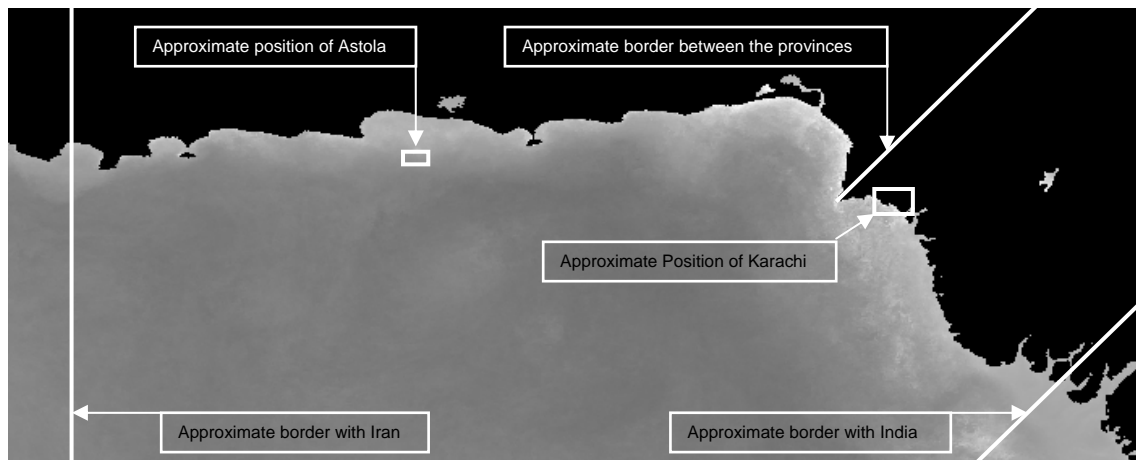


Figure 1: A map of Pakistan, showing key areas in relation to the survey work.

The majority of the surveys were carried out along the Sindh coast, but a WWF-P centre is located at Jiwani, by the border of Iran, where staff carried out regular beach surveys for turtle hatchlings and reported any cetacean strandings to the CCP team. Beach surveys were carried out over the majority of the Balochi coast and on Astola Island (cover photograph) when the CCP team camped along the coast with support from the Pakistan Wetlands Programme and a Darwin Initiative Grant during the 3 week field trip.

Fisherman Workshops

Unfortunately the two workshops planned for each of the coastal provinces (Balochistan & Sindh) were postponed for a few months, due to the recent political unrest. These workshops are set to be hosted by The Rufford Small Grants for Nature Conservation (RSGNC), The Darwin Initiative, and by WWF-P who already has a network of relevant contacts from other ongoing projects. In addition, these workshops will be hosted in the mother-tongue of each province, as those who attend are unlikely to speak English. For this reason, and given the importance of these workshops and their outcome, the funds supplied by RSGNC have been allocated to the workshops and will be supervised by WWF-P financial office. A separate short report of these fisherman workshops can be submitted at a later date.

Samples Collected

Photo Credit: Mauvis Gore



Picture 4: *Members of the CCP team with a sperm whale skull (sample CCP018) that was found during a routine beach survey*

Table 1 details the findings of the CCP team, showing that we collected samples from 25 individual cetaceans. Unfortunately it was not possible in every instance to collect all the data that we were interested in. The reasons being, that in many cases the carcass was in a poor state which prevented the collection of stomach samples, for example, of which we did

not manage to collect any. In several cases the sample was only beach-cast hard tissue remains (e.g. see Picture 4), and in some cases regarding the skulls collected, the teeth were no longer embedded in the rostrum. Nevertheless, this is a significant number of samples collected, and although strandings were thought to be common, we did not expect to find so many cases in such a relatively short time frame.

Table 1: Samples collected or located by the CCP team, detailing which types of samples that are held for each sample number.

| Sample No. | Identified As | Skull | Bones | Teeth | Soft Tissue |
|------------|----------------------|-------|-------|-------|-------------|
| CCP001 | Common Dolphin | No | Yes | No | No |
| CCP002 | Common Dolphin | No | Yes | No | No |
| CCP003 | Unknown Dolphin | No | Yes | Yes | No |
| CCP004 | Bottlenose Dolphin | Yes | No | Yes | No |
| CCP005 | Finless Porpoise | Yes | No | No | No |
| CCP006 | Unknown Whale | No | Yes | No | No |
| CCP007 | Unknown Beaked Whale | Yes | Yes | No | No |
| CCP008 | Humpback Dolphin | Yes | No | Yes | No |
| CCP009 | Humpback Dolphin | Yes | No | Yes | No |
| CCP010 | Common Dolphin | Yes | No | Yes | No |
| CCP011 | Unknown Dolphin | Yes | No | No | No |
| CCP012 | Common Dolphin | No | Yes | No | No |
| CCP013 | Humpback Dolphin | No | Yes | No | No |
| CCP014 | Common Dolphin | No | Yes | No | No |
| CCP015 | Humpback Dolphin | No | Yes | Yes | No |
| CCP016 | Humpback Dolphin | Yes | No | No | No |
| CCP017 | Humpback Dolphin | No | Yes | No | No |
| CCP018 | Sperm Whale | Yes | Yes | No | Yes |
| CCP019 | Bryde's Whale | No | No | No | Yes |
| CCP020 | Bottlenose Dolphin | No | No | No | Yes |
| CCP021 | Blue Whale | Yes | Yes | No | No |
| CCP022 | Unknown Whale | Yes | Yes | No | No |
| CCP023 | Unknown Whale | Yes | Yes | No | No |
| CCP024 | Humpback Dolphin | No | No | No | Yes |
| CCP025 | Finless Porpoise | No | No | No | Yes |

Cetacean Ecology (frequency, distribution, threats)

Photo Credit: CCP



Picture 5: Members of the CCP team identifying and cataloguing the hard tissue samples in CEMB, Karachi University

The field team did discover, from stranded animals or hard tissue remains (see Picture 5), that several species of cetacean do occur in the waters off Pakistan, these include bottlenose dolphins, common dolphins, humpback dolphins, finless porpoise, Bryde's whale, blue whales, and sperm whales (the latter was not recorded in Pakistani waters previously). During the project there was no report or finding of any live

stranded cetaceans. In addition, from the community surveys no one interviewed gave any information on any live stranded cetaceans, only dead ones.

From the community surveys the CCP team identified additional species that the fishermen do see, i.e. species that we did not find any evidence of from our beach surveys. These include spinner dolphins, killer whales, and humpback whales. Although it is likely that other species do occur, but the fishermen could perhaps not identify them, or they are not working in areas where these other species inhabit.

Frequency & Distribution

The data collected from the beach surveys and community surveys suggests that the humpback dolphin, the bottlenose dolphin, and the finless porpoise are regularly found in in-shore waters. The other species appear to be more in off-shore areas according to the fishermen, and we are therefore less likely to come across beach-cast remains of these animals, compared to those that occupy in-shore areas. The only exception being common dolphins, which we collected several samples of, and they are typically off-shore species, which is an interesting observation.

Threats and Concerns

None of the carcasses found showed any signs of interactions between fisheries. However, we found very few samples in a condition to assess such interactions. The community surveys did identify that in some areas cetaceans are seen as a positive sign, and fisherman will not harm them intentionally. There were some people that did suggest that accidental by-catch did occur, however, it was hard to quantify. There were very few indications that cetaceans were caught intentionally, in these interviews people thought they were being caught and used as bait. In some coastal areas, such as Karachi and the villages along the Indus Delta pollution does appear to be of concern, with observations from shore suggesting that the water is likely to be heavily burdened by industrial and domestic pollutants. We are storing samples of soft tissue samples for analysis, however, without this analysis we cannot conclude that this is a serious threat, but it does remain a concern.

Conclusion

It is assumed that the findings from the strandings do not give a full list of cetacean species that occur in Pakistani waters, as strandings records rarely do. However, the community surveys did prove to be very useful in identifying the off-shore species that are less likely to appear in the strandings data. It is important to note that the findings from this study are a big step forward in understanding which cetacean species do occur in these waters, it has also laid the foundation for understanding their basic ecology, including frequency, distribution, and potential threats. Furthermore, these data show that more research is required if we are to devise effective and efficient conservation and management policies to protect these vulnerable species.

In addition, the CCP team are currently working on a more detailed analysis of the data, and hope to publish this work in a recognised, international journal in the near future.

Future Research

The data collected by the CCP team is an important foundation for our understanding of cetacean frequency and distribution in this section of the Indian Ocean Sanctuary. This is especially true for the finless porpoise and the humpback dolphin, of which, very little is known about their ecology at all. Given the success of this project, it is clear that this is an effective and efficient method for collecting significant data that will help to address these questions. Therefore, it is important that this research is continued in order to get a significant data set that can answer the more specific questions relating to frequency & distribution, threats, and perhaps even habitat use.

Future analysis of the samples collected can inform us of the age of individuals, which would be of great interest in understanding the age at death, and whether these species live a comparable length of time to the same species in other regions. We can also identify the sex of these animals and see if this plays any relevant role in age, and how this may affect the dynamics of the population. This data may even help to answer questions as to the threats of these species. There are few samples collected that will be useful for pollutant analysis, given that these samples need to be very fresh to allow for accurate analysis. Nevertheless, this will still be a future aim

of this project if it continues, as this is likely to be an issue, particularly in the areas of Karachi and the Indus Delta.

Financial Summary

Below is a table documenting how the £2,930.00 from The Rufford Small Grants for Nature Conservation was spent throughout the project, some of these expenses do have receipts available upon request, however, things such as groceries, fuel and maintenance do not come with a receipt, where expenditure was noted on a daily basis and a daily average to the nearest pound is presented for the duration of the project. Where given in Rupees, the exchange rate used was 111PK Rupees to £1, as used in the original proposal. Note: The project ran for approximately 100 days, during which time I took a short break over Christmas and New Year.

| | Cost (Rupees) | Cost (Sterling) | Money Left |
|--|--------------------------|----------------------------|-----------------------|
| Glasgow to Karachi (return flight) | N/A | £537.10 | £2392.90 |
| Karachi to Dubai (return flight) | N/A | £138.80 | £2254.10 |
| Camera & Accessories | N/A | £300.74 | £1953.36 |
| Rent in Karachi | 15,000 Rs | £166.42 | £1786.94 |
| Workshop (left with WWF-P finance dept.) | 44,400 Rs | £400.00 | £1386.94 |
| Fuel (Averaged £6 a day over 100 days) | 66,600 Rs | £600.00 | £786.94 |
| Maintenance (Averaged £4 a day over 100 days) | 44,400 Rs | £400.00 | £386.94 |
| Living Expenses (Averaged £5 a day over 80 days) | 44,400 Rs | £400.00 | -£13.06 |