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## AN ASSESSMENT OF CETACEAN MORTALITY IN THE GILLNET FISHERY OF THE NORTHERN ARABIAN SEA



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## Introduction

Gillnet is the main fishing gear being used for catching tuna and other large pelagic in the Northern Arabian Sea. A large gillnet fleet is based in India, Pakistan, Iran, Oman and Somalia (IOTC, 2013). Gillnet being an indiscriminate fishing gear enmeshes not only target species but also a large number of non-target species (Tregenza and Collett, 1998; Tregenza *et al.*, 1997). Entanglement of some threatened and protected animals including dolphins and whales in gillnets is considered to be a point of concern for fisheries scientists and managers. Gillnet being used in Pakistan, Iran and some countries have length more than 2.5 km, therefore, non-compliant to United Nations General Assembly (UNGA) Resolution 46/215 and IOTC Resolution 12/12 which prohibit the use of large-scale driftnets on the high seas. These large scale gillnetting is more harmful to non target species especially cetaceans.

In comparison to other countries of the area, tuna fishing in Pakistan and Iran is based on large scale gillnets, therefore, as expected cetacean's interaction with gillnet is comparatively very high in these two countries. It is estimated that more than 7,000 gillnetters are operating in these two countries. Some of the vessels in both the countries have double registration both in Iran and Pakistan. In Pakistan, about 500 vessels are dedicatedly engaged in catching tuna (Moazzam, 2012) whereas in Iran about 6,500 are involved in this fishery (Naderi, 2012).

## Tuna landings

Tuna landing in the northern Arabian Sea countries (including western Indian coast, Pakistan, Iran, Oman and Yemen) amounting to more than 0.3 million m. tons annually (Fig. 1). The data is obtained through FAO database FishStatJ (Sibeni and Calderini, 2012). The gear wise data is not analyzed however, the tuna fisheries in these countries is largely dependent on gillnets. Country-wise data indicates that Iran is the leading tuna producing countries followed by India, Oman, Yemen and Pakistan (Fig. 2).

Tuna is an important component of the pelagic ecosystem in the offshore waters which is also a favorite habitat of cetacean. A well-diversified cetacean fauna is known from the Arabian Sea (Baldwin *et al.*, 1998; Jefferson *et al.*, 1993; Kumarran, 2012; Moazzam and Niaz, 1988; Moazzam and Niazi, 2013). Presence of whales and

dolphins in the pelagic ecosystem make them prone to interaction with the fishing gears being deployed for catching tuna including their enmeshment in the nets.

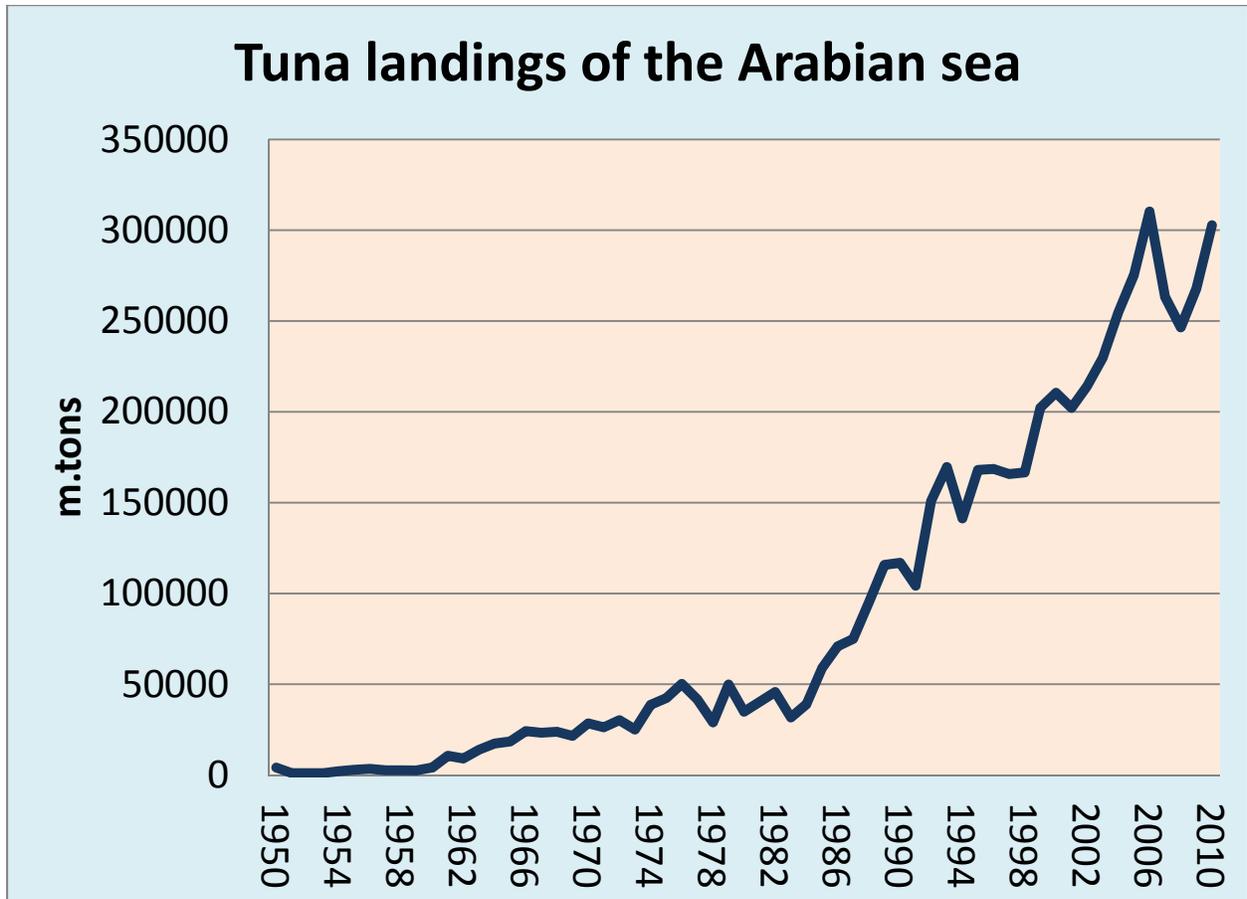


Fig. 1. Tuna landings of the northern Arabian Sea

### Cetacean Interaction with Gillnet Gears

Mortality on account of entrapment in gillnet fishing gears is considered to be largest single threat to cetaceans globally (Baldwin, 1993; Read *et al.*, 2006). There is no detailed study dealing with the mortality of cetaceans in the Arabian Sea, however, instances of such mortality was reported by Baldwin (2003), Kumarran (2012) and Moazzam (2012) from Oman, India and Pakistan respectively. Cetacean including baleen whales, toothed whales, dolphins and porpoises are equally threatened. Extent of the bycatch of cetacean in gillnet the northern Arabian Sea is not well known in most countries but beached cetacean carrying part of the gears and marks of enmeshment provide some evidences about the seriousness of the issue.

According to Baldwin (2003) most susceptible species of the cetacean to entanglement in fishing gears in Oman are coastal whales and dolphin including Bryde's whale, humpback whale, long-beaked common dolphin, Indo-Pacific humpback dolphin, bottlenose dolphin and finless porpoises. In his book, Baldwin (2003) provided photographs of many species of cetaceans which were entangled in gillnet fishing gears.

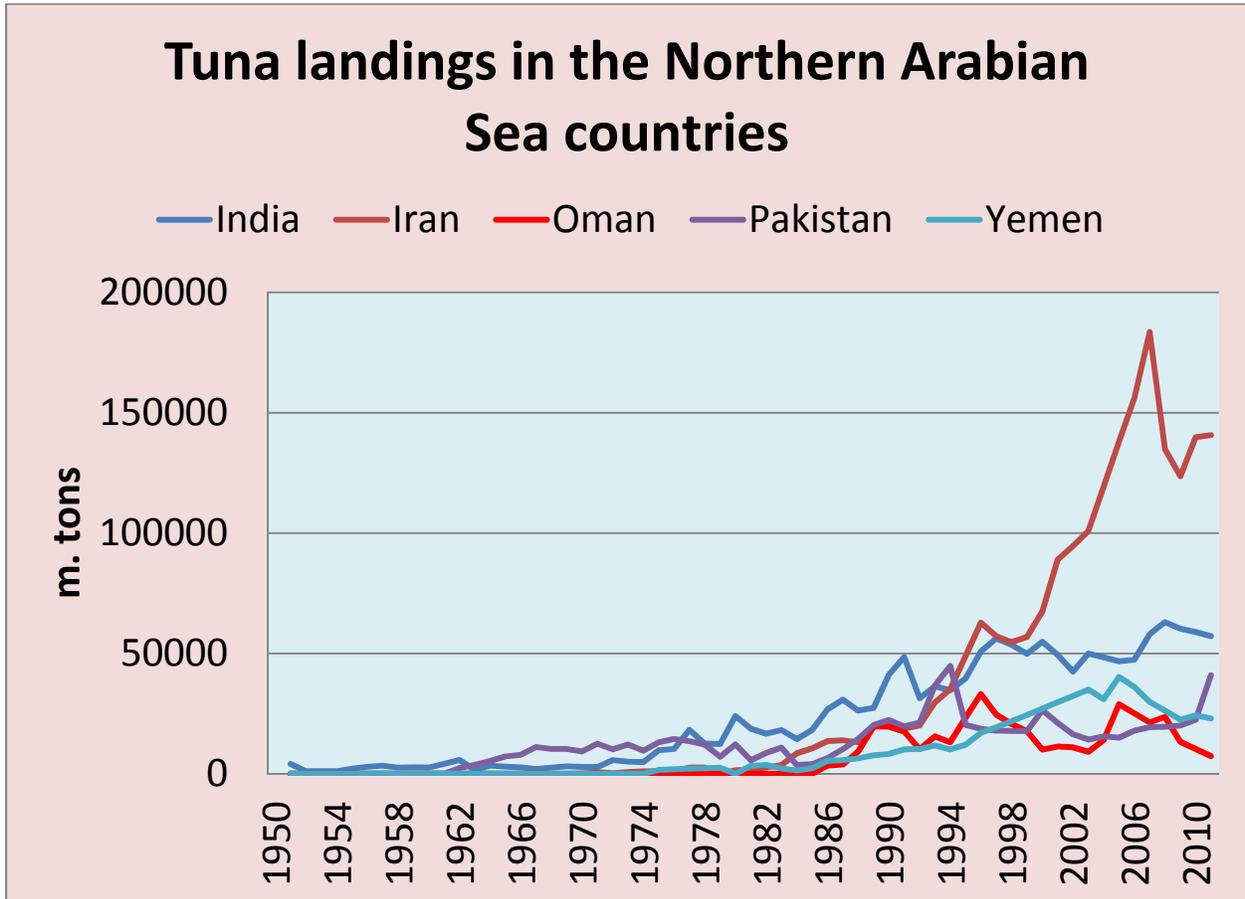


Fig. 2. Tuna landings of the northern Arabian Sea countries

Collins *et al.* (2002) observed that in some parts of Oman such as the Gulf of Masirah, where use of drift and gill nets is prevalent, mortality of dolphin on account of fisheries interaction were high. In some such instances evidence for mortality associated with fisheries was compelling. Thirty-one dolphins showed direct evidence of entanglement in nets and ropes. These included specimens that were either still entangled in gear when encountered or bore lesions consistent with entanglement. They observed that in eight specimens flukes and fins were clearly severed, which is the best method to facilitate the separation of entangled cetacean carcasses from fishing gear.

Almost no information about the mortality in fishing gears in Iran is available, however, entrapment in gillnet is the major threat to cetacean population along Iranian coastline

(Valinassab, Personal communication). Interaction with fishery is considered as a major threat to cetaceans in India also where 19 species (75% of the national total) have been recorded as accidentally entrapped in different fishing gears especially in gillnets (Kumarran, 2012). From Arabian sea coast of India very few studies have been reported to address gillnet interaction with cetacean. However, Kumarran (2012), Jayaparkash *et al.* (1995), Mohan (1985) Pillai and Chandrangathan (1990), Silas *et al.* (1984) and Yousuf *et al.* (2088) have studied impact of fisheries on cetaceans in India. According to Kumarran (2012) 50.2 % of all records of cetacean mortality from India are from fishery interaction.

Along the Pakistan coast, dolphins seem to be more frequent in getting entangled in tuna gillnets (Moazzam, 2012; Niazi and Moazzam, 1990). Indo-pacific humpback dolphin are more frequently entangled in gillnets placed in coastal waters of Pakistan where rarely a few black finless porpoises are also reported. Spinner dolphin, pantropical spotted dolphin and bottlenose dolphins seems to entangle in tuna gillnets deployed in offshore waters. According to fishermen, most of dolphins entangled in gillnet die immediately, thus discarded (Fig. 3).



Fig. 3. Carcass of enmeshed spinner dolphin (*Stenella longirostris*) on board tuna gillnet boat along Pakistan coast

It was previously estimated that 25- 35 dolphins are killed every month in gillnet fishing operations along Pakistan coast (Moazzam, 2012). Baleen whales especially humpback

are reported to get entangled in tuna gillnets but such events are of rare occurrence. According to the information recently collected 1 to 2 whales are entangled every year and in most cases fishermen try to release the entangled whales, however, sometime entangled whale die. During the surveys of dead whales beached along the coast of Pakistan since 2008, three specimens were observed to have net entanglement. Two of these were humpback whale and third was a Bryde's whale.

WWF-Pakistan has started an study on the quantify cetacean mortality in gillnet fisheries of Pakistan which is funded by Indo-Pacific Cetacean Research and Conservation Foundation, Government of Australia since October, 2013. Preliminary analysis of the data reveals that incidences of mortality in tuna gillnet operation is much higher than previously estimated. On average 1-4 dolphins get enmeshed in each fishing trip (Fig. 4).

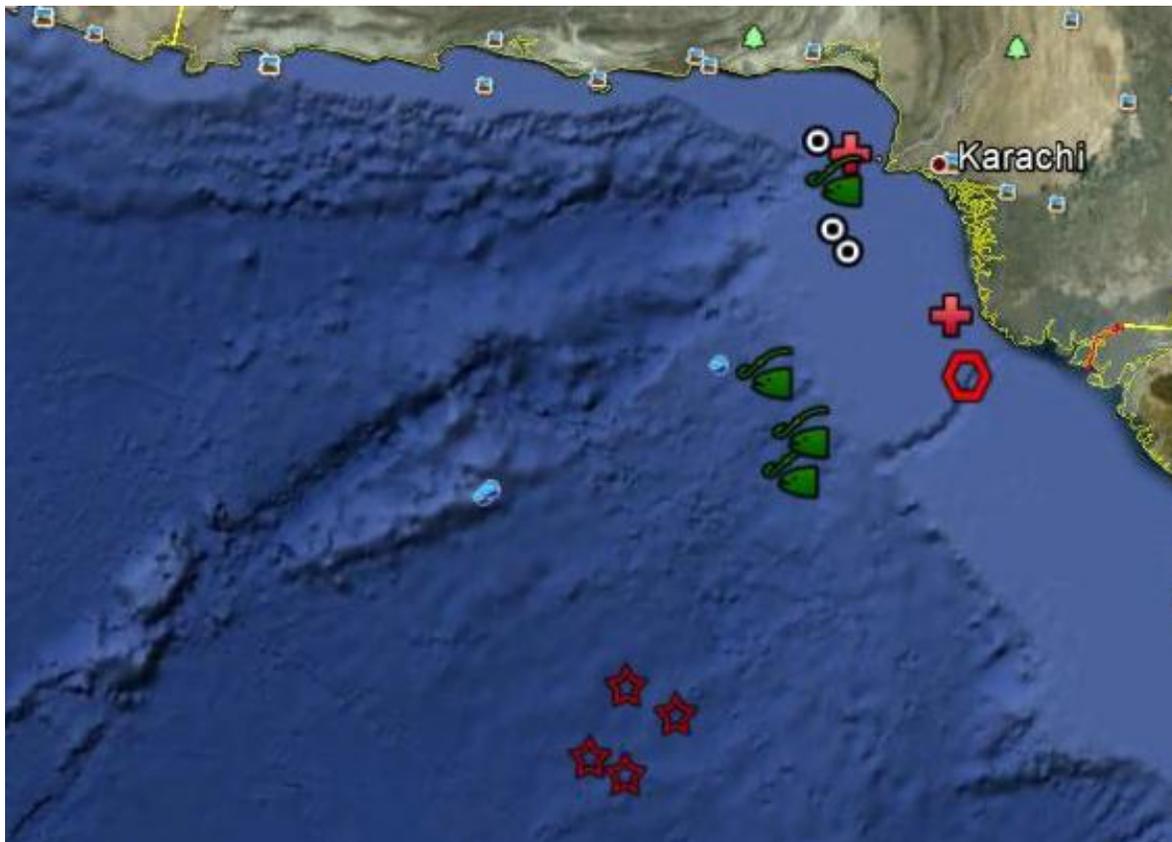


Fig. 4. Location of dolphin mortalities along Pakistan coast during gillnet operation (data of four gillnetters) in March (2013)

The study further revealed that mortality of a number of dolphin species including Indo-Pacific humpback dolphin (*Sousa chinensis*), bottlenose dolphin (*Tursiops aduncus/truncatus*), spinner dolphin (*Stenella longirostris*), Pan-tropical spotted dolphin (*Stenella attenuata*), long beaked common dolphin (*Delphinus capensis tropicalis*), and Risso's

dolphin (*Grampus griseus*), striped dolphin (*Stenella coeruleoalba*) and rough tooth dolphin (*Steno bredanensis*). No baleen whale was observed during the study, however, a few cases of their entrapment in gillnet were previously observed (Fig. 5).



Fig. 5. Bryde's whale entangled in tuna gillnet at Gwader, Balochistan

In addition, on some occasions some smaller toothed whales including dwarf sperm whale were observed to have entangled in tuna gillnet operation on more than two occasions (Fig. 6).



Fig. 6. Dwarf sperm whale (*Kogia sima*) mortality in gillnet operation along Pakistan coast.

Pakistan, WWF has initiated an awareness programme among the fishermen communities to release entrapped whales and other protected species, if found alive in the gillnet or other fishing gears. The communities are getting more aware about the

importance of these animals and some fishermen now strive to release such entrapped animals (Fig. 7).



Fig. 7. Arabian humpback whale enmeshed in the gillnet, towed to the beach and successfully released at Gunz, Balochistan

## **Conclusion**

There are no two opinions that information about cetacean mortality in the fishing gears especially tuna gillnet operation from northern Arabian Sea is limited and there is a need to collect such data from the area. Information about such mortality is especially missing about Iran which has the largest gillnet fleet in the area. There is also need for northern Arabian Sea nations to comply with United Nations General Assembly (UNGA) Resolution 46/215 and IOTC Resolution 12/12 which prohibit the use of large-scale driftnets on the high seas. This will help in reducing the incidences of the mortality of cetaceans in tuna gillnet fishing.

## **References:**

Baldwin, R., 2003. Whales and dolphins of Arabia. Ministry of Information, Sultanate of Oman, Muscat

Baldwin, R., Van Waerebeek, K. and Gallagher, M. (1998). A review of small cetaceans from waters off the Arabian Peninsula. Scientific Committee document SC/50/SM6, International Whaling Commission, Muscat, Oman.

Collins, T., Minton, G., Baldwin, R., Van Waerebeek, K., Davies, A.H. and Cockroft, V. 2002. A preliminary assessment of the frequency, distribution and causes of mortality of beach cast cetaceans in the Sultanate of Oman, January 1999 to February 2002. Paper SC/54/O4, Scientific Committee of IWC, Shimonoseki, Japan, 26 April-10 May 2002. 1-13.

IOTC 2013, Website <http://www.iotc.org/English/data/databases.php#dl> visited on August 24, 2013.

Jayaprakash, A. A., Nammalwar, P., Krishna Pillai, S., and Elayath, M. N. K., 1995. Incidental bycatch of dolphins at Fisheries Harbour, Cochin, with a note on their conservation and management in India. J. mar. boil. Assoc. India 37: 126-133.

Jefferson, T.A., S. Leatherwood, and M.A. Webber, 1993. FAO species identification guide. Marine mammals of the world. Rome, FAO. 1993.

Kumarran, R. P., 2012. Cetaceans and cetacean research in India. J. Cetacean Res. Manage. 12: 159–172.

Moazzam, M., 2012. Status report on bycatch of tuna gillnet operations in Pakistan. IOTC–2012–WPEB08–13.

Moazzam, M., and Niaz, M. S., 2013. Whales and dolphins of Pakistan. WWF-Poster  
Moazzam, M., and Niaz-Rizvi, S. H., 1988. Whales in Waters of Pakistan (Northern Arabian Sea). Presented in International Whaling Commission, Seychelles. 19p.

Mohan, R. S. I., 1985. Observations on the bycatch of dolphins *Stenella longirostris*, *Tursiops aduncus*, *Sousa chinensis* and *Dephinus delphis tropicalis* in gillnets off Calicut coast, India. Pp. 78-83. (In: Silas, E. G., ed.). proceedings of the Symposium on Endangered Marine Animals and Marine Parks. Cochin, India 12-16 January, 1985. Marine Biological association of India, Cochin.

Naderi, R. A., 2012. Fishery in Iran with particular reference to neritic tunas. IOTC–2012–WPNT02–11 Rev\_1

Niazi, M. S., and Moazzam, M., 1990. Fisheries and cetacean mortality along the coast of Pakistan. Symposium on the Mortality of the Cetaceans in Passive Fishing Nets and Traps. October 20-21, 1990. International Whaling Commission La Jolla California (Abstract).

Pillai, C. S. G., and Chandrangathan, S. B., 1990. On the drift net entangled dolphins landed at Sakthikulanara. Mar. Fish. Infor. Serv. T. & E. Ser. 104: 16-17.

Read, A.J., P. Drinker, and S. Northridge. 2006. Bycatch of marine mammals in U.S. and global fisheries. Conserv. Biol. 20:163-169.

Sibeni, F., and Calderini, F., 2012. FishStatJ, a tool for fishery statistics analysis. Release: 2.0.0 (<http://www.fao.org/fishery/statistics/software/fishstatj/en>)

Silas. E. G., Pillai, P. P., Jayaprakash, A. A., and Pillai, M. A., 1984. Focus of small scale fisheries. Driftnet net fisheries off Cochin. Mar. Fish. Infor. Serv. T. & E. Serr. 55.

Tregenza, N.J.C. and Collett, A. 1998. Common dolphin (*Delphinus delphis*) by-catch in pelagic trawl and other fisheries in the northeast Atlantic. *Report of the International Whaling Commission*, 48:453-459.

Tregenza, N.J.C., Berrow, S.D., Hammond, P.S. and Leaper, R. 1997. Harbour porpoise (*Phocaena phocaena* L.) by-catch in set gillnets in the Celtic Sea. *ICES Journal of Marine Science*. 54:896-904.

Yousuf, K. S. S. M., Anoop, A. K., Anoop, B., Afsal, V. V., Vivekanandan, E., Kumarran, R. P., Rajagopalan, M., Krishnakumar, P. K. and Jayasankar, P., 2008. Observations on incidental catch of cetaceans in three landing centres along the Indian coast. *J. Mar. Biol. Ass. UK*. [Biodiversity Records. Published online].