Indian Fisheries and the U.S. MMPA Imports Rule[1]

December 17, 2021

I. Executive Summary

India is the fourth largest seafood exporter in the world, holding 4.41% of the global seafood export market[2]. As of 2019, there were 3.8 million active fisheries in India harvesting seafood for both domestic and export markets[3]. Exports to the United States represent 38% of the total value of India's marine exports[4]. In 2020, India exported 287,923,594 kg of fishery products to the United States valued at $2,454,716,998[5]. India's fisheries rely heavily on gillnets (set and drifting), which is the fishing gear type connected to the highest levels of cetacean bycatch and for which few effective reduction solutions currently exist[6]. Marine mammal bycatch is very poorly documented in India which presents a serious barrier to understanding the scale of bycatch in India's waters.

Under the U.S. Marine Mammal Protection Act (MMPA), the U.S. government "shall ban" all seafood imports caught with fishing gear that kills or seriously injures marine mammals "in excess of United States standards."[7] To implement the requirement, NMFS issued the MMPA Imports Rule,[8] setting out standards that nations must demonstrate to continue exporting fish to the United States after December 31, 2022. Under the Rule, India must apply for and receive a "comparability finding" from the National Marine Fisheries Service, which is essentially a determination that India's bycatch and bycatch program meets U.S. standards.[9]

This report provides a brief assessment of India's export fisheries, its marine mammal populations, potential bycatch issues, and India's legal regime related to bycatch, as applied to the MMPA Imports Rule. Finding current and accurate information about marine mammal populations, bycatch numbers, and fishing regulations for India is extremely difficult. Very little data exists in either the scientific or grey literature materials. What does exist is outdated and/or based on very limited studies. However, our examination of available data indicates that India's current policies and practices do not meet the requirements of the MMPA Imports Rule. These include: under-reporting of bycatch by fisheries and fishermen; a lack of standardized and enforced monitoring programs; lack of reporting through RFMOs; a lack of baseline information on cetacean and marine mammal population, distribution, and abundance, and a lack of regulatory measures requiring bycatch mitigation.

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[2] (Mukherjee et al., 2020)
[3] (Gupta et al., 2020)
[4] (The Marine Products Export Development Authority, 2020)
[5] (NOAA Fisheries, n.d.)
[6] (IWC, 2019)
[7] 16 U.S.C. § 1371(a)(2).
[8] 81 Fed. Reg. 54,415 (Aug. 16, 2016).
[9] 50 C.F.R. § 216.24(h)(6).

II. Map of India

Figure 1: Map of India [10]

[10] (*Interactive Maps of India - Tourism, Railway, Language Maps*, n.d.)

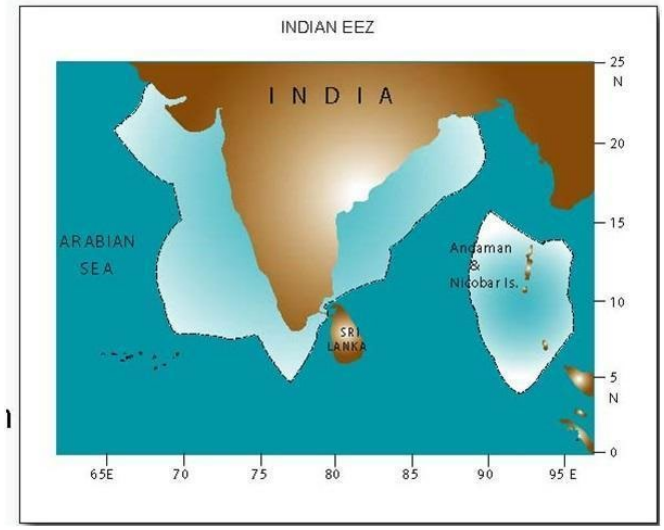

Figure 2: India's Exclusive Economic Zone (EEZ).[11]

III. Export Fisheries

About 14 million people depend directly on the fishery sector for their livelihood in India[12]. A majority of these individuals reside in the 10 union territories (UTs) in India. These include Gujarat, Maharashtra, Karnataka, Goa and Kerala along the west coast and bordering the Arabian Sea; as well as Tamil Nadu, Pondicherry, Andhra Pradesh, Orissa and West Bengal along the east coast and bordering the Bay of Bengal. Lastly, two island union territories, Lakshadweep, and Andaman and Nicobar Islands are in the Arabian Sea and Bay of Bengal, respectively.

Inland fisheries are fully managed by State governments, but Marine Fisheries are a shared responsibility between the Central and Coastal State governments. The Coastal States/UTs are responsible for the development, management and regulation of fisheries in the ocean waters inside the 12 nautical mile (22 km) territorial limit. The national government of India is responsible for the development, management and regulation of fisheries in the EEZ waters beyond 12 nautical miles and up to 200 nautical miles[13] (Figure 2). Therefore, effective bycatch policy will need to be adopted by both State and Federal governments[14].

Marine Fishery Resources	
Coastline	8129 km
Exclusive Economic Zone (EEZ)	2.02 million km^2

[11] (*National Institute of Oceanography Bioinformatics Center, India*, n.d.)
[12] (Rajesh, 2013)
[13](*National Fisheries Development Board*, n.d.)
[14](*FAO Fisheries & Aquaculture - National Aquaculture Sector Overview - India*, n.d.)

Inshore area (<50 m depth)	0.18 million km^2
Continental shelf	0.50 million km^2
Estimated Annual Production Potential	3.90 million tonnes

(Table 1) Marine Fishery Resources as reported by the Indian Central Marine Fisheries Research Institute[15]. *

India has diverse and abundant marine and inland fishing resources (Table 1). According to NOAA Fisheries, India exported 2.88 million kg of fishery products to the United States in 2020, valued at 2.46 billion USD (Table 2)[16]. From 2015-2017, India's leading seafood exports percentages were crustaceans (96.88%) followed by mollusks (1.82%), and frozen fish (0.46%)[17]. This trend has continued with crustaceans, specifically shrimp products, being India's primary fishery export to the United States in 2019 (NOAA Fisheries, n.d.). Despite being India's primary fishery export, shrimp aquaculture is not listed on NMFS's 2020 List of Foreign Fisheries (LOFF). This omission raises serious questions regarding the overall accuracy of India's submissions used to develop the LOFF.

Year	Volume (kg)	Value (USD)
2020	287,923,594	$2,454,716,998
2019	305,661,426	$2,552,318,192
2018	268,211,821	$2,354,832,046
2017	231,704,322	$2,282,730,393
2016	168,493,157	$1,583,021,215

Table 2: Total fishery products imported into the U.S. from India from 2016-2020. Extracted from NOAA fisheries US Trade in Foreign Fishery Products database[18].

According to NMFS's LOFF, Indian Export Fisheries use several different gear types including gillnets and entangling nets, trawls, driftnets, stationary bag nets, purse seines, longlines, pots/traps and lobster traps. Varied products across gear types are exported to the United States. Hand Lines, hand-operated pole-and-lines, hand dredges and aquaculture rafts/mats are listed as 'Exempt' in the List of Foreign Fisheries. All of India's reported Export Fisheries in the LOFF fish in the EEZ, FAO:57 Indian Ocean Eastern and FAO:51 Indian Ocean Western[19].

[15] (Rajesh, 2013)
[16] (NOAA Fisheries, n.d.)
[17] (Nisar et al., 2020)
[18] (NOAA Fisheries, n.d.)
[19] (NOAA Fisheries, 2020)

IV. Marine Mammals

Information on the population status of marine mammal stocks and bycatch rates within India's coastal waters and EEZ is extremely limited [20,21,22,23,24,25,26,27,28,29,30,31]. The lack of research on species distribution and abundance of many of these species has, according to the Indian Ministry of Environment, Forest and Climate Change, been the largest hurdle for the conservation of marine megafauna[32]. The number of marine mammal species found within India's waters is not consistent among governmental reports. Without the necessary documentation and research of species types and abundance of species, it is impossible to properly assess bycatch impact in the India EEZ.

All species of marine mammals in the Indian seas are protected under the Wildlife (Protection) Act, 1972. The Act has six 'Schedules' which give varying degrees of protection. India has classified marine mammals as Schedule I Part I with the highest degree of protection. Intentional capture, use, and trade of marine mammals are punishable under the Act[33,34].

Common Name	Species Name	IUCN Status	WPA, 1972	IUCN Global Stock Assessments of Mature Individuals
Blue Whale	Balaenoptera musculus	Endangered	Schedule I (Part I)	5,000 – 15,000
Fin Whale	Balaenoptera physalus	Vulnerable	Schedule I (Part I)	100,000
Bryde's Whale	Balaenoptera edeni	Least Concern	Schedule I (Part I)	80,000
Common Minke Whale	Balaenoptera acutorostrata	Least Concern	Schedule I (Part I)	200,000
Omura's Whale	Balaenoptera omurai	Data Deficient	N/A	Data Deficient

[20] (Anderson et al., 2020)
[21] (Gupta et al., 2020)
[22] (ICAR-Central Marine Fisheries Research Institute et al., 2018)
[23] (Jeyabaskaran, R et. al, 2016)
[24] (Kiszka et al., 2009)
[25] (MRAG, 2012)
[26] (Savio Lobo, 2012)
[27] (Yousuf et al., 2009)
[28] (Srinivasan et al., 2018)
[29] (Sivakumar (Ed.), 2013)
[30] (Jeyabaskaran & Vivekanandan, 2013)
[31] (Vivekanandan et al., 2010)
[32] (Ministry of Environment, Forest and Climate Change, 2021)
[33] (Wildlife (Protection) Act of 1972, 1972)
[34] (Jeyabaskaran, R et. al, 2016)

Humpback Whale	Megaptera novaeangliae	Endangered	Schedule I (Part I)	84,000
Sperm Whale	Physeter macrocephalus	Endangered	Schedule I (Part I)	100,000
Pygmy Sperm Whale	Kogia breviceps	Least Concern	Schedule I (Part I)	Data Deficient
Dwarf Sperm Whale	Kogia Sima	Least Concern	Schedule I (Part I)	Data Deficient
Cuvier's Beaked Whale	Ziphius cavirostris	Least Concern	Schedule I (Part I)	100,000
Indo-Pacific Beaked Whale	Indopacetus pacificus	Least Concern	N/A	Data Deficient
Short-finned Pilot Whale	Globicephala macrorhynchus	Least Concern	Sch I (Part I)	700,000
Killer Whale	Orcinus orca	Data Deficient	Sch I (Part I)	Data Deficient
False Killer Whale*	Pseudorca crassidens	Near Threatened	Sch I (Part I)	60,000
Pygmy killer whale	Feresa attenuate	Least Concern	Sch I (Part I)	40,000 / Data Deficient
Melon-headed whale	Peponocephala electra	Least Concern	Sch I (Part I)	180,000
Irrawady dolphin*	Orcaella brevirostris	Critically Endangered	Sch I (Part I)	220,000
Indo-Pacific humpbacked dolphin*	Sousa chinensis	Vulnerable	Sch I (Part I)	Data Deficient
Indian Ocean humpback dolphin	Sousa plumbea	Endangered	N/A	10,000
Rough toothed dolphin*	Steno bredanensis	Least Concern	Sch I (Part I)	220,000
Risso's dolphin*	Grampus griseus	Least Concern Globally	Sch I (Part I)	350,000 / Data Deficient
Indo-Pacific Bottlenose dolphin*	Tursiops aduncus	Not Threatened	Sch I (Part I)	40,000 / Data Deficient
Pan tropical spotted dolphin *	Stanella attenuata	Least Concern	Sch I (Part I)	2.3 million
Striped dolphin	Stenella coeruleoalba	Least Concern Globally	Sch I (Part I)	2 million
Long-snouted Spinner dolphin*	Stenella longirostris	Least Concern	Sch I (Part I)	1 million
Common Dolphin	Delphinus delphis	Least Concern	Sch I (Part I)	6 million

Finless porpoise *	Neophocaena phocaenoides	Vulnerable	Sch I (Part I)	Data Deficient
South Asian River Dolphin	Platanista gangetica	Endangered	Sch I (Part I)	Less than 2,000/Data Deficient
Sea cow/ Dugong	Dugong dugon	Vulnerable Globally and Critically Endangered in India	Sch I (Part I)	Data Deficient

Table 3. Conservation status of marine mammals in India[35,36,37] IUCN status based on global assessments[38]
WPA Database last updated 2014
*Listed on the 2020 NOAA List of Foreign Fisheries as Marine Mammal Interactions or Co-occurrence (by Group, Species or Stock) for India[39]

V. Bycatch

Cetacean bycatch in the Indian Ocean has been a concern for decades.[40,41,42,43,44,45,46,47.] Recent and accurate data is not currently available in India according to India's Central Marine Fisheries Research Institute (CMFRI)[48]. This lack of data is echoed through scientific and grey literature sources and is reflected in the 2020 LOFF. The absence of information is due to a lack of regulation regarding catch reports from fisherman as well as the lack of observer programs in India[49].

In 2018, NOAA listed the quality of India's supplied information to the LOFF as "Poor" and the overall risk of marine mammal bycatch as "High"[50]. That lack of quality information is also reflected in the 2020 LOFF. India reported 10 species of Marine Mammals in the "Marine Mammal Interactions or Co-occurrence (by Group, Species or Stock)" and "Marine Mammal Species/ Stock and Annual Average Mortality Estimates" in the 2020 LOFF. India reported "UNKNOWN" or "NOT PROVIDED" as the Average Mortality Estimate for each species listed[51].

[35] (ENVIS Centre on Wildlife & Protected Areas, n.d.)
[36] (Jeyabaskaran & Vivekanandan, 2013)
[37] (Vivekanandan et al., 2010)
[38] (*The IUCN Red List of Threatened Species*, n.d.)
[39] (NOAA Fisheries, 2020)
[40] (Anderson et al., 2020)
[41] (Gupta et al., 2020)
[42] (Jeyabaskaran, R et. al, 2016)
[43] (Kiszka et al., 2009)
[44] (MRAG, 2012)
[45] (Savio Lobo, 2007)
[46] (Yousuf et al., 2009)
[47] (Srinivasan et al., 2018)
[48] (*India Launches Research Project to Address Seafood Export Challenges*, n.d.)
[49] (ICAR-Central Marine Fisheries Research Institute et al., 2018)
[50] (*Federal Register, Volume 83 Issue 52 (Friday, March 16, 2018)*, n.d., p. 83)
[51] (NOAA Fisheries, 2020)

According to the Indian Ministry of Environment, Forest and Climate Change, an estimated 9,000-10,000 cetaceans are bycaught annually across India in mechanized vessels[52]. This estimate, cited in 2021 by the Indian government as a current approximation of marine mammal bycatch, is a strong example of the lack of accurate and current data in this issue. This estimate is drawn from Yousuf et. al, 2009, which is a short-term survey conducted in 2004-2005 where bycatch numbers and species were collected over 80 days from gillnet and purse seine fishing operations[53]. While purse seines and gillnets do represent a large percentage of net types used by India, this estimate does not include potential bycatch numbers from other net and fishing types. In addition, the gillnet fishing industry in India has seen substantial growth since 2004-2005. India's fisheries sector has seen an average annual growth of 10.88%[54] with an increased number of ships using gill nets as well as increased net size.[55,56] The study was based on a very small sample (44 dolphins and 3 landing sites). The sampling was also only conducted for three hours a day for 80 days.

Another commonly cited study regarding India's marine mammal bycatch is Koya et al. (2018).[57] This study used skippers as observers for a gillnet fishery off of northwest India to record tuna catch and cetacean bycatch. The skippers' log sheets reported a bycatch of 30 dolphins out of 567 gillnet fishing operations between 2011-2016. The skippers reporting within this study were not supervised or confirmed by any outside observers.

Due to the limitations of both studies, the staleness of this data, and the substantial growth of the gillnet fishing industry in India, the marine mammal bycatch rates in India are probably considerably higher than the Ministry of Environment, Forest and Climate Change estimates.

Due to the lack of marine mammal bycatch data, newer reports and publications have extrapolated data trends from the Yousuf et. al 2009 and Koya et. al 2018 studies to estimate cetacean bycatch numbers per 1,000 tons of gillnet tuna catch[58]. Based on the results of these two studies, researchers have estimated 161 and 202 cetaceans bycaught per 1,000 tons of gillnetted tuna respectively[59]. India's 2020 national report to the scientific committee of the Indian Ocean Tuna Commission, reported 74,334.64 tons of tuna harvested with gillnets for 2019[60,61]. Acknowledging the serious limitations of the bycatch estimate studies and the subsequent calculation methods, if we apply these bycatch rates to the total 2019 tuna harvest, we estimate that 11,968 - 15,014 cetaceans were bycaught in tuna gillnets by India. In stark contrast to these estimates, India stated in their national report to the Indian Ocean Tuna Commission that there were no reports of marine mammal mortality[62].

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[52] (Ministry of Environment, Forest and Climate Change, 2021)
[53] (Yousuf et al., 2009)
[54] (*National Fisheries Development Board*, n.d.)
[55] (Sherief P S et al., 2016)
[56] (*The IUCN Red List of Threatened Species*, n.d.)
[57] (Koya et al., 2018)
[58] (Kuppusamy, 2019)
[59] (Anderson et al., 2020)
[60] (Ramalingam, L et. al, 2020.)
[61] (Koya et al., 2018)
[62] (Ramalingam, L et. al, 2020.)

NOAA cited the Yousuf et. al study in the "2018 Draft List of Foreign Fisheries (with References and Detailed Information)" as counter evidence to India's bycatch report[63]. NOAA also released data showing India's estimated bycatch in a series of maps (Figure 4, 5)

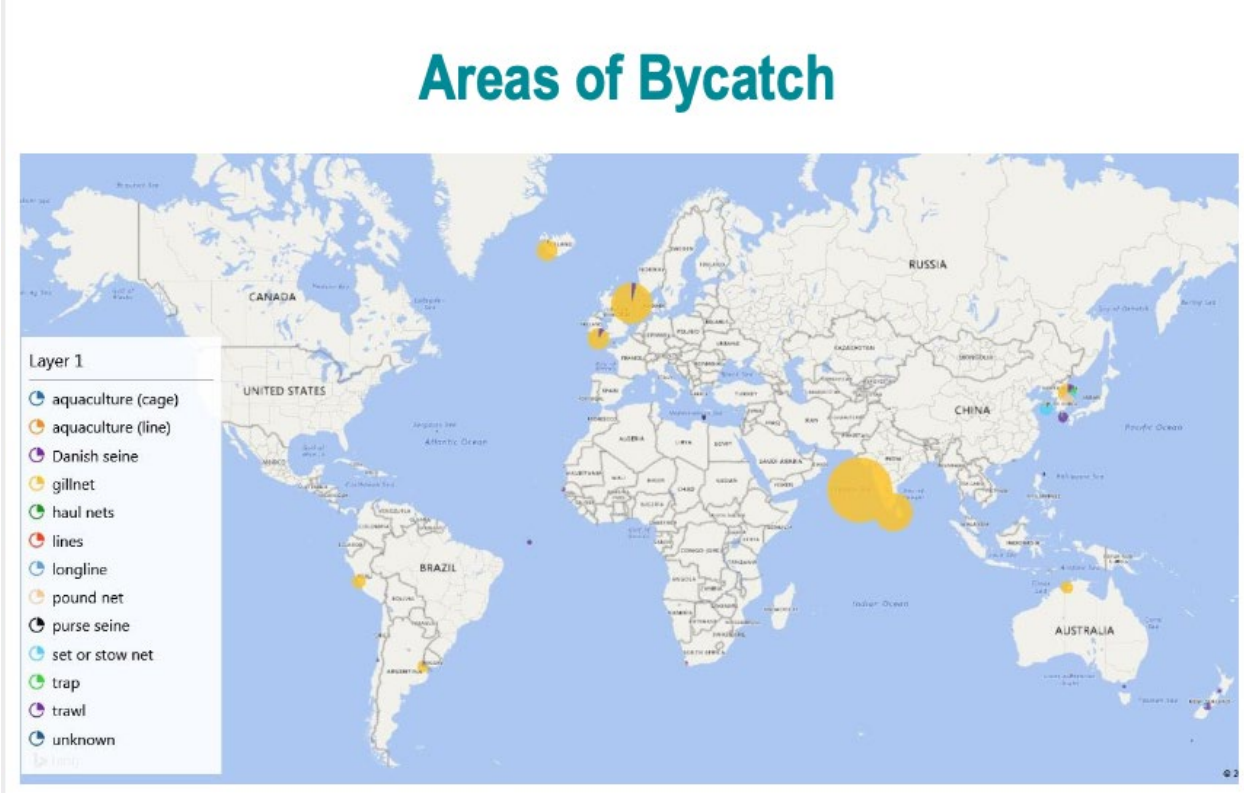


Figure 4: Global areas of bycatch and the responsible net types [64]

[63] (NOAA Fisheries, 2018)
[64] (NOAA Fisheries, Office of International Affairs and Seafood Inspection Program, 2018)

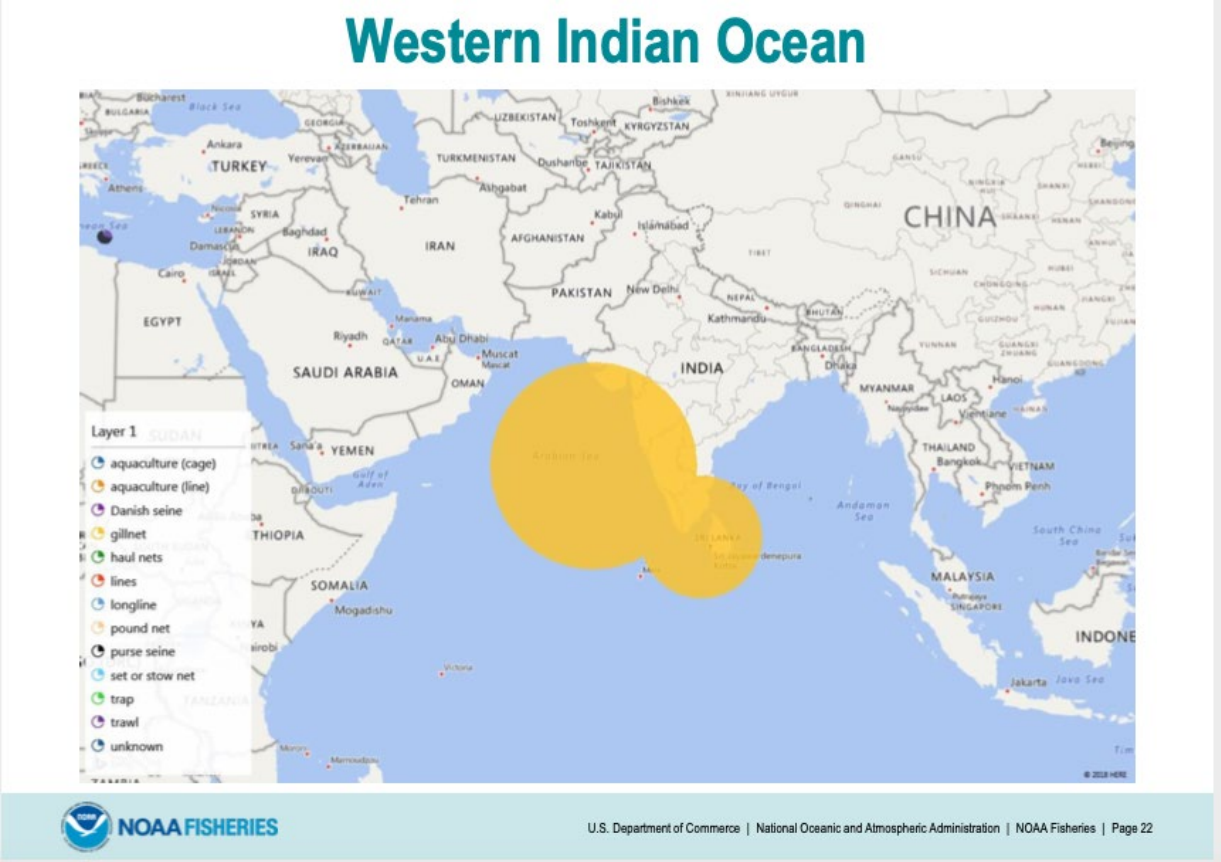


Figure 5: NOAA Fisheries presentation map on bycatch estimates for India and Sri Lanka with offending net types (Gillnets) (NOAA Fisheries, Office of International Affairs and Seafood Inspection Program, 2018).

There are ten species that are regularly caught as bycatch in Indian waters[65]. They include, the Spinner Dolphin (*Stenella longirostris*), Finless Porpoises (*Neophocaena phocaenoides*), Indian Ocean Humpback Dolphins (*Sousa plumbea*), Indo-Pacific Humpback Dolphins (*Sousa chinensis*), Bryde's Whale (*Balaenoptera edeni*), Blue Whales (*Balaenoptera musculus*). Indo-Pacific Bottlenose Dolphins (*Turisops aduncus*), Common Dolphin (*Delphinus delphis*), Risso's Dolphins (*Grampus friseus*) and Pan-Tropical Spotted Dolphins (*Stenella attenuata*) have also been reported[66,67,68,69].

Although not the most frequently caught, the endangered South Asian River Dolphin and the Dugong are also severely threatened by high bycatch mortality numbers. Bycatch mortality of the South Asian River Dolphin is estimated at around 5% of its total population size per year[70]. About 15 Dugongs are estimated to be incidentally captured by shore seine and gillnets every year. These 15 individuals represent roughly 6% of their total population with the total

[65] (Kuppusamy, 2019)
[66](IWC, 2019)
[67] (Kuppusamy, 2019)
[68] (Vivekanandan et al., 2010)
[69] (Yousuf et al., 2009)
[70] (Kelkar & Dey, 2020)

population estimated to be around 250 individuals in India[71]. Dugong habitat and dense areas of Dugong sightings have been shown to overlap with areas of dense coastal fishing pressure. Because of the lack of bycatch data from exporting fisheries, the bycatch risk of dugongs in these fisheries cannot be dismissed or assumed to be nonexistent. Instead, until data is provided proving the contrary, coastal fisheries within Dugong habitat should be considered a high risk[72]. (See Appendix i. & ii. for Dugong and fishery density analysis maps)[73,74]

The IUCN Red List classification of these commonly caught species is shown in Table 4. Bycatch hotspots and high-risk areas identified by the International Whaling Commission can be seen in Figure 6.

Common Name	Species Name	IUCN Status
Blue Whale	Balaenoptera musculus	Endangered
Bryde's Whale	Balaenoptera edeni	Least Concern
Long-snouted Spinner dolphin*	Stenella longirostri	Least Concern
Indo-Pacific humpbacked dolphin*	Sousa chinensis	Vulnerable
Indian Ocean Humpback Dolphin	Sousa plumbea	Endangered
Finless porpoise *	Neophocaena phocaenoides	Vulnerable
Indo-Pacific Bottlenose dolphin*	Tursiops aduncus	Not Threatened
Long beaked common dolphin	Delphinus delphis	Least Concern
Risso's dolphin*	Grampus griseus	Least Concern Globally
Pan tropical spotted dolphin *	Stanella attenuata	Least Concern Globally
South Asian River Dolphin	Platanista gangetica	Endangered
Sea cow/ Dugong	Dugong dugon	Vulnerable Globally and Critically Endangered in India

Table 4. Conservation status of marine mammals in India that are common bycatch[75,76,77], with IUCN status based on global assessments[78]
*Listed on the 2020 NOAA List of Foreign Fisheries as Marine Mammal Interactions or Co-occurrence (by Group, Species or Stock) for India

[71] (Kuppusamy, 2019)
[72] (Pilcher et al., n.d.)
[73] Gujarat, India (Pilcher et al., 2017)
[74] Tamil Nadu, India. (Pilcher et al., 2017)
[75] (ENVIS Centre on Wildlife & Protected Areas, n.d.)
[76] (Jeyabaskaran & Vivekanandan, 2013)
[77] (Vivekanandan et al., 2010)
[78] (*The IUCN Red List of Threatened Species*, n.d.)

Despite the mention of these species in scientific studies, NGO reports, and Indian Government reports, not all of the species mentioned as commonly caught as bycatch were listed on the LOFF as Marine Mammal Interactions or Co-occurrence (by Group, Species, or Stock). Without up-to-date scientific estimates on the population status of all these species or total bycatch numbers, the full impact of fishery bycatch on these species is unknown.

Indian government agencies have lamented this dearth of data and are now taking steps towards improving the understanding of marine megafauna and bycatch in Indian waters, as well as trying to improve India's export prospects to the United States. The Marine Products Export Development Authority (MPEDA) has provided funding for the CMFRI to complete a research project on marine mammals and sea turtles with the aim of lifting the 2018 US ban on wild caught shrimp from India as well as passing the MMPAImport provisions. This study will evaluate the status of 27 species of marine mammals and other marine megafauna within India's EEZ. Researchers will gather data on the status of species stocks and current bycatch rates. However, this study is not estimated to be complete until 2023[79,80] while under the MMPA Imports Rule, India must have submitted its comparability finding, documenting its bycatch and bycatch program, by November 30, 2021.

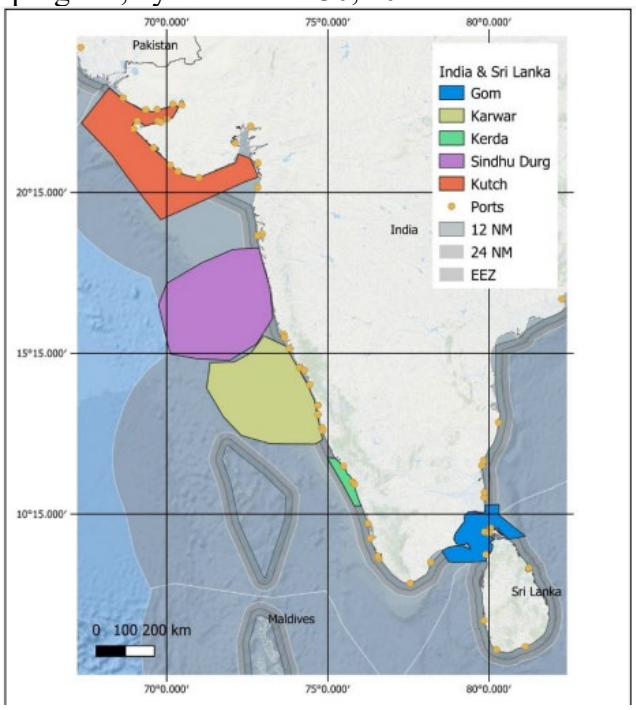


Figure 6: Map of bycatch high-risk areas in India. Port data from the World Food Program, boundaries from Marineregions.org. Bycatch hotspot areas were identified by the IWC Workshop on Bycatch Mitigation Opportunities in the Western Indian Ocean and Arabian Sea[81]. They emphasized that more bycatch assessment work is needed in order to identify additional bycatch high risk areas.

[79] (*India Launches Research Project to Address Seafood Export Challenges*, n.d.)
[80] (The Marine Products Export Development Authority, 2020)
[81] (IWC, 2019)

A. Gillnets

The presence of cetacean bycatch, especially in gillnet catches, has long been recognized. In fact, gillnets are the primary gear responsible for cetacean mortality worldwide[82,83,84,85]. In 2013, India had over 14,000 motorized gillnet vessels in operation[86]. This number increased drastically to 80,000 gillnet vessels by 2019[87]. In 2020, India reported 6,500 gillnet vessels/licenses operating in the Eastern and Western Indian Ocean EEZ that export to the United States from five different fisheries[88].

India's prevalent usage of gillnets, high levels of cetacean bycatch, and lack of observer programs has already been acknowledged by the U.S. government and resulted in India's loss of the dolphin-safe label. On September 28, 2016, the United States Assistant Administrator for Fisheries determined that Indian gillnet fisheries were responsible for regular and significant mortality as well as serious injury of dolphins in tuna gillnet fisheries under the Dolphin Protection Consumer Information Act. This determination resulted in additional documentation required for tuna products marketed or labeled as dolphin-safe. Currently no acceptable observer programs for fisheries and tuna vessels in India have been determined.[89,90]

B. Strandings

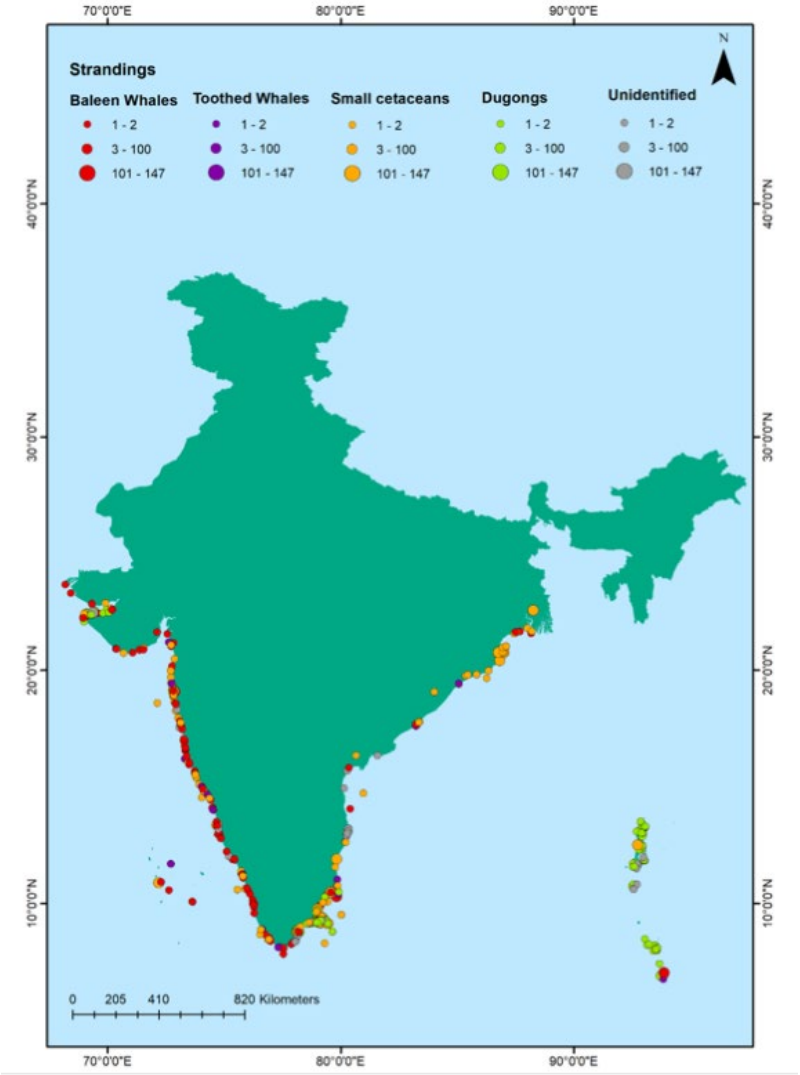
Marine mammal strandings offer crucial information on marine mammal distribution and population[91]. The feeding and habitat areas of marine mammals often overlap with fisheries as both are drawn to the most fish-heavy and productive zones in the ocean. This overlap often results in accidental net entanglement or injuries/mortalities due to hooking in longlines and other fishing gear. Boat strikes are also a significant risk to marine mammals. While the reason for a stranded marine mammal can sometimes be hard to determine, identifying patterns in marine mammal strandings is crucial for identifying regions that require increased monitoring, research and/or regulation[92].

Stranding and bycatch numbers have already been used as indirect means to monitor the status, distribution and abundance of marine mammals within Indian seas[93]. As of 2016, roughly 85% of these stranding reports were made by researchers from the Central Marine Fisheries Research Institute (CMFRI), while the remainder have come predominantly from open source/ community science databases[94]. The number of annual marine mammal sighting/stranding

[82] (Anderson, 2014)
[83] (MRAG, 2012)
[84] (Kiszka et al., 2009)
[85] (IWC, 2019)
[86] (Anderson et al., 2020)
[87] (Kuppusamy, 2019)
[88] (NOAA Fisheries, 2020)
[89] (Fisheries, 2021a)
[90] (*Federal Register :: Fish and Fish Product Import Provisions of the Marine Mammal Protection Act; Final 2020 List of Foreign Fisheries*, n.d.)
[91] (Ministry of Environment, Forest and Climate Change, 2021)
[92] (Dudhat et al., 2021a)
[93] (Jeyabaskaran, R et. al, 2016)
[94] (Vivekanandan et al., 2010)

records have increased in India since 2012 due to the open access database "Sightings and Strandings"[95]. This database is managed by the Marine Mammal Research and Conservation Network of India. The database holds voluntary submissions of sightings and strandings from researchers and individuals[96,97].

Marine mammal strandings are also useful tools to assess bycatch as fisheries bycatch can be the source of strandings. In 2021, a study collected all publicly available data on marine mammal strandings to identify stranding and incidental mortality (animals caught in gillnets, other net entanglements and boat strikes) hotspots in India. The dataset was compiled from scientifically-vetted databases, primary surveys, government reports and newspaper articles. While these data sources are limited and have high levels of reporting bias, the results were able to highlight critical "hotspots" to be prioritized for monitoring marine mammal strandings and increasing marine mammal bycatch monitoring (Figure 3).



[95] (Marine Mammal Research & Conservation Network of India, n.d.)
[96] (Dudhat et al., 2021b)
[97] (Nelms et al., 2021)

Figure 3: General trends of marine mammal strandings across the Indian coastline (Dudhat et al., 2021).

VI. National Legislation/Regulation

The main focus of Indian fishery policy has long been to promote development while generating food and foreign exchange. Regulation and control of bycatch is a relatively recent concern (Gupta et al., 2019). The implementation and enforcement of these regulations in Indian fisheries is inadequate, hindered by poor monitoring and motivation[98,99,100,101,102].

A. Wildlife (Protection) Act of 1972

Marine mammals are protected in India under the Wildlife Protection Act of 1972[103]. The government of India has included all cetaceans under the Act's Schedule-I, thereby providing them the highest degree of protection, including from hunting and trade[104,105]. Although the Act prohibits the intentional killing of marine mammals, incidental catch is still believed to be a serious problem in India. Incidental catch is not addressed in the Act. Any bycaught marine mammals must be discarded either dead or alive while the fishing vessel is still at sea[106]. Many of these incidentally caught cetaceans are then used as bait[107,108]. Without required reporting or third-party observers to record these at-sea bycatch numbers, an accurate assessment of marine mammal bycatch in India is not possible[109]. There are also inconsistent reports that the Act may not apply to waters beyond India's territorial waters (12nm)[110]. We urge NMFS to insist that India clarify this potential limitation of the Act.

B. Marine MegaFauna Stranding Management Guidelines

In January of 2021, the Government of India Ministry of Environment, Forest and Climate Change released its "Marine Megafauna Stranding Management Guidelines." The goal of the guidelines is to improve the coordination between various independent government and NGO organizations responding to marine megafauna stranding, research and management issues, and to support and share data[111]. More specifically, the guidelines provide instructions pertaining to live/dead stranding on the beach, bycatch or entangled animals at sea, and the handling of stranded/entangled animals on board a vessel/boat. The guidelines do not provide requirements for the prevention of bycaught or entangled animals. Instead, each section provides step-by-step

[98] (Anderson et al., 2020)
[99] (Gupta et al., 2019)
[100] (IWC, 2019)
[101] (Johnson, 2010)
[102] (Anderson, 2014)
[103] (The Wild Life (Protection) Act, 1972, 1972)
[104] (ENVIS Centre on Wildlife & Protected Areas, n.d.)
[105] (Wildlife (Protection) Act of 1972, 1972)
[106] (Savio Lobo, 2007)
[107] (IWC, 2019)
[108](Savio Lobo, 2007)
[109] (ICAR-Central Marine Fisheries Research Institute et al., 2018)
[110] (IWC, 2019)
[111] (Ministry of Environment, Forest and Climate Change, 2021)

directions for involved persons that focus on the safety of the human as well as the marine mammal involved in the stranding or entanglement.

The guidelines also establish multiple centers, networks, and organizations. The National Stranding Centre (NSC) was created to maintain a knowledge management system on a national level for marine animal strandings and bycatch. A series of State Stranding Centers (SSC) and Local Stranding Networks, Volunteer Networks, Stranding Coordinators were also established to maintain the state/local level databases respectively. Finally, the guidelines encourage the creation of Rapid Response Teams (RRT) that can take immediate action in case of the stranding of live marine megafauna. In the future, all the data from these various organizations will reside in the national database[112,113].

C. Conservation Initiatives

Several bycatch related initiatives are underway across India. Numerous state governments have implemented fishery closures for 6 to 8 weeks each year during the first two months of monsoon season. This ban aims to reduce the stress on fish populations during breeding and spawning. These measures are also indirectly helping to reduce marine mammal bycatch during those weeks[114]; however, it is unclear what level of bycatch is prevented by these closures.

Researchers in India have also developed a 'Marine Mammal Research and Conservation Network of India' to try to fill in the gaps in research and conservation of marine mammals as well as bycatch mitigation[115]. India has also created a network of 130 Marine Protected Areas (MPAs) that have been used to protect marine mammal habitat. The country has also identified Important Marine Mammal Areas (IMMAs). However, it is unclear whether these designations require any bycatch mitigation beyond the protection provided by the Wildlife (Protection) Act of 1972, or otherwise contain substantive marine mammal protections. The establishment of National cetacean species recovery programs have been created for at-risk species, such as the Arabian Sea population of the Humpback Whale.[116,117]. These programs focus on monitoring and research rather than strict protections. The national and state governments have also invested in education and awareness-raising programs in relation to bycatch, especially for Dugongs[118].

D. Fishery Registration

Registration and obtaining a license with India's Marine Products Export Development Authority or India's Department of Fisheries is mandatory for all fishing vessels in India[119]. All fishing vessels, exporters, and other processing entities must also register with India's MPEDA under Section (2)(b) and (h) of the MPEDA Act 1972. Registration is done for the following

[112](Ministry of Environment, Forest and Climate Change, 2021)
[113] (Marine Mammal Research & Conservation Network of India, n.d.)
[114] (IWC, 2019)
[115] (Marine Mammal Research & Conservation Network of India, n.d.)
[116] (ENVIS Centre on Wildlife & Protected Areas, n.d.)
[117] (IUCN- SSC Cetacean Specialist Group, n.d.)
[118] (Kuppusamy, 2019)
[119] (Government of India Department of Fisheries, n.d.)

categories: Manufacturer Exporter; Merchant, Route through Merchant, Ornamental Fish Exporter, Fishing Vessels, Processing Plants, Storage Premises, Conveyance, Pre-Processing Centers, Live Fish Handling Centers, Chilled Fish Handling Centre, Dried Fish Handling Centre, Independent Cold Storages, and Ice Plants. Seafood processing units in India are approved by the Export Inspection Council of India[120]. All approved MPEDA exporter data is incorporated into an Exporter Directory. The searchable directory holds information including: the complete postal address, name of the Chief Executive, contact numbers, e-mail address, location, and product details.

When applying for a Vessel Registration Certificate with the Indian Department of Fisheries, the applicant must provide: name of fishing boat, registration number and date, call sign (where applicable), port and district where registered, name of owner, permanent residence or principal place of business, shares held, category of ownership (individual, company etc), area of operation, particulars of fishing boat, communication equipment, life saving appliances, number of crew, and base of operation[121]. (See Appendix iii. for full application details)

When applying for a Fishing License Certificate with the Indian Department of Fisheries, the applicant must provide: name of fishing boat, number and date of certificate of registration, number and date of license, name and address of the person/s whom the license is issued, particulars of fishing vessel licensed, make and HP of engine, type of vessel, fishing gear licensed, specific area for which the license is issued, period for which the license is issued[122]. (See Appendix iv. for full certificate details).

Both of these applications lack information about the target species, season, and catch sizes. India reported target species data to the LOFF but it is unclear where this data was collected. We were unable to identify any limits on the number of licenses or vessels that can participate in a particular fishery.

E. Bycatch Reduction Devices

Bycatch Reduction Devices (BRDs) are devices or structures added to fishing gear that reduce capture or enable the escape of non-target species from fishing nets[123]. India's Central Institute of Fisheries Technology has developed and tested BRDs such as the Juvenile Fish Excluder and Shrimp Sorting Device, but India has not issued any nationwide regulations or policies regarding BRDs[124]. India's lack of Bycatch Reduction Device (BRD) regulations and their high level of bycatch for non-mammal species has already resulted in U.S. import bans. Because of the large bycatch numbers of sea turtles, the United States banned imports of wild-caught shrimp from India beginning in 2018 due to the lack of national regulation regarding the use of Turtle Excluder Devices[125,126,127] and the high numbers of sea turtle bycatch. Although

[120] (MPEDA, n.d.)
[121] (Government of India Department of Fisheries, n.d.)
[122] (Government of India Department of Fisheries, n.d.)
[123] (Gupta et al., 2019)
[124] (Gupta et al., 2019)
[125] (*India Pushing Reforms to Address US Concerns over Turtle Bycatch*, n.d.)
[126] (Fisheries, 2021b)
[127](*India Pushing Reforms to Address US Concerns over Turtle Bycatch*, n.d.)

this import ban has influenced India's fishery policy in that India's MPEDA is currently working with state and national officials to strengthen laws and fishing regulations with the aim of having the U.S. ban reversed[128], the country has still not achieved a lifting of the embargo.[129] Multiple states such as Odisha and Andhra Pradesh have statewide policies mandating the use of BRDs, particularly TEDs, but there is not currently an overarching national policy requiring the use of BRDs[130,131]. These state regulations are important for non-target species but do not have a distinct focus on reducing marine mammal bycatch.

The use of pingers is not mandatory in Indian fisheries. Pingers were used experimentally within a single fishery in Kerala in 2017, but it has not become widespread[132].

F. General Marine Fishing Regulations

The Marine Fisheries Regulation Acts of some maritime states have prohibited mechanized fishing within 5-10 km of the shoreline[133,134]. The category of non-mechanized fishing vessels or traditional vessels include catamarans, dugout-canoes, plank-built canoes, masula boats, dhinghi, outrigger canoes and built-up boats. Mechanized boats are operated by engines and allow for distant coastal travel in search of fishing grounds. This category includes line boats (hand line boats, and pole and line vessels), trap boats, dolnetters, gillnetters and trawlers[135]. Minimum mesh size for trawler nets, legally specified minimum landing sizes for commercial species, and seasonal and spatial closures have also been enacted in some states[136,137,138]. Many of these state-based restrictions are intended to protect fish stocks but may provide indirect protections for marine mammals; however, there is no data identifying whether and how much marine mammal bycatch is avoided in any particular fishery due to the restrictions. Therefore, we believe these state restrictions alone are not sufficient to show bycatch mitigation. Summaries of additional maritime state fishing regulations are as follows[139]:

Gujarat:

i. The area up to 9km from the shore is reserved for non-mechanized vessels and mechanized vessels beyond 9km.
ii. No fishing can take place in the territorial waters from 10 June to 15 August every year
iii. In case of trawl net, square mesh of minimum 40 mi-n size at code ends need to be used
iv. Gillnet with mesh size less than 150 mm is prohibited

[128] (The Marine Products Export Development Authority, 2020)
[129]https://www.federalregister.gov/documents/2021/04/30/2021-09077/bureau-of-oceans-and-international-environmental-and-scientific-affairs-annual-certification-of
[130] (Gupta et al., 2019)
[131] (Gupta et al., 2020)
[132] (Edwin et al., 2017)
[133] (Datta, 2013)
[134] (Gupta et al., 2019)
[135] (Tamil Nadu Agricultural University, n.d.)
[136] (Basheer, 2017)
[137] (Gupta et al., 2019)
[138] (Rajesh, 2013)
[139] (Datta, 2013)

Maharashtra

i. Operation of trawl net by mechanized fishing vessels is prohibited from the seashore to 5 fathoms and 10 fathoms depth zones in specified areas.
ii. Fishing by mechanized fishing vessels is banned from 1 June to Nariyal Purnima around the first fortnight of August.
iii. Fishing by mechanized fishing vessels of any type with more than 6 cylinder engines in prohibited within the territorial waters of Maharashtra up to 22km.
iv. Purse-seine shall not be operated by any mechanized fishing vessel within the territorial waters of Greater Mumbai, Thane, Raigad, Ratnagiri amid Sindhudurg districts.
v. Mechanized fishing vessels operating purse-seine gear beyond the territorial waters shall not land the catch caught by such gear in any port other than Mirkrwada (Ratnagiri port).

Goa

i. Mechanized fishing vessels are prohibited from fishing up to 5 km from the coastline.
ii. Net mesh size is restricted. i.e. 20mm for prawns and 24 mm for fish.
iii. Mechanized fishing with trawl nets and purse seines is banned from 5 June to 24 July every year.

Karnataka

i. The area up to 6 km from the shore or up to 4 fathoms (whichever is farther) is reserved for traditional crafts
ii. Mechanized boats (up to 50 feet in length) are allowed to operate beyond 6 km. Deep-sea vessels (over 50 feet in length) are required to operate beyond 30 km.

Kerala

i. Mechanized fishing except fishing by motorized country craft is prohibited within 30m of shore from Kollencode to Manjeswar (590 km). Only fishing with country craft and traditional craft is allowed in these zones.
ii. Small mechanized vessels (<25 GRT) are allowed to operate between 20 - 70 m depth within the zone.
iii. Trawling is banned for 45 days from 15 June to 29 July every year.

Tamil Nadu

i. The area up to 5km off of shore is reserved for traditional non-mechanized boats.
ii. Mechanized boats are permitted to use areas beyond 5km.
iii. Fishing within 100 m of a river mouth or estuary is prohibited.
iv. Gillnet with mesh sizes less than 25mm are prohibited.
v. Shrimp trawl nets with mesh sizes less than 37 mm at cod end are prohibited.
vi. Fish trawl nets with mesh size less than 40 mm at cod end are prohibited.
vii. The number of mechanized fishing vessels which may be used for fishing in any specified area is decided by the Authorized Officer.

Andhra Pradesh

i. The area up to 7km from shore is reserved for traditional craft.
ii. Mechanized boats are allowed to operate beyond 7km.
iii. No vessels may use fishing nets with mesh size below 15mm.
iv. Shrimp trawlers engaged in fishing without turtle excluder devices (TED) shall be liable for confiscation of their entire catch and a fine of Rs 2,500.

Orissa

i. Non-mechanized traditional craft are allowed to operate freely without restriction. The area up to 5km from the shore is reserved for non-mechanized traditional crafts.
ii. Mechanized fishing vessels up to 15 m in length are allowed to operate beyond 5km from the coast.
iii. Mechanized fishing vessels of 25 GRT and above (or 15m in length) aer allowed to operate beyond 10km from shore.

West Bengal

i. The area up to 18 km from shore is reserved for artisanal fishing craft and craft fitted with engines less than 30 HP.
ii. Fishing crafts with engines larger than 30HP are allowed to operate beyond 18km from shore.
iii. Gillnets with mesh size less than 25 mm are prohibited.
iv. Bag net/dol net with mesh size below 37 mm are prohibited.
v. Shore seine/drag net with mesh size below 25 mm are prohibited.
vil. Standard mesh size trawl nets must be fitted with turtle excluder devices (TED).

Andaman and Nicobar Islands

i. Vessels with engines less than or equal to 30HP are only allowed to fish up to 10km from shore.
ii. Vessels with engines larger than 30HP are allowed to operate beyond 10km.
iii. Fishing nets with less than 20mm mesh size are prohibited.
iv. Only trawl nets with standard mesh size and turtle excluder devices (TED) are permitted.
v. Only gillnets, shore seines and dragnets with mesh size above 25mm are permitted.

Lakshadweep

i. The use of purse seine, ring seine, pelagic, mid water and bottom trawl with less than 20mm mesh size is prohibited with the exception of live bait nets.
ii. The use of draft gill nets with less than 50mm mesh size, and shore seine with less than 20mm mesh size are prohibited.

The Maritime Zones of India (Regulation of Fishing by Foreign Vessels) Act of 1981 and 1982 are intended to regulate foreign fishing vessels in the Indian EEZ that are owned and/or operated by either foreign nations or Indian citizens. There is little to no legal accountability

applied to ships within the EEZ except the requirement to follow the seasonal monsoon ban and the ban on intentionally killing species which are protected under the 1972 Wildlife (Protection) Act, including marine mammals[140].

VII. IOTC

Regional Fisheries Management Organizations (RFMOs) have the potential to play a vital role in tackling bycatch around the world, especially with fisheries operating outside of nations' EEZ. India is a member of the Indian Ocean Tuna Commission (IOTC) RFMO. While the IOTC does report catch estimates and has implemented some bycatch related regulations, the data reports for marine mammal bycatch are extremely poor and patchy[141,142]. The IOTC data for India as a whole is insufficient and therefore not a useful tool to estimate India's fishing data or bycatch numbers. For example, in 2020 the IOTC reported that there was a lack of catch-and-effort data and indices of abundance for Indian coastal tuna fisheries and artisanal fisheries. There was also a lack of size frequency data for most of the IOTC major coastal fisheries, including India's coastal longline fishery and driftnet fishery[143].

The IOTC Working Party on Ecosystems and Bycatch (WPEB) recommended that data on marine mammal interactions with IOTC fisheries be collected and reported by participating fisheries to the IOTC[144]. Despite this recommendation, the underreporting of bycatch at the IOTC remains a serious problem. In 2019, India reported zero marine mammal mortalities[145]. While zero mortalities are a goal of the MMPA, India's report to the IOTC is inconsistent with the Indian government and scientific community's statements that marine mammal bycatch in the tuna industry is a significant problem. In 2020, the IOTC Compliance Committee stated that India has not submitted the required data on interactions with Cetaceans (by resolution 13/04). India responded with "The report has been submitted vide vide email by the Director General, Fishery Survey of India dated 30 June, 2020. India has legislation to protect all the marine cetaceans[146]". This submitted data from India is not publicly available.

Since 2010, the IOTC has developed a regional observer plan to monitor its tuna fisheries and their bycatch. This plan requires 5% observer coverage[147,148]. This plan does not appear to be working effectively due to the lack of reported bycatch numbers. According to the IOTC, as of 2015, India had not yet developed an observer program and had reported 0% observer coverage[149]. Other sources confirm the lack of an observer program up to 2018.[150] While other nations have reported regional observer data, the IOTC's regional observer plan as a whole is data deficient. As stated in the IOTC's Working Party on Data Collection and Statistics' 2020

[140] (Rajesh, 2013)
[141](Herrera & García Horcajuelo, 2018)
[142] (IWC, 2019)
[143] (IOTC Working Party on Data Collection and Statistics, 2020)
[144] (IOTC, 2019)
[145] (Ramalingam, L et. al, n.d.)
[146] (IOTC Compliance Committee, 2020)
[147] (*Data and Statistics | IOTC*, n.d.)
[148] (*Working Party on Ecosystems and Bycatch (WPEB) | IOTC*, n.d.)
[149] (IOTC, 2015)
[150] (Pramod, 2018)

report “Most levels of reporting of (industrial fisheries) observer coverage are below those recommended by the Commission (i.e., a minimum of 5% of the total number of fishing operations shall be covered by scientific observers).” In addition, there is little or no observer data collected for artisanal fisheries within the IOTC[151].

As stated previously, the U.S. government has already determined that India does not possess an acceptable observer program for gillnet fisheries and tuna vessels. In 2016, NMFS determined pursuant to the Dolphin Protection Consumer Information Act (DPCIA) that tuna fishery vessels operating under India’s flag were responsible for regular, significant, and serious injury of dolphins in gillnet fisheries, and NMFS also determined that India did not have an acceptable observer program[152, 153].

The IOTC WPEB is also responsible for monitoring and assessing the stock status of its bycatch species. So far, there are very few estimates of the impact of tuna fishing on the population of bycatch species and there is a critical need for marine mammal experts and scientific analyses in future reports. The WPEB strongly encourages the involvement of the marine mammal scientific community in their reports and meetings, but successful collaborations have yet to be fully established.

VIII. Intermediary Nation

India is an intermediary nation that exports processed intermediary products to the United States. According to the 2020 NOAA Final List of Intermediary Nations and Products, India’s exports to other intermediary nations, however, present a significant risk of non-MMPA compliant fishery products from India being exported to the United States through other nations. India is listed as a product source for intermediary export products from China, Japan, Malaysia, Netherlands, Poland, Singapore, South Korea, Sri Lanka, Taiwan, Thailand, and Vietnam[154].

IX. Assessment of India’s “Comparability” under the MMPA Imports Rule

A. Summary:

Under the U.S. Marine Mammal Protection Act (MMPA), the U.S. government “shall ban" all seafood imports caught with fishing gear that kills or seriously injures marine mammals in “in excess of United States standards.” 16 U.S.C. § 1371(a)(2). In applying this requirement, the U.S. “shall insist on reasonable proof” from the exporting nation of the effects of its exporting fisheries on marine mammals – i.e., its marine mammal bycatch. *Id.*

To implement this provision, the National Marine Fisheries Service (NMFS) issued its MMPA Imports Rule. 81 Fed. Reg. 54,415 (Aug. 16, 2016). Under the Rule, in order for India to continue exporting fish to the United States after December 31, 2022, India must apply for and

[151] (IOTC Working Party on Data Collection and Statistics, 2020)
[152] (Fisheries, 2021a)
[153] (*Federal Register :: Fish and Fish Product Import Provisions of the Marine Mammal Protection Act; Final 2020 List of Foreign Fisheries*, n.d.)
[154] (NOAA Fisheries, 2020)

receive a "comparability finding" from the U.S., essentially a determination that its bycatch and bycatch program for each exporting fishery meets U.S. standards. 50 C.F.R. § 216.24(h)(6).

Under the Rule, for export fisheries operating within India's EEZ to receive a comparability finding, India must show:

1. India "[p]rohibits the intentional mortality or serious injury of marine mammals in the course of commercial fishing in the fishery;" and

2. For any fishery deemed an export fishery on NMFS's LOFF, India "maintains a regulatory program" for the fishery "that is comparable in effectiveness to the U.S. regulatory program."

To demonstrate a comparably effective regulatory program, India must show it maintains a program "that includes[ ] or effectively achieves comparable results as" the following components:

(a) "Marine mammal assessments . . . for stocks . . . that are killed or seriously injured in the fishery;"

(b) "An export fishery register," listing all fishing vessels in the fishery, including time, season, gear type, and target species;

(c) Regulatory requirements that include:

(i) A requirement that vessel operators report all marine mammal injury or death;

(ii) A requirement that fishers implement measures to reduce mortality/serious injury;

(d) Monitoring procedures in the export fishery to estimate mortality/serious injury from the fishery and cumulatively from other export fisheries on same marine mammal stocks;

(e) Calculation of bycatch limit for marine mammals taken in fishery. The "bycatch limit" is PBR or a "comparable scientific metric;" and

(f) Demonstration that mortality/serious injury from the fishery (and cumulatively with other export fisheries) "[d]o not exceed the bycatch limit."

Accordingly, in order to achieve a comparability finding for the MMPA Import Rule, India must demonstrate and document that it meets each of the conditions above or maintains a regulatory program that "effectively achieves comparable results," a strict standard.

B. India's Compliance with the MMPA Imports Rule

Applying the MMPA Imports Rule requirements with information currently available to the public, it is apparent that India *lacks* the bycatch measures, monitoring, and data necessary to demonstrate comparability. 50 C.F.R. § 216.24(h)(6)(iii)(C). While aspects of Indian legislation may be comparable to the MMPA, such as the ban on the intentional killing of marine mammals, the severe lack of data available on marine mammal status and marine mammal bycatch, as well as the lack of data provided to the 2020 LOFF make it largely impossible to accurately assess India's export fisheries' bycatch or ultimately comparability to U.S. standards. Therefore, unless significant improvements are made in India's data collection and reporting as well as their observer programs, a U.S. ban on Indian seafood imports will be necessary.

While India is working to improve their research data on marine mammal populations and bycatch, the report is not projected to be completed until 2023, well after the November 2021 deadline for MMPA comparability applications. While India's Marine Megafauna Stranding Management Guidelines have the potential to improve some marine mammal and fishery interactions, the guidelines focus on self-reporting from fishermen and lack an observer program or other mandatory measures to ensure compliance. India also lacks a regulatory program requiring bycatch mitigation at the national level and while some Indian states have various fishery regulations, it is unclear to what degree these regulations affect marine mammal bycatch.

1. Ban on Intentional Killing

The Wildlife (Protection) Act 1972 prohibits the intentional killing, landing, or hunting of any marine mammal. All marine mammals that reside within India have been given the Schedule I classification. However, the Act *allows* killings and injury of protected species in certain situations with the permission of officials. The killing of Schedule I species is permitted if the Chief WildLife Warden believes that any Schedule I species has become dangerous to human life or is so disable or diseased as to be beyond recovery. The killing of protected wildlife is also permitted with a permit related to education, scientific research or scientific management[155]. Furthermore, the Act does not clarify whether incidental bycatch is prohibited; only the illegality of landing a killed protected species.

There have been inconsistent reports that the Act may not apply beyond India's territorial waters (12nm)[156]. NMFS must require that India clarify this discrepancy and ensure the enforcement of the act within all Indian waters and aboard Indian ships.

2. India Does Not Maintain a Regulatory Program "Comparable in Effectiveness" to the U.S. Program for Fisheries.

a. Marine Mammal Stocks and Bycatch Estimates

[155] (Indian Parliament (Act No. 53 of 1972)
[156] (IWC, 2019) Available at: https://archive.iwc.int/pages/view.php?ref=9612&k=

As stated numerous times in this report, India does not have current or accurate data relating to marine mammal stocks nor the bycatch estimates for its fisheries and waters. While India is trying to fill in these gaps with new research, the CMFRI report is not expected to be finished until 2023. Without this critical data, India cannot demonstrate that bycatch in its export fisheries do not exceed PBR.

b. Export Fishery Register

It appears that India maintains a fishery register. India has reported fishery information that was included in the LOFF, including the number of vessels, gear type, the target species and FAO fishing area. The nation also requires all exporting fisheries and fishery product exporters to register in the MPEDA database. It is unclear whether India tracks the season/time of fishing in its register. India's approach to transboundary stocks is unclear. A limitation on the number of fishing vessels or licenses is also unclear.

c. Reporting and Monitoring Requirements

We were unable to identify any Indian statutory or regulatory requirements for monitoring or reporting marine mammal bycatch in export fisheries that are "comparable" to U.S. standards. Both the IOTC and the Indian government have put in place data collection methods for reporting and monitoring marine mammal bycatch incidents. Unfortunately neither the IOTC nor the Indian government's methods for the EEZ have strict requirements, observer coverage, or measures to ensure compliance. The IOTC requires marine mammal bycatch data submission from its member nations but has no enforcement policy or consequences for nations that fail to comply. India has failed to submit bycatch numbers to the IOTC. India's "Sightings and Strandings" database is a step in the right direction. However, it is reliant on voluntary submissions and therefore cannot provide the complete picture of bycatch numbers within Indian waters or aboard Indian ships. The Wildlife (Protection) Act of 1972 formerly required the maintenance of records of wild animals killed or captured but this requirement was omitted by the Wild Life (Protection) Amendment Act, 1991 (44 of 1991), s. 10 (w.e.f. 2-10-1991).

While the IOTC has a 5% observer rate and requests data on bycatch, the programs have proven insufficient in calculating/reporting bycatch or reducing that bycatch within its member fleet. This is due to multiple shortcomings in the IOTC policy. For example, the IOTC has placed the burden of observer schemes/programs on national programs. The IOTC has historically failed to implement a training program to support the implementation of the IOTC regional observer schemes. It has also historically failed to include set standards by which to assess national observer programs in terms of their compliance with IOTC standards. In 2018 the IOTC received funding to address these shortcomings but the project was not due for completion until March 2021[157]. No reports of India addressing this IOTC process have been found since the March 2021 deadline. According to IOTC reports, as of 2019, most levels of observer coverage within its industrial fleet are below the Commission's recommended 5%[158]. The last available data on India's IOTC observer program compliance was from 2015. At that time India had failed

[157] (IOTC Secretariat, 2019)
[158] (IOTC Working Party on Data Collection and Statistics, 2020)

to establish an observer program.[159] India's lack of an observer program is further confirmed by a NMFS determination in 2016 under the DPCIA that India did not have an acceptable observer program[160, 161]. This determination remains in effect.

d. Calculation of a Bycatch Limit

We are not aware that India has calculated a marine mammal bycatch limit for any of its export fisheries. Because of the lack of data pertaining to marine mammal populations/stock and the lack of observer reported bycatch numbers, the calculation of bycatch limits for Indian fisheries and its marine mammals is not currently possible.

e. Regulatory Requirement for Measures to Reduce Bycatch Below Bycatch Limit

India and the IOTC lack regulatory requirements as well as the enforcement necessary to reduce marine mammal bycatch. Because of the lack of stock assessments and a bycatch limit, it is also impossible to determine whether any regulatory program could reduce bycatch below such a limit.

India's Marine Megafauna Stranding Management Guidelines provide guidance to reduce mortality/serious injury to marine mammals that have already been stranded or entangled. However, these guidelines merely provide guidance rather than actual requirements. The guidelines also do not require mitigation measures to reduce the incidental catch of mammals from occurring[162].

As detailed in section VI above, several Indian states have adopted fishery regulations applicable in portions of their waters. Many of these state-based restrictions are intended to protect fish stocks but may provide indirect protections for marine mammals; however, there is no data identifying whether and how much marine mammal bycatch, if any, is avoided in any particular fishery due to the restriction.

X. Conclusion and Recommendation

It is unlikely that India will be able to demonstrate that it meets the U.S. MMPA Imports Rule for any of its export fisheries. An export ban is appropriate for all of India's fisheries, including those within the IOTC.

As detailed above, in order for India to continue exporting seafood to the United States, India bears the burden of demonstrating both that it bans killing and serious injury of marine mammals during commercial fishing and that it "maintains a regulatory program" for the fishery

[159] (IOTC, 2015)
[160] (Fisheries, 2021a)
[161] (*Federal Register :: Fish and Fish Product Import Provisions of the Marine Mammal Protection Act; Final 2020 List of Foreign Fisheries*, n.d.)
[162] (Ministry of Environment, Forest and Climate Change, 2021)

"that is comparable in effectiveness to the U.S. regulatory program." This requires that India have a regulatory program including (or somehow achieving comparable effectiveness as including) stock assessments, a fisheries register, marine mammal bycatch reporting, mitigation requirements, bycatch monitoring, and calculation and proof that bycatch does not exceed PBR or comparable metric.[163]

Based on our assessment of publicly available information, we conclude that it is improbable India will be able to demonstrate comparability under the Rule. India lacks critical information in numerous categories. India does not have marine mammal population and stock assessment data, nor has it calculated PBR. India also lacks a mandatory reporting system and the subsequent bycatch data. The IOTC does not enforce its bycatch reporting policy, making it ineffective. India has failed to report bycatch numbers to the LOFF. India reported zero bycatch to the IOTC which we believe to be inaccurate due to India's lack of reporting structure. India's government has also listed high bycatch number estimates in government reports which directly contradicts their report to the IOTC. India also lacks national-level bycatch mitigation requirements, and it is unclear whether the state-level fishery requirements mitigate marine mammal bycatch in relevant export fisheries. Until this information and reporting structures are established, we believe an import ban is necessary for all of India's exporting fisheries.

[163] 50 C.F.R. § 216.24(h)(6)(iii)(C).

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XII. Appendices

A.

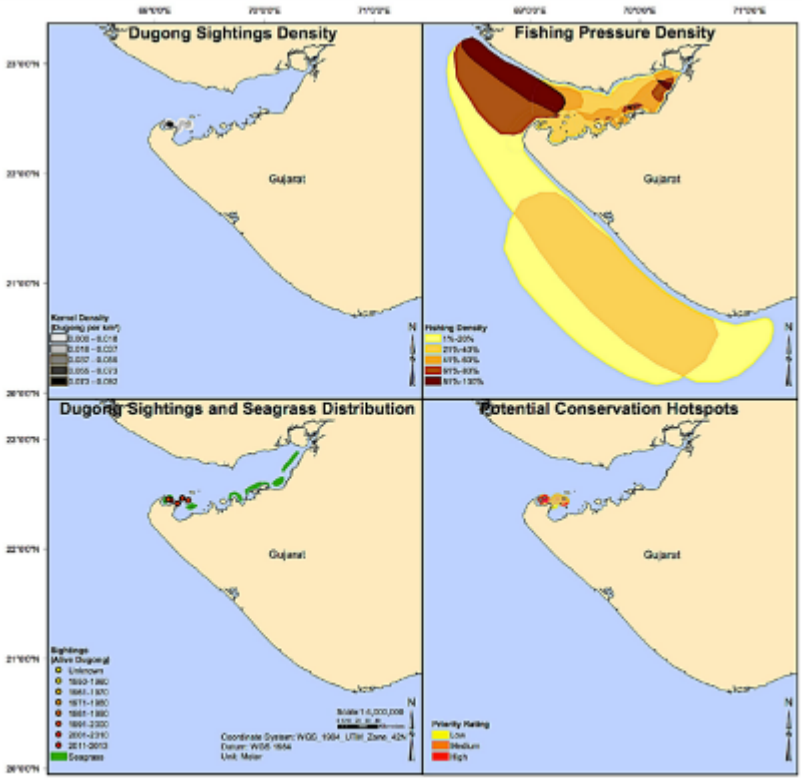

Figure 13: Dugong and fishery density analysis, sightings and seagrass distribution, and priority area identification for Gurarat, India.

Gujarat, India (Pilcher et al., 2017)

B.

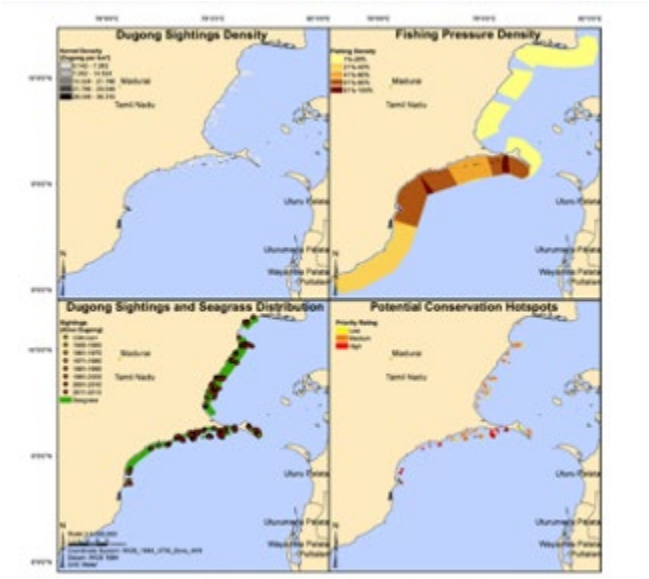

Figure 14: Dugong and fishery density analysis, sightings and seagrass distribution, and priority area identification for Tamil Nadu, India.

Tamil Nadu, India. (Pilcher et al., 2017)

C. (Merchant Shipping (Registration of Indian Fishing Boats), Rules, Amendment Rules 2009, 2009)

APPLICATION FOR REGISTRY OF A FISHING BOAT
[See sub – rule (1) of rule 3]
To THE REGISTRAR OF FISHING BOATS,
Port……. Sir, I/ We …….. of ……..being the owner of fishing Boat called the…….hereby request that the said fishing boat be registered in my/our name/s and a Certificate of Registry be issued to me/ us.
2. Details of Owner(s) of the said fishing boat are as follows: Name Occupation Permanent residence or principal place of business Share (s) held
3. Category of the ownership……. (Company/Individual/Co-operative society/Government/ Hypothecation)
4. Area of operation…….
5. Particulars of fishing boat
(i) Name and address of building yard…….
(ii) Port of Previous Registry (if any)……
(iii) Details of previous mortgages (if any)
……
(iv) Year of build /re-build of fishing boat……..
(v) Hull material (wood/Fiber glass/Steel/Composite)……
(vi) Length…(Mtrs) Breadth…..(Mtrs) Depth…...(Mtrs)
(vii) Engine details ; Make Year of make Engine number HP …… …… ……. …….. Name & address of manufacturer …….. Number and

diameter of cylinders……. Length of stroke…….
Revolution per minute (RPM)/ Speed…… Fuel
Capacity……..
(viii) Type of vessel (Motorized mechanical/ Motorized nonmechanical / Non-motorized / open / semi decked / decked fitted with auxiliary engine)……
(ix) Number of Masts / Bulkheads / Holds ……
(x) Tonnage capacity (Gross Tons) ……
(xi) Details of Fishing gear ……
6. Communication equipment
(i) Maritime Mobile Station Identification (MMSI) No., if allotted ……
(ii) Automatic identification System (AIS) (if fitted) Make & Model ……
(iii) Emergency Position Indicating Radio Beacon (EPIRB) (if fitted) Make & Model …….
(iv) Search & Rescue Transponder (SART) (if fitted) Make & Model …
(v) Other communication equipment, if fitted……
7. Number of crew ……
8. Base of operation ……
9. The following documents are enclosed herewith:- (a) Declaration of ownership (b) Builders certificate (in respect of registration of new vessel) or Bill of sale if purchased
10. I / We request that a name for the Fishing vessels be approved from the following: I II III
Place…… Date…….. Signature of Left thumb impression of owner
Conditions of the certificate of registration

1. This certificate of registration is granted under the provisions of MS Act 1958, as amended.
2. Any change in the fishing boat's name, other markings, layout, design, capacity of the vessel should be affected only with the prior approval of the registration authority.
3. The certificate must be produced for inspection on demand by any authorized person.
4. Should the vessel be lost, broken up or rendered unfit for service, this certificate should be surrendered to the registrar of the fishing boat.

[Form I Substituted by Amendment in 2009 vide G.S.R. No. 448(E), dated 24th June, 2009]

iv. (Merchant Shipping (Registration of Indian Fishing Boats), Rules, Amendment Rules 2009, 2009)
(Government of India Department of Fisheries, n.d.)

Fishing Licence Certificate

1. Name of the Fishing Boat
2. Number & Date of Certificate of Registration
3. Number & Date of Licence
4. Name and Address of the Person/s to whom the Licence is issued
5. Particulars of Fishing Vessel Licensed

a. Length (Mtrs)
b. Breadth (Mtrs)
c. Depth (Mtrs)

6. Make and HP of Engine: Make, Year of Make, Engine Number, HP
7. Type of Vessel
8. Fishing Gear Licensed
9. Specified Area for which the Licence is issued
10. Period for which the Licence is issued

Fishing Licence Certificate

GOVERNMENT OF KERALA
Department of Fisheries
Certificate of Licence of a Fishing Boat

1. Name of the Fishing Boat : **RAMEES**
2. Number & Date of Certificate of Registration (രജിസ്ട്രേഷൻ നമ്പറും തീയതിയും) : **IND-KL-01-MO-4809 & 15/06/2010**
3. Number & Date of Licence (ലൈസൻസിന്റെ നമ്പറും തീയതിയും) : KL-L51260/11 & 04/05/2011
4. Name and Address of the Person/s to whom the Licence is issued (ഉടമസ്ഥന്റെ പേരും മേൽവിലാസവും) :SUBASH S/oRamees, Erikalaveedu, Poovar P.O
5. Particulars of Fishing Vessel Licensed (ബോട്ടിന്റെ വിവരണം)
   a) Length (Mtrs) (നീളം) : 9.750 b) Breadth (Mtrs) (വീതി) : 1.820 c) Depth (Mtrs) (താഴ്ച്ച) : 1.210
6. Make and HP of Engine (എഞ്ചിൻ വിവരണം)

Make (നിർമ്മാണം)	Year of make (നിർമ്മിച്ച വർഷം)	Engine Number (എഞ്ചിൻ നമ്പർ)	HP (എച്ച്. പി
Suzuki	2010	00992K-10815	9.9

7. Type of Vessel (യാനത്തിന്റെ തരം) : FIBRE CRAFT : ഫൈബർ ക്രാഫ്റ്റ്
8. Fishing Gear Licensed (മീൻ വല) : TRADITIONAL_NETS,GILLNET : നാടൻ വല,ഗിൽനെറ്റ്
9. Specified Area for which the Licence is issued (ഏരിയ ഓഫ് ഓപറേഷൻ) : As prescribed in Merchant Shipping Act 1958 (MS Act)
10. Period for which the Licence is issued (ലൈസൻസിന്റെ കാലാവധി) 04/05/2011 to 02/05/2012

Place : THIRUVANANTHAPURAM
Date : 4/05/2011

Signature and Seal of the Authorised Officer