CMFRI Booklet Series No.30/2022

Seafood Watch Assessment of Indian Squid - *A Clarification by ICAR-CMFRI*

Indian marine fisheries have been in a phase of significant expansion over the past decade. As international import standards become increasingly stringent, the transparency and factual accuracy of the state of resources and fisheries in countries such as India, which have a substantial stake and increasing prospects in this sector, are being subjected to the scrutiny of a plethora of agencies including non-state actors. This often leads to an overzealous evaluation and subsequent branding of the status of such resources, with unfortunately minimal analysis of the highly superficial information attributed to such resources. In this backdrop, being a top-notch research institute focussing exclusively on marine resource assessment and augmentation, the Indian Council of Agricultural Research - Central Marine Fisheries Research Institute (ICAR-CMFRI), Kochi, Kerala, India, deems it appropriate to place the factual status of such resources exclusively based on the researched outputs available at its disposal.

A case in this context is the assessment report of Monterey Bay Aquarium's (MBA) Seafood Watch[1] which provides recommendations for three major commercially imported squid species to the United States: the Indian squid (*Uroteuthis duvaucelii*), the mitre squid (*U. chinensis*) and the swordtip squid (*U. edulis*). ICAR-CMFRI has noted inadequacies and inappropriateness in the evidence furnished as well as in the analysis carried out by the auditors of the MBA's Seafood Watch Report. For instance, these three inshore Indo-Pacific species with distribution extending from west of the Indian Ocean to the western Pacific, have been erroneously branded under the "Avoid" category. This branding is the result of an unscientific pooling of four-pronged assessment criteria (Seafood Watch Standard for Fisheries vF3) applied on resources from three different EEZs. According to the Institute's objective evaluation, this report is skewed without taking into cognizance the entire gamut of scientific evidence available. Further, the MBA's report finds the data collection architecture having "shortfalls", whereas the marine fish landings of India are monitored incessantly with their estimated production statistics regularly worked out based on surveys following multistage stratified random sampling design, that are populated

systematically in the National Marine Fishery Resources Data Centre (NMFDC) of ICAR-CMFRI, with proper metadata documentation. With such a comprehensive mechanism in place, the aforementioned assertion made by MBA is unfounded.

ICAR-CMFRI team has carried out a detailed scrutiny of the claims which are listed in the MBA report, based on the four assessment criteria. Our points of departure regarding each criterion-based statement are detailed as remarks in Table 1. It is worth mentioning that this one-sided assessment cites several review articles without acknowledging the 'secondary' references from which information has been obtained (for instance, Saroj et al., (2016) on coral reefs), which tantamount to cherry-picking and violates all norms of scientific ethics. Additionally, pointed responses to factually incorrect statements made in the report have also been helmed up in Table 2.

Table-1 Observations on the Assessment Criteria

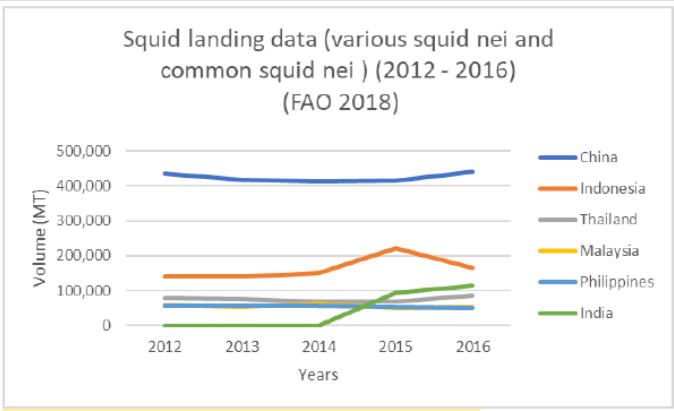
Assessment Criteria	Statements in the MBA report	Remarks
Criterion 1: Impacts on the Species Under Assessment Factor 1.1 – Abundance Factor 1.2 - Fishing Mortality	• In the Seafood Watch Standard for Fisheries, a Productivity-Susceptibility Analysis is conducted **where stock status is not clear**. PSA suggests that, despite having biological characteristics that indicate high productivity, susceptibility to fisheries mortality is also high, and so overall vulnerability to being overfished is high • The current level of mortality is unknown, but recent studies recommended that harvest rates should be reduced so a score of "high" concern is given	• **Stock status of the squid along the eastern Arabian Sea**: Thompson-Bell model output indicates that the yield of *U. (P.) duvaucelii* is closer to the estimates of MSY for the squid fishery along the **west coast** of India (Sasikumar et al., 2017). • Based on the Rapid stock assessment, *U. (P.) duvaucelii* off the **SW coast** of India is classified under the 'abundant' category (Venkatesan et al., 2017) • **Squid productivity**: Recent statolith studies indicates that the lifespan of *U. (P.) duvaucelii* is less than a year, with year-round recruitment to the fishery. There is rapid population turn-over (Sajikumar et al., 2022). The extremely fast growth rates of *U. (P.) duvaucelii* and rapid rates

		of turnover at the population level indicates their 'life-in-the-fast-lane' lifestyle, allowing them to rapidly exploit 'vacuums' created in the ecosystem when predators or competitors are removed. In this way, they function as 'weeds of the sea'. • Additionally, the occurrence of egg mops in gelatinous finger-like strands attached to the substratum in shallow intertidal areas) indicates the spawning of squid in the coastal benthic habitats (Asokan and Kakati 1991) which are non-trawlable. • In these sheltered areas, **the female squids are less subjected to fishing mortality,** as evidenced by a skewed sex ratio in trawl catches. **The chances of egg survival are also relatively high**. • Mechanised fishing operation is prohibited in the inshore waters (State MFRAs). This minimises the overlap of the fishing effort (gear interaction) with the inshore distribution of squids, especially during spawning and egg laying, when they aggregate very close to the shore.

Criterion 2: Impacts on Other Species	• Bottom trawl fisheries are widely recognized as having a high impact on benthic invertebrates, corals, biogenic habitats, and bycatch species, such as sharks and turtles	• Squids, by virtue of their distribution, are caught by high opening off-bottom (semi-pelagic) otter trawl nets that are operated above the sea bottom. Hence, there is NO/minimal impact on benthic invertebrates, corals and biogenic habitats.
Criterion 3: Management Effectiveness	• Effectiveness of Fishery Management," is considered "ineffective" for all the countries, due to the lack of effective measures to address overcapacity of the fleets and reducing fishing effort, which has driven the overall overexploitation of the fishing resources in these countries	• In India, there are input controls in place such as the codend mesh size controls, seasonal mechanised fishing closures (effort reduction), spatial control-limiting the areas fished, apart from, the implementation of MLS to reduce fishing pressure on juveniles. These management measures are effective.
Criterion 4: Impacts on the Habitat and Ecosystem	• Red for bottom trawl fisheries due to the potential physical damage of this fishing method on sensitive habitats (corals and other biogenic habitats) in the area.	• Squids, by virtue of their distribution, are caught by high opening off-bottom (semi-pelagic) otter trawl nets that are operated above the sea bottom. Hence, there is NO impact on benthic invertebrates, corals and biogenic habitats. • The trawl nets are NOT operated above submerged reefs, to avoid net damage and gear loss.

Table-2 Factual response to misleading observations in the MBA report

Sl.No.	Page Number	Statements in MBA report	Remarks
1.	Page No. 10	***Production Statistics*** *Official landing data in South Asian countries is inaccurate due to the limited resources and systems to collect and report catch data. Squid species are not adequately identified in those countries when caught and all the species are pulled together in the production statistics. The top three countries landing squid in South Asia (including the FAO categories various squid nei and common squid nei) between 2012 and 2016 were: China, which reported an average of 423,000 MT of squid landed per year, a volume higher than the sum of the volumes reported by the other top five countries; Indonesia (164,000 MT per year) and Thailand (75,000 MT per year). Then followed Malaysia, the Philippines, and India. Indonesia, Thailand, and India are the countries included in this report.*	• CMFRI is systematically monitoring and documenting marine fishery landings along the Indian Coast since 1950 and is available in the National Marine Fishery Resources Data Centre (NMFDC) of ICAR-CMFRI (CMFRI, FRAD, 1969)

2.	**Page No. 11**	 *Figure 4 Squid landings from 2012 to 2016 in South Asian countries (FAO 2018)*	• **Gross error**: Indian squid landings were shown as Zero during the 2012-2014 periods in Figure 4. • Cephalopods including squid, cuttlefish, and octopus are commercially exploited all along the Indian Coast, catering to the export trade since the mid-seventies (Meiyappan and Mohamed, 2000), and the squid fishery which began in 1961, has been systematically monitored and recorded since then.
3.	**Page No. 11**	*Finally, In India squid landings are reported to FAO as "various squids nei". According to the CMFRI, 94,222, 114,886 and 131,774 MT of squid were landed in India in 2015, 2016, and 2017 respectively (FRAD 2017) (CMFRI 2017) (CMFRI 2018). The amount of Indian squid is unknown, but it could represent around 70% of this catch (Arkhipkin 2015). In 2016, 85% of the catch came from the Western coast of the country (FAO area 51). Around 42% of the squid caught in the country was landed in the Gujarat and Kerala provinces (North and South West India respectively) (CMFRI 2017).*	• The ICAR-Central Marine Fisheries Research Institute has developed a unique method for estimation of fishery catch and effort all along the coastline, thus fully facilitating monitoring and assessment of marine fisheries in the country. The sample survey design is based on a Stratified Multistage Random Sampling Method with space-time stratification. The data on squid landings by species and effort expended are collected from different landing centres according to the sampling plan and reported by the field observers. The quantity of squid landed by species in India is known. The individual species-level database is available in the

			National Marine Fishery Resources Data Centre (NMFDC) of ICAR-CMFRI (Sathianandan et al., 2020).
4.	**Page No. 16**	*Factor 1.1 – Abundance* *INDIA/INDIAN OCEAN* *The last stock assessment for the entire Indian squid stock (Meiyappan et al.1993) considered that the species was exploited at optimum levels. However, this stock assessment was published more than 20 years ago. The most recent assessment, carried out at the regional level in India (Karnataka, Maharashtra) (Mohamed and Rao 1997) (Nitin et al. 2014) (Sundaram and Mane 2019) or in surrounding countries (Pakistan) (Soomro et al. 2015) (Mohsin et al. 2018) suggest that the species is overexploited, but no information is reported about the stock status.*	• As one of the recent published status on the Indian Squid stock health, a size-based analytical model run was performed which indicated that the yield of *U. (P.) duvaucelii* is closer to the estimates of MSY for the squid fishery along the west coast of India (Sasikumar et al., 2017). • Based on the smoothed production time series based Rapid stock assessment *U. (P.) duvaucelii* off the SW coast of India is classified under the 'abundant' category (Venkatesan et al., 2017)
5.	**Page No. 20-21**	*Factor 1.2 - Fishing Mortality*	• As stated in Sl. No. 4 The current level of exploitation along the west coast of India is closer to the estimates of MSY
6.	**Page No. 24**	*Criterion 2: Impacts on Other Species* • *As explained in the introduction section, Indian, mitre and swordtip squid are largely caught via epibenthic otter trawls, nets (falling, cast nets, and purse seiners) and*	• The Squids are columnar and are exploited in high-opening off-bottom (semi-pelagic) trawl nets (Meiyappan and Mohamed, 2000).

		jigs using light luring techniques (Jereb and Roper 2010) (Arkhipkin et al. 2015). • *Very few specific reports on bycatch and discards are available for squid fisheries in the three countries assessed. In tropical countries like Thailand and India, the bycatch problem is a complex issue due to the multi-species and multi-gear nature of the fisheries (Gibinkumar et al. 2012). An exact catch profile for the commercial trawl fisheries targeting squid in India and the Gulf of Thailand has not been found.* •	• Detailed reports on bycatch and discards along the Indian Coast are available at http://eprints.cmfri.org.in/ (For immediate reference Ref 8-10) • The reference, Gibinkumar et al., (2012), is inappropriate as the justification for Criterion 2: It reports the catch from the shrimp trawl (29 m head rope length), which is different from the high opening off-bottom (semi-pelagic) trawl used for squids (99-110m Head rope length).
7.	**Page No. 28**	• *Since no specific stock assessment exists for any of the bycatch species in these countries, they have been grouped under the common denomination "forage fish" (which includes small to medium pelagic species, such as sardines, anchovies or mackerels), "finfish" (which refers to demersal species) or "sharks" (includes both rays and sharks); the unknown bycatch matrix has been used in some cases to assess their stock status.*	• This is not true. In India, several stock assessment studies have been carried out for many of the dominant bycatch species, including some of the common sharks and rays.
8.	**Page No. 29**	*Therefore, based on the above reports regarding gear type, fishing area, regional expert opinion, and the Seafood Watch criteria, the likely species interactions with these gear types include:*	• The Squids are columnar and are exploited in high-opening off-bottom (semi-pelagic) trawl nets (Meiyappan and Mohamed, 2000). These nets are operated off bottom, hence have minimal

		Indian and Thai squid trawl fisheries: benthic invertebrates, corals/biogenic habitat, forage fish, finfish, sharks and turtles;	interaction with the benthic invertebrates, corals/biogenic habitat
9.	**Page No. 29-30**	*SHARKS* *Factor 2.1 – Abundance* *High Concern* *Around 160 species of sharks are reported in Indian waters (Akhilesh et al. 2010). Shark landings along the north-west coast of the country are dominated by the milk sharks (Rhizoprionodon oligolinx and R. acutus) and the spade-nose shark (Scoliodon laticaudus). Landings along the south-west and south-east coasts are dominated by requiem sharks of the genus Carcharhinus. Landing of thresher and mackerel sharks and the oceanic white tip shark (Carcharhinus longimanus) have been found to be increasing in recent years, with increased operations in oceanic waters (Kizhakudan et al. 2015). The contribution of trawl fisheries to total catches between 1985 to 2013, ranged from 19% in West Bengal to around 60% in the state of Tamil Nadu and Puducherry (Kizhakudan et al. 2015). The distribution of Indian sharks classified under IUCN categories indicates that 24% of the species in Indian waters are "Near Threatened," 26% are "Vulnerable," and 3% "Critically endangered." Among the hammerheads Sphyrna lewini , Sphyrna mokarran, and Sphyrna zygaena all three of which have been included in the CITES Appendix II listing*	• The "160 species of sharks" include many species **which either occur occasionally or do not so fall in assorted category so much as to prominently figure in the landings under any category**. The dominant species in trawl fisheries are *Rhizoprionodon* spp. and *Scoliodon laticaudus*. Both are small sharks with faster generation time and the ability for population revival in the face of overfishing. • The *Carcharhinus* species and *Sphyrna* species are **mostly caught in pelagic drift gillnets and longlines**. • Thresher sharks, mackerel sharks and oceanic white tip shark are all caught in **pelagic drift gillnet and longline fisheries**. • There is no/minimal interaction of these large sharks with the semi-pelagic trawls used in squid fisheries in the country.

		that came into effect in September 2014, S. lewini and S. mokarran are classified as "Endangered" and S. zygaena is classfied as "Vulnerable" (Kizhakudan et al. 2015).	
10.	**Page No. 30**	*A Rapid Stock Assessment of sharks based on data for the period 1985 to 2013 and following the classification criteria suggested by (Mohamed et al. 2010) indicates the delicate status of sharks in Indian waters. Sharks were either "less abundant" or "declining" along the Indian coast, except in Tamil Nadu and Puducherry, where, the 3-year average being only 7.6% of the historic maximum, they could be classified as "depleted" (see table below) (Kizhakudan et al. 2015). According to the CMFRI, the main cause behind this reduction in sharks landings is the indiscriminate exploitation of these species in the past decades due to the increasing number and efficiency of large-mechanised fishing vessels and the expansion of fishing to deep water areas (CMFRI 2017).*	• The Rapid Stock Assessment was done using data on total landings of sharks, **which also includes landings by gears other than trawls**. This is not an indicator of landings by trawl fisheries alone. Further, being a method that is done exclusively on the smoothed production time series, the results are subject to high levels of sensitivity. • The mechanised fishing and deep-water fishing indicated here refer to sharks being exploited as targeted and/or bycatch resources in gillnets and longlines particularly those directed towards the exploitation of large pelagic resources such as tunas and billfishes.
11.	**Page No. 30**	*The exact species and volumes caught as a bycatch in the squid fishery are unclear, but several species of sharks present in the area are endangered. Therefore, according to the SFW criteria, abundance of this group of species is scored as "high" concern.*	• This is a very broad comment. The question here would be whether the abundance of shark species being taken as bycatch in trawl fisheries is of high concern. • As mentioned in the earlier comment, most of the shark and ray species that are taken regularly as bycatch in trawl

			fisheries are smaller species with relatively high bounce-back potential.
12.	**Page No. 30**	*SHARKS* *Factor 2.2 - Fishing Mortality* *According to CMFRI figures, landing of elasmobranch species in the country peaked at 74,943 MT in 1998 and after that year, they started to decline (CMFRI 2017). In 2016, 52,840 MT of elasmobranch were reported in the country, 45% of them corresponding to sharks and 51% to rays. The dominant shark species in the landings were Carcharhinus falciformis (37.25%), Alopias superciliosus (11.85%), Sphyrna lewini (11.53%), and Alopias pelagicus (8.53%). The major ray families were Dasyatidae, Mobulidae, Myliobatidae, Gymnuridae, and Rhinopteridae (Zacharia and Najmudeen 2017). In spite of attempts to increase production in the country, shark landings in India are declining. Sharks constituted just 1.4% of the total marine landing last year (CMFRI 2017). Time series also indicate that small-sized sharks have increased in the landings as opposed to larger sharks (Zacharia and Vivekanandan 2013). These factors seem to be indicate that shark abundance in Indian seas is dwindling. Fishing mortality in the trawl fishery is unknown, therefore the unknown bycatch matrix is used to score fishing mortality for these species and a score of "high" concern was given.*	• The high value of 74,943 MT in 1998 was mostly due to the rampant whale shark hunting along several parts of the Indian coast. The whale shark was declared a “protected species” under Schedule I of the Indian Wildlife (Protection) Act in 2001. • **The dominant species are all taken in pelagic drift gill net and longline fisheries**, and are very rarely encountered in bottom trawl net fisheries, except for some smaller individuals of *C. falciformis* (stray numbers) and *Sphyrna lewinii* for which management measures have been suggested and Minimum Legal Size has been proposed - Thomas et al. (2021) • Small-sized sharks may include juveniles of some large species but are mostly sharks such as *Rhizoprionodon* spp. and *Scoliodon* sp. that grow to small sizes and have faster breeding cycles. • Recent studies have indicated that the larger sharks are almost all exploited by mechanised gill net and longlines. Several measures are in place now in India to monitor and manage shark fisheries; an

			NPOA-sharks is under consideration for adoption. • Decline in the proportion of sharks in the total landings may also be due to the diversion of fisheries to other resources or grounds. The complete ban on shark fin trade implemented in India in 2015 (Govt of India, through Notification No.110/(RE-2013)/2009-2014) may be a driver for reduced landings of sharks.
13.	**Page No. 32-33**	*TURTLES (UNSPECIFIED)* *Factor 2.1 – Abundance* *Six species of sea turtles are present in Southeast Asia, including leatherback turtle (Dermochely coriacea), globally vulnerable (although the status of the Northeast Indian Ocean population is unknown) (Wallace et al. 2013); green turtle (Chelonia mydas), endangered (Seminoff 2004); hawksbill turtle (Eretmochelys imbricata), critically endangered (Mortimer and Donnelly 2008); or olive ridley turtle (Lepidochelys olivacea), vulnerable (Abreu-Grobois and Plotkin 2008). This last species is known to congregate in especially large numbers along the coast of Orissa in East India (Savio Lobo 2007). The status of the Northeast Indian Ocean population of Leatherback turtle is unknown (Wallace et al. 2013). Based on the actual and extrapolated changes in subpopulation size, the global mean annual number of green turtle nesting	• India is taking utmost care in protecting sea turtles. One of the world's largest mass nesting or Arribada "arrival by sea" of the Olive Ridley turtle occurs along the coast of Odisha from December to March, supporting a nesting population of about 0.6 million Olive Ridleys, making this one of the most critical conservation areas for this species globally. The intense turtle nesting beach in Odisha, where 90% of all turtles in India nest, is protected as a wildlife sanctuary and national park. Empowered Committee (of the Supreme Court) 2003 recommends banning gillnets within 5 km of the 3 mass nesting beaches for 3 months – breeding season).

		females has declined by 48 to 67% over the last three generations (Seminoff 2004). Hawksbill populations have continued to decline since 1999 and the losses in losses in numbers in the southeast Asia area are of particular concern (Mortimer and Donnelly 2008). Although olive ridley turtle is globally decreasing, no evidence of decline has been observed in Indian rockeries (Abreu-Grobois and Plotkin 2008). The status of sea turtles ranges from vulnerable to critically endangered; therefore, this taxonomic group is scored as "high" concern.	
14.	**Page No. 33-34**	*TURTLES (UNSPECIFIED)* *Factor 2.2 - Fishing Mortality* *High Concern* *According to a survey conducted by CMFRI, along the coastline of India, barring Gahirmatha coast during 1997 to 1998, trawls accounted for 13.1% of the incidental catch of sea turtles in fishing gears (Boopendranath et. 2010). The mortality of 90,000 marine turtles, mostly olive ridleys, was recorded on the shores of Orissa in a span of eight years. Shore based mortality estimates usually capture 7 to 14% of all mortality at sea (Shanker et al. 2006). Thus the total mortality during the same time period would be estimated to be between just over 642, 857 and 1,285,714, and 80,357 to 160,714 per year (Helmbrecht 2011). It seems that the incidence of turtle bycatch in trawlers along the west coast of India has been reduced. Several*	• In India, fishers release live turtles caught in the net into the sea. • Turtle Excluder Device (TED) are used in trawls for releasing the turtles and reducing mortality. These measures can potentially reduce the bycatch as well. • It has been reported in many studies that gear modifications and operational changes are successful in mitigating turtle bycatch. • Religious and cultural values given to sea turtles in many parts of the coastal regions of the country also help avoid targeted hunting • Almost all the coastal states of India have allocated no-trawl fishing zones within 5 nautical miles under the 'Fishing

		maritime states such as West Bengal, Orissa, Andhra Pradesh and Kerala in India have TED regulations, under the Marine Fisheries Regulation Acts. Moreover, due to its mythological status in the Hindu religion, the turtles caught are quickly released by most of the fishermen (A.P. Dineshbabu pers. comm. 2019). However, implementation of the TED regulations has not been sufficiently effective so far (Boopendranath et al. 2010) (Helmbrecht 2011) and this issue is assessed as a "high" concern.	Regulation Act'. Apart from these, annual fishing ban for the period of 60 days is also followed by coastal states • The recent study on the turtle-fishing gear interaction has put the mortality figures at a very low viz., 1025 Jayasankar *et al.* (2022). The trawl interactions accounted for the maximum fatalities (21%) followed by small gillnets (20%). Despite TED adoption uncertainties, the overall picture of turtle mortality owing to fishing is quite healthy evoking the least concern even in comparison to marine mammals, whose biological removal rate too was estimated to be within the NOAA stipulated limits. The main reason behind this level of comfort is the increased awareness and traditional consciousness towards the ecosystem exhibited by Indian fisherfolks. The study was undertaken simultaneously across the Indian coast through a stratified random sampling design.
15.	**Page No. 35**	*CORALS AND OTHER BIOGENIC HABITATS* *Factor 2.1 – Abundance* *High Concern* *Coral reefs are some of the most diverse and valuable ecosystems along the 8,000 km coastline of India. The major reef formations in India are*	• Saroj *et al*. (2016) is not a research article reporting the results of any scientific study but is a brief review article. The authors' opinions on the cited statements in this article are hazy and superficial, with no supporting evidence.

		restricted to the Gulf of Mannar, Palk Bay, Gulf of Kutch, Andaman and Nicobar Islands, and the Lakshadweep islands (Saroj et al. 2016). The west coast of India between Bombay and Goa is also reported to have submerged banks with isolated coral formations (Nair and Qasim 1978). A total of 199 species of coral have been found in Indian waters; the richer biodiversity is found in the coral reefs of the Andaman and Nicobar Islands, with 135 species identified, versus the 29 and 37 species found on the west coast of Kerala/Tamil Nadu and in the Gulf of Kutch. In India, coral reefs face a number of anthropogenic threats such as bleaching, destructive fishing, pollution, and climate change (Saroj et al. 2016). In general, the condition of the coral reefs in nearshore waters is poor and declining (Saroj et al. 2016). Based on the SFW criteria, coral species are considered highly vulnerable taxa and this group is scored as "high" concern.	
16.		*Factor 2.2 - Fishing Mortality* *High Concern* *No protection has been established for the coral reef patches on the west coast of India, where the main squid bottom trawl fishery occurs (Saroj et al. 2016). Along the west coast of India, coral patches are normally avoided by bottom trawlers to protect their valuable nets (A.P. Dineshbabu, pers. comm. 2019). Moreover, high speed bottom trawling adopted by trawl fishers has enabled the trawlers to*	• Dineshbabu *et al.* (2014) is yet another review paper that cites Bagirathan *et al.* (2008 & 2014) to discuss the impact of trawling on corals. However, Bagirathan *et al.* detail the impact of trawling on octocorals (not the vulnerable hard corals) of which none of the octocoral species are listed by the IUCN Red list or CITES.

		exploit coral patches while reducing the impact on the bottom (A.P. Dineshbabu, pers. comm. 2019) (A.P. Dineshbabu et al. 2016). However, although the impact on the corals may be reduced in recent times, the trawl fishery that it is still working in these areas is scored as "high" concern.	• Squids are columnar and they are exploited mainly in high open semi-pelagic trawls. • As stated in the paragraph citing Dineshbabu *pers. comm.* 2019, the coral patches are avoided during trawling operations to protect the gear and hence the gear interaction on the coral reefs are minimal.

The MBA team, which has performed this assessment, would be better advised to return to its drawing board for a relook of the status verdict delivered with respect to Indian squid, in the light of these updated or clarified facts and findings. This would probably lead them to arrive at a “Safe” tag to be issued for the species, which will facilitate the trade by clearing the air in the minds of both consumers and fishers. On a general note, it is also a considered opinion that agencies akin to MBA should desist from making such important far-reaching assessments, not rooted on scientifically sturdy data/published information in future, as these are bound to have high cascading impact on both resource management and seafood trade.

Acknowledgement

The team acknowledges the guidance and support of Dr. A. Gopalakrishnan, Director, ICAR-CMFRI and Shri. A.J. Tharakan, Ocean Committee, Seafood Exporters Association of India for highlighting this issue.

References

1. CMFRI, FRAD (1969) Marine Fish Production in India 1950 – 1968. Technical Report. CMFRI, Kochi. http://eprints.cmfri.org.in/582/1/Bulletin_13.pdf
2. Meiyappan, M M and Mohamed, K S (2003) Cephalopods. *In*: Status of Exploited Marine Fishery Resources of India. CMFRI, Cochin, pp. 221-227. ISBN 81-901219-3-6 http://eprints.cmfri.org.in/41/
3. Sathianandan T. V., Mohamed K. S., S. Kuriakose, Mini K. G., E. Varghese, S. K. Augustine and Manjeesh R. 2020. Fished taxa species diversity along the Indian Coast and its significance in relation to the harvest of marine fishery resources. *In*: Joshi K. K. *et al*. Marine Ecosystem Challenges & Opportunities (MECOS 3). Book of Abstracts. FES DP-56. p. 119-120.
4. Sasikumar G., K.S. Mohamed, P.K. Asokan, M.K. Anil, S. Sundaram, V. Vase, V. Venkatesan, Karamathulla Sahib, K.K. Sajikumar, P. Shiju, P.S. Alloycious, K.M. Jestin Joy, K.R. Sreenath, R. Vidya, R.K. Pradhan and S.N. Bhendekar. (2017). Relating minimum legal size with optimum exploitation pattern in *Uroteuthis (Photololigo) duvaucelii* along eastern Arabian Sea. *In*: (Thomas, S.N., Rao, B.M., Madhu, V.R., Asha, K.K., Binsi, P.K., Viji, P., Sajesh, V.K. and Jha, P.N. Eds.) Fostering Innovations in Fisheries and Aquaculture: Focus on sustainability and Safety - Book of Abstracts, 11th Indian Fisheries and Aquaculture Forum, ICAR-Central Institute of Fisheries Technology, Kochi and Asian Fisheries Society, Indian Branch, 21-24 November, 2017, Kochi, India, pp. 39-40
5. V. Venkatesan, R. Vidya, P.S. Alloycious, K.K. Saji Kumar, K.M. Jestin Joy, K.S. Mohamed (2017). Present status of cephalopod fisheries of Kerala with an assessment of the stock status of major resources *In*: (Thomas, S.N., Rao, B.M., Madhu, V.R., Asha, K.K., Binsi, P.K., Viji, P., Sajesh, V.K. and Jha, P.N. Eds.) Fostering Innovations in Fisheries and Aquaculture: Focus on sustainability and Safety - Book of Abstracts, 11th Indian Fisheries and Aquaculture Forum, ICAR-Central Institute of Fisheries Technology, Kochi and Asian Fisheries Society, Indian Branch, 21-24 November, 2017, Kochi, India, pp. 52.
6. Thomas, Sujitha and Muktha, M and Dash, Swatipriyanka Sen and Kizhakudan, Shoba Joe and Akhilesh, K V and Purushottama, G B and Mahesh, V and Rahangdale, Shikha and Zacharia, P U and Najmudeen, T M and Manojkumar, P P and Remya, L and Wilson, Livi and Roul, Subal Kumar and Pradhan, Rajesh Kumar and Seetha, P K and Yousuf, K S S M and Nataraja, G D (2021) Status of the hammerhead shark (Carcharhiniformes: Sphyrnidae) fishery in Indian waters with observations on the biology of scalloped hammerhead *Sphyrna lewini* (Griffith & Smith, 1834). Aquatic Conservation: Marine and Freshwater Ecosystems. pp. 1-15.

7. Jayasankar, J., Vivekanandan, E., Ratheesh Kumar, R., Rahul, R., Jeyabaskaran, R., Gopalakrishnan, A. (2022). 'Assessment of Marine Mammals stock and bycatch of Marine Mammals and Sea turtle' Project Report Submitted to Marine Products Export Development Authority, ICAR-Central Marine Fisheries Research Institute, Kochi.193 p.
8. http://eprints.cmfri.org.in/14016/1/IJMS_2019_Mahesh%20V_Characterization%20of%20low%20value%20bycatch%20in%20trawl%20fisheries%20off%20Karnataka%20coast.pdf
9. http://eprints.cmfri.org.in/9780/
10. https://krishi.icar.gov.in/jspui/handle/123456789/6307

CMFRI Booklet Series No.30/2022

Team:

Geetha Sasikumar,
P. Laxmilatha,
A.P. Dineshbabu,
Shoba Joe Kizhakudan,
Sreenath K.R.,
J. Jayasankar,
Ratheesh Kumar R.,
C. Ramachandran.

ICAR-Central Marine Fisheries Research Institute (CMFRI)
Kochi Kerala India
December 2022