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ASSESSMENT OF BYCATCH IN GILL NET FISHERIES

(Final Revised Report, April 2013)

Summary:

Following a Scientific Council recommendation and financed with the support of Australia and the United Kingdom, a desk-top study dealing with both the impact of global gillnet fisheries on migratory species and bycatch mitigation measures for gillnet gear was conducted in 2010 and 2011 by Sextant Technology Ltd.

The results were presented to the 17th Scientific Council Meeting and 10th Meeting of the Conference of the Parties in 2011.

The Council's Bycatch Working Group discussed the report and recommended that it required appropriate review by the Council and others. In view of the fact that the deadline for submission of the report was shortly before the Scientific Council and COP in 2011, the Working Group recommended that the report be reviewed intersessionally. The document was open for comments between November 2011 and October 2012.

The attached document is a revised version of the report originally prepared. All comments received were considered by the consultants and taken on board where feasible.

It should be noted that under the terms of the contract it was not possible to include additional data and re-run the analyses.

Report to the Convention on Migratory Species

Assessment of Bycatch in Gill Net Fisheries

V2

15 April 2013

S. M.Waugh[1,2] D.P. Filippi[2] and R. Blyth[2], P.F. Filippi[2]

[1] Present address: Museum of New Zealand Te Papa Tongarewa, PO Box 467, Wellington, New Zealand. susan.waugh@tepapa.govt.nz

[2]Sextant Technology Ltd, 116 Wilton Road, Wellington, New Zealand

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I. Summary Executive

A study was conducted to assess the impacts of gillnet fishing on species listed by the Convention of Migratory Species (CMS species). Concerns about the impact of incidental mortality in gillnet fishing has been expressed for marine mammals, turtles, seabirds and sharks. Such long lived and/or top-predator populations have life-history traits that make them inherently vulnerable to additive adult mortality, with population decreases possible with additional fisheries mortality.

The review of fishery information concluded that gillnet fisheries are too poorly documented to enable analyses of fishery activity or characterisation of the fishing fleets using gillnet methods into discreet fishery units. Rather the research used summary gillnet data at a universal level. This approach may lead biases in the analysis of impacts of gillnet fishing on non-target CMS species, sharks, turtles, marine mammals and seabirds.

Using information about species and gillnet fishing distribution, the analysis examined the relative exposure of species to gillnet activity. The information was then weighted by a factor to take into account the vulnerability of populations to extinction (IUCN weighted exposure). Species most exposed to gillnet fishing came from all species groups listed under the CMS.

Areas of high diversity (CMS species) were west coast of South America, west coast of Africa from the Cape of Good Hope to Algeria, The Red Sea / Persian Gulf to Arabian Gulf, New Zealand / Tasman Sea, and the Aegean Sea.

The twenty Exclusive Economic Zones of 237 areas, in which the greatest exposure to fishing risk occurs for CMS listed species (weighted by IUCN rank) were: Myanmar, Vietnam, Peru, India, Russia (Pacific), Chile, South Africa, China, Namibia, Greece, Galapagos, Bangladesh, Japan (Main Islands), Western Indonesia, Eastern Indonesia, Norway, Mauritania, United Kingdom, Algeria, and Morocco.

The forty species most exposed to risk from gillnet fishing, when weighted by IUCN rank, by taxon group were:

- Seabirds – African Penguin, Peruvian Diving-petrel, Japanese Murrelet, Dark-rumped Petrel, Waved Albatross, Socotra Cormorant, Humboldt Penguin,

Balearic Shearwater, Pink-footed Shearwater, Audouin's Gull, Short-tailed Albatross.

- Cetaceans & Sirenians – Finless Porpoise, Irrawaddy Dolphins, Dugong, North Pacific Right Whale, Atlantic Hump-backed Dolphin, Northern Right Whale, Bottlenose Dolphin, Heaviside's Dolphin, Fin Whale, Sei Whale, Indo-Pacific Hump-backed Dolphin, Blue Whale, Burmeister Porpoise, Baird's Beaked Whale, Omura Whale.
- Seals and Sea Otters – Mediterranean Monk Seal, Marine Otter, Southern River Otter.
- Sea Turtles – Hawskbill Turtle, Kemp's Ridley Turtle, Leatherback Turtle, Loggerhead Turtle, Green Turtle, Olive Ridley Turtle.
- Sharks – Basking Shark, Longfin Mako Shark, Porbeagle Shark, Whale Shark, Great White Shark.

The main recommendation of the research in relation to mitigation was that fishery- and species-specific solutions need to be examined and prioritised. The study provides some guidance as to which areas and which species interaction are most likely to benefit from further monitoring and management. No single mitigation method was found to be effective at reducing bycatch of CMS species across taxon groups. Area and seasonal closures may come near to resolving all species issues, but are unlikely to be a feasible option to implement, given the high reliance of communities on fish from gillnet fishing as a food source. Research to define specific points of interaction between CMS species and particular fisheries is urgently needed.

There is a strong need for improved observer data, better records of bycaught species with a particular focus in the areas of high overlap of at-risk species and a high density of fishing effort. The next step is for further, finer-scaled research to address bycatch issues in those areas, and for data to assess population and behavioural factors for the species identified as highest risk in this analysis is warranted.

II. Introduction

The Convention on Migratory Species was established to conserve species which traverse national boundaries. Species listed under the Convention (CMS species) include many top-predator species, which are inherently 'rare' in ecological terms (Convention on Migratory Species 2011). These species typically have long lifespans and low reproductive output. These life-history traits make such species particularly sensitive to population changes as a result of additive mortality (Stearns 1992, Sibly and Hone 2003), such as that imposed by fisheries bycatch. Imperatives exist within international fisheries management frameworks to address non-target effects of fishing, including minimizing waste and reducing catch of non-target species, and applying precautionary approaches to the management fishing activities when information is uncertain (FAO 1995).

Gillnet fishing and its potential impacts on non-target species have been the focus of much research (e.g. Melvin et al. 1999, Gilman 2009, Lokkeborg 2011). It is well documented that gillnet fishing catches a wide range of non-target species and concern has been raised on the impacts of this bycatch on vulnerable wildlife populations. Among these, CMS species may be particularly vulnerable to population effects of fishing mortality. This is because their natural ranges extend over waters of multiple jurisdictions, with cumulative effects from many different fisheries activities affecting them, and their life-histories place give the species populations an inherent vulnerability to added adult mortality. Coordinated efforts across sectors of the research community, fishing operators and regulating agencies are needed to address the problems of incidental capture of CMS species in gillnet fishing (Melvin and Parish 1999).

Despite many years of concern over the impacts of gillnet fishing on top-predator species, it remains an enigmatic fishery: little is known of the state of the target stocks, fishing practices, catch, bycatch and discarding activities, and fishing efficiency, although in some regions knowledge of national fisheries may be more detailed. This lack of knowledge may be the result of diverse drivers: gillnet fisheries are often 'low value' fisheries (Wilson et al. 2010, Ministry of Fisheries 2011) for which detailed monitoring regimes are uneconomic to implement; they have often classed as a single fishery, when in reality they regroup a diversity of fishing operations both in terms of target stocks and fishing methods; both artisanal and industrial fisheries are described as one

fishery category yet clearly operate on a different basis; gillnet fishing in developing countries are a poorly documented, yet important subsistence activity.

While the incidental catch of many CMS species is documented, prioritisation of efforts is needed as to how to address the potential impacts of its mortality on wildlife population. This is both in terms of the zones to target for mitigation and in relation to the species potentially impacted. Following such data gathering and analysis, efforts to mitigate the fishery interactions can be targeted, and the fisheries concerned can be monitored and fishermen mentored to reduce potential risks to species. Appropriate mitigation technologies can be targeted at the areas and fisheries which are likely to produce the greatest benefit in terms of risk reduction. Without more detailed information on species interactions with gillnet fishing activity, and data on the nature and extent of the fisheries, the extent of mortality of CMS species, and resulting risk to population viability is problematic to explore in meaningful ways.

The approaches we applied to analysing the risk posed by gillnet fishing to CMS species come from an Ecological Risk Assessment (ERA) framework (e.g. Hobday et al. 2011). These approaches have been applied widely to fisheries managing issues of sustainability and environmental effects, in particular in information poor environments. We used a qualitative assessment of the exposure of species to gillnet fishing activity by comparing the spatial distributions and density of activity (where available) for both the CMS species and gillnet fisheries. The outcomes provide a relative ranking of species in terms of their exposure to fishing effort, and the contribution of fishing effort in each Exclusive Economic Zone internationally, to the exposure index. We were thus able to rank species and areas in terms of the likelihood of adverse effects of gillnet fishing.

Because of the limited information about the nature of the fishing operations found in our review, and of the behavioural interactions of species with those fisheries, our analysis stops short of examining species or population level impacts of mortality from the fisheries. Rather it identifies the groups of species, and the areas which require most diligent and detailed examination for the future, to address any risk of mortality non CMS species populations.

The need to mitigate adverse effects of fishing on CMS species requires fishery-specific targeting. Currently, the obscurity of gillnet fisheries, in terms of the information about the operations, level of effort, catch, and bycatch occurring precludes specific

recommendations being developed to target these mitigation activities. Further, detailed research into the problems that appear to be of greatest moment is needed.

The stated requirement to meet the principles set out in the ecosystem management framework for global fisheries needs to be balanced against the socio-economic imperatives surrounding gillnet fishing. Gillnet fishing is a vital method of food gathering for a large population globally, both in developing and industrialised nations. Fish, including aquaculture products accounted for 16% of protein intake for populations globally in 2008 (FAO 2010). This is an increasing food source, with levels of trade in fish products showing an average annual increase of 6% per year in trade for the last several years (FAO 2010). The proportion of the world's food intake that derives from gillnet fishing is not clearly reported, but of 142 million tonnes of fish production in 2008 (FAO 2010) it was estimated that 20% of global fish production is landed from gillnet fishing annually (SAUP 2011; average ratio for 2004 – 2006). It accounts for a high proportion of the protein delivered to table, particularly in developing nations, where some nations rely almost exclusively on gillnet fishing.

1. Definition of gillnet fishing

For the purposes of this study, gillnet fishing includes all fisheries which use passive net methods to target fish, and includes set net, gillnet, driftnet and trammel net fishing. Setnets are nets of any mesh size that are deployed by floating the net in the water column, in pelagic (near surface), middle-depths, or epi-benthic water levels. Gillnets are made of a variety of materials, with recent increase in use of monofilament products for nets, due to its durability and low cost. The FAO (FAO 1990) defines six major groups of gillnet fisheries and each of which has a FAO standard abbreviations code (here in brackets): a) Setnets (GNS); b) encircling nets (GNC); c) combined gillnets – trammel nets (GTN); d) drift nets (GND); e) trammel nets (TNR); f) fixed gillnets (GNF) (figure 1).

Gillnets are designed to trap fish by the gills. They can be of variable dimension, from a few meters to several kilometres long. In industrial fisheries, blocks of gillnets (tans) are put together to form a fleet. Large vessels can carry several fleets of nets, deploying kilometres of net.

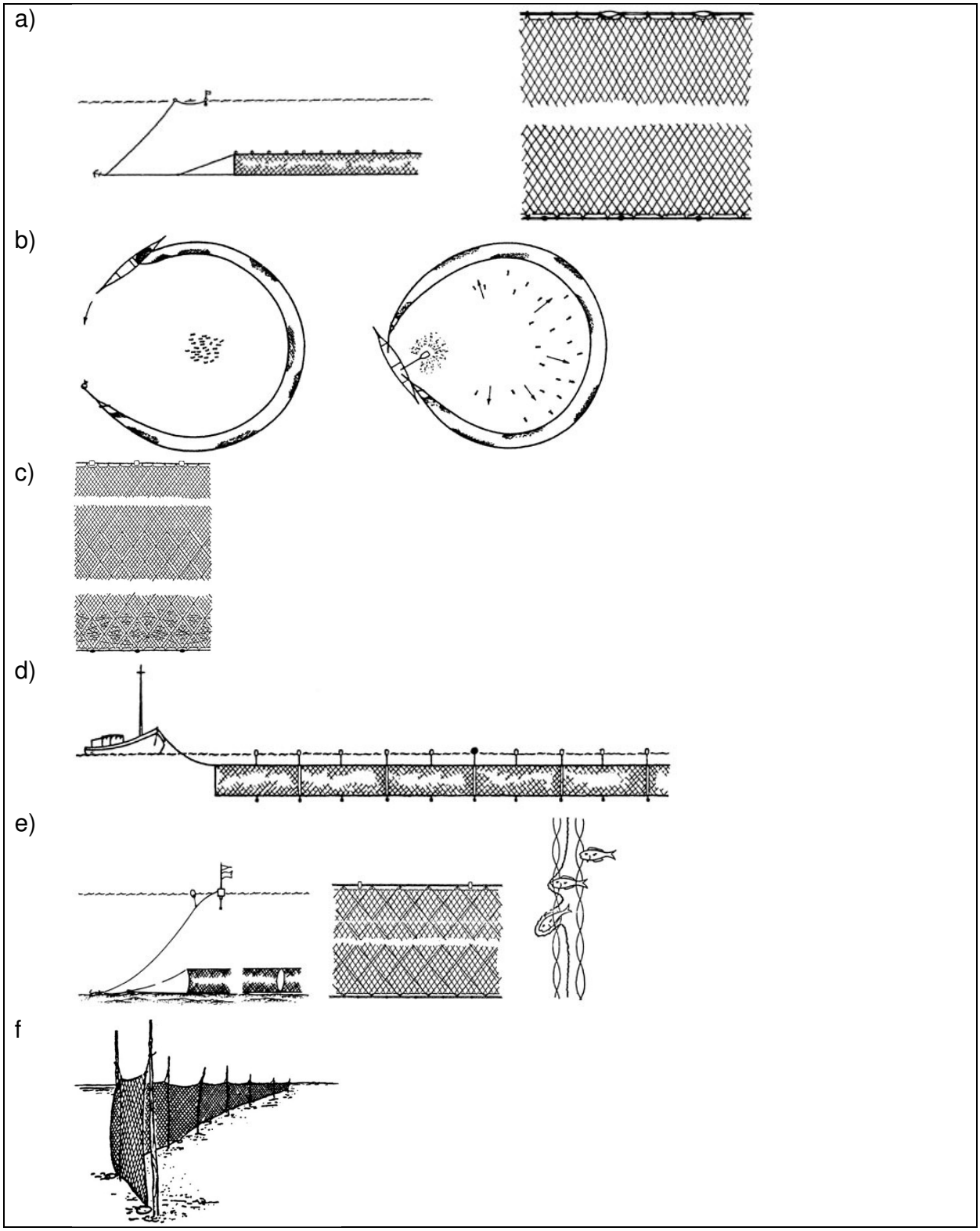

Figure 1-Gillnet types as defined by the FAO (FAO 2001). a) Set gillnets, b) Encircling gillnet, c) Combined gillnet – trammel net, d) Driftnet, e) Trammel nets, f) Fixed gillnet

Because of the need to work with data about fishing effort for this study, we have been limited to researching reported (and therefore 'legal') gillnet fishing only. There are many separate problems associated with illegal gillnet fishing and ghost fishing which are not addressed here. The work is only concerned with gillnet fishing in the marine environment. Gillnet bycatch is also an issue for CMS species occupying estuarine environments such as the otters, manatees and some cetaceans but these issues are not addressed in this report.

2. Species groups – modes of interaction with gillnet fisheries

Gillnets are designed to be transparent and have the same density as water, making them difficult to detect in the water column (Rowe 2007, Lein 1980) and it is for this reason that many species become entangled. Interactions between non-target species and gillnets can be estimated only by the proportion of animals that are caught and drown in gillnets. It is not possible to estimate the proportion of species that become entangled and free themselves and/or break free with part of the fishing gear attached to them (Thomas and Kastelien 1990).

Entanglement of cetaceans has occurred in every region where substantial gillnetting operations and the presence of marine mammals overlap (Jefferson and Curry 1994). Here we include sea cows as part of the group 'cetaceans' due to lack of precision in distribution data to enable us to differentiate these mammal groups geographically. It is thought that the ability for cetaceans to detect gillnets is primarily through acoustic means (Thomas and Kastelein 1990). Cetaceans are able to detect gillnets by the sound the net makes as water passes through it and possibly by the acoustic properties that fish create when entrapped in the net (Thomas and Kastelein 1990). Smaller cetaceans (mainly dolphins and porpoises) become entangled and may drown in the gillnet because they are not strong enough to break free and come to the surface to breathe, whereas larger cetaceans are more able to swim through the nets, but this often results in towing gear which can cause injury and death (Cetacean Bycatch Resource Center 2011).

Pinnipeds and other small marine mammals (e.g. sea otters) interact with gillnets in a similar way to small cetaceans, becoming entangled by their flippers/limbs when they

interact with the net. For seals, there have been reports that some become attracted to gillnets through the use of acoustic pingers and associate gillnets with an easy food source (referred to as the 'dinner bell effect') causing an increased risk of entanglement as well as damage to the target catch (Beeson and Hanan 1996, Mate 1993).

The seabird species most susceptible to capture in gillnets are diving species; encountering and becoming entangled in the net when diving to forage for food and drowning before the net is retrieved (Melvin et al. 1999, Trippel et al. 2003, French 2011). Seabird bycatch has been widely documented in coastal, high-seas, drift and demersal gillnet fisheries. Seabirds may be also be caught in gillnets set deeper than their maximum diving depth as seabirds may encounter nets as they are set or hauled (Lokkeborg 2010).

Seabirds might also be entangled in lost gillnets or discarded piece of gillnets at this material is opportunistically collected by seabirds for the construction of their nest. This can also present a risk for the chicks being caught in the nest by pieces of gillnet gathered by its parents during nest-building (Montevecchi 1991).

Like marine mammals, sea turtles become entangled in gillnets and drown if they cannot break free from the gillnet and reach the surface for air. Serious injury can also be sustained to flippers from lines and ropes which support the gillnet in the water column (Gillman 2010).

Sharks become entangled in gillnets when they swim into the net, and become caught by fins/gills when trying free themselves. Once wrapped in the gillnet, the shark then suffocates. Gillnets are also used to harvest sharks as a target species. Shark damage to nets is unique as they leave behind slimy material and rough skin which they deposit on the net. Aside from fish harvest, gillnets are also used to protect swimmers from shark attacks which results in shark mortality.

III. Method

All objectives of the work were addressed with a common methodology, set out below.

1. Data search methods

The first approach used to evaluate the impact of gillnet fisheries on CMS species was to get detailed information about gillnet fisheries, species distribution, bycatch and mitigation. The information was sought directly from the national departments in charge of the fisheries and thus for each jurisdiction having an Exclusive Economic Zone (EEZ). Agencies were contacted by email and by fax, covering the 262 EEZ and 18 high seas FAO areas. Agencies were invited to fill a form established for the purpose of this study (see annex) or to indicate any relevant documents where the information requested could be found.

The information solicited was a technical description about the gillnets used in EEZs and in the high seas area, the number of vessels, vessel size, period of the year, recent landed catch estimation, effort estimation, spatial information, mitigation, and bycatch summary data (see section 6, table 38).

Despite these efforts and numerous contact attempts, very few countries engaged with the study and sent us information (see Acknowledgements). The information published, found online, were usually not detailed enough or too old for the requirements of the research. In particular information to distinguish one fishery from another, and to define fine-scaled information relevant to different target fisheries, fleets, or areas was lacking.

At the same time, we reviewed online and published literature. Most of the documents found were too old, too general or could not be generalised to fishery specific to inform the analysis of fishery characterisation.

It was therefore not possible to establish a gillnet fishery classification and to produce accurate global maps of the fishing effort for each type of gillnet for the last 3 years (this method is detailed in the next chapter)

An alternative approach was adopted, which consisted of producing a more general view of the gillnet fishing activities at a global scale. For this purpose, effort maps were based on the gillnet fisheries land catch estimation published online (SAUP 2011).

Simultaneously to the requests to official bodies, numerous local and global Non-Governmental Organisations were contacted and information was requested regarding animal bycatch and effectiveness of mitigation. Those requests were fruitful and delivered detailed information regarding cetacean and seabird bycatch and more general information for the other species.

2. Gillnet method description

a) Analysis method

An approach was adopted to use the available information, based on a single gillnet class regrouping all the different gillnet gears. The sensitivity of a species to be caught in a gillnet has also been simplified based only on behavioural information. This method is presented in the next chapter.

b) Overlap analysis

The process of the overlap analysis was staged in several phases:

- First, the area of high species diversity was explored based on the distributions of 123 marine species listed under CMS.
- Secondly, areas of higher density (tonnes of catch per km^2) of gillnet fishing for 262 EEZ and 18 high seas FAO areas were identified.
- Thirdly, the exposure of each CMS species to gillnet fisheries at a global scale was calculated. The results are ranked a) by species the most exposed and b) by the EEZ fishery (all gillnet fishing within the EEZ combined) having the most potential impact in terms of bycatch. These ranks were then weighted by the threat ranking identified by the International Union for the Conservation of Nature (IUCN 2010) for each species in the analysis to give a

weighted score by species, reflecting the likely population level of impact of fisheries exposure (IUCN-weighted exposure).

- Finally, the results were categorized in three levels of exposure: highly exposed, moderately exposed, least exposed.

c) Species included in the study

The species included in the study are the 123 marine species listed under the Convention on Migratory Species.

The CMS species were split in 5 groups: cetaceans & sirenians (hereafter cetaceans), seabirds, sharks, turtles, other sea mammals (pinnipeds and sea-otters). Each group contains respectively 46 species, 59 species, and 6 species each for the remaining groups. The categorisation of the species is set out in the annex of this document (Table 18,Table 19,Table 20,Table 21 and Table 22).

d) Species distribution maps

For each species a distribution map was established with a resolution 0.1° x 0.1° degrees longitude and latitude, derived from published distribution maps. Depending how well-known was the species; the distribution map contains different layers of animal density.

Single layer distribution maps

For most of the species (excluding the birds), the maps consisted of a single layer distribution range. Those maps have been published by the IUCN (IUCN 2011) and have been re-edited for the purpose of the study.

Dual layer distribution maps

Ten species have their maps based on two layers of certainty based on knowledge of the species ranges: areas of known distribution, and areas of uncertain distribution. Those species were: Shortfin Mako Shark, Basking Shark, Great White Shark, Porbeagle Shark, Humpback Whale, Loggerhead Turtle, Green Turtle, Leatherback Turtle, Olive Ridley Turtle and Hawksbill Turtle. The maps for those species were established from

the online published maps of the Fisheries and Aquaculture Department of the FAO (FAO 2011). We have affected a density of 1 for the data for areas of known distribution and 0.1 to the areas of uncertain distribution.

Bird distribution maps

The bird distribution maps were provided by BirdLife International (BirdLife International and NatureServe 2011). The Armenian Gull is not recognised as a distinct taxon by BirdLife International therefore the distribution map from published sources was used (Del Hoyo et al. 1996). All maps had a single layer shapefile describing the range of the species. However when the size and the location of most of the breeding sites was well-known for a species (e.g. those listed by the Agreement on the Conservation of Albatrosses and Petrels, shags, endemic species, penguins), we improved the distribution maps by adding hotspots of distribution around breeding colonies. This approach was used for 32 species for which we took into account more than 500 breeding sites (Annex Table 23).

Bird distribution with foraging radius approach

To improve the distribution maps, we assumed that the species were clustered around breeding sites during the breeding season. To implement this approach, it was assumed that non-breeder birds occupied the full species range, while the breeding adults in breeding season were spread around their breeding colonies following an exponential decay function which extends up to their maximum foraging range radius denoted r_{max}. The density of the breeders at a distance r from their colony follows an exponential decay defined by:

$$D_{breeder}(r) = a \times e^{\frac{\ln(0.01)\times r}{r_{max}}} \qquad \text{(Eq 1)}$$

r is the distance from the colony and a defined by the equation below:

$$a = \frac{P_{col}}{\int_0^{r_{max}} e^{\frac{\ln(0.01)\times r}{r_{max}}}} \qquad \text{(Eq 2)}$$

P_{col} is the number of breeding birds at the colony. Beyond the maximum foraging range, breeder density was assumed to be zero.

Outside of the breeding season, we considered that adults occupied the full species range along with non-breeders. The hot-spots were weighted with the ratio of time spent on the breeding sites per year.

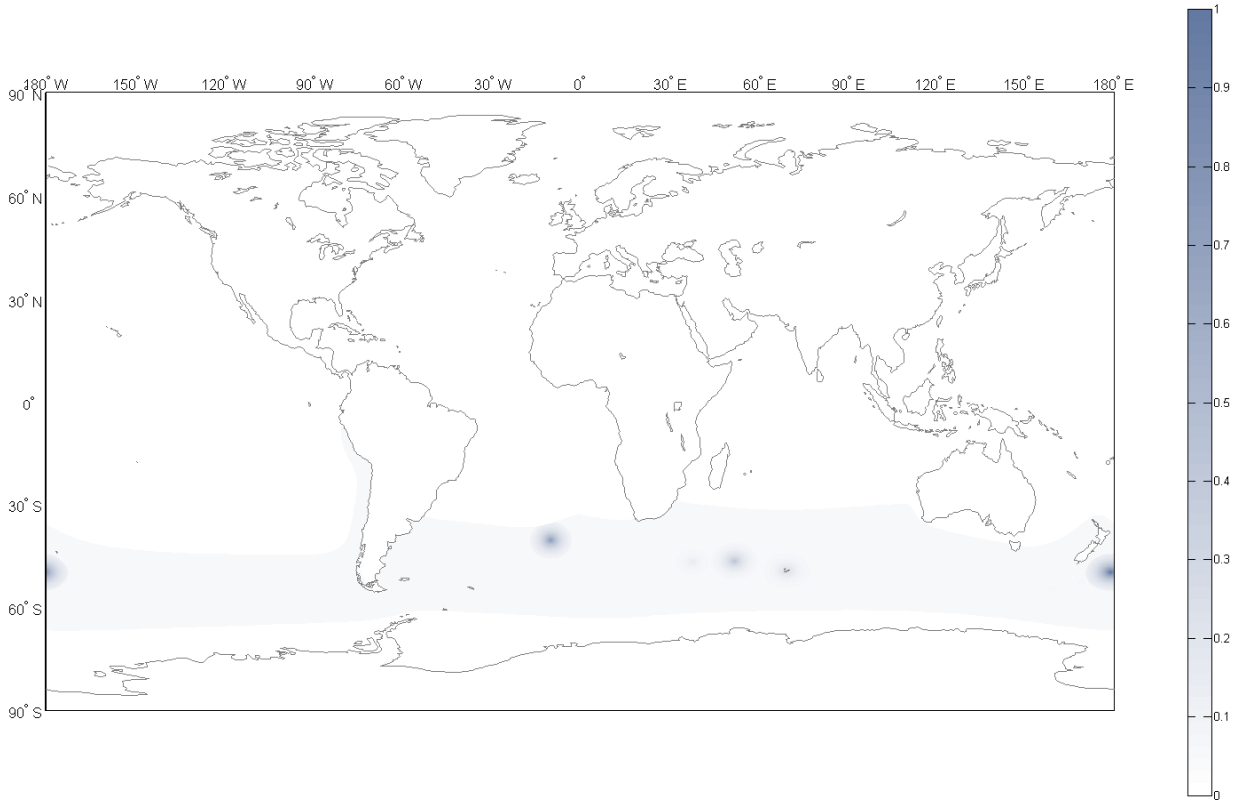

Figure 2- Example of an improved seabird distribution for the Grey Petrel. The square root of the density has been used instead of the density to highlight low density area for the purposes of this map illustration only.

e) Areas of high species diversity

The distribution of the CMS species cumulatively was examined. By summing their distribution, it was possible to show areas of high species diversity.

For this purpose, the distribution of each species was normalized. The spatial normalization was defined as follows:

$$\int_{world} D_{sp} = 1 \qquad \text{(Eq 3)}$$

D_{sp} represents the spatially normalized animal density of the species *sp*. Each species had the same weight, making the results independent from population size which is unknown or poorly known for many species, especially cetaceans.

The spatially normalized distributions were summed for all species. The result is equivalent to a density of species, here called the species diversity index and denoted SDI.

$$SDI = \sum_{species} D_{sp} \qquad \text{(Eq 4)}$$

High values of SDI represent areas of high species diversity, which indicate a high number of species present and/or areas where one or more species are highly concentrated (Figure 3).

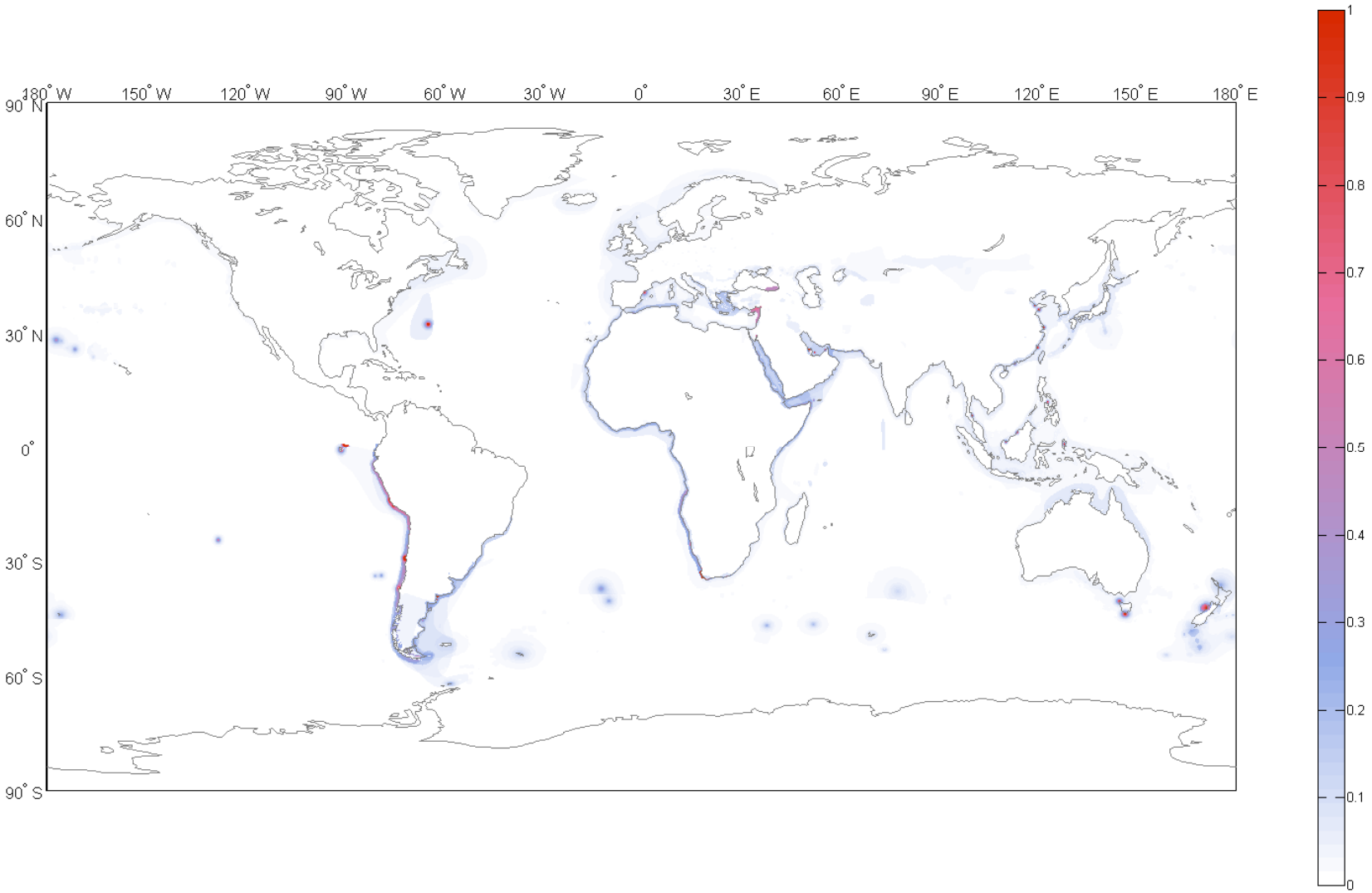

Figure 3- Density of species a normalised SDI. High values represent areas of high species diversity.

Five important areas of species diversity are apparent:

- South America, especially the western coast
- The Western coast of Africa from the Cape of Good Hope to Algeria
- The Red Sea/ Persian Gulf and Arabian Gulf
- New Zealand/Tasman Sea
- Aegean Sea

Numerous, small hotspots appear in the vicinity of major seabird colonies, such as those areas shown in the mid ocean areas of the southern Indian and Atlantic Oceans, Hawaiian chain and south of New Zealand.

f) Overlap between species and gillnet fisheries

An overlap index was noted $O_{sp,EEZ}$ quantifying the overlap between a species distribution and the gillnet fisheries of an EEZ. The overlap index is defined by the following equation.

$$O_{sp,EEZ} = \sqrt[4]{\int_{world} D_{sp} \times C_{EEZ}} \qquad \text{(Eq 5)}$$

D_{sp} is the spatially normalized density of the considered species. C_{EEZ} is the fishing effort density in the considered EEZ or high seas area.

The overlap index of each species/EEZ were sorted by order of importance and divided by the sum of the overlap index.

3. Assumptions of the study

Due to the lack of information regarding gillnet fishing effort and the discrepancy of the units used to describe the effort by different fishery administrations, it was not possible to establish a global homogenous effort density map for the gillnet fishing.

Therefore the estimation of the gillnet catch by EEZ and by high seas FAO areas by Sea Around Us Project for the years 2004, 2005, and 2006 was used. More recent catch estimation was not available at the time of the study. Vectorial maritime boundaries published in the Maritime Boundaries Geodatabase available from the Flanders Marine Institute (VLIZ, Belgium) were used to represent the 262 EEZ in the study (VLIZ 2011).

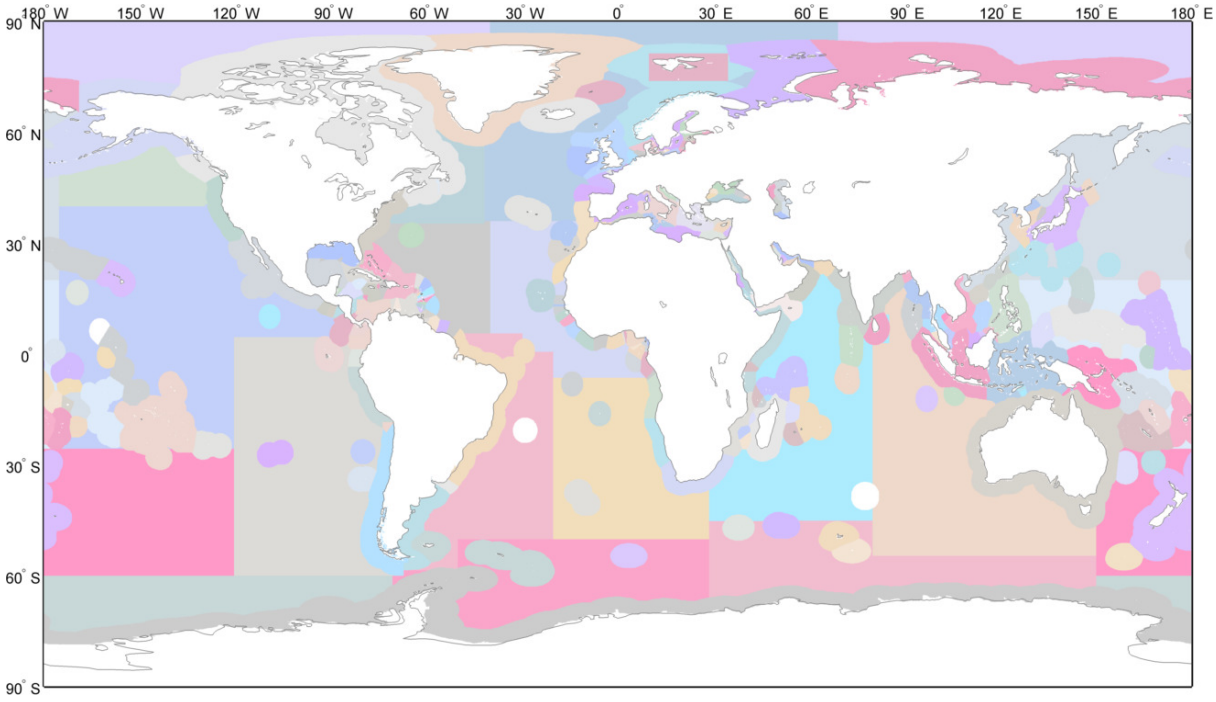

Figure 4 Maritime boundaries of the 262 EEZ and the 18 High Seas FAO areas. Colours are randomly allocated to ensure no two adjacent areas have the same colour

The catch estimated by Sea Around Us Project refers to 'reported landings' as the other catch components are usually unknown (e.g. unreported landings, discards, and ghost kills). The estimations were made from the following data sources: FAO Fishstat, ICES, GFCM, CCAMLR, RECOFI, CECAF and adjusted among other things, to retain only marine finfish species (e.g. removed from the dataset were freshwater fish, molluscs such as squid and crustacean) (SAUP 2011). The catch estimation may be slightly greater than the official jurisdiction statistics, however, they constitute a homogenous set of data which reflect the importance of the gillnet activity in each jurisdiction.

The estimation of catch by Sea Around Us Project applies to a whole EEZ. However the exhaustive review of gillnet fisheries presented in this report revealed that gillnets were used mostly within 20 nautical miles (nm) from shore. Industrialized nations were more likely to extend gillnet fisheries across their whole EEZs and beyond, but coastal deployment of the gillnet was still dominant.

To take into account these differences in the distribution of the effort, the analysis was run with 3 different scenarios:

- Coastal scenario: The effort was spread only within 20 nm from the coast.
- 50:50 scenario: The effort was spread equally between the 20 nm coastal band and the remaining EEZ, with 50% of effort in each area.
- Oil consumption equivalent per capita: This is the standard scenario used and presented in results. This intermediate scenario was based on the oil consumption equivalent per capita for each EEZ. The review of gillnet fisheries highlighted that industrialized countries were more likely to deploy industrial fishing activities across the whole EEZ, including gillnet fisheries. Poorly industrialized countries have their gillnets mostly deployed along the coast within 20 nm of the coast. Oil consumption equivalent per capita was chosen to represent the level of industrialization of nations and as an index to spread gillnet effort in the EEZs. If the oil consumption equivalent per capita was less than 1000 kg, the gillnet effort was spread in the coastal 20 nm strip only. If the oil consumption per capita is greater than 1000 kg, the effort is spread equally in the 20 nm coastal strip and the remaining area of the EEZ. The oil consumption per capita per EEZ are presented in the annexes (Table 24, Figure 5).

The estimation of catch for high seas areas were spread uniformly in the entire high seas areas whatever the scenario.

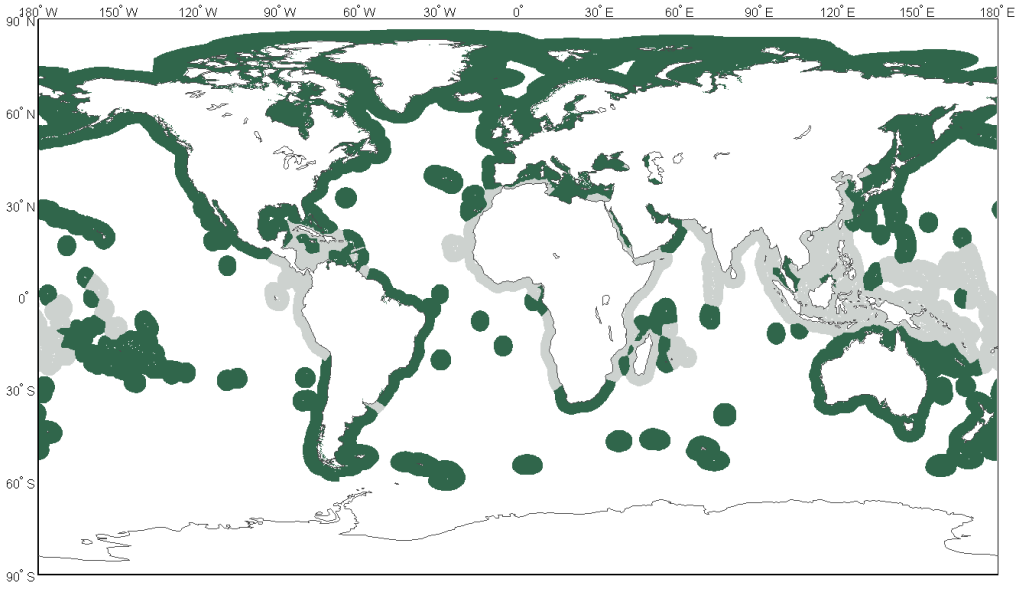

Figure 5 - Oil consumption equivalent per capita scenario. Light green areas represent the EEZs having an oil consumption equivalent per capita less than 1000 kg. Dark green areas represent EEZs having an oil consumption equivalent per capita greater than 1000 kg. High seas zones are not represented.

The highest gillnet effort densities were found in 6 mains areas:

- Central Asia/India
- West Africa
- Northern Europe
- West South America
- North Asia (Japan, China, Russia, Korea)
- South Asia

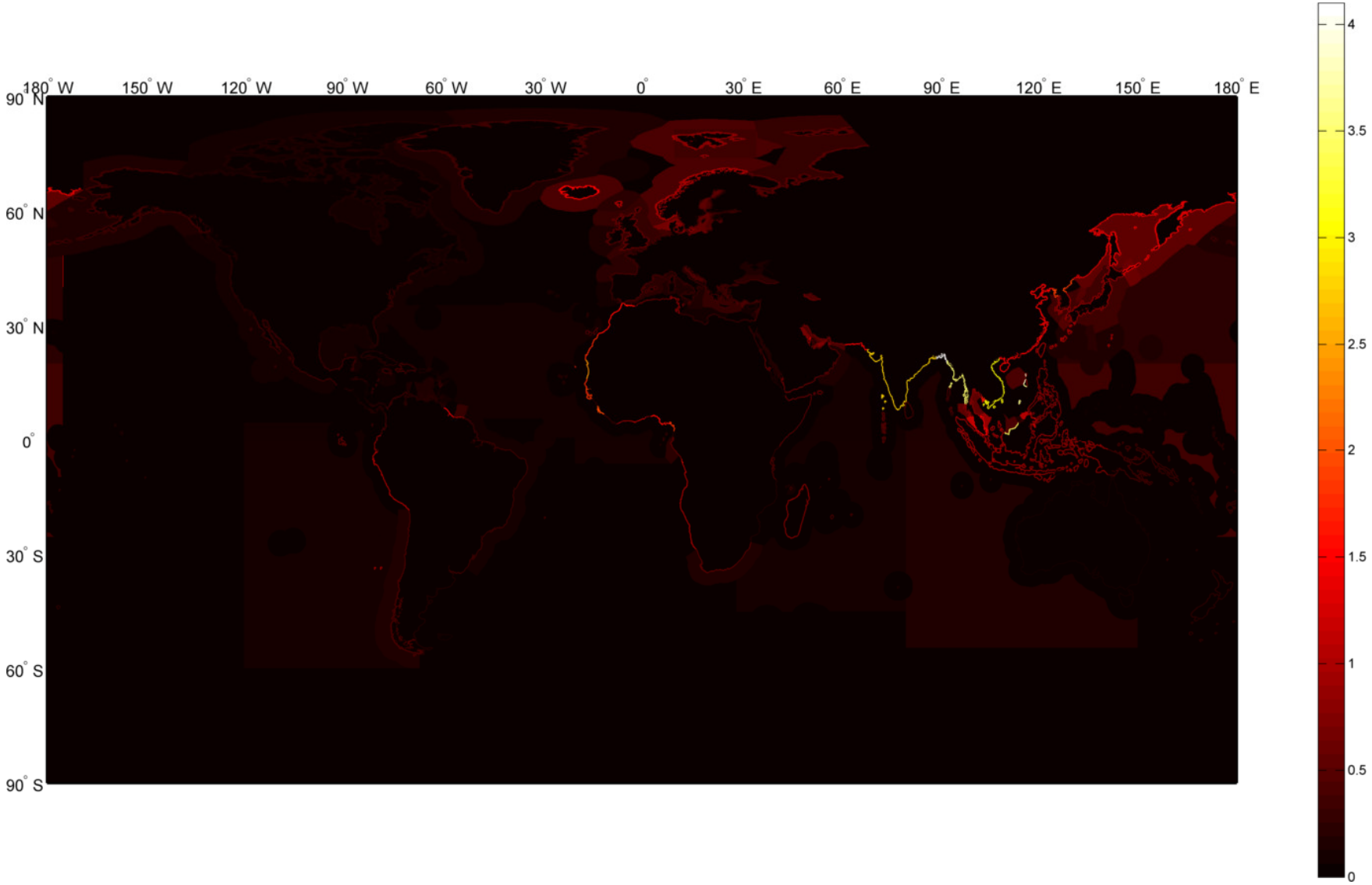

Figure 6 - Gillnet effort density distributed following the oil consumption equivalent per capita scenario expressed in catch density [tonnes . km^{-2}]$^{1/2}$

4. Species impacted by gillnet fishing – ranking and potential for gillnet fishing to impact populations

The analysis was run following the three gillnet fishing effort distribution scenarios described above.

To evaluate the sensitivity of the outcomes to the distribution of the effort, for each species the exposure computed with the coastal scenario and with the exposures computed with the 50:50 scenario was compared.

The test of sensitivity showed that the rank of the species was barely affected by the variation of the effort distribution between the two scenarios, one with all the effort within the coastal strip, the other with it spread 50:50 between coast and wider EEZ. The outputs of these two extreme scenarios showed very little difference in species exposure (Figure 7), with the species most affected by this change was the Short-tailed Albatross (PHA) which was a bit more exposed under the 50:50 scenario. Given this slight movement in species exposure indices, we proceeded to apply the 'oil equivalent' scenario to the remaining aspects of the analysis, confident that this change had little leverage on the species listings, but considering that it more realistically represented the spread of effort by EEZ than either of the more simplistic scenarios.

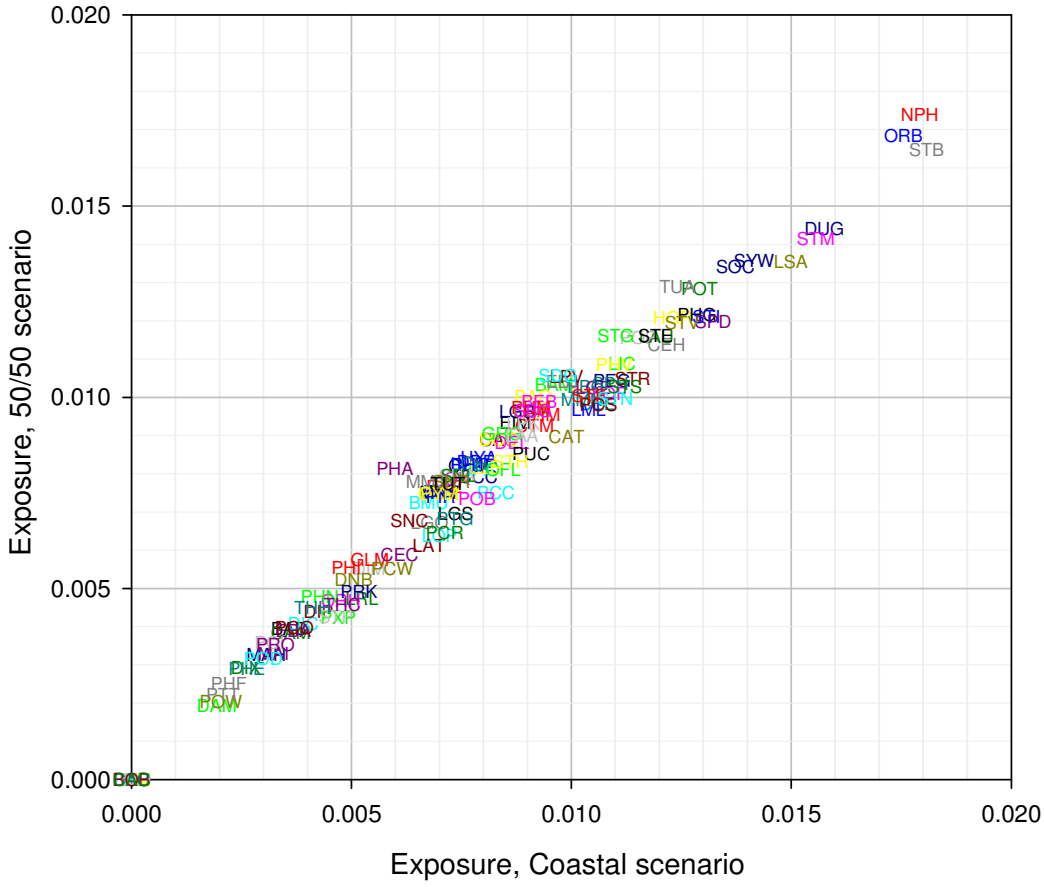

Figure 7 - Comparison of the exposure of a species to gillnet fishing computed with the coastal scenario and the exposure computed with the 50:50 scenario

The species that were most exposed to gillnet fisheries were coastal species overlapping with the regions of high density gillnet fishing. Species with small distributions in region of high fishing effort density (e.g. Terns and Gulls) were particularly exposed. However some of them were seldom observed caught in gillnets.

Conversely, species that were less exposed were southern pelagic species overlapping little with gillnet fisheries, or species with widespread ranges overlapping moderately with gillnet fisheries.

Ideally the exposure index should be weighted with a behavioural index of individuals of that species to be caught in gillnets, to estimate the risk of adverse effects for the whole population. An estimation of the true susceptibility for each species to each gillnet fishery was not possible to do due to the lack of information.

However, to have a approximate estimation of the exposure E_{sp} from the overlap O_{sp}, a simplified behavioural index B_{sp} was estimated.

$$E_{sp,EEZ} = B_{sp} \times O_{sp,EEZ} \qquad \text{(Eq 6)}$$

The simplified behavioural index was defined as follows:

The species was accorded a behavioural index of 1.0 if:

- There was at least one observation of bycatch in a gillnet fishery.
- The animal had at least one behaviour presenting a risk to be caught by gillnets.

Behaviours which may put the animal at risk of being caught were:

- following fishing vessels,
- feeding from fisheries offal,
- diving to catch prey,
- stealing baits from fishing lines,
- feeding on fisheries target species (adult size).

All the other species are accorded a simplified behavioural index of 0.01

The next step was to focus on threatened species and identify which of them were the most exposed to the gillnet fisheries.

For this purpose, the exposure index E_{sp} was weighted with the threatened species rank set out by the International Union for the Conservation of Nature (IUCN 2011). The IUCN coefficient of the species was denoted T_{sp} . The IUCN weighted exposure is noted W_{sp}.

$$W_{sp,EEZ} = T_{sp} \times E_{sp,EEZ} \qquad \text{(Eq 7)}$$

The coefficient T_{sp} were defined as follows:

Table 1 - Weight T_{sp} function of IUCN rank

IUCN Rank	T_{sp}
NT	.4
LC	.2
VU	.6
EN	.8
CR	1.0
Not defined	.5

IV. Results

The results of the IUCN weighted exposure analysis are outlined below. The intermediate results, overlap and un-weighted exposure, are presented in the annexes of this document (page 100 and page 103)

1. Fishery description

a) Global overview of the gillnet fisheries

In 2006, the total from gillnet fishing landed catch was estimated about 16 million tonnes (SAUP 2011). This represented 20% of the world total landed catch. The catch remained the same during the decade 1996 - 2006 however when examined in detail, great variations in the contribution of the gillnet fisheries varied in time and in space.

The EEZs were sorted by order of importance of their gillnet catch in 2006 (Table 2, data source: SAUP 2011). The percentage of gillnet catch of the total fish catch for each jurisdiction is noted.

The regions presenting the highest gillnet catch in 2006 were :

- Northeast & northwest Pacific: Russia, Pacific northwest high seas FAO area.
- South Asia: India and Bangladesh, eastern Indian Ocean high seas FAO area
- Southeast Asia: Vietnam, Myanmar, Philippines, Indonesia, Malaysia, Thailand and Pacific western central high seas FAO area.
- East Asia: China, Japan.
- Northern Europe: Norway, Iceland.

The characteristics of gillnet fisheries are presented below by region. Details about gillnet fisheries by jurisdiction are presented when they make a significant contribution either in terms of gillnet effort on in bycatch. A full description of the gillnet fisheries

are presented in the annex of this document based on the replies of our survey and publicly available information (Table 38)

Table 2 Gillnet catch by EEZ in 2006 (SAUP 2011). The percentage of total fish catch from gillnet catch and the gillnet catch density are set out by EEZ sorted by gillnet catch in 2006.

EEZ	Gillnet catch year 2006 [tonnes]	Gillnet catch/ Total catch %	Gillnet catch Density [tonnes. km^{-2}]
Russia Pacific	1597186	32	0.467
Myanmar	1462590	86	2.811
India	1446008	41	0.887
Vietnam	1443049	79	1.033
Pacific Western Central - High seas Areas	789796	32	0.124
Indian Ocean Eastern - High seas Areas	711725	69	0.032
Indonesia (Eastern)	639530	31	0.177
China	634024	9	0.277
Pacific Northwest - High seas Areas	566316	50	0.055
Indonesia (Western)	464922	27	0.189
Bangladesh	436808	91	5.562
Norway	355914	18	0.255
Japan Main Isl.	272443	17	0.148
Iceland	244520	21	0.317
Philippines	225021	13	0.099
Pacific Southeast - High seas Areas	181062	10	0.007
Morocco	155914	20	0.573
Malaysia Sarawak	152563	32	0.978
Indian Ocean Western - High seas Areas	146348	17	0.009
Malaysia East	136132	27	1.024
Japan Outer Isl.	132840	14	0.051
Thailand	127672	26	0.417
Russia Barrents Sea	118336	53	0.090
Korea South	117830	21	0.248
Korea North	117423	59	1.015
Peru	113138	2	0.125
Alaska	106897	5	0.003
Malaysia West	103973	24	1.512
Western Sahara (Morocco)	103422	18	0.344
Pacific Eastern Central - High seas Areas	103354	16	0.003
Mauritania	100007	44	0.643
United Kingdom	96557	6	0.125
Chile	95415	3	0.047
Mexico	92509	10	0.028
Malaysia Sabah	83896	27	0.936
Nigeria	83033	29	0.383
Svalbard Isl. (Norway)	82922	57	0.195
Madagascar	79545	60	0.066
Sierra Leone	73260	60	0.459
Canada	71751	7	0.012
Guinea	67199	71	0.614
Greenland	62073	15	0.026
Pakistan	59522	23	0.269
Brazil	58648	13	0.018
Iran	58463	29	0.356
Denmark	54471	9	0.506
Greece	51617	18	0.104
Cameroon	51171	56	3.483
Atlantic Eastern Central - High seas Areas	49839	20	0.006
Namibia	49115	12	0.088
Spain	48679	11	0.088
Taiwan	47546	16	0.041
Papua New Guinea	45652	16	0.019
Atlantic Western Central - High seas Areas	44471	42	0.006
Atlantic Southwest - High seas Areas	42820	6	0.003
Senegal	39315	10	0.250
South Africa	38101	7	0.036

Cambodia	37400	63	0.782
Angola	36712	18	0.073
Pacific Southwest - High seas Areas	36354	16	0.002
Sweden	32956	11	0.194
Oman	31791	21	0.059
Guyana	31375	59	0.231
Somalia	28805	88	0.035
Yemen	28370	20	0.052
Saudi Arabia Persian Gulf	25789	26	0.758
Faeroe Isl.(Denmark)	25504	4	0.095
USA East Coast	25412	2	0.028
United Arab Emirates	25198	29	0.441
France	24526	7	0.073
Ecuador	23154	14	0.098
Australia	21886	13	0.003
Suriname	19061	63	0.149
Ireland	18776	3	0.046
Gabon	18454	43	0.095
Maldives	18353	10	0.020
Tunisia	17745	16	0.173
J. Fernandez, Felix and Ambrosio Isl. (Chile)	17658	14	0.035
Turkey Black Sea	16993	7	0.099
Turkey Mediterranean Sea	15979	5	0.191
Gambia	15771	49	0.697
Atlantic SouthEast - High seas Areas	15361	10	0.001
New Zealand	15334	4	0.004
Desventuradas Isl.(Chile)	14906	13	0.033
Algeria	14712	10	0.114
Poland	13889	19	0.440
Italy	12944	10	0.024
Ghana	12915	5	0.057
Venezuela	12711	4	0.027
Atlantic Northeast - High seas Areas	11117	2	0.002
Atlantic Northwest - High seas Areas	11107	6	0.004
Canary Isl.(Spain)	10801	16	0.024
Bahrain	10057	33	1.132
Croatia	9723	10	0.172
Andaman & Nicobar Isl. (India)	9719	24	0.015
Solomon Isl.	9646	48	0.006
Pacific Northeast - High seas Areas	9281	13	0.002
Fiji	9063	51	0.007
Tanzania	8343	35	0.035
Sudan	8264	46	0.094
Colombia	7741	17	0.009
Jan Mayen Isl. (Norway)	7641	25	0.026
Saudi Arabia Red Sea	7620	19	0.041
Germany	7566	11	0.132
Argentina	7322	1	0.007
Jamaica	7100	56	0.027
Kuwait	6522	43	0.533
Libya	6456	47	0.018
Sri Lanka	6445	27	0.012
Finland	6444	8	0.071
USA West Coast	6317	1	0.008
Egypt	6139	32	0.023
Haiti	5833	72	0.052
Netherlands	5599	5	0.088
Cote d'Ivoire	5557	23	0.032
USA Golf Of Mexico	5352	1	0.008
Portugal	4839	4	0.015
Latvia	4798	6	0.150
Galapagos Isl.(Ecuador)	4636	8	0.006
Dominican Rep.	4587	42	0.017
Russia Baltic Sea Kaliningrad	4190	10	0.360
Mauritius	4178	12	0.003
Cuba	4075	20	0.011
Congo Republic	3973	16	0.098
Uruguay	3794	4	0.029
Ukraine	3609	16	0.025
Kiribati	3527	15	0.001

Qatar	3014	18	0.095
Russia Siberia	2891	35	0.001
Easter Isl.(Chile)	2864	7	0.004
Hong Kong	2686	5	1.281
Panama	2680	3	0.008
Singapore	2514	8	3.055
French Guyana	2256	44	0.017
Mozambique	2047	8	0.004
Mayotte (FR)	2022	33	0.032
Lebanon	1866	22	0.097
French Polynesia	1863	18	0.000
Brunei	1750	73	0.069
Cape Verde	1738	25	0.002
Estonia	1727	3	0.043
Malta	1670	15	0.030
Lithuania	1568	7	0.257
Congo	1533	33	1.430
Cyprus	1506	18	0.015
Israel	1387	24	0.051
Eritrea	1329	15	0.017
Navassa Isl. (Haiti)	1267	78	0.110
Albania	1251	38	0.112
Honduras	1251	34	0.005
Martinique	1175	31	0.025
Lord Howe Isl. (Australia)	1133	35	0.002
Montenegro	1062	15	0.143
Liberia	1045	10	0.004
Trinidad & Matin Isl (BR)	1018	22	0.002
Sao Tome & Principe	902	18	0.005
Benin	895	11	0.030
Micronesia	895	4	0.000
Togo	855	5	0.056
Trinidad & Tobago	843	20	0.011
Channel Isl.(UK)	837	3	0.072
Costa Rica	826	18	0.001
Madeira Isl.(Portugal)	804	10	0.002
Brit. Virgin Isl.(UK)	803	62	0.010
Azores Isl.(Portugal)	778	5	0.001
Guadeloupe (FR)	654	6	0.007
Kenya	619	23	0.006
Christmas Isl.(Australia)	617	43	0.002
Syria	603	18	0.059
Macau (China)	594	3	14.488
El Salvador	592	3	0.006
Cocos Isl.(Australia)	560	39	0.001
St Lucia	556	37	0.036
Puerto Rico (US)	500	11	0.003
Dominica	494	16	0.017
Russia Black Sea	488	5	0.007
Equatorial Guinea	466	22	0.002
Vanuatu	427	3	0.001
Gaza Strip	421	21	0.163
New Caledonia	417	13	0.000
Marshall Isl.	396	4	0.000
Seychelles	377	1	0.000
Timor Leste	343	94	0.004
Guinea-Bissau	331	3	0.003
Wallis & Futuna (FR)	323	50	0.001
Tuvalu	279	14	0.000
Russia Baltic Sea St Petersburg	275	2	0.022
Nicaragua	241	1	0.002
Antigua & Barbuda	215	7	0.002
Palau	213	5	0.000
Comoros Isl.	207	4	0.001
Haiwaii NorthWest Isl.	206	7	0.000
Anguila (UK)	180	72	0.002
Falkland Isl. (Malvinas) (Disputed)	165	0	0.000
St Paul & Amsterdam (FR)	161	11	0.000
Belgium	159	3	0.046
St Pierre & Miquelon (FR)	152	42	0.012

Mozambique Channel Isl. (FR)	149	2	0.000
Haiwaii Main Isl.	145	3	0.000
Grenada	128	12	0.005
Ascencion Isl.	122	12	0.000
Iraq	107	26	0.179
Tonga	103	15	0.000
St Vincent & The Grenadines	91	59	0.003
Monaco	86	11	0.302
American Samoa	75	6	0.000
Norfolk Isl. (Australia)	69	33	0.000
Windward Netherlands Antilles	69	93	0.006
Arctic Sea - High seas Areas	69	88	0.000
Cook Isl.(NZ)	69	15	0.000
St Kitts & Nevis	67	15	0.007
Indian Ocean Antarctic - High seas Areas	64	4	0.000
Bahamas	58	1	0.000
Brit. Indian Oce (UK)*	56	5	0.000
Guam (US)	54	2	0.000
Montserrat (UK)	50	100	0.007
Djibouti	50	19	0.007
Barbados	46	17	0.000
Bosnia	45	8	3.214
Tromelin Isl.(FR)	42	1	0.000
Crozet Isl.(FR)	41	5	0.000
Leeward Netherland Antilles	40	28	0.001
Palmyra Atoll & Kingman Reef (US)	37	4	0.000
Cayman Isl.(UK)	35	100	0.000
Reunion (FR)	24	1	0.000
Jordan	22	14	0.232
Johnston Atoll (US)	21	3	0.000
Northern Marianas (US)	16	0	0.000
Kerguelen Isl. (FR)	16	0	0.000
Nauru	15	1	0.000
Jarvis Isl.(US)	14	2	0.000
Slovenia	14	2	0.075
Bermuda (UK)	13	8	0.000
Bulgaria	12	5	0.000
Romania	10	17	0.000
Tokelau (NZ)	8	31	0.000
Guatemala	7	1	0.000
Belize	5	0	0.000
Georgia	4	5	0.000
Prince Edward Isl. (SA)	4	3	0.000
Clipperton Isl.(FR)	4	0	0.000
Pitcairn (UK)	3	100	0.000
Samoa	3	1	0.000
Niue (NZ)	1	33	0.000
St Helena (UK)	1	2	0.000
Howland & Baker Isl.(US)	1	0	0.000
Atlantic Antarctic - High seas Areas	1	0	0.000
South Georgia & Sandwich Isl. (UK)	0	0	0.000
Macquarie Isl.(Australia)	0	0	0.000
Bouvet Isl.(Norway)	0	0	0.000
Gibraltar (UK)	0	0	0.000
Heard & McDonald Isl.(Australia)	0	0	0.000
Turks & Caicos Isl. (UK)	0	0	0.000
Wake Isl.(US)	0	0	0.000
Pacific Antarctic - High seas Areas	0	0	0.000

*Note that British Indian Ocean Territory was included in error as this territory is now a no-take zone for fisheries, The results have not been adjusted to take into account this error, but the authors consider that the weight added to the analyses by this fishing effort is negligable.

b) Gillnet fisheries in South Asia and South East Asia

EEZs in South Asia and South East Asia were characterized by a great variety of small scale/artisanal gillnet fisheries, operating essentially in coastal inshore areas and estuaries, targeting a wide range of species. During the last decade, the small-scale fisheries became more and more mechanized as many boats were equipped outboard motors. The coastal fishing communities of these regions have been severely impacted by the Tsunami of December 2004.

- **Myanmar.** Driftnets and gillnets are commonly used in Myanmar to fish pelagic species (finfish) and demersal fish such as marine catfish and jewfish and shrimps (Project Global 2011). The gillnet landed catch was one the highest of the world in 2006 (1.46 million tonnes). The gillnet catch has almost tripled in the last decade (0.48 million tonnes in 1996, 1.46 million tonnes in 2006, SAUP 2011).

- **Bangladesh.** The Bangladeshi gillnet fisheries consisted mostly of artisanal gillnet driftnets and setnets targeting demersal fish, Indian salmon and shrimps. These gillnets are operated between 8 m and 30 m depth in inshore areas all year round excepted during the monsoon period (Hossain 2004). The gillnet landed catch has doubled in 10 years (258,000 tonnes in 1996 and 437,000 tonnes in 2006) (SAUP 2011) and many of the targeted species have been over-exploited (Khan et al. 2003). Bangladesh is one of the jurisdictions with the highest density of gillnet catch per km^2.

- **India.** India fisheries relied heavily on coastal artisanal gillnet fisheries (41% of the total catch in 2006) (SAUP 2011). Some reviews of fishing centres in India indicated the use of motorized boats up to 15 m long deploying gillnets about 0.5-6 km long up to 70 km from the coast (Yousuf 2008). The gillnet landed catch has doubled in the last 10 years (0.68 million tonnes in 1996, 1.44 million tonnes in 2006) (SAUP 2011).

- **Vietnam.** The gillnet landed catch in 2006 consisted of more than 86% of the total landed catch in 2006. It has increased by 45% during the years 1996-2006 (SAUP 2011). The gillnet fishing density was among the highest in the world. The number of gillnet boats and driftnet boats (non mechanized and mechanized) were estimated to be greater than 28000 in 2005 (Dung 2006) .

- **Indonesia.** Indonesia is one the top 5 jurisdictions for gillnet catch with more than 1.1 million tonnes for the year 2006 (Table 2). Indonesian fisheries are extremely diverse. Fisheries are mostly small scale involving numerous unpowered and powered small sized vessel (334202 boats in 1998). Most of the unpowered boats were operated in the vicinity of coastal villages by 3 - 5 fishermen and a wide variety of gear including gillnets. The fishing sector represented 2 million fishermen in 1998 (FAO 2011). Gillnet catch represented ~30% of the total catch for both Western and Eastern Indonesia. Gillnet catch increased steadily by about 4% during the last 5 years in both Eastern and Western Indonesia (SAUP 2011).

c) Gillnet fisheries in Northwest Pacific

Gillnets and driftnets are abundantly used in the Northwest Pacific to catch Sockeye, Pink and Chum salmon and squids. 566 000 tonnes of fish and squids were caught with gillnets and driftnet in 2006, representing half of the total catch. Since 1997, the total catch and the gillnet catch has decreased proportionally by 50% (SAUP 2011).

- **Pacific Russia EEZ**. Gillnet activity in the Pacific Russia EEZ is essentially dominated by Russian and Japanese large-scale driftnet fisheries targeting Sockeye, Pink and Chum salmons and squids (Artukhin et al. 2010). Russia was one of the few jurisdictions still allowing long driftnet fishing in its EEZ. Those large scale fisheries competed strongly with artisanal/small scale fisheries due to the depletion of the fishing stock.

d) Gillnet fisheries in East Asia

- **China.** (source FAO 2011) With 634000 tonnes of gillnet catch, China is one of the most important players in gillnet fisheries (SAUP 2011). In 2004, the marine fishing fleet of China consisted of 279 937 motorized vessels, showing little change from 1999. The areas in which the vessels operated included the national jurisdiction of China and other areas under agreements between China and the East Asian jurisdictions (including Japan, Republic of Korea and Vietnam), as well as on the high seas. Total fleet power was 13.74 million kW. In 2004, the most common fishing gear used was the trawl net. In terms of

production, trawlers accounted for 47.6% of catch, gillnets accounted for around 17%, setnets 15%, lines and hooks 6%, purse seines 5.3%, and other fishing gears 9%. Compared with 1999, the trawl catch was similar, but the proportion of gillnet, lines and hooks and purse seines increased, while the proportion of setnets and other fishing gear decreased. The catch in 2004 basically reflected the main fishery resources in the national jurisdiction of China. Outside the Chinese EEZ area, squid, hairtail, Jack mackerel and tunas were the main target stocks. In 2004, there were 4060 marine fishery villages, 82 more than in 1999, and there were 3.32 million traditional fishermen in China's marine fisheries. Fishery villages were mainly concentrated in Shandong (946), Guangong (896), Zhejiang (654), Fujian (522), Liaoning (410) and Hainan (290). Fujian province had the greatest number in terms of traditional fishermen (900 000), followed by Guangdong (660 000), Shandong (580 000), Zhejiang (380 000), Hainan (280 000) and Liaoning (180 000).

- **Japan:** The FAO profilme was not available for this jurisdiction at the time of writing.

e) Gillnet fisheries in Northern Europe

- **Norway** (source FAO 2011) The fleet was comprised of 9,931 vessels in 2003. This was 25 per cent less than 1999 when there were 13,196 vessels. The main species targeted by these vessels were cod and herring. The fleet is divided into coastal and offshore administrative categories. Offshore fisheries are purse seiners, longliners and trawlers. The coastal fleet consists of relatively small vessels, mostly between eight and 13 metres long. The coastal fleet generally targets demersal species with a variety of fishing gear, including gillnets, hand-lines, long-lines and Danish seines. Cod were the main species both in terms of volume and value, followed by haddock, anglerfish and saithe. These vessels were operated by 1-2 fishermen and were on average 10.5 gross tonnage.

- **Iceland**. (source Icelandic Fisheries 2011) Gillnets were mainly used by small to intermediate sized boats, similar in size to longliners. Each net is about 50 m long, but a few (often around 10m) nets are tied together and a number of such units placed by each ship. The nets are left to soak for one night,

preferably not longer to maintain the quality of the catch. Gillnets are used extensively during the late winter season when the cod is migrating to the spawning grounds. These fisheries begin in January, reach a peak in March and end in May. Gillnets are used all around Iceland but by far the most important grounds are south Iceland and south west Iceland where the main spawning grounds are found (Figure 8). Cod is the primary target for gillnets as with so many other fishing gears, but large amounts of saithe are also fished, as well as lesser amounts of haddock, monkfish, ling. Besides cod gillnets, many specialized versions of bottom gillnets are also used, mainly differing in mesh size. For example, there are nets optimized for haddock (140-150 mm mesh size), lumpsuckers (180-270 mm), flatfish (165-200 mm) and Atlantic halibut (460 mm). Except for the lumpsucker nets, none of these are in large scale use. Common gillnets used in cod fisheries have a 140 to 204 mm mesh size, the former being the minimum allowed in most grounds. All of these nets are bottom gillnets. Driftnets have only been used in Herring fisheries (63 mm mesh size) and only prior to 1987 (Gunnarsson et al. 1998, Kristjánsson 1983, Þór 2002, Þór 2003, Þór 2005)

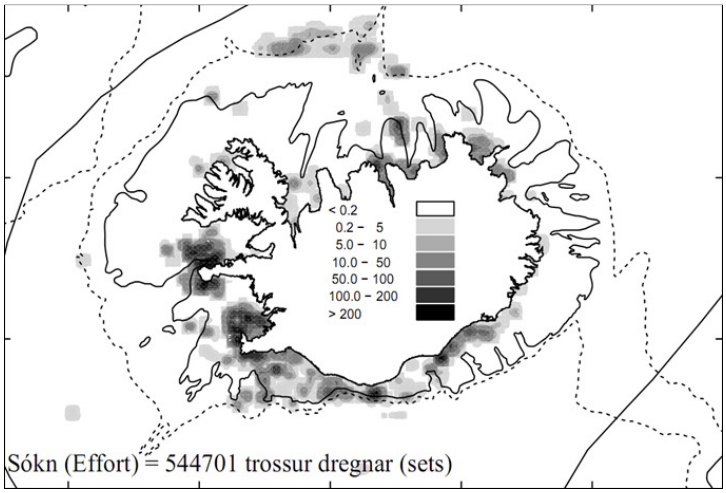

Figure 8 - Location of effort with gillnets in 2008 (sets), dark areas indicate highest effort (source Icelandic Fisheries 2011).

f) Gillnet fisheries in South America

- **Peru**. Small scale fisheries in Peru are widespread and numerous (>100 ports, >9500 vessels, >37000 fishermen) and operate industrial along the Peruvian

coastline (Alfaro-Shigueto et al. 2011). The small scale fisheries have rapidly expanded in recent decades (i. e. 34% and 54% increase in the number of fishermen and vessels (Alfaro-Shigueto et al. 2010). The main fishing gear consists of a variety of method including gillnets, driftnets, trammel nets and bottom setnets (Alfaro-Shigueto et al. 2011). The small scale fisheries are primarily export oriented and all species are used indiscriminately in fishmeal production, adversely affecting marine biodiversity, conflicting also with artisanal subsistence fisheries occurring within 5 miles from the coast (Sueiro 2005). The estimated gillnet landed catch was 113000 tonnes for 2006, ranking Peru among the top 20 most important gillnet contributors globally (SAUP 2011).

- **Chile.** Gillnetting is a commonly used artisanal and large scale fishing method in the EEZ of Chile. The gillnet fisheries consist of artisanal/large scale driftnet fisheries and artisanal coastal gillnets. Large scale driftnets target mainly swordfish. The driftnets might range between 2.4 km and 4.3 km long, 60 m deep despite the official limitation of 2.47 km (Weidner and Serrano, 1997). Industrial driftnet fisheries operate with boats between 18 m and 73 m long. The number of vessels in the industrial fleet has reduced by one order of magnitude between 1991 and 2003 (IFOP 2006). Artisanal driftnets fisheries use shorter driftnets up to 1.8 km long and 45 m deep with a mesh size about 53 cm, identical to industrial driftnet (Weidner and Serrano, 1997) operated by smaller boats of 9 - 18 m. In both cases, driftnets are set between 9 m and 60 m depth. The coastal artisanal gillnets are operated by smaller boats with smaller mesh (20 cm) set at 1 to 2 miles from the shore. The artisanal gillnet mainly targets are jack mackerel, sardines and anchovies. The reported landed catch of the SUBPESCA indicated that these artisanal gillnet fisheries were the main contributor of all Chilean gillnet fisheries (437,000 tonnes of fish caught in 2005 - 2006 compared to ~3000 tonnes of fish caught by driftnets in 1995) (SUBPESCA 2006).

g) Gillnet fisheries in the Mediterranean Sea

The Mediterranean and Black Sea gillnet fisheries consist mostly of small scale artisanal fisheries operating within 12 miles of the shore. 80% of the European fishing vessels are

<12m long (~33000 boats). The fishing methods are diverse trawls, driftnets, gillnets, purse seines and longlines and many boats use multiple gear types (Ancha 2008). Gillnets are mostly used for inshore fisheries but also in high seas area targeting high value species (e.g merlin, bluefin tuna, Black Sea turbot). The European Union banned pelagic driftnet in 2002 however non- European Union countries increasingly use them in the Mediterranean (OCEANA 2006). Illegal large scale swordfish driftnets fisheries are still operating all year long in several Mediterranean areas such as the Alboran Sea. General Fisheries Commission for the Mediterranean adopted a binding resolution where driftnets of any length were prohibited for capturing large migratory species. However compliance with these agreement is far from complete and illegal fishing is still reported to occur according to OCEANA, (OCEANA 2009, EJF 2007, Secretary of Commerce of the United State 2008).

In terms of gillnet fisheries in the Mediterranean, Greece has the largest fleet with 21000 boats and is also the main European gillnet catch contributor (Gerosa and Casale 1999).

France has 742 boats of an average length of 7m-9m using gillnet, driftnet, encircling nets to target breams, sole hake, red mullets and crustacean in the Mediterranean involving ~1000 fishermen (IFREMER 2011).

Turkey is also an important gillnet player with the Black Sea turbot fishery involving 185 boats operating 19000 bottom gillnets from six ports in western Turkey (Oztürk 2001)

Morocco Mediterranean fisheries was the bulk of large scale driftnet fishing nations with a fleet involving 117 vessels using driftnets up to 14km long (Tudela et al. 2005). However the Moroccan Government is phasing out of Morocco's driftnet fleet under the EU-Morocco Fisheries Partnership Agreement and initiatives with the United State (Secretary of Commerce of the United States 2008)

h) Gillnet fisheries in Africa

- **Morocco**. In its Atlantic fisheries, Morocco with 259,000 tonnes of gillnet catch in 2006 is one of the 10 biggest contributors of gillnet catch globally. Morocco's gillnet fisheries are represented by an artisanal fishery sector operating in coastal areas and large scale driftnet swordfish fishery operating in the Mediterranean described previously. The artisanal fishery consists of around 18000 small wooden boats (<6m long) with outboard engines. The

main fishing gear used are gillnets to catch small species. Most of the catch supplies local markets (Franquesa et al. 2001).

- **Mauritania.** (source FAO 2011) With 100000 tonnes of fish caught with gillnets in 2006, Mauritania is an important player in gillnet bycatch. Mauritanian gillnet fisheries are mostly small scale/artisanal fisheries supplying local markets. The artisanal fishing sector consisted in 3000 dugout boats and 10000 fishermen.

- **South Africa.** Gillnets used in South Africa consist only of the shark gillnet fishery. They are used to protect the swimmers from shark attacks. The overall length of shark nets is 27.5km deployed in 38 localities. They are usually set at 400m from the coast in shallow water, in 2 or 3 rows. The dimension of the net ranged between 200m and 300m in length with wide stretched mesh (50cm) (Kwazulu-Natal Sharks Board 2011).

i) Gillnet fisheries in Oceania

- **New Zealand.** (source: New Zealand Ministry of Fishery 2011). Gillnet fisheries in New Zealand were mostly represented by setnet fisheries (6278 tonnes in 2006) and inshore driftnet fisheries (44 tonnes in 2006). The number of vessels participating in gillnetting in New Zealand was 457 in 2006 but decreased to 304 vessels in 2009. 87% of those vessels were less than 12m long. The top 5 targets species by total net length in order were: flatfish, rig, school shark, grey mullet and tarakihi. The number of fishing events by net length, mesh size and net height are presented in the Table 3. The distribution of the gillnet catch for the period 2006-2010 is presented in Figure 9.

Table 3 - The size of gillnets used in New Zealand by count of fishing event (source New Zealand Ministry of Fishery 2011).

Measure	Category	2006/2007	2007/2008	2008/2009	2009/2010
Total net length (m)	<400	4,151	3,630	3,017	3,028
	400 to <600	4,642	3,794	4,317	4,302
	600 to <800	5,007	4,688	4,163	4,283
	800 to <1000	3,674	3,180	3,455	4,064
	1000 to <1200	4,468	3,540	3,588	3,986
	Over 1200	4,716	4,111	3,916	4,144
	Unknown	3			4
Net height (m)	*<2*	*1,628*	*1,561*	*1,538*	*1,637*
	2 to <2.6	*1,611*	*1,377*	*1,121*	*1,234*
	2.6 to <3	*1,358*	*1,744*	*1,553*	*1,730*
	3 to <4	*2,369*	*1,923*	*1,606*	*1,642*
	4 & over	*1,782*	*1,903*	*2,107*	*2,064*
	Unknown	*17,913*	*14,435*	*14,531*	*15,504*
Mesh Size (mm)	<120	5,114	4,645	5,129	5,237
	120 to <125	*4,196*	3,343	2,598	2,465
	125 to <130	7,858	6,881	6,919	8,119
	130 to <175	6,143	4,868	4,523	4,427
	175 & over	2,833	2,726	2,476	2,854
	Unknown	517	480	811	709

Table 4 - The number of gillnet captures reported by fishermen within New Zealand EEZ for species listed by the Convention on Migratory Species (source New Zealand Ministry of Fishery 2011).

Species Name	2008/2009	2009/2010
Common dolphin	1	3
Dusky dolphin	0	1
Green Turtle	1	0
Humpback Whale	1	0
Dolphins and Toothed Whales	3	0
White Pointer Shark	3	5
Southern Giant Petrel	1	0
White -chinned Petrel	0	1

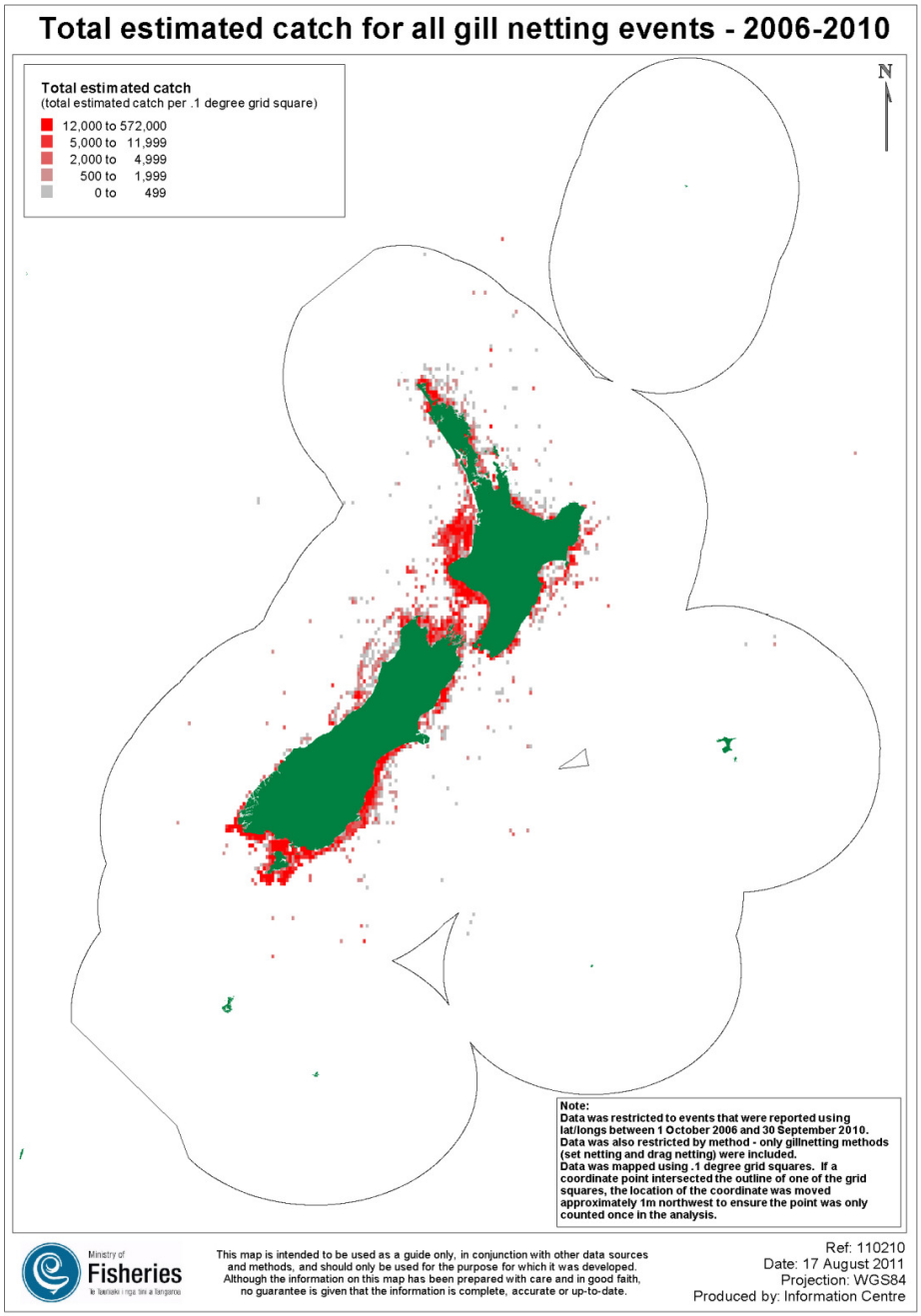

Figure 9 - Total estimated catch for all gillnetting events for the period 2006-2010 in the New Zealand EEZ (source New Zealand Ministry of Fishery 2011).

The total number of captures for the CMS species reported by fishermen since the introduction of the non-fish protected species catch return are detailed in Table 4.

2. Overlap analysis outputs

a) Exposure index for all species

The analysis outputs were presented in tabular form and mapped to show relative exposure levels within each EEZ. For all species summed, Figure 10 shows the areas where most exposure occurs (red colours).

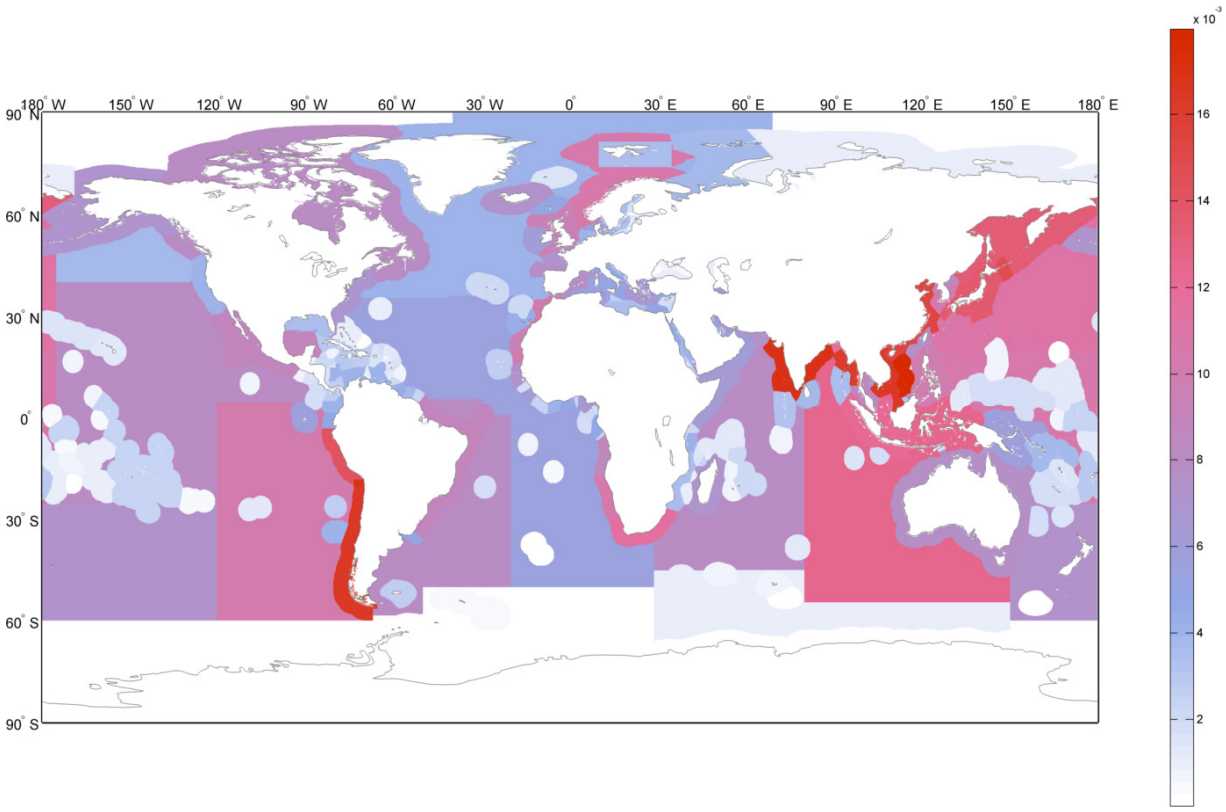

Figure 10 - EEZs and High Seas FAO areas showing with the IUCN weighted exposures summed across species. Areas with colours furthest up the scale bar (red colours) had higher species exposures.

The 30 EEZs having the highest exposure, for the sum of all species was explored (Table 5).

Table 5 - EEZ and high seas FAO areas presenting the highest exposure for all species (top 30 ranked jurisdictions in descending order of importance).

Rank	EEZ or high seas FAO area	Sum of all species IUCN weighted exposures in the EEZ
1	Myanmar	1.54
2	Vietnam	1.52
3	Peru	1.49
4	India	1.43
5	Russia Pacific	1.29
6	Chile	1.28
7	South Africa	1.27
8	China	1.27
9	Namibia	1.25
10	Greece	1.20
11	Galapagos Isl.(Ecuador)	1.16
12	Bangladesh	1.13
13	Japan Main Isl.	1.12
14	Indonesia (Western)	1.11
15	Indonesia (Eastern)	1.07
16	Norway	1.06
17	Mauritania	1.01
18	United Kingdom	0.99
19	Algeria	0.98
20	Morocco	0.95
21	Western Sahara (Morocco)	0.95
22	Pacific Western Central - High seas Areas	0.92
23	Iceland	0.91
24	Tunisia	0.87
25	Japan Outer Isl.	0.86
26	Turkey Mediterranean Sea	0.85
27	Pacific Northwest - High seas Areas	0.85
28	Philippines	0.84
29	Bahrain	0.83
30	Korea South	0.81

The most exposed species, using the IUCN-weighted outcomes were sorted into 3 categories; most exposed (pink), moderately exposed (green) and least exposed (blue). All five species groups in the study were represented within the top 40 most exposed species to gillnet fishing (Table 6).

Table 6 - Species ranked by IUCN-weighted exposure. All species. Those marked with pink shading are the most exposed 40 species across all EEZs combined, those shaded green were the moderately exposed 40 species, and those shaded blue the least exposed species

Rank	Species code	Family	species	Common name	IUCN weighted exposure
1	NPH	cetacean	Neophocaena phocaenoides	Finless Porpoise	2.466
2	ORB	cetacean	Orcaella brevirostris	Irrawaddy Dolphin	2.421
3	MMN	marine mammals other	Monachus monachus	Mediterranean Monk Seal	2.204
4	SPD	seabirds	Spheniscus demersus	African Penguin	2.201
5	DUG	cetacean	Dugong dugon	Dugong / Sea Cow	2.164
6	EIM	turtle	Eretmochelys imbricata	Hawksbill Turtle	2.073
7	LPK	turtle	Lepidochelys kempii	Kemp's Ridley Turtle	2.009
8	PEG	seabirds	Pelecanoides garnotii	Peruvian diving petrel	1.972
9	DCC	turtle	Dermochelys coriacea	Leatherback Turtle	1.965
10	LOF	marine mammals other	Lontra felina	Marine Otter	1.852
11	EBJ	cetacean	Eubalaena japonica	North Pacific Right Whale	1.842
12	POT	cetacean	Sousa teuszii	Atlantic Hump-backed Dolphin	1.795
13	EBG	cetacean	Eubalaena glacialis	Northern Right Whale	1.779
14	SYW	seabirds	Synthliboramphus wumizusume	Japanese Murrelet	1.762
15	PTG	seabirds	Pterodroma phaeopygia	Dark-rumped Petrel	1.743
16	PIR	seabirds	Phoebastria_irrorata	Waved Albatross	1.642
17	PHG	seabirds	Phalacrocorax nigrogularis	Socotra Cormorant	1.592
18	CAC	turtle	Caretta caretta	Loggerhead Turtle	1.572
19	CHM	turtle	Chelonia mydas	Green Turtle	1.484
20	SPH	seabirds	Spheniscus humboldti	Humboldt Penguin	1.466
21	TUA	cetacean	Tursiops aduncus	Indian or Bottlenose Dolphin	1.433
22	LPV	turtle	Lepidochelys olivacea	Olive Ridley Turtle	1.386
23	CEH	cetacean	Cephalorhynchus heavisidii	Heaviside's Dolphin	1.383
24	BOB	cetacean	Balaenoptera borealis	Sei Whale	1.369
25	BAP	cetacean	Balaenoptera physalus	Fin Whale	1.366
26	BMU	cetacean	Balaenoptera musculus	Blue Whale	1.324
27	PUM	seabirds	Puffinus mauretanicus	Balearic shearwater	1.269
28	SOC	cetacean	Sousa chinensis	Indo-Pacific Humpbacked Dolphin	1.267
29	CTM	shark	Cetorhinus maximus	Basking Shark	1.234
30	IPA	shark	Isurus paucus	Longfin Mako Shark	1.140
31	POS	cetacean	Phocoena spinipinnis	Burmeister Porpoise	1.131
32	PHA	seabirds	Phoebastria_albatrus	Short-tailed Albatross	1.131
33	PUC	seabirds	Puffinus creatopus	Pink-footed Shearwater	1.116
34	RHT	shark	Rhincodon typus	Whale Shark	1.113
35	LOP	marine mammals other	Lontra provocax	Southern River Otter	1.102
36	BEB	cetacean	Berardius bairdii	Baird's Beaked Whale	1.097
37	CCC	shark	Carcharodon carcharias	Great White Shark	1.094
38	BAO	cetacean	Balaenoptera omurai	Omura' Whale	1.094
39	LMN	shark	Lamna nasus	Porbeagle Shark	1.090
40	LAU	seabirds	Larus audouinii	Audouin's Gull	1.085
41	IOX	shark	Isurus oxyrinchus	Shortfin Mako Shark	1.075
42	PYM	cetacean	Physeter macrocephalus	Sperm Whale	1.019
43	DIM	seabirds	Thalassarche_melanophrys	Black-browed Albatross	1.004
44	PCR	seabirds	Pelecanus crispus	Dalmatian Pelican	0.972
45	POB	cetacean	Pontoporia blainvillei	La Plata Dolphin	0.971
46	PHN	seabirds	Phoebastria_nigripes	Black-footed Albatross	0.941
47	HYA	cetacean	Hyperoodon ampullatus	Northern Bottlenose Whale	0.915

48	SNL	cetacean	Stenella longirostris	Spinner Dolphin	0.906
49	CEE	cetacean	Cephalorhynchus eutropia	Chilean Dolphin	0.852
50	OOR	cetacean	Orcinus orca	Killer whale	0.849
51	PHF	seabirds	Phoebetria fusca	Sooty Albatross	0.830
52	THH	seabirds	Thalassarche_chlororhynchos	Yellow-nosed Albatross	0.829
53	LAT	seabirds	Larus atlanticus	Olrog's Gull	0.816
54	LGO	cetacean	Lagenorhynchus obscurus	Dusky Dolphin	0.764
55	DEL	cetacean	Delphinapterus leucas	Beluga	0.764
56	LGS	cetacean	Lagenorhynchus australis	Peale's Dolphin	0.754
57	SNC	cetacean	Stenella clymene	Clymene dolphin	0.752
58	LLE	seabirds	Larus leucophthalmus	White-eyed Gull	0.748
59	STM	seabirds	Sterna maxima	Royal Tern	0.720
60	PCW	seabirds	Procellaria westlandica	Westland Petrel	0.718
61	GLM	cetacean	Globicephala melas	Long-finned Pilot Whale	0.678
62	MMO	cetacean	Monodon monoceros	Narwhal	0.675
63	PRK	seabirds	Procellaria parkinsoni	Black Petrel	0.658
64	CEC	cetacean	Cephalorhynchus commersonii	Commerson's Dolphin	0.636
65	PRO	seabirds	Procellaria aequinoctialis	White-chinned Petrel	0.621
66	DIC	seabirds	Thalassarche_chrysostoma	Grey-headed Albatross	0.592
67	POW	seabirds	Pterodroma cahow	Cahow Bermuda Petrel	0.591
68	DIP	seabirds	Diomedea epomophora	Royal Albatross	0.584
69	DIX	seabirds	Diomedea exulans	Wandering Albatross	0.575
70	PHI	seabirds	Phoebastria_immutabilis	Laysan Albatross	0.571
71	PCO	seabirds	Procellaria conspicillata	Spectacled Petrel	0.564
72	BAB	cetacean	Balaenoptera bonaerensis	Antarctic Minke whale	0.549
73	POD	cetacean	Phocoena dioptrica	Spectacled Porpoise	0.530
74	HGR	marine mammals other	Halichoerus grypus	Grey Seal	0.522
75	LIC	seabirds	Larus ichthyaetus	Great Black-headed Gull	0.518
76	PTT	seabirds	Pterodroma atrata	Henderson Petrel	0.511
77	POP	cetacean	Phocoena phocoena	Common Porpoise	0.504
78	LGE	seabirds	Larus genei	Slender-billed Gull	0.485
79	DNB	seabirds	Thalassarche_bulleri	Buller's Albatross	0.471
80	PHV	marine mammals other	Phoca vitulina	Common Seal	0.470
81	LML	seabirds	Larus melanocephalus	Mediterranean Gull	0.462
82	BAM	cetacean	Balaena mysticetus	Bowhead Whale	0.448
83	SBG	seabirds	Sterna bergii	Great Crested Tern	0.429
84	LHM	seabirds	Larus hemprichii	Sooty Gull	0.428
85	DAL	cetacean	Phocoenoides dalli	Dall's Porpoise	0.428
86	LGA	cetacean	Lagenorhynchus acutus	Atlantic White-sided Dolphin	0.419
87	LGB	cetacean	Lagenorhynchus albirostris	White-beaked Dolphin	0.417
88	THC	seabirds	Thalassarche_cauta	Shy Albatross	0.408
89	PCI	seabirds	Procellaria cinerea	Grey Petrel	0.405
90	ORH	cetacean	Orcaella heinsohni	Australian Snubfin dolphin	0.402
91	GRG	cetacean	Grampus griseus	Risso's Dolphin	0.399
92	LAA	seabirds	Larus armenicus	Armenian Gull	0.390
93	PCC	seabirds	Pelecanus onocrotalus	White Pelican	0.384
94	DDE	cetacean	Delphinus delphis	Common Dolphin	0.373
95	LGH	cetacean	Lagenodelphis hosei	Fraser's Dolphin	0.372
96	OFL	marine mammals other	Arctocephalus australis	South American Seal	0.369
97	PHE	seabirds	Phoebetria palpebrata	Light-mantled Sooty Albatross	0.364
98	SNA	cetacean	Stenella attenuata	Pantropical Spotted Dolphin	0.361
99	SNR	cetacean	Stenella coeruleoalba	Striped Dolphin	0.355
100	TUT	cetacean	Tursiops truncatus	Bottlenosed Dolphin	0.351
101	MNV	cetacean	Megaptera novaeangliae	Humpback Whale	0.341
102	EBA	cetacean	Eubalaena australis	Southern Right Whale	0.235
103	MAI	seabirds	Macronectes giganteus	Southern Giant Petrel	0.195
104	MAH	seabirds	Macronectes halli	Northern Giant Petrel	0.191

105	PXP	seabirds	Phalacrocorax pygmeus	Pygmy Cormorant	0.184
106	STB	seabirds	Sterna bernsteini	Chinese Crested Tern	0.024
107	STI	seabirds	Sterna lorata	Peruvian tern	0.024
108	LSA	seabirds	Larus saundersi	Saunder's Gull	0.020
109	DAM	seabirds	Diomedea amsterdamensis	Amsterdam Albatross	0.012
110	STE	seabirds	Sterna balaenarum	Damara Tern	0.011
111	BAE	cetacean	Balaenoptera edeni	Bryde's whale	0.009
112	LRL	seabirds	Larus relictus	Relict Gull	0.006
113	CAM	cetacean	Caperea marginata	Pygmy Right whale	0.006
114	STV	seabirds	Sterna sandvicensis	Sandwich Tern	0.006
115	STR	seabirds	Sterna repressa	White-cheeked Tern	0.005
116	STS	seabirds	Sterna saundersi	Saunder's Tern	0.005
117	STG	seabirds	Sterna bengalensis	Lesser Crested Tern	0.005
118	STN	seabirds	Sterna nilotica	Gull-billed Tern	0.005
119	STF	seabirds	Sterna albifrons	Little Tern	0.005
120	SDG	seabirds	Sterna dougallii	Roseate Tern	0.005
121	CAT	seabirds	Sterna caspia	Caspian Tern	0.005
122	STH	seabirds	Sterna hirundo	Common Tern	0.004
123	STP	seabirds	Sterna paradisaea	Arctic Tern	0.002

b) Exposure index by species group

The results in this section are presented with a table of species level ratings for six species groups (cetaceans, seabirds, pinnipeds & otters, turtles and sharks). The results in the first table sums the exposure for CMS species across all fishery areas; second the information is presented in map form, displaying the spatial distribution of summed species in the group and plotted by EEZ; thirdly, the contribution of exposure from each EEZ is tabulated, and those with the greatest contribution included.

Cetaceans & Sirenians

This species group was most affected in Southeast Asia, South Asia, East Asia, Northeast Pacific, Northern Europe and South America (Figure 11). Gillnet exposure affects smaller coastal dwelling species as well large whales (Table 7). Cetaceans are spread evenly between the highest, medium and lowest risk groupings in Table 7. The EEZs where the exposure occurred are set out in Table 8.

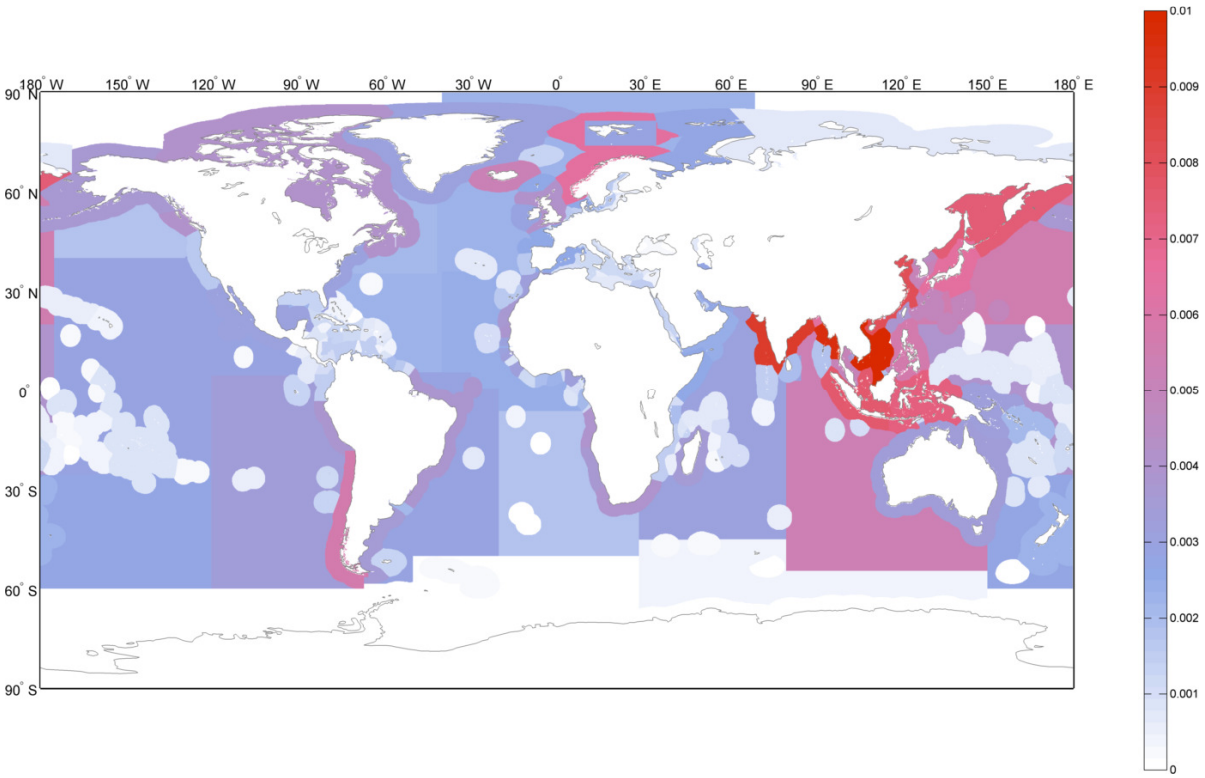

Figure 11 - EEZs and High Seas FAO areas showing with the IUCN weighted exposures summed across cetaceans. Areas with colours furthest up the scale bar (red colours) had higher cetacean exposures.

Table 7 - Cetaceans ranked by their IUCN-weighted exposure. Those marked with pink shading are the most exposed 40 species, those shaded green were the moderately exposed 40 species, and those shaded blue the least exposed species

Rank	Species code	Family	species	Common name	IUCN weighted exposure
1	NPH	cetacean	Neophocaena phocaenoides	Finless Porpoise	2.466
2	ORB	cetacean	Orcaella brevirostris	Irrawaddy Dolphin	2.421
5	DUG	cetacean	Dugong dugon	Dugong / Sea Cow	2.164
11	EBJ	cetacean	Eubalaena japonica	North Pacific Right Whale	1.842
12	POT	cetacean	Sousa teuszii	Atlantic Hump-backed Dolphin	1.795
13	EBG	cetacean	Eubalaena glacialis	Northern Right Whale	1.779
21	TUA	cetacean	Tursiops aduncus	Indian or Bottlenose Dolphin	1.433
23	CEH	cetacean	Cephalorhynchus heavisidii	Heaviside's Dolphin	1.383
24	BOB	cetacean	Balaenoptera borealis	Sei Whale	1.369
25	BAP	cetacean	Balaenoptera physalus	Fin Whale	1.366
26	BMU	cetacean	Balaenoptera musculus	Blue Whale	1.324
28	SOC	cetacean	Sousa chinensis	Indo-Pacific Humpbacked Dolphin	1.267
31	POS	cetacean	Phocoena spinipinnis	Burmeister Porpoise	1.131
36	BEB	cetacean	Berardius bairdii	Baird's Beaked Whale	1.097
38	BAO	cetacean	Balaenoptera omurai	Omura' Whale	1.094
42	PYM	cetacean	Physeter macrocephalus	Sperm Whale	1.019
45	POB	cetacean	Pontoporia blainvillei	La Plata Dolphin	0.971
47	HYA	cetacean	Hyperoodon ampullatus	Northern Bottlenose Whale	0.915
48	SNL	cetacean	Stenella longirostris	Spinner Dolphin	0.906
49	CEE	cetacean	Cephalorhynchus eutropia	Chilean Dolphin	0.852
50	OOR	cetacean	Orcinus orca	Killer whale	0.849
54	LGO	cetacean	Lagenorhynchus obscurus	Dusky Dolphin	0.764
55	DEL	cetacean	Delphinapterus leucas	Beluga	0.764
56	LGS	cetacean	Lagenorhynchus australis	Peale's Dolphin	0.754
57	SNC	cetacean	Stenella clymene	Clymene dolphin	0.752
61	GLM	cetacean	Globicephala melas	Long-finned Pilot Whale	0.678
62	MMO	cetacean	Monodon monoceros	Narwhal	0.675
64	CEC	cetacean	Cephalorhynchus commersonii	Commerson's Dolphin	0.636
72	BAB	cetacean	Balaenoptera bonaerensis	Antarctic Minke whale	0.549
73	POD	cetacean	Phocoena dioptrica	Spectacled Porpoise	0.530
77	POP	cetacean	Phocoena phocoena	Common Porpoise	0.504
82	BAM	cetacean	Balaena mysticetus	Bowhead Whale	0.448
85	DAL	cetacean	Phocoenoides dalli	Dall's Porpoise	0.428
86	LGA	cetacean	Lagenorhynchus acutus	Atlantic White-sided Dolphin	0.419
87	LGB	cetacean	Lagenorhynchus albirostris	White-beaked Dolphin	0.417
90	ORH	cetacean	Orcaella heinsohni	Australian Snubfin dolphin	0.402
91	GRG	cetacean	Grampus griseus	Risso's Dolphin	0.399
94	DDE	cetacean	Delphinus delphis	Common Dolphin	0.373
95	LGH	cetacean	Lagenodelphis hosei	Fraser's Dolphin	0.372
98	SNA	cetacean	Stenella attenuate	Pantropical Spotted Dolphin	0.361
99	SNR	cetacean	Stenella coeruleoalba	Striped Dolphin	0.355
100	TUT	cetacean	Tursiops truncatus	Bottlenosed Dolphin	0.351
101	MNV	cetacean	Megaptera novaeangliae	Humpback Whale	0.341
102	EBA	cetacean	Eubalaena australis	Southern Right Whale	0.235
111	BAE	cetacean	Balaenoptera edeni	Bryde's whale	0.009
113	CAM	cetacean	Caperea marginata	Pygmy Right whale	0.006

Table 8 - EEZ and high seas FAO areas presenting the highest exposure for all the cetacean & sirenians listed in descending order of importance.

EEZ or high seas FAO area	Sum of all cetacean and sirenian IUCN weighted exposures in the EEZ
Vietnam	1.000
Myanmar	0.953
India	0.903
China	0.801
Indonesia (Western)	0.751
Russia Pacific	0.743
Indonesia (Eastern)	0.733
Japan Main Isl.	0.655
Norway	0.642
Bangladesh	0.635
Chile	0.571
Philippines	0.570
Pacific Northwest - High Seas Areas	0.549
Indian Ocean Eastern - High Seas Areas	0.536
Iceland	0.521
Malaysia Sarawak	0.518
Korea South	0.516
Malaysia East	0.507
Malaysia Sabah	0.502
Thailand	0.502
Malaysia West	0.497
Japan Outer Isl.	0.486
Korea North	0.468
Canada	0.419
United Kingdom	0.416
Angola	0.405
Pacific Western Central - High Seas Areas	0.403
South Africa	0.394
Brazil	0.388
Mauritania	0.386
Cambodia	0.384
Taiwan	0.383
Peru	0.378
Western Sahara (Morocco)	0.374
Namibia	0.373
Alaska	0.373
Madagascar	0.354
Argentina	0.348
Australia	0.340
Pacific Southeast - High Seas Areas	0.333
Morocco	0.328
Nigeria	0.324
Pakistan	0.322
Guinea	0.317
Papua New Guinea	0.317
Sierra Leone	0.317
Mexico	0.309
USA East Coast	0.309
Greenland	0.308
Indian Ocean Western - High Seas Areas	0.306
Senegal	0.297
Svalbard Isl. (Norway)	0.296
Atlantic Southwest - High Seas Areas	0.291
Cameroon	0.289
Pacific Eastern Central - High Seas Areas	0.288
Ireland	0.283
Pacific Southwest - High Seas Areas	0.278
Iran	0.276
Russia Barrents Sea	0.273
Faeroe Isl.(Denmark)	0.265
France	0.265

Seabirds

Seabirds are most affected by gillnet fishing in South America, South Africa & Namibia, New Zealand and northeast Pacific (Figure 12). They are also highly exposed in most of the southern and central high seas areas. The mode of interactions with gillnets was apparent for this species group with many of the diving seabirds more exposed to gillnet fishing than surface feeders (Table 9). Seabirds were represented in the highest, medium and least exposed groups. The exposure in EEZs most contributing for seabirds is set out in Table 10.

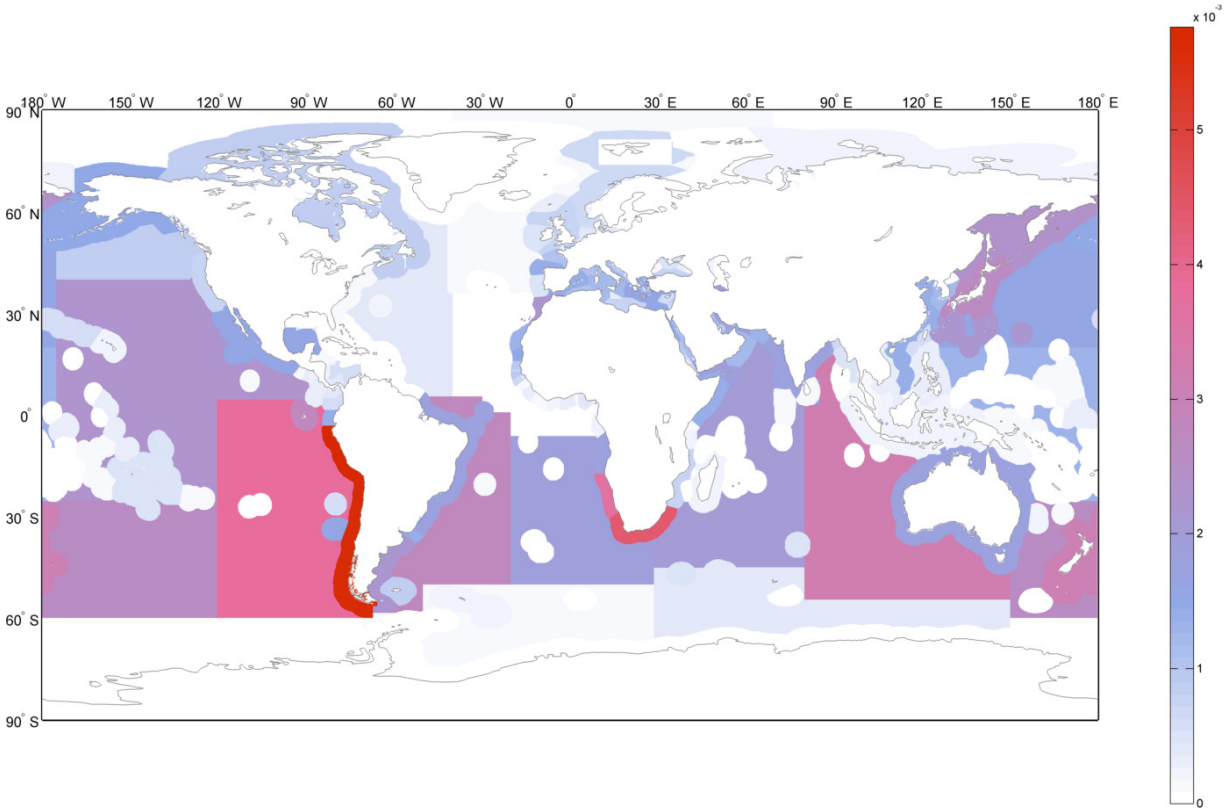

Figure 12 - EEZs and High Seas FAO areas showing with the IUCN weighted exposures summed across seabirds. Areas with colours furthest up the scale bar (red colours) had higher seabird exposures.

Table 9 - Seabird IUCN-weighted exposure

Rank	Species code	Family	species	Common name	IUCN weighted exposure
4	PEG	seabirds	Pelecanoides garnotii	Peruvian diving petrel	1.972
8	SYW	seabirds	Synthliboramphus wumizusume	Japanese Murrelet	1.762
14	PTG	seabirds	Pterodroma phaeopygia	Dark-rumped Petrel	1.743
15	PIR	seabirds	Phoebastria_irrorata	Waved Albatross	1.642
16	PHG	seabirds	Phalacrocorax nigrogularis	Socotra Cormorant	1.592
17	SPH	seabirds	Spheniscus humboldti	Humboldt Penguin	1.466
20	PUM	seabirds	Puffinus mauretanicus	Balearic shearwater	1.269
27	PHA	seabirds	Phoebastria_albatrus	Short-tailed Albatross	1.131
32	PUC	seabirds	Puffinus creatopus	Pink-footed Shearwater	1.116
33	LAU	seabirds	Larus audouinii	Audouin's Gull	1.085
40	DIM	seabirds	Thalassarche_melanophrys	Black-browed Albatross	1.004
43	PCR	seabirds	Pelecanus crispus	Dalmatian Pelican	0.972
44	PHN	seabirds	Phoebastria_nigripes	Black-footed Albatross	0.941
46	PHF	seabirds	Phoebetria fusca	Sooty Albatross	0.830
51	THH	seabirds	Thalassarche_chlororhynchos	Yellow-nosed Albatross	0.829
52	LAT	seabirds	Larus atlanticus	Olrog's Gull	0.816
53	LLE	seabirds	Larus leucophthalmus	White-eyed Gull	0.748
58	STM	seabirds	Sterna maxima	Royal Tern	0.720
59	PCW	seabirds	Procellaria westlandica	Westland Petrel	0.718
60	PRK	seabirds	Procellaria parkinsoni	Black Petrel	0.658
63	PRO	seabirds	Procellaria aequinoctialis	White-chinned Petrel	0.621
65	DIC	seabirds	Thalassarche_chrysostoma	Grey-headed Albatross	0.592
66	POW	seabirds	Pterodroma cahow	Cahow Bermuda Petrel	0.591
67	DIP	seabirds	Diomedea epomophora	Royal Albatross	0.584
68	DIX	seabirds	Diomedea exulans	Wandering Albatross	0.575
69	PHI	seabirds	Phoebastria_immutabilis	Laysan Albatross	0.571
70	PCO	seabirds	Procellaria conspicillata	Spectacled Petrel	0.564
71	LIC	seabirds	Larus ichthyaetus	Great Black-headed Gull	0.518
75	PTT	seabirds	Pterodroma atrata	Henderson Petrel	0.511
76	LGE	seabirds	Larus genei	Slender-billed Gull	0.485
78	DNB	seabirds	Thalassarche_bulleri	Buller's Albatross	0.471
79	LML	seabirds	Larus melanocephalus	Mediterranean Gull	0.462
81	SBG	seabirds	Sterna bergii	Great Crested Tern	0.429
83	LHM	seabirds	Larus hemprichii	Sooty Gull	0.428
84	THC	seabirds	Thalassarche_cauta	Shy Albatross	0.408
88	PCI	seabirds	Procellaria cinerea	Grey Petrel	0.405
89	LAA	seabirds	Larus armenicus	Armenian Gull	0.390
92	PCC	seabirds	Pelecanus onocrotalus	White Pelican	0.384
93	PHE	seabirds	Phoebetria palpebrata	Light-mantled Sooty Albatross	0.364
97	MAI	seabirds	Macronectes giganteus	Southern Giant Petrel	0.195
103	MAH	seabirds	Macronectes halli	Northern Giant Petrel	0.191
104	PXP	seabirds	Phalacrocorax pygmeus	Pygmy Cormorant	0.184
105	STB	seabirds	Sterna bernsteini	Chinese Crested Tern	0.024
106	STI	seabirds	Sterna lorata	Peruvian tern	0.024
107	LSA	seabirds	Larus saundersi	Saunder's Gull	0.020
108	DAM	seabirds	Diomedea amsterdamensis	Amsterdam Albatross	0.012
109	STE	seabirds	Sterna balaenarum	Damara Tern	0.011
110	LRL	seabirds	Larus relictus	Relict Gull	0.006
112	STV	seabirds	Sterna sandvicensis	Sandwich Tern	0.006
114	STR	seabirds	Sterna repressa	White-cheeked Tern	0.005
115	STS	seabirds	Sterna saundersi	Saunder's Tern	0.005
116	STG	seabirds	Sterna bengalensis	Lesser Crested Tern	0.005

117	STN	seabirds	Sterna nilotica	Gull-billed Tern	0.005
118	STF	seabirds	Sterna albifrons	Little Tern	0.005
119	SDG	seabirds	Sterna dougallii	Roseate Tern	0.005
120	CAT	seabirds	Sterna caspia	Caspian Tern	0.005
121	STH	seabirds	Sterna hirundo	Common Tern	0.004
122	STP	seabirds	Sterna paradisaea	Arctic Tern	0.002
123	PEG	seabirds	Pelecanoides garnotii	Peruvian diving petrel	1.972

Table 10 - EEZ and high seas FAO areas presenting the highest exposure for all the seabirds in descending order of importance

EEZ or high seas FAO area	Sum of all seabird IUCN weighted exposures in the EEZ
Peru	0.576
Chile	0.566
South Africa	0.436
Pacific Southeast - High Seas Areas	0.384
Namibia	0.366
Indian Ocean Eastern - High Seas Areas	0.321
New Zealand	0.314
Galapagos Isl.(Ecuador)	0.279
Atlantic Southwest - High Seas Areas	0.275
Japan Main Isl.	0.264
Pacific Southwest - High Seas Areas	0.257
Russia Pacific	0.242
Pacific Eastern Central - High Seas Areas	0.226
Argentina	0.222
Morocco	0.222
Japan Outer Isl.	0.221
Indian Ocean Western - High Seas Areas	0.201
Iran	0.188
Atlantic SouthEast - High Seas Areas	0.185
Yemen	0.180
Australia	0.176
India	0.175
Angola	0.172
Brazil	0.172
Greece	0.161
Turkey Mediterranean Sea	0.160
J. Fernandez, Felix and Ambrosio Isl. (Chile)	0.159
Pacific Northwest - High Seas Areas	0.156
Mexico	0.155
Egypt	0.152
Alaska	0.149
Mauritania	0.146
Spain	0.142
United Arab Emirates	0.142
Ecuador	0.141
Somalia	0.141
Uruguay	0.140
China	0.135
Pacific Western Central - High Seas Areas	0.134
Pakistan	0.131
Western Sahara (Morocco)	0.129
Bahrain	0.125
Oman	0.125
Korea South	0.123
Saudi Arabia Persian Gulf	0.123
Italy	0.120
Tunisia	0.117
Saudi Arabia Red Sea	0.112
Algeria	0.108
France	0.106
Senegal	0.099
Croatia	0.097
Sudan	0.092
Kuwait	0.091
Qatar	0.089
Pacific Northeast - High Seas Areas	0.088
Canada	0.086
Falkland Isl. (Malvinas) (Disputed)	0.085
Lebanon	0.083
Gambia	0.081
Mozambique	0.080

Seals and otters IUCN-weighted exposure

Seals and otters are most exposed to gillnet fishing in South America, East of Mediterranean Sea, North Africa and Northern Europe (Figure 13). The most exposed species included Mediterranean Monk Seal, followed by the two otter species, all in the most exposed group of species (Table 11). The EEZs contributing most to the exposure are set out in Table 12.

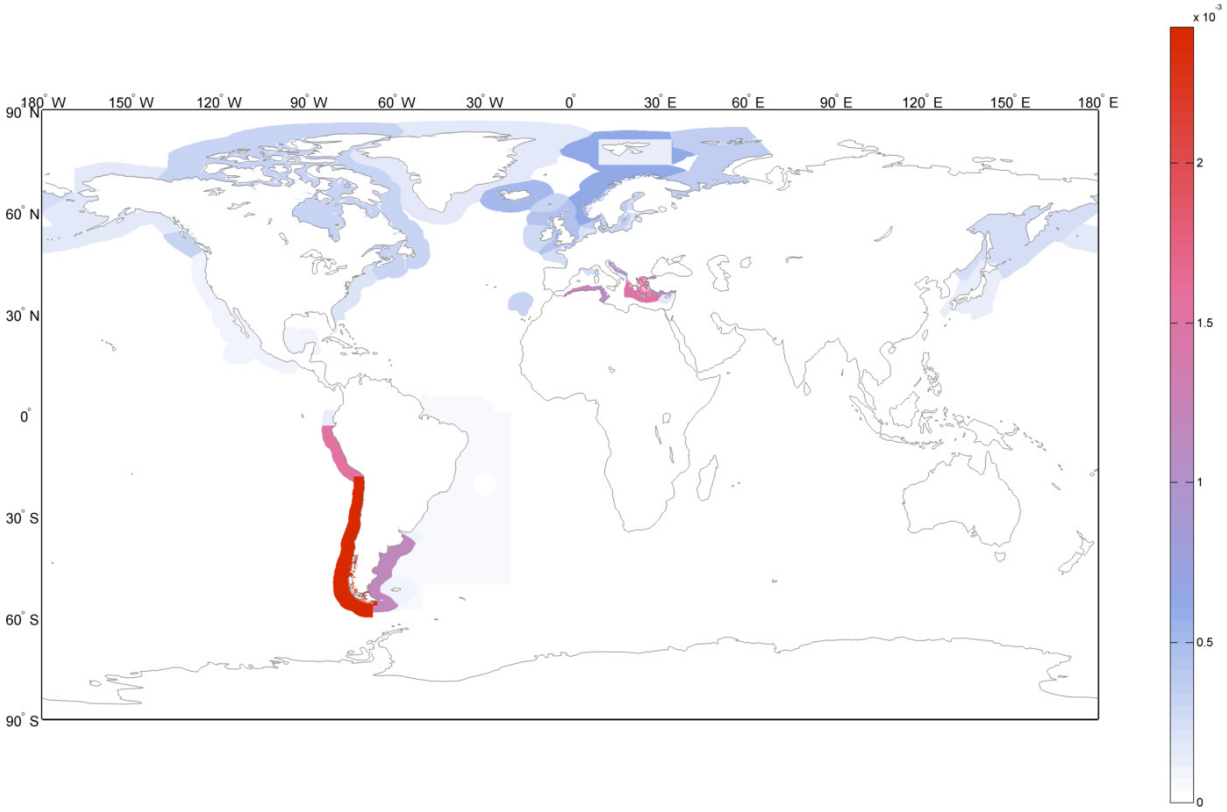

Figure 13 - EEZs and High Seas FAO areas showing with the IUCN weighted exposures summed across pinnipeds and otters. Areas with colours furthest up the scale bar (red colours) had higher pinniped and otter exposures.

Table 11 - Seals and otters ranked by their IUCN-weighted exposure. Those marked with pink shading are the most exposed 40 species, those shaded green were the moderately exposed 40 species, and those shaded blue the least exposed specie

Rank	Species code	Family	species	Common name	IUCN weighted exposure
3	MMN	marine mammals other	Monachus monachus	Mediterranean Monk Seal	2.204
10	LOF	marine mammals other	Lontra feline	Marine Otter	1.852
35	LOP	marine mammals other	Lontra provocax	Southern River Otter	1.102
74	HGR	marine mammals other	Halichoerus grypus	Grey Seal	0.522
80	PHV	marine mammals other	Phoca vitulina	Common Seal	0.470
96	OFL	marine mammals other	Arctocephalus australis	South American Seal	0.369

Table 12 - EEZ and high seas FAO areas presenting the highest exposure for all the seals and otters in descending order of importance.

EEZ or high seas FAO area	Sum of all seal and otter IUCN weighted exposures in the EEZ
Chile	0.242
Peru	0.152
Greece	0.149
Algeria	0.122
Argentina	0.114
Tunisia	0.107
Turkey Mediterranean Sea	0.106
Croatia	0.099
Norway	0.063
Montenegro	0.062
Iceland	0.052
United Kingdom	0.043
Sweden	0.037
Russia Barrents Sea	0.035
Denmark	0.034
Madeira Isl.(Portugal)	0.033
Canada	0.032
Faeroe Isl.(Denmark)	0.031
Bosnia	0.028
Poland	0.028
Ireland	0.028
Russia Pacific	0.026
Finland	0.025
France	0.023
Albania	0.023
Germany	0.022
Netherlands	0.022
Latvia	0.022
USA East Coast	0.021
Russia Baltic Sea Kaliningrad	0.021
Cyprus	0.018

Turtle IUCN-weighted exposure

Turtles were most affected by gillnet fishing in south Asia, southeast Asia, east Asia, northwest Africa, western Europe, Mexico and Japan (Figure 14).

This species group may be highly affected by gillnet fishing with all turtle species represented within the top 40 species most exposed to gillnet fishing (Table 13) The EEZs contributing the greatest components of the risk to turtles are set out in Table 14.

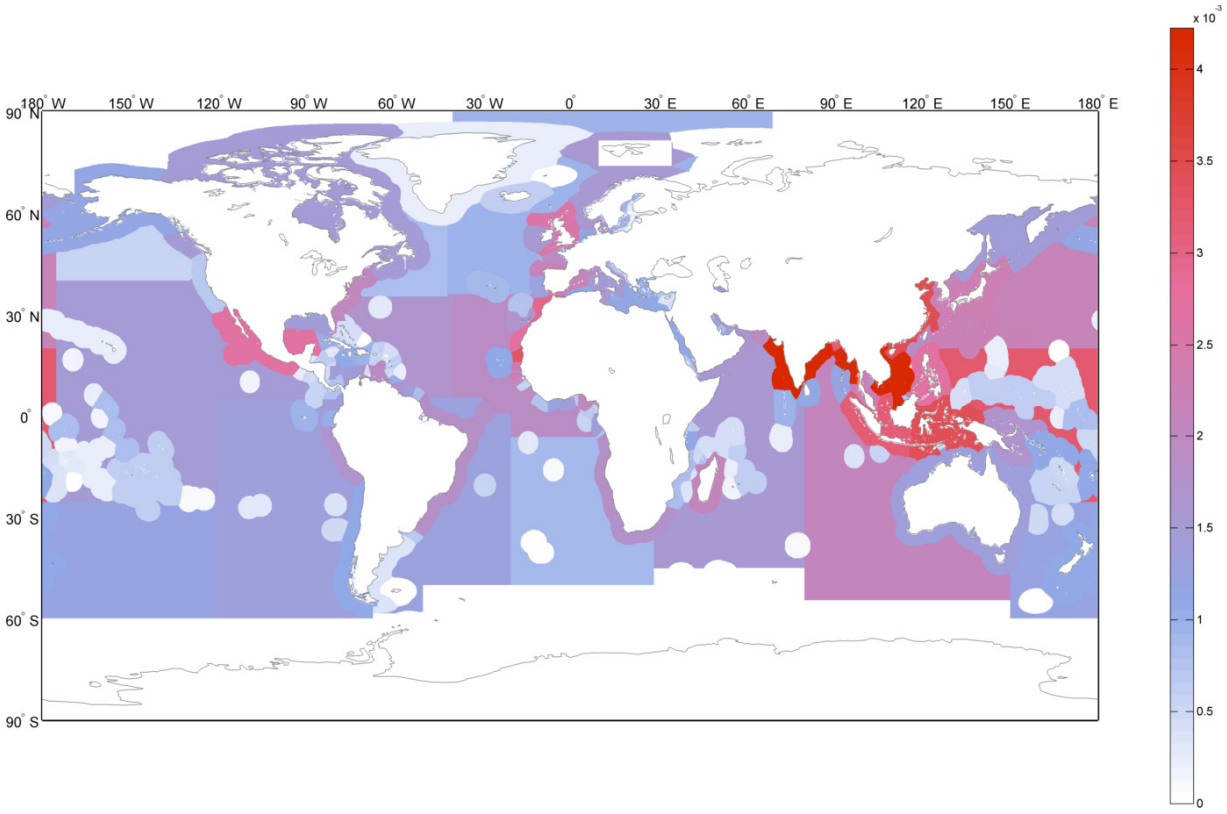

Figure 14 - EEZs and High Seas FAO areas showing with the IUCN weighted exposures summed across turtles. Areas with colours furthest up the scale bar (red colours) had higher turtle exposures.

Table 13 - Turtles ranked by their IUCN-weighted exposure. Those marked with pink shading are the most exposed 40 species, those shaded green were the moderately exposed 40 species, and those shaded blue the least exposed species

Rank	Species code	Family	species	Common name	IUCN weighted exposure
6	EIM	turtle	Eretmochelys imbricata	Hawksbill Turtle	2.073
7	LPK	turtle	Lepidochelys kempii	Kemp's Ridley Turtle	2.009
9	DCC	turtle	Dermochelys coriacea	Leatherback Turtle	1.965
18	CAC	turtle	Caretta caretta	Loggerhead Turtle	1.572
19	CHM	turtle	Chelonia mydas	Green Turtle	1.484
22	LPV	turtle	Lepidochelys olivacea	Olive Ridley Turtle	1.386

Table 14 - EEZ and high seas FAO areas presenting the highest exposure for all the turtles in descending order of importance.

EEZ or high seas FAO area	Sum of all turtle IUCN weighted exposures in the EEZ
India	0.422
Vietnam	0.420
Myanmar	0.415
China	0.347
Indonesia (Eastern)	0.340
Mauritania	0.323
Pacific Western Central - High seas Areas	0.319
Bangladesh	0.316
Indonesia (Western)	0.313
Morocco	0.295
Western Sahara (Morocco)	0.277
Mexico	0.269
Philippines	0.264
United Kingdom	0.254
Malaysia Sarawak	0.243
Senegal	0.241
Malaysia East	0.235
Thailand	0.230
Japan Main Isl.	0.224
Japan Outer Isl.	0.224
Korea South	0.219
Malaysia West	0.218
Spain	0.217
Pacific Northwest - High seas Areas	0.212
Korea North	0.211
Malaysia Sabah	0.209
Madagascar	0.208
Indian Ocean Eastern - High seas Areas	0.208
Nigeria	0.200
USA East Coast	0.200
France	0.196
Sierra Leone	0.196
Guinea	0.195
Pakistan	0.193
Taiwan	0.191
Venezuela	0.187
Atlantic Eastern Central - High Seas Areas	0.185
Namibia	0.184
Brazil	0.182
Angola	0.178
Cameroon	0.178
South Africa	0.178
Denmark	0.170
Papua New Guinea	0.170
Cambodia	0.168
Canary Isl.(Spain)	0.167
Tunisia	0.166
Atlantic Western Central - High Seas Areas	0.166
Peru	0.165
Guyana	0.162

Shark IUCN-weighted exposure

Sharks were most exposed to gillnet fishing in East Asia, Japan, SouthEast Asia, South Asia, Morocco but also widely spread in many EEZs and high seas areas (Figure 15). This species group may be highly affected by gillnet fishing with five of the six shark species represented within the top 40 species most exposed to gillnet fishing (Table 15). The EEZs contributing most to the exposure of sharks to gillnet fishing are set out in Table 16.

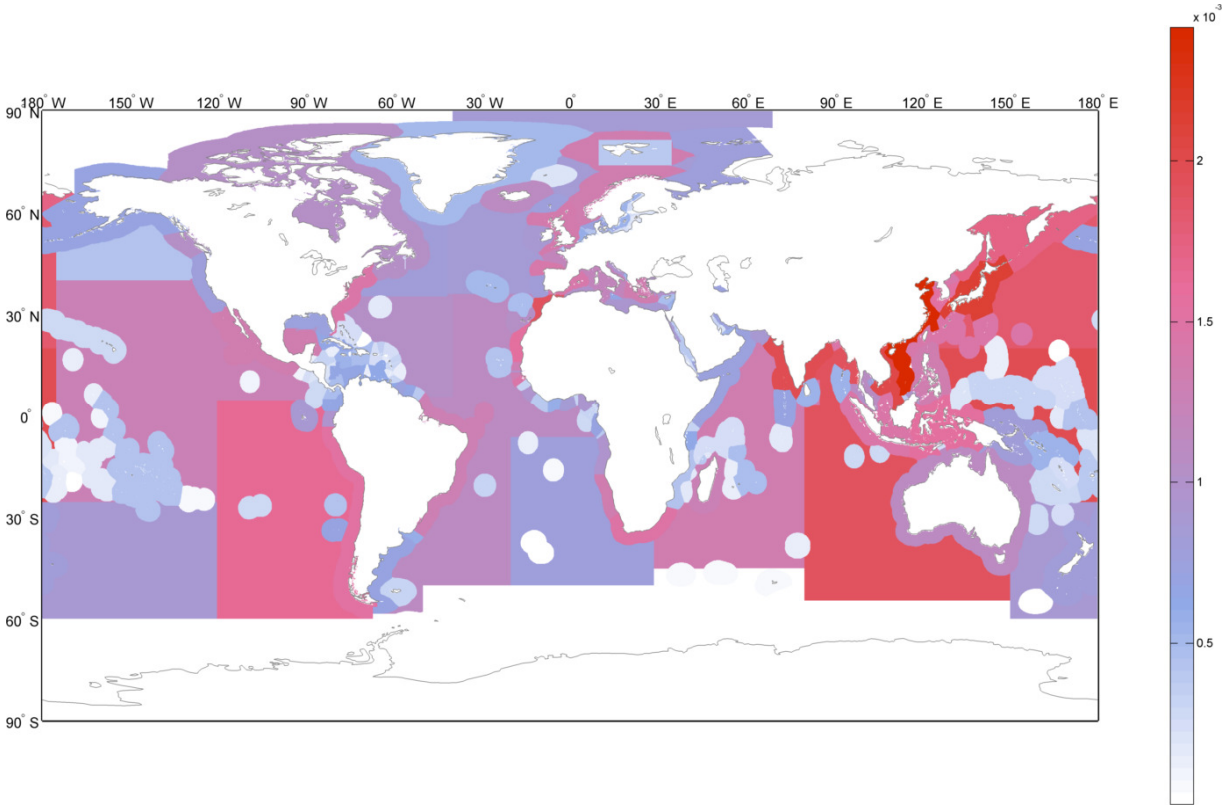

Figure 15 - EEZs and High Seas FAO areas showing with the IUCN weighted exposures summed across sharks. Areas with colours furthest up the scale bar (red colours) had higher shark exposures.

Table 15 - Shark ranked by their IUCN-weighted exposure. Those marked with pink shading are the most exposed 40 species, those shaded green were the moderately exposed 40 species, and those shaded blue the least exposed species

Rank	Species code	Family	species	Common name	IUCN weighted exposure
29	CTM	shark	Cetorhinus maximus	Basking Shark	1.234
30	IPA	shark	Isurus paucus	Longfin Mako Shark	1.140
34	RHT	shark	Rhincodon typus	Whale Shark	1.113
37	CCC	shark	Carcharodon carcharias	Great White Shark	1.094
39	LMN	shark	Lamna nasus	Porbeagle Shark	1.090
41	IOX	shark	Isurus oxyrinchus	Shortfin Mako Shark	1.075

Table 16 - EEZ and high seas FAO areas presenting the highest exposure for all the sharks in descending order of importance.

EEZ or high seas FAO area	Sum of all shark IUCN weighted exposures in the EEZ
China	0.241
Japan Main Isl.	0.213
Vietnam	0.202
India	0.199
Pacific Western Central - High Seas Areas	0.198
Myanmar	0.192
Morocco	0.192
Indian Ocean Eastern - High Seas Areas	0.190
Pacific Northwest - High Seas Areas	0.183
Russia Pacific	0.171
Pacific Southeast - High Seas Areas	0.164
Mauritania	0.158
Indonesia (Eastern)	0.156
Western Sahara (Morocco)	0.156
Chile	0.153
Korea South	0.153
Peru	0.152
South Africa	0.149
Bangladesh	0.146
Indonesia (Western)	0.145
Guinea	0.144
Japan Outer Isl.	0.144
USA East Coast	0.144
Taiwan	0.141
Korea North	0.141
Spain	0.140
United Kingdom	0.138
Mexico	0.136
Greece	0.135
Philippines	0.135
Namibia	0.133
Indian Ocean Western - High Seas Areas	0.133
Norway	0.132
Senegal	0.130
Brazil	0.129
Pacific Eastern Central - High Seas Areas	0.128
Madagascar	0.127
France	0.118
Italy	0.117
Tunisia	0.117
Malaysia Sarawak	0.112
Australia	0.111
Iceland	0.110
Atlantic Eastern Central - High Seas Areas	0.110
Atlantic Southwest - High Seas Areas	0.110
Malaysia East	0.109
Thailand	0.106
Canada	0.105
Canary Isl.(Spain)	0.104
Atlantic Western Central - High Seas Areas	0.102
Malaysia West	0.101
Algeria	0.100
Gambia	0.100
Turkey Mediterranean Sea	0.100
Croatia	0.098
Malaysia Sabah	0.096
Sierra Leone	0.096
Ecuador	0.095
Angola	0.094
Libya	0.092
Nigeria	0.092

Species level analysis conclusion:

The results of the study show that all taxon groups are affected by gillnet fishing with each group being represented within the top 40 species most highly exposed to gillnet fishing of the CMS species included in the study. Turtles and sharks are highly affected with 5/6 shark species represented within the top 40, and all turtle species ranked within the top 25. These two groups of CMS species are likely to be most impacted by gillnet fishing.

3. Mitigation methods and their application in gillnet fisheries

The aim of mitigation techniques should be to eliminate or substantially reduce the incidental capture of non-target species (Bachce 2003). Understanding the circumstances that lead to the death of non-target species in gillnets is essential to determining how future mortalities can be prevented (Rowe 2007), and as such, changes to practices and implementing mitigation is essential.

Many mitigation methods to reduce bycatch have been proposed although very few of these have been applied (French 2011) or are operationally unsuitable (Dawson 1991). Extensive reviews of mitigation techniques for single species-groups or in relation to gillnet fishing generally have been conducted (e.g. Melvin & Parrish 1999, Bull 2006, Rowe 2007. Gillman et al. 2009, Gilman et al. 2010, ACAP 2011, Lokkeborg 2011). These reviews and original research papers relating to mitigation research are summarised below. Mitigation methods which are specific to gillnet fisheries only are discussed.

a) Visual Alerts

This method involves alerting non-target species to gillnets with visual cues in order to deter non-target species, with the aim of decreasing entanglement rates. Visual alerts include changing net colour, net illumination, using larger (more visible) twine sizes for nets, increasing the number of filaments used in the nets and visual markers (i.e.: corks) which are placed along the net. Visual cues have been effective at reducing bycatch for seabirds (Bull 2007), cetaceans, pinnipeds (Barlow and Cameron 2003) and turtles (Gilman et al. 2010). One issue with this method is that target catch rates are often also reduced as a result of visual alerts.

Melvin et al. (1999) found that bycatch of common murres decreased when the upper 20 and 50 meshes of the net were made more visible, compared with monofilament nets. Rhinoceros auklet bycatch was also reduced but only in the upper 50 meshes of the nets. The catch of the target sockeye salmon however was also reduced by more than half when the upper 50 meshes were made more visible.

Wang et al. (2010) investigated the use of visual alerts to reduce the bycatch of turtles in gillnets. Shark shaped silhouettes were placed along the gillnet and illumination of nets

by LED and chemical lights were used as potential deterrents for green sea turtles. While shark shaped silhouettes reduced sea turtle bycatch, they also substantially reduced target species catch rate. Both types of illumination techniques reduced bycatch while having no effect on target species catch rates.

b) Acoustic Alerts:

Pingers

Pingers were first developed to deter marine mammals from gillnets. Pingers are small underwater acoustic warning devices that emit high-frequency pulsed signals that, when attached along a net, deter non-target species from approaching the net (Rowe 2007). Although pingers have been successful in reducing bycatch levels for some species, effectiveness appears to be very fishery and species specific (Zollet 2009). Pingers have been effective at reducing bycatch of common dolphins (Evans et al. 1977), Franciscana dolphins (Bordino et al., 2002), Harbour porpoises (Culik et al. 2001, Gearin et al. 2000, Johnston 2002) Humpbacked dolphins (Peddemors 2000) pinniped species (Johnston 2002) and short beaked common dolphins (Barlow and Cameron 2003). Carretta et al. (2008) observed the complete elimination of beaked whale bycatch when pingers were introduced to the California drift gillnet fishery.

Information on the use of pingers at deterring seabird bycatch is very limited. Melvin et al. (1999) found that common murre bycatch was reduced by 50% when acoustic deterrents were incorporated with monofilament nets. In the same study however, pingers had no effect at deterring Rhinoceros auklets from entanglement.

Barlow and Cameron (2003) observed a reduced bycatch rate of seals and sea lions when acoustic deterrents were used, yet in other studies, pinnipeds have associated the sound of pingers with food (Bordino et al. 2002), thus increasing accidental entanglement of these species.

Problems associated with acoustic deterrents include habitat exclusion, especially from coastal areas forcing some species into sub-optimal foraging habitat (Culik et al. 2001, Rowe 2007). Habituation may also be an issue putting into question the long term effectiveness of pingers (Cox et al. 2003). Pingers are also costly (in comparison to other

mitigation methods), they need regular servicing, and they can interfere with net operations such as setting and hauling.

Passive Reflectors

This method involves modifying the acoustic properties of the gillnet so that animals (mainly cetaceans) are more likely to detect the presence of gillnets. Modifications include chemically enhancing net fibres, increasing the density of net fibres, and adding extra float or bead chains along the net (Rowe 2007). For cetaceans, this measure is based on the assumption that dolphins and porpoises echolocate in the vicinity of gillnets (Read 2000). Trials using passive reflectors have reduced bycatch of bottlenose dolphins (Goodson et al.. 1994) and harbour porpoises (Trippel et al.. 2003). An observed reduction in seabird bycatch occurred when barium sulphate was added to the nylon of gillnets, yet this was attributed to the increased visibility of the nets to seabirds as they had been dyed blue to mask the colour of the chemical addition (Trippel et al. 2003).

Issues with this method include net handling problems, the high cost of chemically enhancing nets and the level of variation for cetaceans to detect the modified net (Rowe 2007).

c) Operational measures:

Time/Area closures

Time/area closures have the potential to be successful for all species groups if implemented appropriately. This method involves closing an area to fishing for a specific time period when levels of incidental entanglement for potential bycatch species are considered to be too high (Rowe 2007). For this method to be effective, an extensive knowledge of the temporal patterns of both potential bycatch species and target fish species is required.

Murray et al. (2000) noted that the spatial and temporal variation in occurence in some species from year to year may make it difficult to determine the appropriate time and area for suitable closure. An example of this was highlighted by the closure of the sink gillnet fishery in the Gulf of Maine for the month of November, 1994 in an attempt to

reduce harbour porpoise bycatch. Highest bycatch rates were observed in September; well before the closure dates and this, coupled with the small area which the measure covered, proved the closure ineffective. Melvin et al. (1999), however, showed that opening fisheries only during peak salmon abundance reduced seabird bycatch, supporting the time/area mitigation technique.

Sub-surface net setting

This method involves changing the depth at which the net is set to reduce bycatch. It is particularly applicable for seabirds as most seabird bycatch is observed at depths of less than 20m below the surface (Zydelis et al. 2009) and by setting the net below the maximum diving depth, it greatly reduces bycatch of diving seabirds (Lokkeborg 2011). A reduction in seabird bycatch was observed in the Japanese gillnet fishery when nets were set 2 m below the surface, however fishing efficiency was also reduced by up to 95% (Hayase & Yatsu 1993, cited by Melvin et al. 1999).

Net modifications

Fishing equipment modifications have been effective at reducing bycatch in seabirds (French 2011), pinnipeds, cetaceans (Northridge and Sanderson 2003) and turtles (Romero 2008). It is often difficult, however, to alter fishing equipment attributes without reducing fishing effectiveness (Bull 2007).

Equipment changes include modifying the diameter of monofilament twine and mesh size, reducing net panel height and reducing the number and length of tie downs used. Northridge and Sanderson (2003) observed significantly reduced bycatch levels in seal and harbour porpoise bycatch when thinner twine diameter was used, possibly because the thinner twine meant it was easier for these species to break free. Nets that were smaller in profile (half panel height) had less turtle bycatch and releasing turtles was easier in smaller nets (Eckert et al. 2008 and Gearhart et al. 2009). Cambie (2010) suggested that setting equipment in shallower water and adjusting the weighting design of the nets, would allow entangled turtles to reach the surface to breathe.

Time of day fishing restrictions

The time of day that fishing nets are set can potentially impact bycatch rates. Melvin et al (1999) showed that by avoiding fishing at dawn, bycatch rates of both the auklet and the common murre were reduced significantly while target catch rates were only reduced by around 5%.

Other operational measures that may potentially reduce bycatch include:

- reduced net soak time,
- provisional equipment carried on board to release incidental bycatch,
- regular patrolling of nets to release incidental bycatch,
- avoiding congregations of bycatch species where possible,
- attaching suspender lines to the gillnet which hold the net below the float line.

d) Mitigation conclusions

This review demonstrates that there is no one universal solution to the problem of gillnet bycatch. Many mitigation techniques are species- and area-specific and while one measure may work for one species or species group, it may be ineffective or detrimental to another. Additionally, some techniques that are very effective at reducing bycatch are also linked to reductions in fishing efficiency. Bycatch reduction through mitigation has been demonstrated to some degree in all species groups, yet the effectiveness these methods within each species group in not universal.

Time/area closures have the potential to be useful at reducing bycatch across multiple species groups yet the effectiveness of this method is closely linked to spatial and temporal patterns of the non-target species (Lokkeborg 2011). For many species, more in-depth biological information is needed to apply this method effectively.

V. Discussion

1. Species

The results of this study show that gillnet bycatch is a ubiquitous problem, with all taxon groups in this study (sharks, cetaceans, seabirds, turtles, pinnipeds, otters) being represented within the top 40 highest ranked species for likely adverse effects of gillnet fishing. The shark and turtle groups were both highly ranked with all turtle species ranked within the top 25 species most exposed species, and 5 out of the 6 shark species ranked within the top 40. Within the CMS listed species, these are the two species groups which are most likely affected by adverse effects of gillnet fishing.

The impact that gillnet fishing is having on species populations was not elucidated from this analysis; all populations could, to some degree be affected by gillnet fishing, but the highest ranking species are likely to be affected more strongly.

2. Area

The results from this analysis highlight five important areas where there was a high overlap between species and gillnet fishing and that require further examination. The results based on numerical outputs of the analsyis show the areas with highest overlap were:

- South America (both Atlantic and Pacific coastlines)
- West coast of Africa (from Cape of Good Hope to Algeria)
- The Red Sea/Persian Gulf to Arabian Gulf
- New Zealand/Tasman Sea
- The Aegean Sea

If specific populations are affected by bycatch mortality from gillnets, these areas are the ones in which adverse effects are most likely to be observed. These are also the areas where more monitoring and detailed fishing statistics are required to assess impacts at a population level in more detailed analysis.

Table 17 - Top 10% of EEZs most likely to be affecting each species group.

Species Group	Top 10% EEZ most affected
Cetaceans	China, Russia Pacific, India, Myanmar and Vietnam.
Seabirds	Chile, Peru, South Africa and Morocco
Sharks	Russia Pacific, Myanmar, Morrocco, India, Vietnam, Japan (Main Isl.) and China
Turtles	Bangladesh, Indonesia (Eastern), China, Myanmar, Vietnam and India.
Seals and Otters	Chile and Norway

3. Mitigation effects

Currently, there is no single solution that can be applied globally to solve gillnet bycatch issues for the CMS species. The study of how gear technology alone, or in combination with other measures can be used as an effective solution is still in its infancy (Gilman et al. 2010). Solutions to gillnet bycatch problems are extremely complex and need to be addressed on a case by case basis. There are many factors that contribute to the efficacy of a particular measure including the gillnet fishery type, catch per unit effort, the area fished, and the size and behaviour of the non-target species (Gilman et al. 2010, Wallace et al. 2010). Some techniques that are very effective at reducing bycatch are also linked to reductions in fishing efficiency.

The level of effectiveness for some mitigation methods varies both between and within species groups. This was observed by Melvin et al. (1999) who found that Common Murre bycatch was reduced by 50% when acoustic pingers were incorporated with monofilament nets. In the same study however, pingers had no effect at deterring Rhinoceros Auklets from entanglement.

Amongst the most effective mitigation solutions reviewed in this study were time/area closures. This method has proved to be very effective in a number of different areas, and

can potentially be successful at reducing bycatch across multiple species groups. One problem with this method however is that to be implemented appropriately, and be operationally viable, extensive temporal and spatial knowledge of potential bycatch species and target species is required (Murray et al. 2000). Gathering this type of information can be very time consuming to sufficiently take into account the levels of seasonal variation needed to define the size of the area, and the time period that the area will be closed.

It is also critical that the socioeconomic situation is assessed when taking into account viable mitigation measures (Gilman 2010). In many developing countries, gillnet fishing is the main tool for food gathering for subsistence communities making time/area closures simply not a politically viable management option.

Gear technology approaches used in conjunction with other mitigation measures specific to individual fisheries and non-target species is likely to be the most viable way forward in many areas. The effective use of acoustic deterrents (cetaceans, pinnipeds), passive reflectors (cetaceans, seabirds, pinnipeds) and the alteration of fishing methods (all species groups) have all shown promise at being effective mitigation tools. The further development and implementation of mitigation measures is an urgent requirement for every species group reviewed in this study. However, the lack of information on both mitigation measures and individual species behaviours has made it difficult to recommend the most effective types of mitigation measures for each species/ species group. We recommend the further, more detailed analysis of specific fishery/ species group couplings to develop these solutions further.

Wallace et al. (2010) acknowledges that when examining the impacts of fishing bycatch on turtle populations, bycatch mitigation efforts should focus on areas of high bycatch / high effort areas. Areas that have low observed effort, but potentially high impacts on the population means there is less confidence in bycatch rates and, observer efforts should be increased to quantify these issues.

4. Limitations of the study

This study provides a global analysis of the gillnet bycatch problem and outlines the most important regions for further investigation. Lack of information has meant it is likely that small but important effects are currently under-represented. Fine scale effects

(to 0.1 km) could be explored by the analytical model used here but poor quality information has limited the applications of the analysis, and meant that we cannot address gillnet bycatch problems at a local level.

It is important to note that the overlap between species distributions and gillnet fishing effort is not necessarily linked to high rates of bycatch mortality. This level of analysis would require behavioural information for each species on modes of interactions with gillnets; information that is non-existent or difficult to obtain for many species to a sufficient level for this study. For example, many of the coastal species have high ranks, due to high exposure to gillnet activity (co-occurrence in the same areas) it remains to be determined whether exposure equates to interactions between the species and gillnets and the mortality occurs in proportion to the level of exposure. An attempt to account in the analysis was done by incorporating the behaviour of each species into the analysis to outline any potential interactions that a species may have with gillnets. Even taking behaviour into consideration, it may be likely that the magnitude of the problem is still being under-represented for some species.

The analysis has been done for the CMS species only. Some EEZs which have been identified as having a low exposure in our studies could be areas of high exposure if other species had been taken into account.

Over-estimation of the exposure may occur when there is no temporal overlap between the fishing season and species distributions in the area due to migration.

There may be a considerable underestimation of the exposure in areas where both gillnet fishing and species are highly concentrated. This may be so when the species distribution maps don't take into account local hotspots such as feeding zones, migration corridors, reproduction sites. This may affect particularly turtles and seabirds which breed on the coastline and so could be potentially highly exposed to inshore gillnet activities.

Misrepresentation of the exposure may occur due to both uniform representation of the species distribution and the gillnet catch distribution. Both distributions may not overlap in reality at small temporal and spatial scales.

There was a higher level of reporting and observation of bycatch incidence in the waters of more industrialised nations. It is possible that bycatch mortality of species that

are distributed outside industrialised areas is occurring, but not being reported as frequently.

Gilman (2010) outlines that there are four categories of information that are needed to categorise the risk that coastal nets are posing to sea turtles. These categories can be applied broadly to cover all species groups in this study.

These are:

- **Knowledge** on the magnitude of the problem in terms of both non-target species and the fishery
- **Characterisation of the fishery**; gear types used, characteristics of each gear type and fishing operations and catch characteristics.
- **Management framework**; which includes monitoring and mitigation programmes
- **Socioeconomic consideration** – what are the implications of how mitigation measures will effect social and economic situations?

The study presented here represents a novel element in understanding potential gillnet fishing impacts on non-target species. It uses the extremely poor information about the fisheries to explore which areas and species that may be to have adversely affected by mortality in gillnets. The information requirements to examine fisheries impacts on species or populations were not met. Nevertheless, targeting of mitigation and information gathering can be prioritised as a result of the study.

VI. Recommendations:

The study found:

- The information available about gillnet fisheries is extremely poorly documented, hampering detailed analysis of the problem of incidental catch in these widely used fishing methods.
- Bycatch linked with gillnet fisheries is sparsely recorded, creating possible biases in any analyses.
- Distribution for many species, such as cetaceans, is poorly known, as are population data. Ranges may be described, but areas of intense use are not described for many groups of animals listed on CMS appendices.
- Gillnet fishing effort was concentrated in south east Asia, northern Europe, north west Pacific, west African Coast and the west coast of South America.
- Areas of high species diversity for CMS species were the west coast of South America, west coast of Africa from the Cape of Good Hope to Algeria, the Red Sea / Persian Gulf to Arabian Gulf, New Zealand / Tasman Sea, and the Aegean Sea.
- The twenty Exclusive Economic Zones of 237 areas analysed, in which the greatest exposure to fishing risk occurs for CMS listed species (weighted by IUCN rank) were: Myanmar, Vietnam, Peru, India, Russia (Pacific), Chile, South Africa, China, Namibia, Greece, Galapagos, Bangladesh, Japan (Main Islands), Western Indonesia, Eastern Indonesia, Norway, Mauritania, United Kingdom, Algeria, and Morocco.
- The forty species most exposed to risk from gillnet fishing, when weighted by IUCN rank, by taxon group were:
    - **Seabirds** – African Penguin, Peruvian Diving-petrel, Japanese Murrelet, Dark-rumped Petrel, Waved Albatross, Socotra Cormorant, Humboldt Penguin, Balearic Shearwater, Pink-footed Shearwater, Audouin's Gull, Short-tailed Albatross.

- **Cetaceans & Sirenians** – Finless Porpoise, Irrawaddy Dolphins, Dugong, North Pacific Right Whale, Atlantic Hump-backed Dolphin, Northern Right Whale, Bottlenose Dolphin, Heaviside's Dolphin, Fin Whale, Sei Whale, Indo-Pacific Hump-backed Dolphin, Blue Whale, Burmeister Porpoise, Baird's Beaked Whale, Omura Whale
- **Seals and Sea Otters** – Mediterranean Monk Seal, Marine Otter, Southern River Otter.
- **Sea Turtles** – Hawskbill Turtle, Kemp's Ridley Turtle , Leatherback Turtle, Loggerhead Turtle, Green Turtle, Olive Ridley Turtle.
- **Sharks** – Basking Shark, Longfin Mako Shark, Porbeagle Shark, Whale Shark, Great White Shark.

- Bycatch through entanglement was known to occur for sea turtles, cetaceans, pinnipeds, sirenians and sharks. Diving seabirds were documented entangled when diving for food, but some species may become entangled during hauling or setting of nets.
- Among most likely to be affected, CMS listed sharks and turtles have high rankings compared to other taxa: All six turtle species are listed among the top 23 ranked species identified in the analysis, and all 6 shark species are in the top 41 ranked species.
- Mitigation methods identified included visual alerts, acoustic alerts, seasonal or area closures or changes to net configurations.
- However, mitigation methods were found to either reduce fishing efficiency considerably, or had little documented of bycatch reduction effect.
- Seasonal or area closure therefore appears to be the most effective way of avoiding bycatch of non-target species in gillnet fisheries.
- Targeting closures to cover periods of most intensive interaction between affected non-target species is necessary, and further research is needed to examine the interactions in areas identified in this study, specifically to examine behavioural data and seasonal occurrence of affected species and fisheries.

- Next steps: There are strong requirements for improved observer data, better records of bycaught species with a particular focus in the areas of high overlap of at-risk species and strong fishing effort. Further, finer-scaled research to address bycatch issues in the areas, and for the species identified as highest risk in this analysis is warranted.

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VIII. Annexes

1. Marine species listed under the CMS part of the study

Table 18 - The 46 species of the CMS part of the cetacean and sirenian group.

CMS list	Species code	Group	Species	Alternative species name	Common name
I	BAM	Cetacean	Balaena mysticetus		Bowhead Whale
II	BAB	cetacean	Balaenoptera bonaerensis		Antarctic Minke whale
I/II	BOB	cetacean	Balaenoptera borealis		Sei Whale
II	BAE	cetacean	Balaenoptera edeni		Bryde's whale
I	BMU	cetacean	Balaenoptera musculus		Blue Whale
II	BAO	cetacean	Balaenoptera omurai		Omura' Whale
I/II	BAP	cetacean	Balaenoptera physalus		Fin Whale
II	BEB	cetacean	Berardius bairdii		Baird's Beaked Whale
II	CAM	cetacean	Caperea marginata		Pygmy Right whale
II	CEC	cetacean	Cephalorhynchus commersonii		Commerson's Dolphin
II	CEE	cetacean	Cephalorhynchus eutropia		Chilean Dolphin
II	CEH	cetacean	Cephalorhynchus heavisidii		Heaviside's Dolphin
II	DEL	cetacean	Delphinapterus leucas		Beluga
II	DDE	cetacean	Delphinus delphis		Common Dolphin
II	DUG	cetacean	Dugong dugon		Dugong / Sea Cow
I	EBA	cetacean	Eubalaena australis		Southern Right Whale
I	EBG	cetacean	Eubalaena glacialis		Northern Right Whale
I	EBJ	cetacean	Eubalaena japonica		North Pacific Right Whale
II	GLM	cetacean	Globicephala melas		Long-finned Pilot Whale
II	GRG	cetacean	Grampus griseus		Risso's Dolphin
II	HYA	cetacean	Hyperoodon ampullatus		Northern Bottlenose Whale
II	LGH	cetacean	Lagenodelphis hosei		Fraser's Dolphin
II	LGA	cetacean	Lagenorhynchus acutus		Atlantic White-sided Dolphin
II	LGB	cetacean	Lagenorhynchus albirostris		White-beaked Dolphin
II	LGS	cetacean	Lagenorhynchus australis		Peale's Dolphin
II	LGO	cetacean	Lagenorhynchus obscurus		Dusky Dolphin
I	MNV	cetacean	Megaptera novaeangliae		Humpback Whale
II	MMO	cetacean	Monodon monoceros		Narwhal
II	NPH	cetacean	Neophocaena phocaenoides		Finless Porpoise
I/II	ORB	cetacean	Orcaella brevirostris		Irrawaddy Dolphin
II	ORH	cetacean	Orcaella heinsohni		Australian Snubfin dolphin
II	OOR	cetacean	Orcinus orca		Killer whale
II	POD	cetacean	Phocoena dioptrica		Spectacled Porpoise
II	POP	cetacean	Phocoena phocoena		Common Porpoise
II	POS	cetacean	Phocoena spinipinnis		Burmeister Porpoise
II	DAL	cetacean	Phocoenoides dalli		Dall's Porpoise
I/II	PYM	cetacean	Physeter macrocephalus		Sperm Whale
I/II	POB	cetacean	Pontoporia blainvillei		La Plata Dolphin
II	SOC	cetacean	Sousa chinensis		Indo-Pacific Humpbacked Dolphin
II	POT	cetacean	Sousa teuszii		Atlantic Hump-backed Dolphin
II	SNA	cetacean	Stenella attenuate		Pantropical Spotted Dolphin
II	SNC	cetacean	Stenella clymene		Clymene dolphin
II	SNR	cetacean	Stenella coeruleoalba		Striped Dolphin
II	SNL	cetacean	Stenella longirostris		Spinner Dolphin
II	TUA	cetacean	Tursiops aduncus		Indian or Bottlenose Dolphin
II	TUT	cetacean	Tursiops truncates		Bottlenosed Dolphin

Table 19 - The 59 species of the CMS in the seabird group.

CMS list	Species code	Group	Species	Alternative species name	Common name
I	DAM	seabirds	Diomedea amsterdamensis		Amsterdam Albatross
II	DIP	seabirds	Diomedea epomophora		Royal Albatross
II	DIX	seabirds	Diomedea exulans		Wandering Albatross
II	LAA	seabirds	Larus armenicus	Larus michahellis	Armenian Gull
I	LAT	seabirds	Larus atlanticus		Olrog's Gull
I/II	LAU	seabirds	Larus audouinii		Audouin's Gull
II	LGE	seabirds	Larus genei		Slender-billed Gull
II	LHM	seabirds	Larus hemprichii		Sooty Gull
II	LIC	seabirds	Larus ichthyaetus		Great Black-headed Gull
I/II	LLE	seabirds	Larus leucophthalmus		White-eyed Gull
II	LML	seabirds	Larus melanocephalus		Mediterranean Gull
I	LRL	seabirds	Larus relictus		Relict Gull
I	LSA	seabirds	Larus saundersi		Saunder's Gull
II	MAI	seabirds	Macronectes giganteus		Southern Giant Petrel
II	MAH	seabirds	Macronectes halli		Northern Giant Petrel
I	PEG	seabirds	Pelecanoides garnotii		Peruvian diving petrel
I/II	PCR	seabirds	Pelecanus crispus		Dalmatian Pelican
I/II	PCC	seabirds	Pelecanus onocrotalus		White Pelican
II	PHG	seabirds	Phalacrocorax nigrogularis		Socotra Cormorant
II	PXP	seabirds	Phalacrocorax pygmeus		Pygmy Cormorant
I	PHA	seabirds	Phoebastria_albatrus	Diomedea albatrus	Short-tailed Albatross
II	PHI	seabirds	Phoebastria_immutabilis	Diomedea immutabilis	Laysan Albatross
II	PIR	seabirds	Phoebastria_irrorata	Diomedea irrorata	Waved Albatross
II	PHN	seabirds	Phoebastria_nigripes	Diomedea nigripes	Black-footed Albatross
II	PHF	seabirds	Phoebetria fusca		Sooty Albatross
II	PHE	seabirds	Phoebetria palpebrata		Light-mantled Sooty Albatross
II	PRO	seabirds	Procellaria aequinoctialis		White-chinned Petrel
II	PCI	seabirds	Procellaria cinerea		Grey Petrel
II	PCO	seabirds	Procellaria conspicillata		Spectacled Petrel
II	PRK	seabirds	Procellaria parkinsoni		Black Petrel
II	PCW	seabirds	Procellaria westlandica		Westland Petrel
I	PTT	seabirds	Pterodroma atrata		Henderson Petrel
I	POW	seabirds	Pterodroma cahow		Cahow Bermuda Petrel
I	PTG	seabirds	Pterodroma phaeopygia		Dark-rumped Petrel
I	PUC	seabirds	Puffinus creatopus		Pink-footed Shearwater
I	PUM	seabirds	Puffinus mauretanicus		Balearic shearwater
II	SPD	seabirds	Spheniscus demersus		African Penguin
I	SPH	seabirds	Spheniscus humboldti		Humboldt Penguin
II	STF	seabirds	Sterna albifrons		Little Tern
II	STE	seabirds	Sterna balaenarum		Damara Tern
II	STG	seabirds	Sterna bengalensis		Lesser Crested Tern
II	SBG	seabirds	Sterna bergii		Great Crested Tern
I	STB	seabirds	Sterna bernsteini		Chinese Crested Tern
II	CAT	seabirds	Sterna caspia		Caspian Tern
II	SDG	seabirds	Sterna dougallii		Roseate Tern
II	STH	seabirds	Sterna hirundo		Common Tern
I	STI	seabirds	Sterna lorata		Peruvian tern
II	STM	seabirds	Sterna maxima		Royal Tern
II	STN	seabirds	Sterna nilotica		Gull-billed Tern
II	STP	seabirds	Sterna paradisaea		Arctic Tern
II	STR	seabirds	Sterna repressa		White-cheeked Tern
II	STV	seabirds	Sterna sandvicensis		Sandwich Tern
II	STS	seabirds	Sterna saundersi		Saunder's Tern
I	SYW	seabirds	Synthliboramphus wumizusume		Japanese Murrelet
II	DNB	seabirds	Thalassarche_bulleri	Diomedea bulleri	Buller's Albatross
II	THC	seabirds	Thalassarche_cauta	Diomedea cauta	Shy Albatross

II	THH	seabirds	Thalassarche_chlororhynchos	Diomedea chlororhynchos	Yellow-nosed Albatross
II	DIC	seabirds	Thalassarche_chrysostoma	Diomedea chrysostoma	Grey-headed Albatross
II	DIM	seabirds	Thalassarche_melanophrys	Diomedea melanophris	Black-browed Albatross

Table 20 - The 6 species of the CMS in the shark group

CMS list	Species code	Group	Species	Alternative species name	Common name
I/II	CCC	shark	Carcharodon carcharias		Great White Shark
I/II	CTM	shark	Cetorhinus maximus		Basking Shark
II	IOX	shark	Isurus oxyrinchus		Shortfin Mako Shark
II	IPA	shark	Isurus paucus		Longfin Mako Shark
II	LMN	shark	Lamna nasus		Porbeagle Shark
II	RHT	shark	Rhincodon typus		Whale Shark

Table 21 - The 6 species of the CMS in the turtle group

CMS list	Species code	Group	Species	Alternative species name	Common name
I/II	CAC	turtle	Caretta caretta		Loggerhead Turtle
I/II	CHM	turtle	Chelonia mydas		Green Turtle
I/II	DCC	turtle	Dermochelys coriacea		Leatherback Turtle
I/II	EIM	turtle	Eretmochelys imbricata		Hawksbill Turtle
I/II	LPK	turtle	Lepidochelys kempii		Kemp's Ridley Turtle
I/II	LPV	turtle	Lepidochelys olivacea		Olive Ridley Turtle

Table 22 - The 6 species of the CMS in the other sea mammals group

CMS list	Species code	Group	Species	Alternative species name	Common name
II	HGR	Marine mammals other	Halichoerus grypus		Grey Seal
I	LOF	Marine mammals other	Lontra feline		Marine Otter
I	LOP	Marine mammals other	Lontra provocax		Southern River Otter
I/II	MMN	Marine mammals other	Monachus monachus		Mediterranean Monk Seal
II	OFL	Marine mammals other	*Arctocephalus australis*		South American Seal
II	PHV	Marine mammals other	Phoca vitulina		Common Seal

Table 23 - Thirty two seabird species for which a foraging-radius approach was applied

Species code	Species	Common name	World population	Pop type (0 whole; 1 breeding pairs)	Foraging radius (km)	Start of the Breeding season month	Endt of the Breeding season month
DAM	Diomedea amsterdamensis	Amsterdam Albatross	26	1	1200	2	2
DIP	Diomedea epomophora	Royal Albatross	7900	1	1000	10	10
DIX	Diomedea exulans	Wandering Albatross	8050	1	1800	1	1
LAT	Larus atlanticus	Olrog's Gull	3500	1	7	7	11
LAU	Larus audouinii	Audouin's Gull	19200	1	160	2	7
MAI	Macronectes giganteus	Southern Giant Petrel	50170	1	189	6	6
MAH	Macronectes halli	Northern Giant Petrel	11800	1	550	8	5
PHG	Phalacrocorax nigrogularis	Socotra Cormorant	110000	1	0	1	1
PHA	Phoebastria albatrus	Short-tailed Albatross	470	1	1500	10	6
PHI	Phoebastria immutabilis	Laysan Albatross	591356	1	1000	9	7
PIR	Phoebastria irrorata	Waved Albatross	9620	1	165	3	12
PHN	Phoebastria nigripes	Black-footed Albatross	61307	1	250	10	6
PHF	Phoebetria fusca	Sooty Albatross	13890	1	350	7	5
PHE	Phoebetria palpebrata	Light-mantled Sooty Albatross	22611	1	1516	9	5
PRO	Procellaria aequinoctialis	White-chinned Petrel	1241000	1	1868	10	5
PCI	Procellaria cinerea	Grey Petrel	111684	1	600	2	12
PCO	Procellaria conspicillata	Spectacled Petrel	10000	1	600	9	3
PRK	Procellaria parkinsoni	Black Petrel	3333	1	522	10	6
PCW	Procellaria westlandica	Westland Petrel	4000	1	400	2	12
PTT	Pterodroma atrata	Henderson Petrel	74999.5	0	195	1	1
POW	Pterodroma cahow	Cahow Bermuda Petrel	71	1	200	10	6
PTG	Pterodroma phaeopygia	Dark-rumped Petrel	14999.5	0	200	4	9
PUC	Puffinus creatopus	Pink-footed Shearwater	24000	1	200	11	5
SPD	Spheniscus demersus	African Penguin	28500	1	400	11	11
SPH	Spheniscus humboldti	Humboldt Penguin	15000	1	170	5	5
STB	Sterna bernsteini	Chinese Crested Tern	25	1	100	1	1
STI	Sterna lorata	Peruvian tern	1750	1	100	10	1
DNB	Thalassarche bulleri	Buller's Albatross	30460	1	413	12	9
THC	Thalassarche cauta	Shy Albatross	12585	1	200	7	7
THH	Thalassarche chlororhynchos	Yellow-nosed Albatross	69100	1	1800	8	4
DIC	Thalassarche chrysostoma	Grey-headed Albatross	95748	1	800	9	5
DIM	Thalassarche melanophrys	Black-browed Albatross	601686	1	1100	9	5

2. EEZ statistics

Table 24 - Energy use (kg of oil equivalent per capita) by EEZ. Energy use refers to use of primary energy before transformation to other end-use fuels, which is equal to indigenous production plus imports and stock changes, minus exports and fuels supplied to ships and aircraft engaged in international transport. Estimation from the World Bank: average value for perio2002-200 and United Nation Statistics Division year 2004, 2005 or 2006. Listed in alphabetical order by EEZ name.

EEZ name	Country	Sovereign	ISO	Energy use (kg of oil eq per capita) average 2000-2005	Source
Albanian Exclusive Economic Zone	Albania	Albania	ALB	615	World Bank
Algerian Exclusive Economic Zone	Algeria	Algeria	DZA	901	World Bank
American Samoa Exclusive Economic Zone	American Samoa	United States	ASM	7827	World Bank
Angolan Exclusive Economic Zone	Angola	Angola	AGO	536	World Bank
Antigua and Barbuda Exclusive Economic Zone	Antigua and Barbuda	Antigua and Barbuda	ATG	1695	2006 (United Nation Statistics Division)
Argentinean Exclusive Economic Zone	Argentina	Argentina	ARG	1652	World Bank
Australian Exclusive Economic Zone	Australia	Australia	AUS	5647	World Bank
Macquarie Island Exclusive Economic Zone	Macquarie Island	Australia	AUS	5647	World Bank
Lord Howe Isl Australia	Australia	Australia	AUS	5647	World Bank
Bahamas Exclusive Economic Zone	Bahamas	Bahamas	BHS	2144	2006 (United Nation Statistics Division)
Bahraini Exclusive Economic Zone	Bahrain	Bahrain	BHR	9407	World Bank
Bangladeshi Exclusive Economic Zone	Bangladesh	Bangladesh	BGD	142	World Bank
Barbados Exclusive Economic Zone	Barbados	Barbados	BRB	1451	2006 (United Nation Statistics Division)
Belgian Exclusive Economic Zone	Belgium	Belgium	BEL	5594	World Bank
Bermudian Exclusive Economic Zone	Bermuda	United Kingdom	BMU	2717	2006 (United Nation Statistics Division)
Bosnian and Herzegovinian Exclusive Economic Zone	Bosnia and Herzegovina	Bosnia and Herzegovina	BIH	1167	World Bank
Bouvet Island Exclusive Economic Zone	Bouvet Island	Norway	BVT	5772	World Bank
Brazilian Exclusive Economic Zone	Brazil	Brazil	BRA	1091	World Bank
Trindade Exclusive Economic Zone	Trindade	Brazil	BRA	1091	World Bank
Belizean Exclusive Economic Zone	Belize	Belize	BLZ	1021	2006 (United Nation Statistics Division)
British Indian Ocean Territory Exclusive Economic Zone	British Indian Ocean Territory	United Kingdom	IOT	3729	World Bank
Solomon Islands Exclusive Economic Zone	Solomon Islands	Solomon Islands	SLB	123	2006 (United Nation Statistics Division)
British Virgin Islands Exclusive Economic Zone	British Virgin Islands	United Kingdom	VGB	1464	2006 (United Nation Statistics Division)
Brunei Darussalam	Brunei Darussalam	Brunei Darussalam	BRN	7472	World Bank
Bulgarian Exclusive Economic Zone	Bulgaria	Bulgaria	BGR	2500	World Bank
Myanmar Exclusive Economic Zone	Myanmar	Myanmar	MMR	270	World Bank
Eritrean Exclusive Economic Zone	Eritrea	Eritrea	ERI	194	World Bank
Cambodian Exclusive Economic Zone	Cambodia	Cambodia	KHM	323	World Bank
Cameroonian Exclusive Economic Zone	Cameroon	Cameroon	CMR	392	World Bank
Canadian Exclusive Economic Zone	Canada	Canada	CAN	8012	World Bank
Cape Verdean Exclusive Economic Zone	Cape Verde	Cape Verde	CPV	209	2006 (United Nation Statistics Division)
Cayman Islands Exclusive Economic Zone	Cayman Islands	United Kingdom	CYM	3387	2006 (United Nation Statistics Division)
Sri Lankan Exclusive Economic Zone	Sri Lanka	Sri Lanka	LKA	438	World Bank
Chilean Exclusive Economic Zone	Chile	Chile	CHL	1475	2006 (United Nation Statistics Division)

Easter Island Exclusive Economic Zone	Easter Island	Chile	CHL	1475	2006 (United Nation Statistics Division)
Desventuradas Isl.(Chile)	Desventuradas Island	Chile	CHL	1475	2006 (United Nation Statistics Division)
J. Fernandez Felix and Ambrosio Isl. (Chile)	J. Fernandez Felix and Ambrosio Isl. (Chile)	Chile	CHL	1475	2006 (United Nation Statistics Division)
Chinese Exclusive Economic Zone	China	China	CHN	906	World Bank
Taiwanese Exclusive Economic Zone	Taiwan	Taiwan	TWN	906	World Bank
Christmas Island Exclusive Economic Zone	Christmas Island	Australia	CXR	5647	World Bank
Cocos Islands Exclusive Economic Zone	Cocos Islands	Australia	CCK	5647	World Bank
Colombian Exclusive Economic Zone	Colombia	Colombia	COL	676	World Bank
Comoran Exclusive Economic Zone	Comoro Islands	Comoro Islands	COM	60	2006 (United Nation Statistics Division)
Mayotte Exclusive Economic Zone	Mayotte	France	MYT	1108	Reunion Island
Democratic Republic of the Congo Exclusive Economic Zone	Democratic Republic of the Congo	Democratic Republic of the Congo	COD	330	World Bank
Congolese Exclusive Economic Zone	République du Congo	République du Congo	COG	292	World Bank
Cook Islands Exclusive Economic Zone	Cook Islands	New Zealand	COK	1033	2006 (United Nation Statistics Division)
Costa Rican Exclusive Economic Zone	Costa Rica	Costa Rica	CRI	770	World Bank
Croatian Exclusive Economic Zone	Croatia	Croatia	HRV	1822	World Bank
Cuban Exclusive Economic Zone	Cuba	Cuba	CUB	956	World Bank
Cypriote Exclusive Economic Zone	Cyprus	Cyprus	CYP	2653	World Bank
Beninese Exclusive Economic Zone	Benin	Benin	BEN	335	World Bank
Bornholm Exclusive Economic Zone	Denmark	Denmark	DNK	3602	World Bank
Danish Exclusive Economic Zone	Denmark	Denmark	DNK	3602	World Bank
Dominican Exclusive Economic Zone	Dominica	Dominica	DMA	578	2006 (United Nation Statistics Division)
Dominican Republic Exclusive Economic Zone	Dominican Republic	Dominican Republic	DOM	818	World Bank
Ecuadorean Exclusive Economic Zone	Ecuador	Ecuador	ECU	716	World Bank
Galapagos Exclusive Economic Zone	Galapagos Islands	Ecuador	ECU	716	World Bank
El Salvador Exclusive Economic Zone	El Salvador	El Salvador	SLV	696	World Bank
Equatorial Guinean Exclusive Economic Zone	Equatorial Guinea	Equatorial Guinea	GNQ	1008	2006 (United Nation Statistics Division)
Estonian Exclusive Economic Zone	Estonia	Estonia	EST	3790	World Bank
Faeroe Islands Exclusive Economic Zone	Faeroe Islands	Denmark	FRO	4671	2006 (United Nation Statistics Division)
Falkland Islands (Malvinas) Exclusive Economic Zone	Falkland Islands (Malvinas)*	Disputed United Kingdom / Argentina	FLK	4725	2006 (United Nation Statistics Division)
South Georgian Exclusive Economic Zone	South Georgia and the South Sandwich Islands	United Kingdom	SGS	3729	World Bank
Fijian Exclusive Economic Zone	Fiji	Fiji	FJI	665	2006 (United Nation Statistics Division)
Finnish Exclusive Economic Zone	Finland	Finland	FIN	6420	World Bank
French Exclusive Economic Zone	France	France	FRA	4294	World Bank
Glorioso Exclusive Economic Zone	Glorioso Islands	France	ATF	1062	World Bank
Juan de Nova Exclusive Economic Zone	Juan de Nova Island	France	ATF	1062	World Bank
Bassas da India Exclusive Economic Zone	Bassas da India	France	ATF	1062	World Bank
Ile Europa Exclusive Economic Zone	Ile Europa	France	ATF	1062	World Bank
Ile Tromelin Exclusive Economic Zone	Ile Tromelin	France	ATF	1062	World Bank
French Guiana Exclusive Economic Zone	French Guiana	France	GUF	1413	2006 (United Nation Statistics Division)
French Polynesian Exclusive Economic Zone	French Polynesia	France	PYF	1108	2006 (United Nation Statistics Division)
Djiboutian Exclusive Economic Zone	Djibouti	Djibouti	DJI	174	2006 (United Nation

					Statistics Division)
Gabonese Exclusive Economic Zone	Gabon	Gabon	GAB	1240	World Bank
Georgian Exclusive Economic Zone	Georgia	Georgia	GEO	630	World Bank
Gambian Exclusive Economic Zone	Gambia	Gambia	GMB	75	2006 (United Nation Statistics Division)
Gaza strip	Palestinian territories	Palestinian territories	PSE	265	2006 (United Nation Statistics Division)
German Exclusive Economic Zone	Germany	Germany	DEU	4135	World Bank
Ghanaian Exclusive Economic Zone	Ghana	Ghana	GHA	397	World Bank
Gibraltarian Exclusive Economic Zone	Gibraltar	United Kingdom	GIB	4429	World Bank
Line Group Exclusive Economic Zone	Line Group	Kiribati	KIR	92	2004 (United Nation Statistics Division)
Phoenix Group Exclusive Economic Zone	Phoenix Group	Kiribati	KIR	92	2004 (United Nation Statistics Division)
Kiribati Exclusive Economic Zone	Kiribati	Kiribati	KIR	92	2004 (United Nation Statistics Division)
Greek Exclusive Economic Zone	Greece	Greece	GRC	2568	World Bank
Greenlandic Exclusive Economic Zone	Greenland	Denmark	GRL	3360	2004 (United Nation Statistics Division)
Grenadian Exclusive Economic Zone	Grenada	Grenada	GRD	925	2006 (United Nation Statistics Division)
Guadeloupe Exclusive Economic Zone	Guadeloupe and Martinique	France	GLP	1503	2006 (United Nation Statistics Division)
Guam EEZ	Guam	United States	GUM	7827	World Bank
Guatemalan Exclusive Economic Zone	Guatemala	Guatemala	GTM	612	World Bank
Guinea Bissau Exclusive Economic Zone	Guinea Bissau	Guinea Bissau	GNB	67	2006 (United Nation Statistics Division)
Guyanese Exclusive Economic Zone	Guyana	Guyana	GUY	626	2006 (United Nation Statistics Division)
Haitian Exclusive Economic Zone	Haiti	Haiti	HTI	247	World Bank
Heard and McDonald Islands Exclusive Economic Zone	Heard and McDonald Islands	Australia	HMD	5647	World Bank
Honduran Exclusive Economic Zone	Honduras	Honduras	HND	540	World Bank
Honk Kong	China	China	CHN	1746	2006 (United Nation Statistics Division)
Icelandic Exclusive Economic Zone	Iceland	Iceland	ISL	11333	World Bank
Indian Exclusive Economic Zone	India	India	IND	455	World Bank
Andaman and Nicobar Islands Exclusive Economic Zone	Andaman and Nicobar	India	CHN	906	World Bank
Indonesian Exclusive Economic Zone (eastern)	Indonesia	Indonesia	IDN	790	World Bank
Indonesian Exclusive Economic Zone (western)	Indonesia	Indonesia	IDN	790	World Bank
Iranian Exclusive Economic Zone	Iran	Iran	IRN	1972	World Bank
Iraqi Exclusive Economic Zone	Iraq	Iraq	IRQ	1102	World Bank
Irish Exclusive Economic Zone	Ireland	Ireland	IRL	3452	World Bank
Israeli Exclusive Economic Zone	Israel	Israel	ISR	2911	World Bank
Italian Exclusive Economic Zone	Italy	Italy	ITA	3014	World Bank
Ivory Coast Exclusive Economic Zone	Ivory Coast	Ivory Coast	CIV	387	World Bank
Jamaican Exclusive Economic Zone	Jamaica	Jamaica	JAM	1431	World Bank
Japanese Exclusive Economic Zone	Japan	Japan	JPN	4033	World Bank
Japan Outer Isl.	Japan	Japan	JPN	4033	World Bank
Johnston Atoll Exclusive Economic Zone	Johnston Atoll	United States	USA	7827	World Bank
Jordanian Exclusive Economic Zone	Jordan	Jordan	JOR	1021	World Bank
Kenyan Exclusive Economic Zone	Kenya	Kenya	KEN	449	World Bank
North Korean Exclusive Economic Zone	North Korea	North Korea	PRK	865	World Bank
South Korean Exclusive Economic Zone	South Korea	South Korea	KOR	4074	World Bank
Kuwaiti Exclusive Economic Zone	Kuwait	Kuwait	KWT	9142	World Bank
Lebanese Exclusive Economic Zone	Lebanon	Lebanon	LBN	1326	World Bank
Latvian Exclusive Economic Zone	Latvia	Latvia	LVA	1453	2006 (United Nation Statistics Division)
Liberian Exclusive Economic Zone	Liberia	Liberia	LBR	61	2006 (United Nation Statistics Division)

Libyan Exclusive Economic Zone	Libya	Libya	LBY	3063	World Bank
Lithuanian Exclusive Economic Zone	Lithuania	Lithuania	LTU	2517	World Bank
Macao	China	China	CHN	1594	2006 (United Nation Statistics Division)
Madagascan Exclusive Economic Zone	Madagascar	Madagascar	MDG	45	2004 (United Nation Statistics Division)
Malaysian Exclusive Economic Zone (west)	Malaysia	Malaysia	MYS	2098	World Bank
Malaysian Exclusive Economic Zone (east)	Malaysia	Malaysia	MYS	2098	World Bank
Malaysia Sabah	Malaysia	Malaysia	MYS	2098	World Bank
Maldives Exclusive Economic Zone	Maldives	Maldives	MDV	965	2006 (United Nation Statistics Division)
Malaysia Sarawak	Malaysia	Malaysia	MYS	2098	World Bank
Maltese Exclusive Economic Zone	Malta	Malta	MLT	1995	World Bank
Martinique	Martinique	France	MTQ	1577	2006 (United Nation Statistics Division)
Mauritanian Exclusive Economic Zone	Mauritania	Mauritania	MRT	165	2006 (United Nation Statistics Division)
Mauritian Exclusive Economic Zone	Mauritius	Mauritius	MUS	835	2004 (United Nation Statistics Division)
Mexican Exclusive Economic Zone	Mexico	Mexico	MEX	1511	World Bank
Hawai borthwest islands	United States	United States	USA	7827	World Bank
Monégasque Exclusive Economic Zone	Monaco	Monaco	MCO	4294	France
Montserrat Exclusive Economic Zone	Montserrat	United Kingdom	MSR	2235	2006 (United Nation Statistics Division)
Moroccan Exclusive Economic Zone	Morocco	Morocco	MAR	372	World Bank
Mozambican Exclusive Economic Zone	Mozambique	Mozambique	MOZ	400	World Bank
Omani Exclusive Economic Zone	Oman	Oman	OMN	3499	World Bank
Namibian Exclusive Economic Zone	Namibia	Namibia	NAM	616	World Bank
Nauruan Exclusive Economic Zone	Nauru	Nauru	NRU	3457	2006 (United Nation Statistics Division)
Dutch Exclusive Economic Zone	Netherlands	Netherlands	NLD	4705	World Bank
Sint-Maarten Exclusive Economic Zone	Southern Saint-Martin	Netherlands	ANT	1204	2006 (United Nation Statistics Division)
Netherlands Antilles Exclusive Economic Zone	Netherlands Antilles	Netherlands	ANT	1204	2006 (United Nation Statistics Division)
New Caledonian Exclusive Economic Zone	New Caledonia	France	NCL	3631	2006 (United Nation Statistics Division)
Vanuatu Exclusive Economic Zone	Vanuatu	Vanuatu	VUT	139	2006 (United Nation Statistics Division)
New Zealand Exclusive Economic Zone	New Zealand	New Zealand	NZL	4086	World Bank
Nicaraguan Exclusive Economic Zone	Nicaragua	Nicaragua	NIC	542	World Bank
Nigerian Exclusive Economic Zone	Nigeria	Nigeria	NGA	730	World Bank
Niue Exclusive Economic Zone	Niue	New Zealand	NIU	605	2006 (United Nation Statistics Division)
Norfolk Island Exclusive Economic Zone	Norfolk Island	Australia	NFK	5647	World Bank
Norwegian Exclusive Economic Zone	Norway	Norway	NOR	5772	World Bank
Jan Mayen Exclusive Economic Zone	Jan Mayen	Norway	SJM	5772	World Bank
Northern Mariana Islands Economic Zone	Northern Mariana Islands and Guam	United States	MNP	7827	World Bank
Micronesian Exclusive Economic Zone	Micronesia	Micronesia	FSM	605	Niue
Marshall Islands Exclusive Economic Zone	Marshall Islands	Marshall Islands	MHL	584	2006 (United Nation Statistics Division)
Palau Exclusive Economic Zone	Palau	Palau	PLW	3168	2006 (United Nation Statistics Division)
Pakistani Exclusive Economic Zone	Pakistan	Pakistan	PAK	460	World Bank
Panamanian Exclusive Economic Zone	Panama	Panama	PAN	842	World Bank
Papua New Guinean Exclusive Economic Zone	Papua New Guinea	Papua New Guinea	PNG	257	2006 (United Nation Statistics Division)
Peruvian Exclusive Economic Zone	Peru	Peru	PER	464	World Bank
Philippines Exclusive Economic Zone	Philippines	Philippines	PHL	493	World Bank
Pitcairn Exclusive Economic Zone	Pitcairn	United Kingdom	PCN	3729	World Bank

Polish Exclusive Economic Zone	Poland	Poland	POL	2445	World Bank
Portuguese Exclusive Economic Zone	Portugal	Portugal	PRT	2385	World Bank
Madeiran Exclusive Economic Zone	Madeira	Portugal	PRT	2385	World Bank
Azores Exclusive Economic Zone	Azores	Portugal	PRT	2385	World Bank
Guinean Exclusive Economic Zone	Guinea	Guinea	GIN	47	2006 (United Nation Statistics Division)
East Timor Exclusive Economic Zone	East Timor	East Timor	TLS	56	2006 (United Nation Statistics Division)
Oecussi Ambeno Exclusive Economic Zone	Oecussi Ambeno	East Timor	TLS	56	2006 (United Nation Statistics Division)
Puerto Rican Exclusive Economic Zone	Puerto Rico and Virgin Islands of the United States	United States	PRI	165	2006 (United Nation Statistics Division)
Qatari Exclusive Economic Zone	Qatar	Qatar	QAT	19354	World Bank
Réunion Exclusive Economic Zone	Réunion	France	REU	1062	2006 (United Nation Statistics Division)
Romanian Exclusive Economic Zone	Romania	Romania	ROU	1799	World Bank
Russia (Barents Sea)	Russia	Russia	RUS	4293	World Bank
Russia (Black Sea)	Russia	Russia	RUS	4293	World Bank
Russia (Baltic Sea Kalinigrad)	Russia	Russia	RUS	4293	World Bank
Russia (Pacific)	Russia	Russia	RUS	4293	World Bank
Russian Exclusive Economic Zone (Siberia)	Russia	Russia	RUS	4293	World Bank
Russia (Baltic Sea St Petersburg)	Russia	Russia	RUS	4293	World Bank
St. Helena Exclusive Economic Zone	Saint Helena	United Kingdom	SHN	3729	World Bank
Saint Kitts and Nevis Exclusive Economic Zone	Saint Kitts and Nevis	Saint Kitts and Nevis	KNA	1080	2004 (United Nation Statistics Division)
Anguilla Exclusive Economic Zone	Anguilla	United Kingdom	AIA	1242	2006 (United Nation Statistics Division)
Saint Lucia Exclusive Economic Zone	Saint Lucia	Saint Lucia	LCA	749	2004 (United Nation Statistics Division)
Saint-Pierre and Miquelon Exclusive Economic Zone	Saint Pierre and Miquelon	France	SPM	4294	World Bank
Saint Vincent and the Grenadines Exclusive Economic Zone	Saint Vincent and the Grenadines	Saint Vincent and the Grenadines	VCT	595	2004 (United Nation Statistics Division)
Sao Tome and Principe Exclusive Economic Zone	Sao Tome and Principe	Sao Tome and Principe	STP	236	2006 (United Nation Statistics Division)
Saudi Arabian Exclusive Economic Zone (Red Sea)	Saudi Arabia	Saudi Arabia	SAU	5249	World Bank
Saudi Arabian Exclusive Economic Zone (persian Gulf)	Saudi Arabia	Saudi Arabia	SAU	5249	World Bank
Senegalese Exclusive Economic Zone	Senegal	Senegal	SEN	237	World Bank
Seychellois Exclusive Economic Zone	Seychelles	Seychelles	SYC	2877	2006 (United Nation Statistics Division)
Sierra Leonian Exclusive Economic Zone	Sierra Leone	Sierra Leone	SLE	44	2004 (United Nation Statistics Division)
Singaporean Exclusive Economic Zone	Singapore	Singapore	SGP	4548	World Bank
Vietnamese Exclusive Economic Zone	Vietnam	Vietnam	VNM	513	World Bank
Slovenian Exclusive Economic Zone	Slovenia	Slovenia	SVN	3402	World Bank
Somali Exclusive Economic Zone	Somalia	Somalia	SOM	21	2006 (United Nation Statistics Division)
South African Exclusive Economic Zone	South Africa	South Africa	ZAF	2621	World Bank
Prince Edward Islands Exclusive Economic Zone	Prince Edward Islands	South Africa	ZAF	2621	World Bank
Canary Islands Exclusive Economic Zone	Canary Islands	Spain	ESP	3059	World Bank
Spanish Exclusive Economic Zone	Spain	Spain	ESP	3059	World Bank
Western Saharan Exclusive Economic Zone	Western Sahara	Morocco	ESH	372	World Bank
Sudanese Exclusive Economic Zone	Sudan	Sudan	SDN	390	World Bank
Surinamese Exclusive Economic Zone	Suriname	Suriname	SUR	1416	2006 (United Nation Statistics Division)
Svalbard Isl. (Norway)	Svalbard Isl.	Norway	GGY	5772	World Bank
Swedish Exclusive Economic Zone	Sweden	Sweden	SWE	2953	2006 (United Nation Statistics Division)
Syrian Exclusive Economic Zone	Syria	Syria	SYR	979	World Bank

Thailand Exclusive Economic Zone	Thailand	Thailand	THA	1235	World Bank
Togolese Exclusive Economic Zone	Togo	Togo	TGO	392	World Bank
Tokelau Exclusive Economic Zone	Tokelau	New Zealand	TKL	605	Niue
Tongan Exclusive Economic Zone	Tonga	Tonga	TON	555	2006 (United Nation Statistics Division)
Trinidad and Tobago Exclusive Economic Zone	Trinidad and Tobago	Trinidad and Tobago	TTO	8019	World Bank
United Arab Emirates Exclusive Economic Zone	United Arab Emirates	United Arab Emirates	ARE	10724	World Bank
Tunisian Exclusive Economic Zone	Tunisia	Tunisia	TUN	799	World Bank
Turkish Exclusive Economic Zone (Mediterranean Sea)	Turkey	Turkey	TUR	1118	World Bank
Turkey Black Sea	Turkey	Turkey	TUR	1118	World Bank
Turks and Caicos Exclusive Economic Zone	Turks and Caicos Islands	United Kingdom	TCA	3729	World Bank
Tuvaluan Exclusive Economic Zone	Tuvalu	Tuvalu	TUV	-1	World Bank
Ukrainian Exclusive Economic Zone	Ukraine	Ukraine	UKR	2938	World Bank
Egyptian Exclusive Economic Zone	Egypt	Egypt	EGY	686	World Bank
United Kingdom Exclusive Economic Zone	United Kingdom	United Kingdom	GBR	3729	World Bank
Jersey Exclusive Economic Zone	Jersey	United Kingdom	GBR	3729	World Bank
Guernsey Exclusive Economic Zone	Guernsey	United Kingdom	GBR	3729	World Bank
Tanzanian Exclusive Economic Zone	Tanzania	Tanzania	TZA	410	World Bank
Alaskan Exclusive Economic Zone	Alaska	United States	USA	7827	World Bank
Hawaiian Exclusive Economic Zone (main island)	Hawaii	United States	USA	7827	World Bank
Navassa Isl (Haiti)	Haiti	Haiti	HTI	247	World Bank
Palmyra Atoll Exclusive Economic Zone	Palmyra Atoll	United States	USA	7827	World Bank
Jarvis Island Exclusive Economic Zone	Jarvis Island	United States	USA	7827	World Bank
Howland and Baker Island Exclusive Economic Zone	Howland Island and Baker Island	United States	USA	7827	World Bank
United States Exclusive Economic Zone (West Coast)	United States	United States	USA	7827	World Bank
USA East Coast	United States	United States	USA	7827	World Bank
USA Golf Of Mexico	United States	United States	USA	7827	World Bank
Ascension Exclusive Economic Zone	Ascension	United Kingdom	ASC	3729	World Bank
Tristan Da Cunha Exclusive Economic Zone	Tristan da Cunha	United Kingdom	TAA	3729	World Bank
Uruguayan Exclusive Economic Zone	Uruguay	Uruguay	URY	892	World Bank
Venezuelan Exclusive Economic Zone	Venezuela	Venezuela	VEN	2304	World Bank
Wake Island Exclusive Economic Zone	Wake Island	United States	WAK	7827	World Bank
Wallis and Futuna Exclusive Economic Zone	Wallis and Futuna	France	WLF	537	2006 (United Nation Statistics Division)
Samoan Exclusive Economic Zone	Samoa	Samoa	WSM	303	2006 (United Nation Statistics Division)
Yemeni Exclusive Economic Zone	Yemen	Yemen	YEM	273	World Bank
Serbia-Montenegrian Exclusive Economic Zone	Serbia-Montenegro	Serbia-Montenegro	SCG	1562	2006 (United Nation Statistics Division)
Amsterdam Island & St. Paul Island Exclusive Economic Zone	Amsterdam Island and Saint Paul Island	France	ATF	4294	World Bank
Crozet Islands Exclusive Economic Zone	Crozet Islands	France	ATF	4294	World Bank
Kerguelen Islands Exclusive Economic Zone	Kerguelen Islands	France	ATF	4294	World Bank
Clipperton Island Exclusive Economic Zone	Clipperton Island	France	CPT	4294	World Bank
Paracel Islands Exclusive Economic Zone	Paracel Islands	Disputed China/Taiwan/Vietnam	XXX	906	World Bank
Spratly Islands Exclusive Economic Zone	Spratly Islands	Disputed China/Philippines/Vietnam/Taiwan/Malaysia	XXX	905	World Bank
Russia-Japan conflict zone	Southern Kuriles	Disputed Russia/Japan	XXX	4293	World Bank

Colombia - Jamaica (Joint Regime)	Colombia - Jamaica	Joint Regime Colombia/Jamaica	XXX	1431	World Bank
Nigeria - Sao Tome and Principe Joint	Nigeria - Sao Tome and Principe	Joint Regime Nigeria - Sao Tome and Principe	XXX	730	World Bank
Joint Japan - Korea	Joint Regime Japan/ South Korea	Joint Regime Japan/ South Korea	XXX	4074	World Bank
Conflict Zone	Disputed China/Taiwan	Disputed China/Taiwan	XXX	906	World Bank
Japan - South Korea Conflict Zone	Japan - South Korea Conflict Zone	Disputed Japan/South Korea	XXX	4074	World Bank
Joint Development Area Australia - East Timor	Australia - East Timor	Joint Regime Australia/East Timor	XXX	5647	World Bank
Protected Zone established under the Torres Strait Treaty	Australia - Papua New Guinea	Joint Regime Australia - Papua New Guinea	XXX	5647	World Bank
Area en controversia (disputed - Peruvian point of view)	Disputed Chile/Peru	Disputed Chile/Peru	XXX	1475	2006 (United Nation Statistics Division)
Antarctic 200NM zone beyond the coastline	Antarctica	Antarctica	ATA	0	World Bank
Saint-Martin Exclusive Economic Zone	Northern Saint-Martin	France	MAF	1503	Guadeloupe
Azerbaijanis Exclusive Economic Zone	Azerbaijan	Azerbaijan	AZE	1466	World Bank
Kazakh Exclusive Economic Zone	Kazakhstan	Kazakhstan	KAZ	3100	World Bank
Turkmen Exclusive Economic Zone	Turkmenistan	Turkmenistan	TKM	3314	World Bank

*A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).

3. Results by overlap index

Table 25 - Species ranked by overlap. All species

Rank	Species code	Family	Species	Common name	Overlap index
1	NPH	cetacean	Neophocaena phocaenoides	Finless Porpoise	1.729834
2	STB	seabirds	Sterna bernsteini	Chinese Crested Tern	1.717597
3	ORB	cetacean	Orcaella brevirostris	Irrawaddy Dolphin	1.698112
4	DUG	cetacean	Dugong dugon	Dugong / Sea Cow	1.518014
5	STM	seabirds	Sterna maxima	Royal Tern	1.515499
6	LSA	seabirds	Larus saundersi	Saunder's Gull	1.388563
7	SOC	cetacean	Sousa chinensis	Indo-Pacific Humpbacked Dolphin	1.332731
8	STI	seabirds	Sterna lorata	Peruvian tern	1.271844
9	POT	cetacean	Sousa teuszii	Atlantic Hump-backed Dolphin	1.259429
10	SYW	seabirds	Synthliboramphus wumizusume	Japanese Murrelet	1.235895
11	TUA	cetacean	Tursiops aduncus	Indian or Bottlenose Dolphin	1.206462
12	STV	seabirds	Sterna sandvicensis	Sandwich Tern	1.205789
13	CEH	cetacean	Cephalorhynchus heavisidii	Heaviside's Dolphin	1.164302
14	SPD	seabirds	Spheniscus demersus	African Penguin	1.158219
15	STE	seabirds	Sterna balaenarum	Damara Tern	1.150589
16	LAU	seabirds	Larus audouinii	Audouin's Gull	1.141359
17	PHG	seabirds	Phalacrocorax nigrogularis	Socotra Cormorant	1.116908
18	HGR	marine mammals other	Halichoerus grypus	Grey Seal	1.099358
19	STR	seabirds	Sterna repressa	White-cheeked Tern	1.090445
20	LIC	seabirds	Larus ichthyaetus	Great Black-headed Gull	1.089308
21	STS	seabirds	Sterna saundersi	Saunder's Tern	1.089156
22	STG	seabirds	Sterna bengalensis	Lesser Crested Tern	1.078656
23	STN	seabirds	Sterna nilotica	Gull-billed Tern	1.061086
24	POP	cetacean	Phocoena phocoena	Common Porpoise	1.060545
25	PEG	seabirds	Pelecanoides garnotii	Peruvian diving petrel	1.037612
26	SPH	seabirds	Spheniscus humboldti	Humboldt Penguin	1.028118
27	LGE	seabirds	Larus genei	Slender-billed Gull	1.02097
28	STF	seabirds	Sterna albifrons	Little Tern	1.008609
29	PHV	marine mammals other	Phoca vitulina	Common Seal	0.988178
30	LOF	marine mammals other	Lontra felina	Marine Otter	0.974533
31	LML	seabirds	Larus melanocephalus	Mediterranean Gull	0.973279
32	LPV	turtle	Lepidochelys olivacea	Olive Ridley Turtle	0.972248
33	EBJ	cetacean	Eubalaena japonica	North Pacific Right Whale	0.968866
34	SDG	seabirds	Sterna dougallii	Roseate Tern	0.959458
35	CAT	seabirds	Sterna caspia	Caspian Tern	0.956267
36	POS	cetacean	Phocoena spinipinnis	Burmeister Porpoise	0.952267
37	BAM	cetacean	Balaena mysticetus	Bowhead Whale	0.942369
38	EBG	cetacean	Eubalaena glacialis	Northern Right Whale	0.935856
39	MMN	marine mammals other	Monachus monachus	Mediterranean Monk Seal	0.92759
40	BEB	cetacean	Berardius bairdii	Baird's Beaked Whale	0.923174
41	BAO	cetacean	Balaenoptera omurai	Omura' Whale	0.920814
42	SBG	seabirds	Sterna bergii	Great Crested Tern	0.90351
43	LHM	seabirds	Larus hemprichii	Sooty Gull	0.900748
44	DAL	cetacean	Phocoenoides dalli	Dall's Porpoise	0.899804
45	CEE	cetacean	Cephalorhynchus eutropia	Chilean Dolphin	0.897024
46	PUM	seabirds	Puffinus mauretanicus	Balearic shearwater	0.890444

47	LGA	cetacean	Lagenorhynchus acutus	Atlantic White-sided Dolphin	0.882536
48	LGB	cetacean	Lagenorhynchus albirostris	White-beaked Dolphin	0.877474
49	EIM	turtle	Eretmochelys imbricata	Hawksbill Turtle	0.872379
50	CTM	shark	Cetorhinus maximus	Basking shark	0.865391
51	LPK	turtle	Lepidochelys kempii	Kemp's Ridley Turtle	0.845511
52	GRG	cetacean	Grampus griseus	Risso's Dolphin	0.839958
53	CAC	turtle	Caretta caretta	Loggerhead Turtle	0.826912
54	DCC	turtle	Dermochelys coriacea	Leatherback Turtle	0.826912
55	LAA	seabirds	Larus armenicus	Armenian Gull	0.820656
56	STH	seabirds	Sterna hirundo	Common Tern	0.811912
57	PCC	seabirds	Pelecanus onocrotalus	White Pelican	0.807091
58	DEL	cetacean	Delphinapterus leucas	Beluga	0.803405
59	IPA	shark	Isurus paucus	Longfin Mako shark	0.799951
60	PHA	seabirds	Phoebastria_albatrus	Short-tailed Albatross	0.793051
61	LLE	seabirds	Larus leucophthalmus	White-eyed Gull	0.786896
62	DDE	cetacean	Delphinus delphis	Common Dolphin	0.785438
63	LGH	cetacean	Lagenodelphis hosei	Fraser's Dolphin	0.783364
64	PUC	seabirds	Puffinus creatopus	Pink-footed Shearwater	0.782582
65	CHM	turtle	Chelonia mydas	Green Turtle	0.781022
66	RHT	shark	Rhincodon typus	Whale Shark	0.780718
67	OFL	marine mammals other	Arctocephalus australis	South American Seal	0.776876
68	HYA	cetacean	Hyperoodon ampullatus	Northern Bottlenose Whale	0.770532
69	CCC	shark	Carcharodon carcharias	Great White Shark	0.767739
70	LMN	shark	Lamna nasus	Porbeagle shark	0.764928
71	SNL	cetacean	Stenella longirostris	Spinner Dolphin	0.762594
72	SNA	cetacean	Stenella attenuata	Pantropical Spotted Dolphin	0.759866
73	IOX	shark	Isurus oxyrinchus	Shortfin Mako shark	0.754187
74	SNR	cetacean	Stenella coeruleoalba	Striped Dolphin	0.746145
75	TUT	cetacean	Tursiops truncatus	Bottlenosed Dolphin	0.739723
76	BAE	cetacean	Balaenoptera edeni	Bryde's whale	0.737189
77	PTG	seabirds	Pterodroma phaeopygia	Dark-rumped Petrel	0.733426
78	BOB	cetacean	Balaenoptera borealis	Sei Whale	0.720079
79	BAP	cetacean	Balaenoptera physalus	Fin Whale	0.718872
80	MNV	cetacean	Megaptera novaeangliae	Humpback Whale	0.716756
81	PYM	cetacean	Physeter macrocephalus	Sperm Whale	0.715051
82	OOR	cetacean	Orcinus orca	Killer whale	0.714425
83	MMO	cetacean	Monodon monoceros	Narwhal	0.709832
84	BMU	cetacean	Balaenoptera musculus	Blue Whale	0.696779
85	PIR	seabirds	Phoebastria_irrorata	Waved Albatross	0.690936
86	PCR	seabirds	Pelecanus crispus	Dalmatian Pelican	0.682034
87	POB	cetacean	Pontoporia blainvillei	La Plata Dolphin	0.681307
88	LGO	cetacean	Lagenorhynchus obscurus	Dusky Dolphin	0.64286
89	LGS	cetacean	Lagenorhynchus australis	Peale's Dolphin	0.634419
90	SNC	cetacean	Stenella clymene	Clymene dolphin	0.63313
91	PHI	seabirds	Phoebastria_immutabilis	Laysan Albatross	0.600686
92	LOP	marine mammals other	Lontra provocax	Southern River Otter	0.579696
93	LAT	seabirds	Larus atlanticus	Olrog's Gull	0.572399
94	GLM	cetacean	Globicephala melas	Long-finned Pilot Whale	0.570857
95	CEC	cetacean	Cephalorhynchus commersonii	Commerson's Dolphin	0.535107
96	DIM	seabirds	Thalassarche_melanophrys	Black-browed Albatross	0.528156
97	DAM	seabirds	Diomedea amsterdamensis	Amsterdam Albatross	0.525587
98	PCW	seabirds	Procellaria westlandica	Westland Petrel	0.503979
99	DNB	seabirds	Thalassarche_bulleri	Buller's Albatross	0.495736
100	PHN	seabirds	Phoebastria_nigripes	Black-footed Albatross	0.495035
101	EBA	cetacean	Eubalaena australis	Southern Right Whale	0.494585
102	CAM	cetacean	Caperea marginata	Pygmy Right whale	0.491002
103	BAB	cetacean	Balaenoptera bonaerensis	Antarctic Minke whale	0.462312

104	PRK	seabirds	Procellaria parkinsoni	Black Petrel	0.46143
105	POD	cetacean	Phocoena dioptrica	Spectacled Porpoise	0.445766
106	PHF	seabirds	Phoebetria fusca	Sooty Albatross	0.436894
107	THH	seabirds	Thalassarche_chlororhynchos	Yellow-nosed Albatross	0.436009
108	PRO	seabirds	Procellaria aequinoctialis	White-chinned Petrel	0.435673
109	LRL	seabirds	Larus relictus	Relict Gull	0.430667
110	THC	seabirds	Thalassarche_cauta	Shy Albatross	0.428971
111	PCI	seabirds	Procellaria cinerea	Grey Petrel	0.426469
112	STP	seabirds	Sterna paradisaea	Arctic Tern	0.426419
113	ORH	cetacean	Orcaella heinsohni	Australian Snubfin dolphin	0.423199
114	DIC	seabirds	Thalassarche_chrysostoma	Grey-headed Albatross	0.415607
115	MAI	seabirds	Macronectes giganteus	Southern Giant Petrel	0.410614
116	DIP	seabirds	Diomedea epomophora	Royal Albatross	0.41002
117	DIX	seabirds	Diomedea exulans	Wandering Albatross	0.403693
118	MAH	seabirds	Macronectes halli	Northern Giant Petrel	0.403004
119	PCO	seabirds	Procellaria conspicillata	Spectacled Petrel	0.395583
120	PXP	seabirds	Phalacrocorax pygmeus	Pygmy Cormorant	0.388056
121	PHE	seabirds	Phoebetria palpebrata	Light-mantled Sooty Albatross	0.382575
122	POW	seabirds	Pterodroma cahow	Cahow Bermuda Petrel	0.311002
123	PTT	seabirds	Pterodroma atrata	Henderson Petrel	0.268927

4. Results by un-weighted exposure

a) Un-weighted exposure of all species

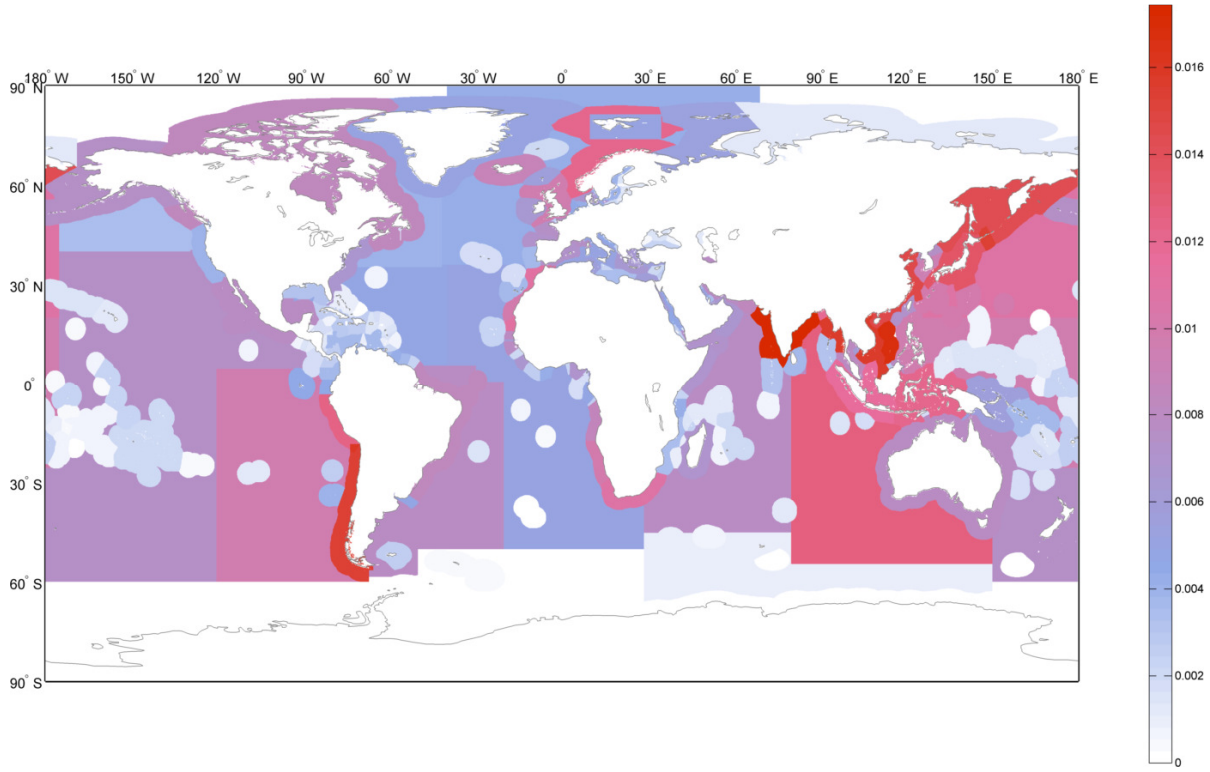

Figure 16 - EEZs and High Seas FAO areas showing with the un-weighted exposures summed across all species. Areas with colours furthest up the scale bar (red colours) had higher species exposures.

Table 26 - All species ranked by their un-weighted exposure index

Rank	Species code	Family	Species	Common name	Un-weighted exposure index
1	NPH	cetacean	Neophocaena phocaenoides	Finless Porpoise	2.090
2	ORB	cetacean	Orcaella brevirostris	Irrawaddy Dolphin	2.052
3	DUG	cetacean	Dugong dugon	Dugong / Sea Cow	1.834
4	STM	seabirds	Sterna maxima	Royal Tern	1.831
5	SOC	cetacean	Sousa chinensis	Indo-Pacific Humpbacked Dolphin	1.610
6	POT	cetacean	Sousa teuszii	Atlantic Hump-backed Dolphin	1.522
7	SYW	seabirds	Synthliboramphus wumizusume	Japanese Murrelet	1.493
8	TUA	cetacean	Tursiops aduncus	Indian or Bottlenose Dolphin	1.458
9	CEH	cetacean	Cephalorhynchus heavisidii	Heaviside's Dolphin	1.407
10	SPD	seabirds	Spheniscus demersus	African Penguin	1.399
11	LAU	seabirds	Larus audouinii	Audouin's Gull	1.379
12	PHG	seabirds	Phalacrocorax nigrogularis	Socotra Cormorant	1.349
13	HGR	marine mammals other	Halichoerus grypus	Grey Seal	1.328
14	LIC	seabirds	Larus ichthyaetus	Great Black-headed Gull	1.316
15	POP	cetacean	Phocoena phocoena	Common Porpoise	1.281

16	PEG	seabirds	Pelecanoides garnotii	Peruvian diving petrel	1.254
17	SPH	seabirds	Spheniscus humboldti	Humboldt Penguin	1.242
18	LGE	seabirds	Larus genei	Slender-billed Gull	1.233
19	PHV	marine mammals other	Phoca vitulina	Common Seal	1.194
20	LOF	marine mammals other	Lontra felina	Marine Otter	1.177
21	LML	seabirds	Larus melanocephalus	Mediterranean Gull	1.176
22	LPV	turtle	Lepidochelys olivacea	Olive Ridley Turtle	1.175
23	EBJ	cetacean	Eubalaena japonica	North Pacific Right Whale	1.171
24	POS	cetacean	Phocoena spinipinnis	Burmeister Porpoise	1.150
25	BAM	cetacean	Balaena mysticetus	Bowhead Whale	1.138
26	EBG	cetacean	Eubalaena glacialis	Northern Right Whale	1.131
27	MMN	marine mammals other	Monachus monachus	Mediterranean Monk Seal	1.121
28	BEB	cetacean	Berardius bairdii	Baird's Beaked Whale	1.115
29	BAO	cetacean	Balaenoptera omurai	Omura' Whale	1.112
30	SBG	seabirds	Sterna bergii	Great Crested Tern	1.092
31	LHM	seabirds	Larus hemprichii	Sooty Gull	1.088
32	DAL	cetacean	Phocoenoides dalli	Dall's Porpoise	1.087
33	CEE	cetacean	Cephalorhynchus eutropia	Chilean Dolphin	1.084
34	PUM	seabirds	Puffinus mauretanicus	Balearic shearwater	1.076
35	LGA	cetacean	Lagenorhynchus acutus	Atlantic White-sided Dolphin	1.066
36	LGB	cetacean	Lagenorhynchus albirostris	White-beaked Dolphin	1.060
37	EIM	turtle	Eretmochelys imbricata	Hawksbill Turtle	1.054
38	CTM	shark	Cetorhinus maximus	Basking shark	1.045
39	LPK	turtle	Lepidochelys kempii	Kemp's Ridley Turtle	1.021
40	GRG	cetacean	Grampus griseus	Risso's Dolphin	1.015
41	CAC	turtle	Caretta caretta	Loggerhead Turtle	0.999
42	DCC	turtle	Dermochelys coriacea	Leatherback Turtle	0.999
43	LAA	seabirds	Larus armenicus	Armenian Gull	0.991
44	PCC	seabirds	Pelecanus onocrotalus	White Pelican	0.975
45	DEL	cetacean	Delphinapterus leucas	Beluga	0.971
46	IPA	shark	Isurus paucus	Longfin Mako shark	0.966
47	PHA	seabirds	Phoebastria_albatrus	Short-tailed Albatross	0.958
48	LLE	seabirds	Larus leucophthalmus	White-eyed Gull	0.951
49	DDE	cetacean	Delphinus delphis	Common Dolphin	0.949
50	LGH	cetacean	Lagenodelphis hosei	Fraser's Dolphin	0.946
51	PUC	seabirds	Puffinus creatopus	Pink-footed Shearwater	0.945
52	CHM	turtle	Chelonia mydas	Green Turtle	0.944
53	RHT	shark	Rhincodon typus	Whale Shark	0.943
54	OFL	marine mammals other	Arctocephalus australis	South American Seal	0.939
55	HYA	cetacean	Hyperoodon ampullatus	Northern Bottlenose Whale	0.931
56	CCC	shark	Carcharodon carcharias	Great White Shark	0.928
57	LMN	shark	Lamna nasus	Porbeagle shark	0.924
58	SNL	cetacean	Stenella longirostris	Spinner Dolphin	0.921
59	SNA	cetacean	Stenella attenuata	Pantropical Spotted Dolphin	0.918
60	IOX	shark	Isurus oxyrinchus	Shortfin Mako shark	0.911
61	SNR	cetacean	Stenella coeruleoalba	Striped Dolphin	0.901
62	TUT	cetacean	Tursiops truncatus	Bottlenosed Dolphin	0.894
63	PTG	seabirds	Pterodroma phaeopygia	Dark-rumped Petrel	0.886
64	BOB	cetacean	Balaenoptera borealis	Sei Whale	0.870
65	BAP	cetacean	Balaenoptera physalus	Fin Whale	0.868
66	MNV	cetacean	Megaptera novaeangliae	Humpback Whale	0.866
67	PYM	cetacean	Physeter macrocephalus	Sperm Whale	0.864
68	OOR	cetacean	Orcinus orca	Killer whale	0.863
69	MMO	cetacean	Monodon monoceros	Narwhal	0.858
70	BMU	cetacean	Balaenoptera musculus	Blue Whale	0.842
71	PIR	seabirds	Phoebastria_irrorata	Waved Albatross	0.835
72	PCR	seabirds	Pelecanus crispus	Dalmatian Pelican	0.824

73	POB	cetacean	Pontoporia blainvillei	La Plata Dolphin	0.823
74	LGO	cetacean	Lagenorhynchus obscurus	Dusky Dolphin	0.777
75	LGS	cetacean	Lagenorhynchus australis	Peale's Dolphin	0.766
76	SNC	cetacean	Stenella clymene	Clymene dolphin	0.765
77	PHI	seabirds	Phoebastria_immutabilis	Laysan Albatross	0.726
78	LOP	marine mammals other	Lontra provocax	Southern River Otter	0.700
79	LAT	seabirds	Larus atlanticus	Olrog's Gull	0.692
80	GLM	cetacean	Globicephala melas	Long-finned Pilot Whale	0.690
81	CEC	cetacean	Cephalorhynchus commersonii	Commerson's Dolphin	0.646
82	DIM	seabirds	Thalassarche_melanophrys	Black-browed Albatross	0.638
83	PCW	seabirds	Procellaria westlandica	Westland Petrel	0.609
84	DNB	seabirds	Thalassarche_bulleri	Buller's Albatross	0.599
85	PHN	seabirds	Phoebastria_nigripes	Black-footed Albatross	0.598
86	EBA	cetacean	Eubalaena australis	Southern Right Whale	0.598
87	BAB	cetacean	Balaenoptera bonaerensis	Antarctic Minke whale	0.559
88	PRK	seabirds	Procellaria parkinsoni	Black Petrel	0.557
89	POD	cetacean	Phocoena dioptrica	Spectacled Porpoise	0.539
90	PHF	seabirds	Phoebetria fusca	Sooty Albatross	0.528
91	THH	seabirds	Thalassarche_chlororhynchos	Yellow-nosed Albatross	0.527
92	PRO	seabirds	Procellaria aequinoctialis	White-chinned Petrel	0.526
93	THC	seabirds	Thalassarche_cauta	Shy Albatross	0.518
94	PCI	seabirds	Procellaria cinerea	Grey Petrel	0.515
95	ORH	cetacean	Orcaella heinsohni	Australian Snubfin dolphin	0.511
96	DIC	seabirds	Thalassarche_chrysostoma	Grey-headed Albatross	0.502
97	MAI	seabirds	Macronectes giganteus	Southern Giant Petrel	0.496
98	DIP	seabirds	Diomedea epomophora	Royal Albatross	0.495
99	DIX	seabirds	Diomedea exulans	Wandering Albatross	0.488
100	MAH	seabirds	Macronectes halli	Northern Giant Petrel	0.487
101	PCO	seabirds	Procellaria conspicillata	Spectacled Petrel	0.478
102	PXP	seabirds	Phalacrocorax pygmeus	Pygmy Cormorant	0.469
103	PHE	seabirds	Phoebetria palpebrata	Light-mantled Sooty Albatross	0.462
104	POW	seabirds	Pterodroma cahow	Cahow Bermuda Petrel	0.376
105	PTT	seabirds	Pterodroma atrata	Henderson Petrel	0.325
106	STB	seabirds	Sterna bernsteini	Chinese Crested Tern	0.021
107	LSA	seabirds	Larus saundersi	Saunder's Gull	0.017
108	STI	seabirds	Sterna lorata	Peruvian tern	0.015
109	STV	seabirds	Sterna sandvicensis	Sandwich Tern	0.015
110	STE	seabirds	Sterna balaenarum	Damara Tern	0.014
111	STR	seabirds	Sterna repressa	White-cheeked Tern	0.013
112	STS	seabirds	Sterna saundersi	Saunder's Tern	0.013
113	STG	seabirds	Sterna bengalensis	Lesser Crested Tern	0.013
114	STN	seabirds	Sterna nilotica	Gull-billed Tern	0.013
115	STF	seabirds	Sterna albifrons	Little Tern	0.012
116	SDG	seabirds	Sterna dougallii	Roseate Tern	0.012
117	CAT	seabirds	Sterna caspia	Caspian Tern	0.012
118	STH	seabirds	Sterna hirundo	Common Tern	0.010
119	BAE	cetacean	Balaenoptera edeni	Bryde's whale	0.009
120	DAM	seabirds	Diomedea amsterdamensis	Amsterdam Albatross	0.006
121	CAM	cetacean	Caperea marginata	Pygmy Right whale	0.006
122	LRL	seabirds	Larus relictus	Relict Gull	0.005
123	STP	seabirds	Sterna paradisaea	Arctic Tern	0.005

b) Un-weighted exposure of seabirds

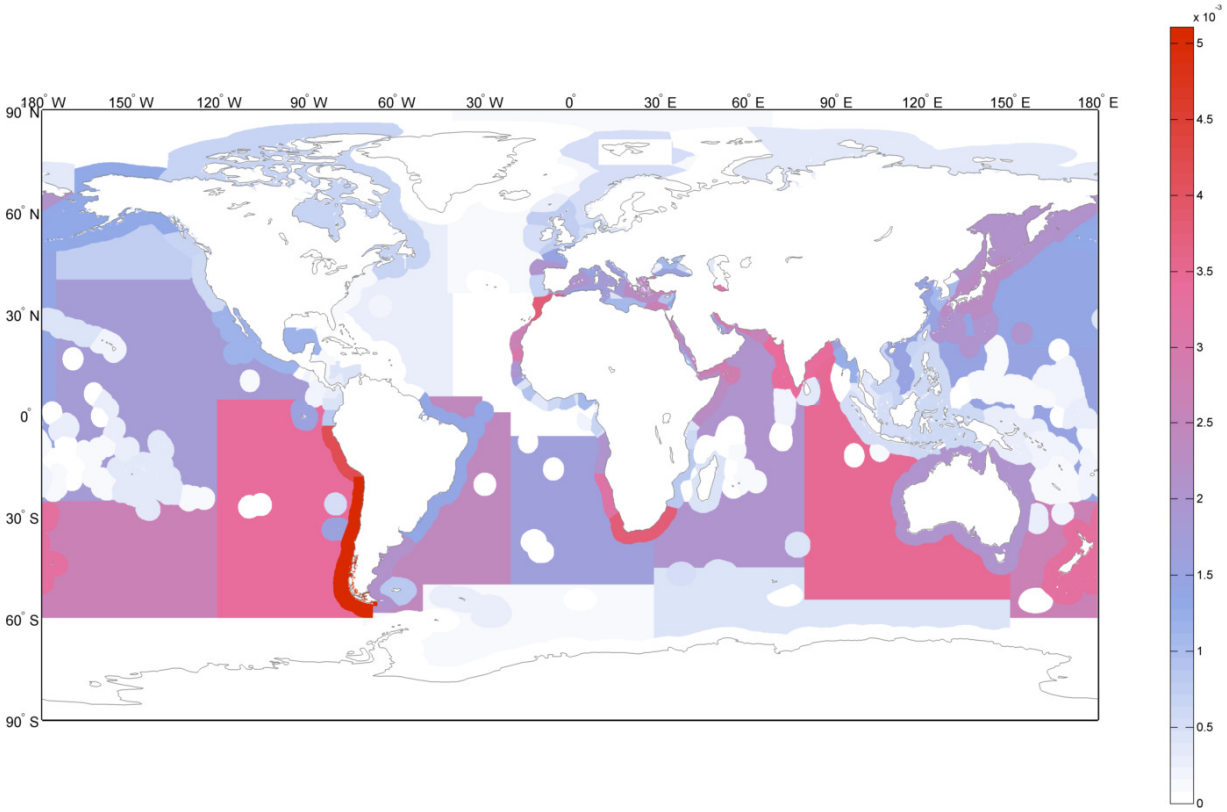

Figure 17 - EEZs and High Seas FAO areas showing with the un-weighted exposures summed across seabirds. Areas with colours furthest up the scale bar (red colours) had higher seabird exposures.

Table 27 - Seabirds ranked by their un-weighted exposure index

Rank	Species code	Family	Species	Common name	Un-weighted exposure index
4	STM	seabirds	Sterna maxima	Royal Tern	1.831
7	SYW	seabirds	Synthliboramphus wumizusume	Japanese Murrelet	1.493
10	SPD	seabirds	Spheniscus demersus	African Penguin	1.399
11	LAU	seabirds	Larus audouinii	Audouin's Gull	1.379
12	PHG	seabirds	Phalacrocorax nigrogularis	Socotra Cormorant	1.349
14	LIC	seabirds	Larus ichthyaetus	Great Black-headed Gull	1.316
16	PEG	seabirds	Pelecanoides garnotii	Peruvian diving petrel	1.254
17	SPH	seabirds	Spheniscus humboldti	Humboldt Penguin	1.242
18	LGE	seabirds	Larus genei	Slender-billed Gull	1.233
21	LML	seabirds	Larus melanocephalus	Mediterranean Gull	1.176
30	SBG	seabirds	Sterna bergii	Great Crested Tern	1.092
31	LHM	seabirds	Larus hemprichii	Sooty Gull	1.088
34	PUM	seabirds	Puffinus mauretanicus	Balearic shearwater	1.076
43	LAA	seabirds	Larus armenicus	Armenian Gull	0.991
44	PCC	seabirds	Pelecanus onocrotalus	White Pelican	0.975
47	PHA	seabirds	Phoebastria_albatrus	Short-tailed Albatross	0.958
48	LLE	seabirds	Larus leucophthalmus	White-eyed Gull	0.951

51	PUC	seabirds	Puffinus creatopus	Pink-footed Shearwater	0.945
63	PTG	seabirds	Pterodroma phaeopygia	Dark-rumped Petrel	0.886
71	PIR	seabirds	Phoebastria_irrorata	Waved Albatross	0.835
72	PCR	seabirds	Pelecanus crispus	Dalmatian Pelican	0.824
77	PHI	seabirds	Phoebastria_immutabilis	Laysan Albatross	0.726
79	LAT	seabirds	Larus atlanticus	Olrog's Gull	0.692
82	DIM	seabirds	Thalassarche melanophrys	Black-browed Albatross	0.638
83	PCW	seabirds	Procellaria westlandica	Westland Petrel	0.609
84	DNB	seabirds	Thalassarche bulleri	Buller's Albatross	0.599
85	PHN	seabirds	Phoebastria nigripes	Black-footed Albatross	0.598
88	PRK	seabirds	Procellaria parkinsoni	Black Petrel	0.557
90	PHF	seabirds	Phoebetria fusca	Sooty Albatross	0.528
91	THH	seabirds	Thalassarche chlororhynchos	Yellow-nosed Albatross	0.527
92	PRO	seabirds	Procellaria aequinoctialis	White-chinned Petrel	0.526
93	THC	seabirds	Thalassarche cauta	Shy Albatross	0.518
94	PCI	seabirds	Procellaria cinerea	Grey Petrel	0.515
96	DIC	seabirds	Thalassarche chrysostoma	Grey-headed Albatross	0.502
97	MAI	seabirds	Macronectes giganteus	Southern Giant Petrel	0.496
98	DIP	seabirds	Diomedea epomophora	Royal Albatross	0.495
99	DIX	seabirds	Diomedea exulans	Wandering Albatross	0.488
100	MAH	seabirds	Macronectes halli	Northern Giant Petrel	0.487
101	PCO	seabirds	Procellaria conspicillata	Spectacled Petrel	0.478
102	PXP	seabirds	Phalacrocorax pygmeus	Pygmy Cormorant	0.469
103	PHE	seabirds	Phoebetria palpebrata	Light-mantled Sooty Albatross	0.462
104	POW	seabirds	Pterodroma cahow	Cahow Bermuda Petrel	0.376
105	PTT	seabirds	Pterodroma atrata	Henderson Petrel	0.325
106	STB	seabirds	Sterna bernsteini	Chinese Crested Tern	0.021
107	LSA	seabirds	Larus saundersi	Saunder's Gull	0.017
108	STI	seabirds	Sterna lorata	Peruvian tern	0.015
109	STV	seabirds	Sterna sandvicensis	Sandwich Tern	0.015
110	STE	seabirds	Sterna balaenarum	Damara Tern	0.014
111	STR	seabirds	Sterna repressa	White-cheeked Tern	0.013
112	STS	seabirds	Sterna saundersi	Saunder's Tern	0.013
113	STG	seabirds	Sterna bengalensis	Lesser Crested Tern	0.013
114	STN	seabirds	Sterna nilotica	Gull-billed Tern	0.013
115	STF	seabirds	Sterna albifrons	Little Tern	0.012
116	SDG	seabirds	Sterna dougallii	Roseate Tern	0.012
117	CAT	seabirds	Sterna caspia	Caspian Tern	0.012
118	STH	seabirds	Sterna hirundo	Common Tern	0.010
120	DAM	seabirds	Diomedea amsterdamensis	Amsterdam Albatross	0.006
122	LRL	seabirds	Larus relictus	Relict Gull	0.005
123	STP	seabirds	Sterna paradisaea	Arctic Tern	0.005

c) Un-weighted exposure of sea turtles

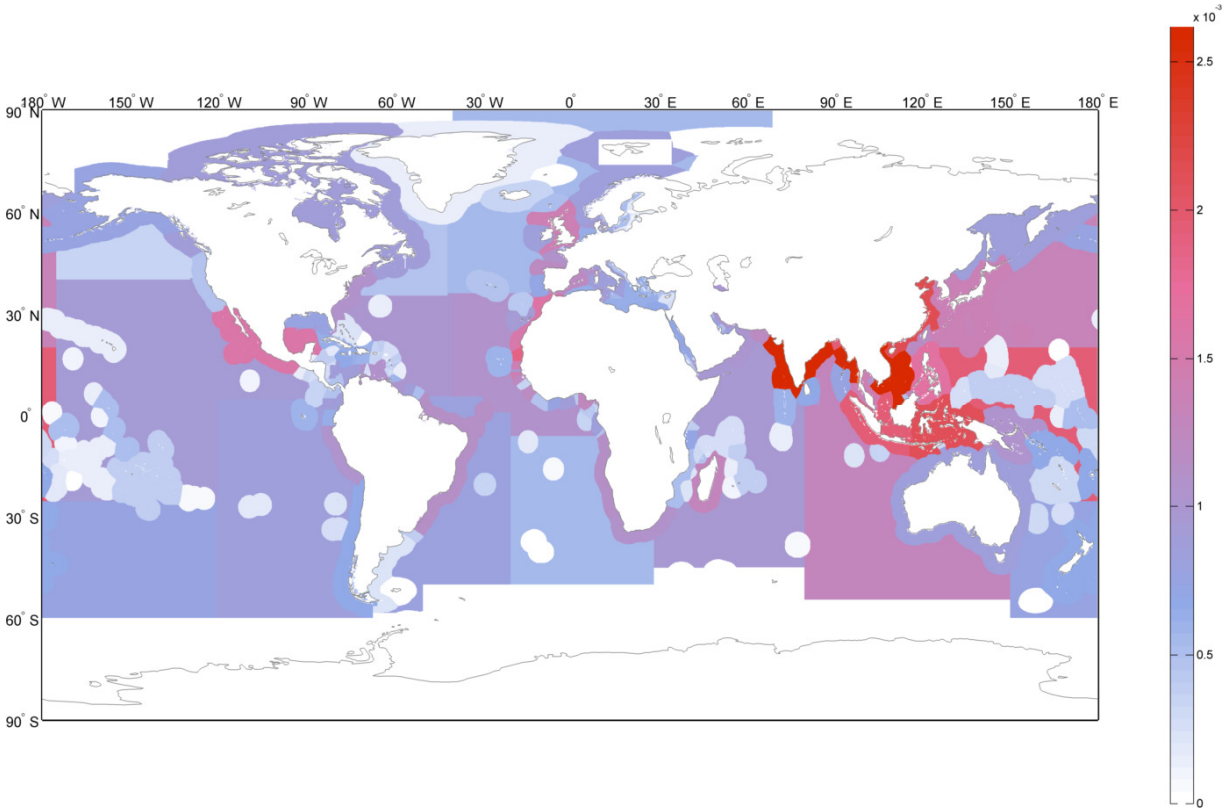

Figure 18 - EEZs and High Seas FAO areas showing with the un-weighted exposures summed across turtles. Areas with colours furthest up the scale bar (red colours) had higher turtle exposures.

Table 28 - Turtles ranked by their un-weighted exposure index

Rank	Species code	Family	Species	Common name	Un-weighted exposure index
22	LPV	turtle	Lepidochelys olivacea	Olive Ridley Turtle	1.175
37	EIM	turtle	Eretmochelys imbricata	Hawksbill Turtle	1.054
39	LPK	turtle	Lepidochelys kempii	Kemp's Ridley Turtle	1.021
41	CAC	turtle	Caretta caretta	Loggerhead Turtle	0.999
42	DCC	turtle	Dermochelys coriacea	Leatherback Turtle	0.999
52	CHM	turtle	Chelonia mydas	Green Turtle	0.944

d) Un-weighted exposure of sharks

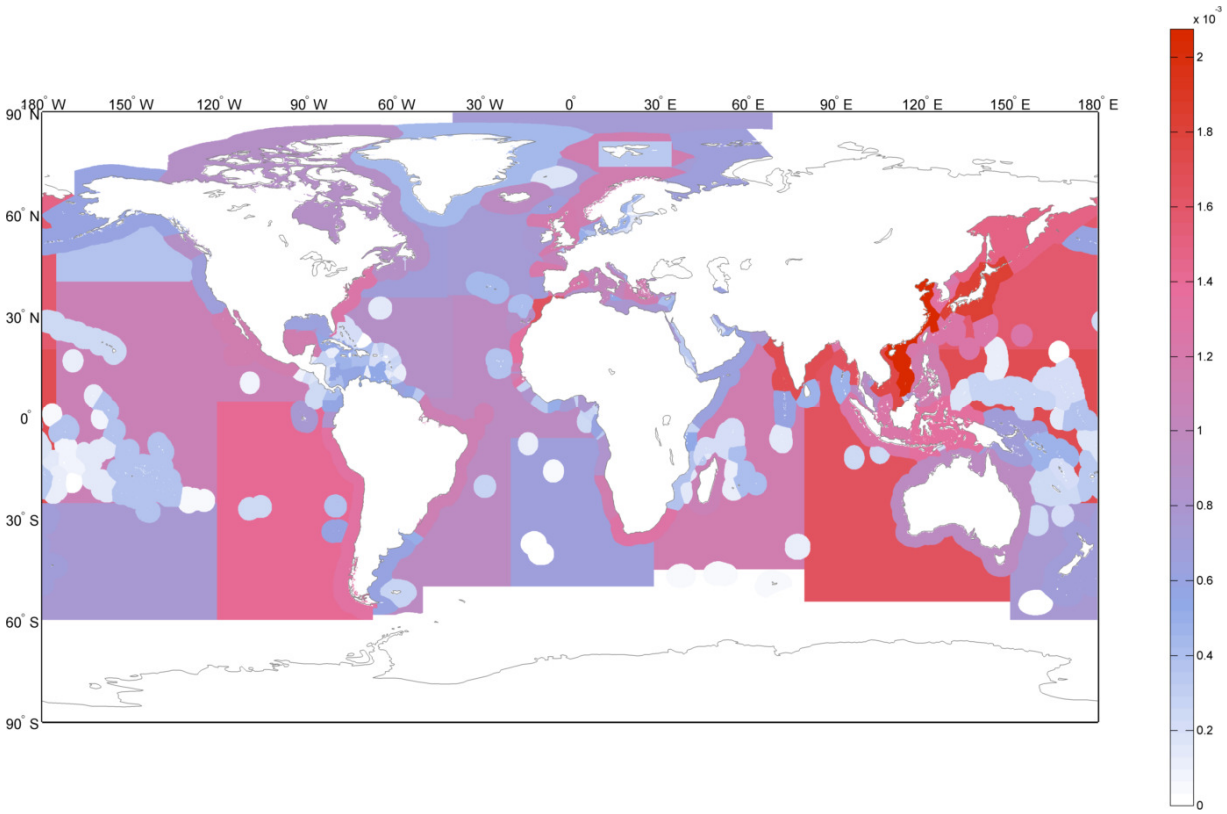

Figure 19 - EEZs and High Seas FAO areas showing with the un-weighted exposures summed across sharks. Areas with colours furthest up the scale bar (red colours) had higher shark exposures.

Table 29 - Sharks ranked by their un-weighted exposure index

Rank	Species code	Family	Species	Common name	Un-weighted exposure index
38	CTM	shark	Cetorhinus maximus	Basking shark	1.045
46	IPA	shark	Isurus paucus	Longfin Mako shark	0.966
53	RHT	shark	Rhincodon typus	Whale Shark	0.943
56	CCC	shark	Carcharodon carcharias	Great White Shark	0.928
57	LMN	shark	Lamna nasus	Porbeagle shark	0.924
60	IOX	shark	Isurus oxyrinchus	Shortfin Mako shark	0.911

e) Un-weighted exposure of pinnipeds and otters;

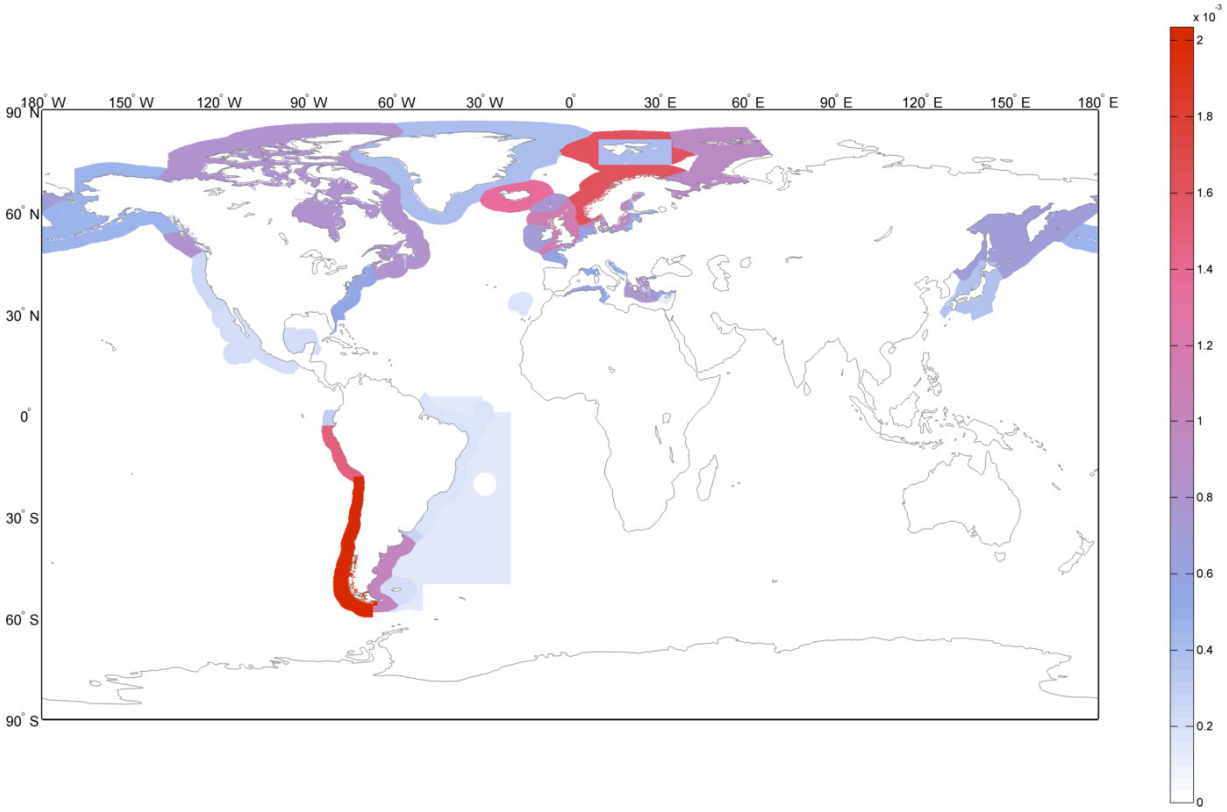

Figure 20 - EEZs and High Seas FAO areas showing with the un-weighted exposures summed across pinnipeds and otters. Areas with colours furthest up the scale bar (red colours) had higher pinniped and otter exposures.

Table 30 - Seal, sea lions and otters ranked by their un-weighted exposure index

Rank	Species code	Family	Species	Common name	Un-weighted exposure index
13	HGR	marine mammals other	Halichoerus grypus	Grey Seal	1.328
19	PHV	marine mammals other	Phoca vitulina	Common Seal	1.194
20	LOF	marine mammals other	Lontra felina	Marine Otter	1.177
27	MMN	marine mammals other	Monachus monachus	Mediterranean Monk Seal	1.121
54	OFL	marine mammals other	Arctocephalus australis	South American Seal	0.939

5. Results by EEZ and High Seas FAO areas

a) High Seas FAO areas and EEZ sorted by their contribution in the un-weighted exposure for all species

Table 31 - EEZs and high seas FAO areas sorted presenting the highest un-weighted exposure for all species

Rank	EEZ or High Seas FAO area	Sum of all species un-weighted exposure index
1	Myanmar	1.530
2	Vietnam	1.497
3	India	1.478
4	Russia Pacific	1.325
5	China	1.240
6	Peru	1.218
7	Chile	1.190
8	Norway	1.173
9	Bangladesh	1.157
10	Morocco	1.146
11	Indonesia (Western)	1.106
12	Namibia	1.103
13	Japan Main Isl.	1.102
14	Indonesia (Eastern)	1.072
15	Western Sahara (Morocco)	1.063
16	Mauritania	1.051
17	Iceland	1.006
18	South Africa	0.992
19	Angola	0.950
20	Nigeria	0.917
21	Sierra Leone	0.890
22	Guinea	0.883
23	United Kingdom	0.875
24	Philippines	0.834
25	Pacific Northwest - High seas Areas	0.825
26	Bahrain	0.823
27	Japan Outer Isl.	0.823
28	Senegal	0.805
29	Greece	0.804
30	Cameroon	0.797
31	Pacific Western Central - High seas Areas	0.795
32	Malaysia West	0.793
33	Malaysia East	0.787
34	Thailand	0.778
35	Korea South	0.771
36	Pakistan	0.765
37	Iran	0.758
38	Yemen	0.747
39	Malaysia Sarawak	0.743
40	Russia Barrents Sea	0.742
41	United Arab Emirates	0.742
42	Indian Ocean Eastern - High seas Areas	0.740
43	Korea North	0.738
44	Saudi Arabia Persian Gulf	0.737
45	Malaysia Sabah	0.736
46	Spain	0.734
47	Svalbard Isl. (Norway)	0.728
48	Alaska	0.713
49	Galapagos Isl.(Ecuador)	0.697
50	Turkey Mediterranean Sea	0.688
51	Somalia	0.678
52	Denmark	0.671
53	Algeria	0.666

54	Tunisia	0.656
55	Ghana	0.655
56	Gambia	0.650
57	Brazil	0.647
58	Oman	0.625
59	J. Fernandez, Felix and Ambrosio Isl. (Chile)	0.624
60	Argentina	0.623
61	Greenland	0.620
62	Turkey Black Sea	0.620
63	Madagascar	0.614
64	Cambodia	0.610
65	Canada	0.609
66	New Zealand	0.608
67	France	0.603
68	Taiwan	0.602
69	Sweden	0.577
70	Ireland	0.573
71	Cote d'Ivoire	0.572
72	Faeroe Isl.(Denmark)	0.567
73	Gabon	0.564
74	Italy	0.563
75	Pacific Southeast - High seas Areas	0.561
76	Sudan	0.542
77	Mexico	0.533
78	Saudi Arabia Red Sea	0.531
79	Croatia	0.527
80	Australia	0.525
81	Papua New Guinea	0.523
82	Qatar	0.511
83	USA East Coast	0.510
84	Egypt	0.507
85	Uruguay	0.502
86	Indian Ocean Western - High seas Areas	0.502
87	Lebanon	0.487
88	Pacific Eastern Central - High seas Areas	0.484
89	Atlantic Southwest - High seas Areas	0.449
90	Congo Republic	0.448
91	Pacific Southwest - High seas Areas	0.441
92	Kuwait	0.441
93	Tanzania	0.434
94	Poland	0.433
95	Netherlands	0.428
96	Germany	0.419
97	Ecuador	0.406
98	Atlantic Eastern Central - High seas Areas	0.402
99	Atlantic Western Central - High seas Areas	0.400
100	Libya	0.395
101	Syria	0.392
102	Israel	0.381
103	Finland	0.378
104	Guyana	0.378
105	Portugal	0.359
106	Congo	0.355
107	Pacific Northeast - High seas Areas	0.352
108	Solomon Isl.	0.352
109	Atlantic Northeast - High seas Areas	0.352
110	Canary Isl.(Spain)	0.348
111	USA West Coast	0.347
112	Venezuela	0.342
113	Mozambique	0.340
114	Liberia	0.339
115	Andaman & Nicobar Isl. (India)	0.339
116	Sri Lanka	0.337
117	Latvia	0.335
118	Suriname	0.328
119	Hong Kong	0.324
120	Montenegro	0.323
121	Eritrea	0.321
122	Russia Baltic Sea Kaliningrad	0.318
123	Atlantic Northwest - High seas Areas	0.318

124	Togo	0.317
125	Benin	0.316
126	Jan Mayen Isl. (Norway)	0.314
127	Atlantic SouthEast - High seas Areas	0.312
128	Maldives	0.302
129	Cyprus	0.298
130	Colombia	0.291
131	USA Golf Of Mexico	0.291
132	Malta	0.282
133	Falkland Isl. (Malvinas)(Disputed)	0.279
134	Estonia	0.272
135	Ukraine	0.270
136	Brunei	0.267
137	Channel Isl.(UK)	0.262
138	Jamaica	0.261
139	Fiji	0.256
140	Guinea-Bissau	0.247
141	Desventuradas Isl.(Chile)	0.245
142	Albania	0.244
143	Cuba	0.243
144	Haiti	0.243
145	Singapore	0.243
146	Lithuania	0.239
147	Haiwaii NorthWest Isl.	0.230
148	Dominican Rep.	0.230
149	Kenya	0.225
150	Gaza Strip	0.223
151	Russia Siberia	0.223
152	Mayotte (FR)	0.218
153	Panama	0.214
154	Cape Verde	0.213
155	Sao Tome & Principe	0.206
156	French Polynesia	0.205
157	Equatorial Guinea	0.204
158	Kiribati	0.201
159	French Guyana	0.197
160	Macau (China)	0.194
161	Mauritius	0.192
162	Madeira Isl.(Portugal)	0.190
163	Trinidad & Tobago	0.180
164	Belgium	0.179
165	Azores Isl.(Portugal)	0.178
166	Iraq	0.169
167	Martinique	0.164
168	Timor Leste	0.164
169	Honduras	0.163
170	Christmas Isl.(Australia)	0.161
171	St Pierre & Miquelon (FR)	0.159
172	Bermuda (UK)	0.158
173	Vanuatu	0.156
174	Costa Rica	0.155
175	Micronesia	0.155
176	Jordan	0.155
177	Bosnia	0.152
178	Brit. Virgin Isl.(UK)	0.150
179	Russia Black Sea	0.150
180	Djibouti	0.150
181	Cocos Isl.(Australia)	0.148
182	Guadeloupe (FR)	0.144
183	Comoros Isl.	0.143
184	Trindade & Matin Isl (BR)	0.140
185	New Caledonia	0.140
186	St Lucia	0.137
187	Lord Howe Isl. (Australia)	0.136
188	El Salvador	0.135
189	Dominica	0.133
190	Puerto Rico (US)	0.131
191	Seychelles	0.126
192	Palau	0.121
193	Georgia	0.119

194	St Paul & Amsterdam (FR)	0.118
195	Monaco	0.116
196	Marshall Isl.	0.115
197	Norfolk Isl. (Australia)	0.115
198	Tuvalu	0.111
199	Easter Isl.(Chile)	0.110
200	Nicaragua	0.109
201	Antigua & Barbuda	0.105
202	Grenada	0.105
203	Prince Edward Isl. (SA)	0.105
204	Anguila (UK)	0.104
205	Wallis & Futuna (FR)	0.100
206	Haiwaii Main Isl.	0.099
207	Kerguelen Isl. (FR)	0.095
208	St Vincent & The Grenadines	0.093
209	Romania	0.091
210	Bulgaria	0.089
211	Pitcairn (UK)	0.089
212	Crozet Isl.(FR)	0.084
213	Mozambique Channel Isl. (FR)	0.083
214	Leeward Netherland Antilles	0.083
215	Bahamas	0.081
216	St Kitts & Nevis	0.081
217	Indian Ocean Antarctic - High seas Areas	0.080
218	Windward Netherlands Antilles	0.079
219	Tonga	0.077
220	Montserrat (UK)	0.075
221	Cook Isl.(New Zealand)	0.073
222	Brit. Indian Oce (UK)	0.070
223	Slovenia	0.070
224	Cayman Isl.(UK)	0.069
225	Guam (US)	0.068
226	Ascencion Isl.	0.068
227	Arctic Sea - High seas Areas	0.067
228	American Samoa	0.065
229	Nauru	0.063
230	Tromelin Isl.(FR)	0.063
231	Barbados	0.061
232	Palmyra Atoll & Kingman Reef (US)	0.060
233	Belize	0.059
234	South Georgia & Sandwich Isl. (UK)	0.057
235	Northern Marianas (US)	0.057
236	Guatemala	0.056
237	Clipperton Isl.(FR)	0.056
238	Reunion (FR)	0.055
239	Samoa	0.052
240	Johnston Atoll (US)	0.046
241	Tokelau (NZ)	0.044
242	Jarvis Isl.(US)	0.041
243	Howland & Baker Isl.(US)	0.028
244	St Helena (UK)	0.026
245	Atlantic Antarctic - High seas Areas	0.021
246	Macquarie Isl.(Australia)	0.000
247	Bouvet Isl.(Norway)	0.000
248	Gibraltar (UK)	0.000
249	Heard & McDonald Isl.(Australia)	0.000
250	Niue (NZ)	0.000
251	Russia Baltic Sea St Petersburg	0.000
252	Turks & Caicos Isl (UK)	0.000
253	Navassa Isl. (Haiti)	0.000
254	Wake Isl.(US)	0.000
255	Pacific Antarctic - High seas Areas	0.000

b) High Seas FAO areas and EEZ sorted by their contribution in the IUCN weighted exposure for all species

Table 32 - EEZs and high seas FAO areas sorted presenting the highest IUCN weighted exposure for all species

Rank	EEZ or High Seas FAO area	Sum of all species IUCN weighted exposure index
1	Myanmar	1.539
2	Vietnam	1.518
3	Peru	1.488
4	India	1.432
5	Russia Pacific	1.294
6	Chile	1.280
7	South Africa	1.271
8	China	1.268
9	Namibia	1.246
10	Greece	1.195
11	Galapagos Isl.(Ecuador)	1.164
12	Bangladesh	1.132
13	Japan Main Isl.	1.121
14	Indonesia (Western)	1.115
15	Indonesia (Eastern)	1.075
16	Norway	1.057
17	Mauritania	1.011
18	United Kingdom	0.987
19	Algeria	0.976
20	Morocco	0.949
21	Western Sahara (Morocco)	0.947
22	Pacific Western Central - High seas Areas	0.917
23	Iceland	0.908
24	Tunisia	0.873
25	Japan Outer Isl.	0.860
26	Turkey Mediterranean Sea	0.851
27	Pacific Northwest - High seas Areas	0.848
28	Philippines	0.836
29	Bahrain	0.826
30	Korea South	0.808
31	Malaysia East	0.805
32	Malaysia West	0.802
33	Angola	0.795
34	Thailand	0.794
35	Croatia	0.792
36	Korea North	0.777
37	Malaysia Sarawak	0.767
38	Denmark	0.762
39	Indian Ocean Eastern - High seas Areas	0.753
40	Malaysia Sabah	0.742
41	Nigeria	0.741
42	Guinea	0.735
43	Sierra Leone	0.727
44	Saudi Arabia Persian Gulf	0.725
45	Senegal	0.721
46	Spain	0.710
47	Mexico	0.687
48	United Arab Emirates	0.687
49	Pacific Southeast - High seas Areas	0.684
50	Alaska	0.681
51	France	0.672
52	Iran	0.669
53	Brazil	0.668
54	Ireland	0.667
55	USA East Coast	0.667
56	Cameroon	0.663
57	Pakistan	0.639
58	Yemen	0.636

59	J. Fernandez, Felix and Ambrosio Isl. (Chile)	0.628
60	Madagascar	0.626
61	Argentina	0.623
62	Cambodia	0.618
63	Taiwan	0.612
64	New Zealand	0.587
65	Canada	0.578
66	Ecuador	0.572
67	Somalia	0.553
68	Pacific Eastern Central - High seas Areas	0.544
69	Oman	0.540
70	Papua New Guinea	0.536
71	Gambia	0.533
72	Indian Ocean Western - High seas Areas	0.524
73	Ghana	0.524
74	Atlantic Southwest - High seas Areas	0.505
75	Canary Isl.(Spain)	0.502
76	Qatar	0.499
77	Montenegro	0.496
78	Venezuela	0.489
79	Uruguay	0.486
80	Gabon	0.485
81	Russia Barrents Sea	0.485
82	Italy	0.485
83	Netherlands	0.471
84	Germany	0.467
85	Atlantic Western Central - High seas Areas	0.465
86	Svalbard Isl. (Norway)	0.461
87	Faeroe Isl.(Denmark)	0.459
88	Atlantic Eastern Central - High seas Areas	0.457
89	Cote d'Ivoire	0.456
90	Australia	0.451
91	Sweden	0.449
92	Pacific Southwest - High seas Areas	0.446
93	Portugal	0.435
94	Guyana	0.430
95	Kuwait	0.425
96	Mozambique	0.423
97	USA Golf Of Mexico	0.420
98	Greenland	0.407
99	Sudan	0.398
100	Egypt	0.379
101	Saudi Arabia Red Sea	0.378
102	Colombia	0.376
103	Suriname	0.373
104	Pacific Northeast - High seas Areas	0.372
105	Tanzania	0.370
106	Solomon Isl.	0.369
107	Libya	0.367
108	Atlantic Northwest - High seas Areas	0.365
109	Andaman & Nicobar Isl. (India)	0.364
110	USA West Coast	0.363
111	Atlantic SouthEast - High seas Areas	0.363
112	Congo Republic	0.355
113	Sri Lanka	0.335
114	Malta	0.333
115	Hong Kong	0.327
116	Atlantic Northeast - High seas Areas	0.322
117	Cape Verde	0.308
118	Fiji	0.305
119	Jamaica	0.299
120	Madeira Isl.(Portugal)	0.295
121	Maldives	0.295
122	Haiwaii NorthWest Isl.	0.292
123	Channel Isl.(UK)	0.291
124	Congo	0.281
125	Falkland Isl. (Malvinas) (Disputed)	0.281
126	Haiti	0.276
127	Panama	0.275
128	Cuba	0.274

129	Liberia	0.272
130	Brunei	0.270
131	Poland	0.268
132	French Polynesia	0.262
133	Dominican Rep.	0.262
134	Azores Isl.(Portugal)	0.259
135	Turkey Black Sea	0.252
136	Togo	0.251
137	Benin	0.250
138	Trinidad & Tobago	0.249
139	Lebanon	0.247
140	Singapore	0.245
141	Kiribati	0.241
142	Desventuradas Isl.(Chile)	0.237
143	Eritrea	0.237
144	Finland	0.237
145	Jan Mayen Isl. (Norway)	0.229
146	Albania	0.228
147	Bosnia	0.227
148	Mayotte (FR)	0.224
149	French Guyana	0.224
150	Sao Tome & Principe	0.217
151	Israel	0.215
152	Bermuda (UK)	0.212
153	Cyprus	0.209
154	Latvia	0.207
155	Costa Rica	0.206
156	Guinea-Bissau	0.197
157	Belgium	0.196
158	Macau (China)	0.196
159	Mauritius	0.196
160	Russia Baltic Sea Kaliningrad	0.195
161	Syria	0.190
162	Kenya	0.190
163	Honduras	0.190
164	Martinique	0.186
165	El Salvador	0.184
166	Equatorial Guinea	0.183
167	Gaza Strip	0.179
168	Micronesia	0.174
169	Brit. Virgin Isl.(UK)	0.171
170	Estonia	0.168
171	Vanuatu	0.167
172	Trindade & Matin Isl (BR)	0.166
173	Timor Leste	0.165
174	Ukraine	0.164
175	Christmas Isl.(Australia)	0.164
176	Guadeloupe (FR)	0.164
177	St Pierre & Miquelon (FR)	0.162
178	Iraq	0.162
179	New Caledonia	0.157
180	St Lucia	0.156
181	Grenada	0.152
182	Dominica	0.151
183	Puerto Rico (US)	0.149
184	Cocos Isl.(Australia)	0.148
185	Russia Siberia	0.147
186	Comoros Isl.	0.146
187	Lithuania	0.146
188	Lord Howe Isl. (Australia)	0.143
189	Seychelles	0.138
190	Nicaragua	0.136
191	St Paul & Amsterdam (FR)	0.134
192	Norfolk Isl. (Australia)	0.134
193	Tuvalu	0.132
194	Palau	0.132
195	Marshall Isl.	0.131
196	Antigua & Barbuda	0.121
197	Leeward Netherland Antilles	0.120
198	Pitcairn (UK)	0.119

199	St Vincent & The Grenadines	0.119
200	Wallis & Futuna (FR)	0.119
201	Anguila (UK)	0.118
202	Prince Edward Isl. (SA)	0.114
203	Easter Isl.(Chile)	0.114
204	Djibouti	0.111
205	Bahamas	0.100
206	Haiwaii Main Isl.	0.099
207	Monaco	0.095
208	Mozambique Channel Isl. (FR)	0.093
209	St Kitts & Nevis	0.092
210	Tonga	0.091
211	Windward Netherlands Antilles	0.090
212	Russia Black Sea	0.089
213	Crozet Isl.(FR)	0.088
214	Montserrat (UK)	0.086
215	Jordan	0.083
216	Cook Isl.(New Zealand)	0.081
217	Kerguelen Isl. (FR)	0.081
218	Guam (US)	0.079
219	Cayman Isl.(UK)	0.078
220	Ascencion Isl.	0.077
221	Indian Ocean Antarctic - High seas Areas	0.077
222	Belize	0.076
223	American Samoa	0.075
224	Brit. Indian Oce (UK)	0.075
225	Nauru	0.074
226	Guatemala	0.074
227	Clipperton Isl.(FR)	0.074
228	Palmyra Atoll & Kingman Reef (US)	0.071
229	Tromelin Isl.(FR)	0.070
230	Barbados	0.070
231	Slovenia	0.063
232	Northern Marianas (US)	0.063
233	Samoa	0.062
234	Reunion (FR)	0.057
235	South Georgia & Sandwich Isl. (UK)	0.053
236	Georgia	0.053
237	Tokelau (NZ)	0.052
238	Romania	0.052
239	Johnston Atoll (US)	0.051
240	Bulgaria	0.049
241	Jarvis Isl.(US)	0.047
242	Arctic Sea - High seas Areas	0.045
243	Howland & Baker Isl.(US)	0.033
244	St Helena (UK)	0.031
245	Atlantic Antarctic - High seas Areas	0.021
246	Macquarie Isl.(Australia)	0.000
247	Bouvet Isl.(Norway)	0.000
248	Gibraltar (UK)	0.000
249	Heard & McDonald Isl.(Australia)	0.000
250	Niue (NZ)	0.000
251	Russia Baltic Sea St Petersburg	0.000
252	Turks & Caicos Isl (UK)	0.000
253	Navassa Isl. (Haiti)	0.000
254	Wake Isl.(US)	0.000
255	Pacific Antarctic - High seas Areas	0.000

c) High Seas FAO areas EEZ sorted by their contribution in the exposures for all species groups

Table 33 - High Seas FAO areas EEZ sorted by their contribution in the different exposures for all cetacean sorted by IUCN weighted exposure

EEZ, High Seas FAO area	Overall rank	Family	Overlap index	Un-weighted exposure index	IUCN weighted exposure index
Vietnam	937	cetacean	0.935	1.064	1
Myanmar	127	cetacean	0.892	1.013	0.953
India	462	cetacean	0.859	0.974	0.903
China	187	cetacean	0.766	0.875	0.801
Indonesia (Western)	477	cetacean	0.703	0.8	0.751
Russia Pacific	857	cetacean	0.783	0.928	0.743
Indonesia (Eastern)	472	cetacean	0.707	0.802	0.733
Japan Main Isl.	517	cetacean	0.663	0.76	0.655
Norway	732	cetacean	0.664	0.787	0.642
Bangladesh	57	cetacean	0.614	0.694	0.635
Chile	167	cetacean	0.58	0.642	0.571
Philippines	782	cetacean	0.548	0.622	0.57
Pacific Northwest - High seas Areas	1257	cetacean	0.589	0.662	0.549
Indian Ocean Eastern - High seas Areas	1232	cetacean	0.588	0.626	0.536
Iceland	457	cetacean	0.515	0.61	0.521
Malaysia Sarawak	612	cetacean	0.496	0.562	0.518
Korea South	547	cetacean	0.486	0.561	0.516
Malaysia East	597	cetacean	0.48	0.544	0.507
Thailand	1002	cetacean	0.474	0.538	0.502
Malaysia Sabah	602	cetacean	0.47	0.535	0.502
Malaysia West	592	cetacean	0.466	0.529	0.497
Japan Outer Isl.	522	cetacean	0.466	0.527	0.486
Korea North	542	cetacean	0.415	0.491	0.468
Canada	147	cetacean	0.438	0.515	0.419
United Kingdom	1067	cetacean	0.433	0.513	0.416
Angola	17	cetacean	0.399	0.454	0.405
Pacific Western Central - High seas Areas	1272	cetacean	0.422	0.462	0.403
South Africa	952	cetacean	0.432	0.47	0.394
Brazil	87	cetacean	0.396	0.45	0.388
Mauritania	627	cetacean	0.417	0.471	0.386
Cambodia	137	cetacean	0.359	0.408	0.384
Taiwan	192	cetacean	0.373	0.423	0.383
Peru	777	cetacean	0.397	0.448	0.378
Western Sahara (Morocco)	972	cetacean	0.402	0.453	0.374
Alaska	1082	cetacean	0.366	0.434	0.373
Namibia	672	cetacean	0.412	0.446	0.373
Madagascar	587	cetacean	0.372	0.418	0.354
Argentina	27	cetacean	0.339	0.383	0.348
Australia	32	cetacean	0.367	0.405	0.34
Pacific Southeast - High seas Areas	1262	cetacean	0.39	0.409	0.333
Morocco	657	cetacean	0.358	0.403	0.328
Nigeria	717	cetacean	0.333	0.374	0.324
Pakistan	762	cetacean	0.327	0.367	0.322
Papua New Guinea	772	cetacean	0.318	0.358	0.317
Sierra Leone	927	cetacean	0.327	0.367	0.317
Guinea	427	cetacean	0.327	0.367	0.317
USA East Coast	1117	cetacean	0.327	0.371	0.309
Mexico	637	cetacean	0.332	0.371	0.309
Greenland	402	cetacean	0.344	0.407	0.308
Indian Ocean Western - High seas Areas	1237	cetacean	0.351	0.369	0.306
Senegal	917	cetacean	0.32	0.361	0.297
Svalbard Isl. (Norway)	987	cetacean	0.359	0.425	0.296
Atlantic Southwest - High seas Areas	1217	cetacean	0.319	0.344	0.291
Cameroon	142	cetacean	0.298	0.335	0.289
Pacific Eastern Central - High seas Areas	1247	cetacean	0.32	0.356	0.288
Ireland	492	cetacean	0.292	0.346	0.283

Pacific Southwest - High seas Areas	1267	cetacean	0.314	0.327	0.278
Iran	482	cetacean	0.279	0.317	0.276
Russia Barrents Sea	842	cetacean	0.322	0.381	0.273
Faeroe Isl.(Denmark)	302	cetacean	0.275	0.326	0.265
France	327	cetacean	0.27	0.32	0.265
Somalia	947	cetacean	0.265	0.297	0.26
Spain	967	cetacean	0.242	0.287	0.259
United Arab Emirates	1027	cetacean	0.253	0.29	0.259
Denmark	262	cetacean	0.293	0.347	0.256
Atlantic Eastern Central - High seas Areas	1197	cetacean	0.265	0.294	0.247
Oman	667	cetacean	0.255	0.286	0.245
Yemen	1157	cetacean	0.25	0.281	0.243
Gambia	367	cetacean	0.255	0.287	0.236
Atlantic Western Central - High seas Areas	1222	cetacean	0.247	0.274	0.231
New Zealand	707	cetacean	0.254	0.268	0.227
Ghana	382	cetacean	0.233	0.262	0.226
Saudi Arabia Persian Gulf	912	cetacean	0.21	0.248	0.222
Atlantic Northeast - High seas Areas	1202	cetacean	0.244	0.288	0.22
Gabon	357	cetacean	0.226	0.254	0.218
Atlantic Northwest - High seas Areas	1207	cetacean	0.225	0.257	0.209
Uruguay	1132	cetacean	0.213	0.237	0.207
Solomon Isl.	107	cetacean	0.202	0.227	0.204
Tanzania	1077	cetacean	0.203	0.229	0.2
Sri Lanka	162	cetacean	0.197	0.222	0.199
Cote d'Ivoire	507	cetacean	0.205	0.23	0.199
Guyana	432	cetacean	0.225	0.249	0.198
Brunei	117	cetacean	0.172	0.196	0.183
Pacific Northeast - High seas Areas	1252	cetacean	0.173	0.196	0.182
Hong Kong	452	cetacean	0.175	0.198	0.182
Atlantic SouthEast - High seas Areas	1212	cetacean	0.205	0.217	0.179
Andaman & Nicobar Isl. (India)	467	cetacean	0.177	0.198	0.175
Bahrain	52	cetacean	0.165	0.196	0.175
USA West Coast	1112	cetacean	0.181	0.205	0.172
Suriname	982	cetacean	0.191	0.212	0.168
Sweden	992	cetacean	0.163	0.193	0.162
Canary Isl.(Spain)	962	cetacean	0.179	0.199	0.16
Netherlands	682	cetacean	0.186	0.221	0.158
Portugal	797	cetacean	0.146	0.173	0.156
Venezuela	1137	cetacean	0.177	0.196	0.155
Germany	377	cetacean	0.18	0.213	0.153
Kuwait	552	cetacean	0.145	0.172	0.153
Singapore	932	cetacean	0.141	0.16	0.151
Mozambique	662	cetacean	0.162	0.177	0.15
Egypt	1062	cetacean	0.148	0.176	0.15
Ecuador	277	cetacean	0.167	0.184	0.143
Maldives	607	cetacean	0.161	0.176	0.142
Colombia	207	cetacean	0.163	0.18	0.142
J. Fernandez, Felix and Ambrosio Isl. (Chile)	182	cetacean	0.154	0.15	0.139
Congo Republic	222	cetacean	0.146	0.163	0.139
Saudi Arabia Red Sea	907	cetacean	0.132	0.157	0.138
Jamaica	512	cetacean	0.155	0.172	0.136
Jan Mayen Isl. (Norway)	737	cetacean	0.154	0.182	0.136
Sudan	977	cetacean	0.126	0.15	0.131
Qatar	827	cetacean	0.123	0.146	0.13
USA Golf Of Mexico	1122	cetacean	0.147	0.163	0.129
Falkland Isl. (Malvinas) (Disputed)	307	cetacean	0.118	0.13	0.128
Mayotte (FR)	217	cetacean	0.129	0.145	0.127
Galapagos Isl.(Ecuador)	282	cetacean	0.149	0.163	0.125
Desventuradas Isl.(Chile)	177	cetacean	0.128	0.14	0.125
Haiti	437	cetacean	0.142	0.157	0.124
Fiji	317	cetacean	0.129	0.141	0.122
Cuba	247	cetacean	0.139	0.154	0.122
Liberia	567	cetacean	0.121	0.136	0.118
Dominican Rep.	272	cetacean	0.134	0.149	0.118
Italy	502	cetacean	0.12	0.142	0.112
Greece	397	cetacean	0.137	0.162	0.112
Congo	227	cetacean	0.115	0.129	0.11
Togo	1007	cetacean	0.113	0.127	0.11
Tunisia	1032	cetacean	0.117	0.138	0.109
Benin	257	cetacean	0.112	0.126	0.109

Macau (China)	582	cetacean	0.104	0.118	0.108
French Guyana	342	cetacean	0.119	0.132	0.105
Cape Verde	152	cetacean	0.114	0.127	0.105
Channel Isl.(UK)	1072	cetacean	0.118	0.139	0.104
Sao Tome & Principe	902	cetacean	0.109	0.122	0.104
Panama	767	cetacean	0.119	0.131	0.103
Algeria	7	cetacean	0.105	0.124	0.102
Mauritius	632	cetacean	0.112	0.123	0.101
Christmas Isl.(Australia)	197	cetacean	0.099	0.112	0.099
Kenya	537	cetacean	0.101	0.113	0.099
Timor Leste	817	cetacean	0.096	0.108	0.095
Equatorial Guinea	292	cetacean	0.093	0.104	0.088
French Polynesia	347	cetacean	0.095	0.099	0.086
Kiribati	392	cetacean	0.093	0.101	0.086
Guinea-Bissau	812	cetacean	0.089	0.099	0.086
Cocos Isl.(Australia)	202	cetacean	0.084	0.093	0.086
Honduras	447	cetacean	0.098	0.108	0.085
Eritrea	132	cetacean	0.081	0.095	0.085
Trinidad & Tobago	1022	cetacean	0.096	0.106	0.084
Martinique	622	cetacean	0.095	0.106	0.084
Vanuatu	702	cetacean	0.087	0.097	0.083
New Caledonia	697	cetacean	0.09	0.099	0.083
Comoros Isl.	212	cetacean	0.082	0.092	0.081
Lord Howe Isl. (Australia)	42	cetacean	0.099	0.102	0.08
Croatia	242	cetacean	0.091	0.108	0.08
St Pierre & Miquelon (FR)	892	cetacean	0.081	0.096	0.08
Brit. Virgin Isl.(UK)	112	cetacean	0.088	0.097	0.077
Trindade & Matin Isl (BR)	92	cetacean	0.08	0.088	0.077
Turkey Mediterranean Sea	1037	cetacean	0.098	0.116	0.076
Libya	572	cetacean	0.086	0.102	0.075
Azores Isl.(Portugal)	807	cetacean	0.07	0.08	0.075
Costa Rica	237	cetacean	0.085	0.094	0.074
Guadeloupe (FR)	412	cetacean	0.084	0.093	0.073
Poland	792	cetacean	0.057	0.068	0.073
Micronesia	747	cetacean	0.076	0.084	0.073
Russia Siberia	862	cetacean	0.08	0.094	0.071
St Lucia	887	cetacean	0.08	0.088	0.07
Norfolk Isl. (Australia)	727	cetacean	0.081	0.083	0.068
Dominica	267	cetacean	0.078	0.086	0.068
Puerto Rico (US)	822	cetacean	0.076	0.084	0.067
Seychelles	922	cetacean	0.069	0.076	0.066
Palau	757	cetacean	0.066	0.073	0.066
Madeira Isl.(Portugal)	802	cetacean	0.072	0.079	0.066
Belgium	67	cetacean	0.077	0.092	0.065
Finland	322	cetacean	0.051	0.06	0.065
Easter Isl.(Chile)	172	cetacean	0.065	0.068	0.062
Iraq	487	cetacean	0.055	0.065	0.057
Latvia	562	cetacean	0.045	0.053	0.057
El Salvador	287	cetacean	0.066	0.073	0.056
Nicaragua	712	cetacean	0.063	0.07	0.055
Russia Baltic Sea Kaliningrad	852	cetacean	0.043	0.051	0.055
Malta	617	cetacean	0.062	0.073	0.054
Antigua & Barbuda	22	cetacean	0.061	0.068	0.054
Anguila (UK)	882	cetacean	0.061	0.067	0.053
Djibouti	352	cetacean	0.053	0.06	0.052
St Paul & Amsterdam (FR)	1167	cetacean	0.05	0.054	0.052
Marshall Isl.	752	cetacean	0.055	0.059	0.051
Tuvalu	1052	cetacean	0.054	0.059	0.051
Wallis & Futuna (FR)	1147	cetacean	0.05	0.055	0.048
Haiwaii NorthWest Isl.	642	cetacean	0.055	0.06	0.047
Mozambique Channel Isl. (FR)	332	cetacean	0.053	0.059	0.047
Estonia	297	cetacean	0.037	0.043	0.047
Grenada	407	cetacean	0.053	0.059	0.047
St Vincent & The Grenadines	897	cetacean	0.052	0.057	0.045
Montenegro	1162	cetacean	0.052	0.061	0.045
Indian Ocean Antarctic - High seas Areas	1227	cetacean	0.039	0.042	0.043
Bahamas	47	cetacean	0.047	0.052	0.043
Haiwaii Main Isl.	1087	cetacean	0.049	0.053	0.042
Albania	2	cetacean	0.047	0.056	0.041
St Kitts & Nevis	877	cetacean	0.047	0.052	0.041

Lebanon	557	cetacean	0.05	0.059	0.041
Lithuania	577	cetacean	0.032	0.038	0.041
Windward Netherlands Antilles	687	cetacean	0.046	0.051	0.041
Montserrat (UK)	652	cetacean	0.044	0.049	0.039
Ascencion Isl.	1127	cetacean	0.04	0.043	0.038
Israel	497	cetacean	0.045	0.053	0.037
Leeward Netherland Antilles	692	cetacean	0.042	0.047	0.037
Tonga	1017	cetacean	0.039	0.042	0.036
Brit. Indian Oce (UK)	102	cetacean	0.039	0.042	0.036
Kerguelen Isl. (FR)	1177	cetacean	0.033	0.036	0.036
Cayman Isl.(UK)	157	cetacean	0.04	0.045	0.035
Cook Isl.(New Zealand)	232	cetacean	0.037	0.04	0.035
Cyprus	252	cetacean	0.04	0.048	0.033
Guam (US)	417	cetacean	0.035	0.038	0.033
Tromelin Isl.(FR)	337	cetacean	0.036	0.04	0.033
Gaza Strip	372	cetacean	0.038	0.045	0.032
Barbados	62	cetacean	0.036	0.04	0.031
American Samoa	12	cetacean	0.033	0.036	0.031
Syria	997	cetacean	0.037	0.043	0.03
Prince Edward Isl. (SA)	957	cetacean	0.028	0.03	0.03
Belize	97	cetacean	0.034	0.038	0.03
Reunion (FR)	832	cetacean	0.033	0.036	0.03
Jordan	532	cetacean	0.027	0.032	0.029
Crozet Isl.(FR)	1172	cetacean	0.027	0.028	0.029
Bermuda (UK)	72	cetacean	0.029	0.032	0.028
Palmyra Atoll & Kingman Reef (US)	1097	cetacean	0.03	0.033	0.028
Northern Marianas (US)	742	cetacean	0.029	0.031	0.027
Guatemala	422	cetacean	0.03	0.034	0.026
Nauru	677	cetacean	0.028	0.03	0.026
Samoa	1152	cetacean	0.026	0.029	0.025
Turkey Black Sea	1042	cetacean	0.049	0.059	0.024
Monaco	647	cetacean	0.025	0.029	0.024
Clipperton Isl.(FR)	1182	cetacean	0.028	0.031	0.024
Johnston Atoll (US)	527	cetacean	0.023	0.025	0.021
Bosnia	77	cetacean	0.022	0.026	0.019
Tokelau (NZ)	1012	cetacean	0.02	0.022	0.019
Jarvis Isl.(US)	1102	cetacean	0.02	0.022	0.019
South Georgia & Sandwich Isl. (UK)	312	cetacean	0.015	0.016	0.016
Ukraine	1057	cetacean	0.036	0.042	0.016
Pitcairn (UK)	787	cetacean	0.016	0.017	0.016
St Helena (UK)	872	cetacean	0.014	0.015	0.013
Atlantic Antarctic - High seas Areas	1192	cetacean	0.011	0.012	0.013
Howland & Baker Isl.(US)	1107	cetacean	0.013	0.014	0.012
Slovenia	942	cetacean	0.014	0.017	0.012
Arctic Sea - High seas Areas	1187	cetacean	0.012	0.015	0.01
Russia Black Sea	847	cetacean	0.019	0.022	0.009
Romania	837	cetacean	0.012	0.014	0.005
Bulgaria	122	cetacean	0.011	0.013	0.005
Georgia	362	cetacean	0.01	0.011	0.004
Macquarie Isl.(Australia)	37	cetacean	0	0	0
Bouvet Isl.(Norway)	82	cetacean	0	0	0
Gibraltar (UK)	387	cetacean	0	0	0
Heard & McDonald Isl.(Australia)	442	cetacean	0	0	0
Niue (NZ)	722	cetacean	0	0	0
Russia Baltic Sea St Petersburg	867	cetacean	0	0	0
Turks & Caicos Isl (UK)	1047	cetacean	0	0	0
Navassa Isl. (Haiti)	1092	cetacean	0	0	0
Wake Isl.(US)	1142	cetacean	0	0	0
Pacific Antarctic - High seas Areas	1242	cetacean	0	0	0

Table 34 - High Seas FAO areas EEZ sorted by their contribution in the different exposures for all seabirds sorted by IUCN weighted exposure

EEZ, High Seas FAO area	Overall rank	Family	Overlap index	Un-weighted exposure index	IUCN weighted exposure index
Peru	776	seabirds	0.459	0.421	0.576
Chile	166	seabirds	0.491	0.511	0.566
South Africa	951	seabirds	0.513	0.382	0.436
Pacific Southeast - High seas Areas	1261	seabirds	0.3	0.336	0.384
Namibia	671	seabirds	0.412	0.315	0.366
Indian Ocean Eastern - High seas Areas	1231	seabirds	0.382	0.35	0.321
New Zealand	706	seabirds	0.311	0.33	0.314
Galapagos Isl.(Ecuador)	281	seabirds	0.133	0.158	0.279
Atlantic Southwest - High seas Areas	1216	seabirds	0.215	0.245	0.275
Japan Main Isl.	516	seabirds	0.288	0.225	0.264
Pacific Southwest - High seas Areas	1266	seabirds	0.257	0.269	0.257
Russia Pacific	856	seabirds	0.3	0.211	0.242
Pacific Eastern Central - High seas Areas	1246	seabirds	0.152	0.181	0.226
Argentina	26	seabirds	0.186	0.211	0.222
Morocco	656	seabirds	0.5	0.379	0.222
Japan Outer Isl.	521	seabirds	0.243	0.205	0.221
Indian Ocean Western - High seas Areas	1236	seabirds	0.262	0.204	0.201
Iran	481	seabirds	0.48	0.297	0.188
Atlantic SouthEast - High seas Areas	1211	seabirds	0.15	0.166	0.185
Yemen	1156	seabirds	0.403	0.282	0.18
Australia	31	seabirds	0.277	0.201	0.176
India	461	seabirds	0.763	0.338	0.175
Angola	16	seabirds	0.332	0.2	0.172
Brazil	86	seabirds	0.116	0.137	0.172
Greece	396	seabirds	0.246	0.23	0.161
Turkey Mediterranean Sea	1036	seabirds	0.292	0.256	0.16
J. Fernandez, Felix and Ambrosio Isl. (Chile)	181	seabirds	0.131	0.155	0.159
Pacific Northwest - High seas Areas	1256	seabirds	0.117	0.139	0.156
Mexico	636	seabirds	0.126	0.117	0.155
Egypt	1061	seabirds	0.369	0.266	0.152
Alaska	1081	seabirds	0.116	0.135	0.149
Mauritania	626	seabirds	0.501	0.303	0.146
Spain	966	seabirds	0.255	0.203	0.142
United Arab Emirates	1026	seabirds	0.333	0.209	0.142
Ecuador	276	seabirds	0.131	0.081	0.141
Somalia	946	seabirds	0.431	0.226	0.141
Uruguay	1131	seabirds	0.109	0.129	0.14
China	186	seabirds	0.533	0.147	0.135
Pacific Western Central - High seas Areas	1271	seabirds	0.157	0.144	0.134
Pakistan	761	seabirds	0.548	0.26	0.131
Western Sahara (Morocco)	971	seabirds	0.385	0.264	0.129
Bahrain	51	seabirds	0.204	0.146	0.125
Oman	666	seabirds	0.351	0.207	0.125
Saudi Arabia Persian Gulf	911	seabirds	0.281	0.17	0.123
Korea South	546	seabirds	0.216	0.105	0.123
Italy	501	seabirds	0.187	0.183	0.12
Tunisia	1031	seabirds	0.265	0.173	0.117
Saudi Arabia Red Sea	906	seabirds	0.291	0.223	0.112
Algeria	6	seabirds	0.242	0.16	0.108
France	326	seabirds	0.174	0.149	0.106
Senegal	916	seabirds	0.364	0.202	0.099
Croatia	241	seabirds	0.149	0.155	0.097
Sudan	976	seabirds	0.295	0.186	0.092
Kuwait	551	seabirds	0.214	0.124	0.091
Qatar	826	seabirds	0.19	0.125	0.089
Pacific Northeast - High seas Areas	1251	seabirds	0.065	0.077	0.088
Canada	146	seabirds	0.064	0.067	0.086
Falkland Isl. (Malvinas)(Disputed)	306	seabirds	0.076	0.082	0.085
Lebanon	556	seabirds	0.147	0.146	0.083

Gambia	366	seabirds	0.289	0.165	0.081
Mozambique	661	seabirds	0.134	0.086	0.08
Turkey Black Sea	1041	seabirds	0.145	0.158	0.079
United Kingdom	1066	seabirds	0.133	0.078	0.079
Libya	571	seabirds	0.166	0.107	0.076
USA West Coast	1111	seabirds	0.065	0.059	0.073
Syria	996	seabirds	0.114	0.117	0.072
Israel	496	seabirds	0.141	0.132	0.071
Bangladesh	56	seabirds	0.358	0.175	0.068
Norway	731	seabirds	0.101	0.055	0.064
Guinea	426	seabirds	0.331	0.163	0.063
Colombia	206	seabirds	0.045	0.042	0.063
Denmark	261	seabirds	0.126	0.065	0.06
Taiwan	191	seabirds	0.18	0.072	0.06
Desventuradas Isl.(Chile)	176	seabirds	0.046	0.055	0.057
Haiwaii NorthWest Isl.	641	seabirds	0.039	0.047	0.057
Cyprus	251	seabirds	0.092	0.092	0.056
Albania	1	seabirds	0.085	0.084	0.056
Eritrea	131	seabirds	0.184	0.11	0.054
Ukraine	1056	seabirds	0.151	0.104	0.054
Montenegro	1161	seabirds	0.064	0.069	0.051
French Polynesia	346	seabirds	0.034	0.04	0.049
Myanmar	126	seabirds	0.337	0.127	0.049
Portugal	796	seabirds	0.079	0.064	0.049
Ireland	491	seabirds	0.105	0.052	0.048
Prince Edward Isl. (SA)	956	seabirds	0.043	0.048	0.046
St Paul & Amsterdam (FR)	1166	seabirds	0.051	0.043	0.045
Panama	766	seabirds	0.031	0.028	0.045
Netherlands	681	seabirds	0.088	0.053	0.044
Crozet Isl.(FR)	1171	seabirds	0.041	0.045	0.043
Nigeria	716	seabirds	0.334	0.111	0.043
Kerguelen Isl. (FR)	1176	seabirds	0.041	0.045	0.043
Germany	376	seabirds	0.1	0.046	0.041
Atlantic Western Central - High seas Areas	1221	seabirds	0.022	0.026	0.041
Atlantic Northwest - High seas Areas	1206	seabirds	0.021	0.025	0.038
Indian Ocean Antarctic - High seas Areas	1226	seabirds	0.038	0.04	0.038
Gaza Strip	371	seabirds	0.076	0.064	0.037
Iraq	486	seabirds	0.073	0.049	0.036
Philippines	781	seabirds	0.265	0.06	0.036
Malta	616	seabirds	0.039	0.046	0.035
Sierra Leone	926	seabirds	0.29	0.089	0.035
Costa Rica	236	seabirds	0.025	0.022	0.034
Ghana	381	seabirds	0.261	0.087	0.034
Faeroe Isl.(Denmark)	301	seabirds	0.031	0.027	0.031
El Salvador	286	seabirds	0.016	0.019	0.031
Cameroon	141	seabirds	0.242	0.078	0.031
Vietnam	936	seabirds	0.517	0.071	0.029
Russia Black Sea	846	seabirds	0.078	0.056	0.029
Kiribati	391	seabirds	0.032	0.03	0.029
Bermuda (UK)	71	seabirds	0.014	0.017	0.027
South Georgia & Sandwich Isl. (UK)	311	seabirds	0.025	0.028	0.026
Gabon	356	seabirds	0.178	0.067	0.026
Channel Isl.(UK)	1071	seabirds	0.027	0.03	0.026
Djibouti	351	seabirds	0.089	0.051	0.025
Congo Republic	221	seabirds	0.151	0.064	0.025
Hong Kong	451	seabirds	0.096	0.03	0.024
Tanzania	1076	seabirds	0.165	0.06	0.023
Cote d'Ivoire	506	seabirds	0.212	0.058	0.023
Indonesia (Eastern)	471	seabirds	0.345	0.057	0.022
Monaco	646	seabirds	0.026	0.028	0.021
Haiwaii Main Isl.	1086	seabirds	0.016	0.018	0.021
Indonesia (Western)	476	seabirds	0.278	0.052	0.02
Congo	226	seabirds	0.122	0.051	0.02
Madagascar	586	seabirds	0.21	0.043	0.02
Nicaragua	711	seabirds	0.012	0.012	0.02
Lord Howe Isl. (Australia)	41	seabirds	0.036	0.029	0.019
Bosnia	76	seabirds	0.031	0.033	0.019
Belgium	66	seabirds	0.034	0.022	0.018
Russia Siberia	861	seabirds	0.061	0.033	0.018
USA East Coast	1116	seabirds	0.03	0.012	0.018

Clipperton Isl.(FR)	1181	seabirds	0.01	0.012	0.018
Jordan	531	seabirds	0.036	0.036	0.018
Benin	256	seabirds	0.127	0.045	0.018
Togo	1006	seabirds	0.127	0.046	0.018
Honduras	446	seabirds	0.02	0.011	0.017
Macau (China)	581	seabirds	0.076	0.02	0.017
Malaysia Sarawak	611	seabirds	0.251	0.04	0.016
Kenya	536	seabirds	0.122	0.041	0.016
Norfolk Isl. (Australia)	726	seabirds	0.02	0.019	0.016
Guinea-Bissau	811	seabirds	0.09	0.04	0.015
Malaysia East	596	seabirds	0.195	0.04	0.015
Thailand	1001	seabirds	0.24	0.038	0.015
Pitcairn (UK)	786	seabirds	0.008	0.01	0.015
Sri Lanka	161	seabirds	0.14	0.037	0.014
Malaysia West	591	seabirds	0.178	0.037	0.014
Bulgaria	121	seabirds	0.033	0.025	0.014
Marshall Isl.	751	seabirds	0.017	0.017	0.014
Atlantic Northeast - High seas Areas	1201	seabirds	0.01	0.012	0.014
Liberia	566	seabirds	0.127	0.034	0.013
Malaysia Sabah	601	seabirds	0.154	0.033	0.013
Guatemala	421	seabirds	0.01	0.008	0.012
Romania	836	seabirds	0.032	0.02	0.012
Trindade & Matin Isl (BR)	91	seabirds	0.006	0.008	0.012
Georgia	361	seabirds	0.021	0.018	0.011
Papua New Guinea	771	seabirds	0.148	0.028	0.011
Slovenia	941	seabirds	0.019	0.016	0.011
Cambodia	136	seabirds	0.117	0.028	0.011
Cook Isl.(New Zealand)	231	seabirds	0.01	0.012	0.01
Atlantic Antarctic - High seas Areas	1191	seabirds	0.01	0.01	0.01
Poland	791	seabirds	0.056	0.024	0.009
Maldives	606	seabirds	0.091	0.024	0.009
Northern Marianas (US)	741	seabirds	0.008	0.008	0.008
Johnston Atoll (US)	526	seabirds	0.006	0.007	0.008
Guam (US)	416	seabirds	0.008	0.008	0.008
Solomon Isl.	106	seabirds	0.077	0.02	0.008
Equatorial Guinea	291	seabirds	0.059	0.019	0.007
Fiji	316	seabirds	0.022	0.019	0.007
Tonga	1016	seabirds	0.008	0.009	0.006
Brunei	116	seabirds	0.064	0.013	0.005
American Samoa	11	seabirds	0.006	0.007	0.005
Mauritius	631	seabirds	0.036	0.012	0.005
New Caledonia	696	seabirds	0.029	0.01	0.004
Micronesia	746	seabirds	0.015	0.011	0.004
Singapore	931	seabirds	0.053	0.011	0.004
Christmas Isl.(Australia)	196	seabirds	0.012	0.009	0.004
Vanuatu	701	seabirds	0.023	0.009	0.003
Easter Isl.(Chile)	171	seabirds	0.002	0.002	0.003
Tuvalu	1051	seabirds	0.007	0.008	0.003
Mozambique Channel Isl. (FR)	331	seabirds	0.013	0.004	0.003
Timor Leste	816	seabirds	0.041	0.008	0.003
Wallis & Futuna (FR)	1146	seabirds	0.006	0.007	0.003
Palau	756	seabirds	0.016	0.007	0.003
Seychelles	921	seabirds	0.03	0.005	0.002
Nauru	676	seabirds	0.005	0.005	0.002
Samoa	1151	seabirds	0.003	0.004	0.001
Tokelau (NZ)	1011	seabirds	0.003	0.003	0.001
Jarvis Isl.(US)	1101	seabirds	0.002	0.003	0.001
Reunion (FR)	831	seabirds	0.009	0.001	0.001
Howland & Baker Isl.(US)	1106	seabirds	0.002	0.002	0.001
Korea North	541	seabirds	0.057	0.001	0
Sweden	991	seabirds	0.067	0.001	0
Finland	321	seabirds	0.033	0	0
Andaman & Nicobar Isl. (India)	466	seabirds	0.036	0	0
Canary Isl.(Spain)	961	seabirds	0.045	0	0
Comoros Isl.	211	seabirds	0.014	0	0
Mayotte (FR)	216	seabirds	0.022	0	0
Cuba	246	seabirds	0.015	0	0
Dominican Rep.	271	seabirds	0.016	0	0
Estonia	296	seabirds	0.026	0	0
Haiti	436	seabirds	0.017	0	0

Iceland	456	seabirds	0.012	0	0
Jamaica	511	seabirds	0.013	0	0
Latvia	561	seabirds	0.02	0	0
Lithuania	576	seabirds	0.014	0	0
Azores Isl.(Portugal)	806	seabirds	0.013	0	0
Russia Barrents Sea	841	seabirds	0.019	0	0
Russia Baltic Sea Kaliningrad	851	seabirds	0.026	0	0
USA Golf Of Mexico	1121	seabirds	0.014	0	0
Antigua & Barbuda	21	seabirds	0.004	0	0
Macquarie Isl.(Australia)	36	seabirds	0	0	0
Bahamas	46	seabirds	0.003	0	0
Barbados	61	seabirds	0.002	0	0
Bouvet Isl.(Norway)	81	seabirds	0	0	0
Belize	96	seabirds	0.003	0	0
Brit. Indian Oce (UK)	101	seabirds	0.002	0	0
Brit. Virgin Isl.(UK)	111	seabirds	0	0	0
Cape Verde	151	seabirds	0	0	0
Cayman Isl.(UK)	156	seabirds	0.003	0	0
Cocos Isl.(Australia)	201	seabirds	0	0	0
Dominica	266	seabirds	0.006	0	0
Tromelin Isl.(FR)	336	seabirds	0.009	0	0
French Guyana	341	seabirds	0.007	0	0
Gibraltar (UK)	386	seabirds	0	0	0
Greenland	401	seabirds	0.01	0	0
Grenada	406	seabirds	0	0	0
Guadeloupe (FR)	411	seabirds	0	0	0
Guyana	431	seabirds	0	0	0
Heard & McDonald Isl.(Australia)	441	seabirds	0	0	0
Martinique	621	seabirds	0.007	0	0
Montserrat (UK)	651	seabirds	0	0	0
Windward Netherlands Antilles	686	seabirds	0.003	0	0
Leeward Netherland Antilles	691	seabirds	0.003	0	0
Niue (NZ)	721	seabirds	0	0	0
Jan Mayen Isl. (Norway)	736	seabirds	0.003	0	0
Madeira Isl.(Portugal)	801	seabirds	0.009	0	0
Puerto Rico (US)	821	seabirds	0.004	0	0
Russia Baltic Sea St Petersburg	866	seabirds	0	0	0
St Helena (UK)	871	seabirds	0	0	0
St Kitts & Nevis	876	seabirds	0.003	0	0
Anguila (UK)	881	seabirds	0	0	0
St Lucia	886	seabirds	0.007	0	0
St Pierre & Miquelon (FR)	891	seabirds	0	0	0
St Vincent & The Grenadines	896	seabirds	0	0	0
Sao Tome & Principe	901	seabirds	0.01	0	0
Suriname	981	seabirds	0	0	0
Svalbard Isl. (Norway)	986	seabirds	0.01	0	0
Trinidad & Tobago	1021	seabirds	0	0	0
Turks & Caicos Isl (UK)	1046	seabirds	0	0	0
Navassa Isl. (Haiti)	1091	seabirds	0	0	0
Palmyra Atoll & Kingman Reef (US)	1096	seabirds	0	0	0
Ascencion Isl.	1126	seabirds	0	0	0
Venezuela	1136	seabirds	0.007	0	0
Wake Isl.(US)	1141	seabirds	0	0	0
Arctic Sea - High seas Areas	1186	seabirds	0	0	0
Atlantic Eastern Central - High seas Areas	1196	seabirds	0	0	0
Pacific Antarctic - High seas Areas	1241	seabirds	0	0	0

Table 35 - High Seas FAO areas EEZ sorted by their contribution in the different exposures for all sharks sorted by IUCN weighted exposure

EEZ, High Seas FAO area	Overall rank	Family	Overlap index	Un-weighted exposure index	IUCN weighted exposure index
China	188	shark	0.175	0.207	0.241
Japan Main Isl.	518	shark	0.154	0.183	0.213
Vietnam	938	shark	0.147	0.174	0.202
India	463	shark	0.144	0.171	0.199
Pacific Western Central - High seas Areas	1273	shark	0.144	0.17	0.198
Morocco	658	shark	0.139	0.165	0.192
Myanmar	128	shark	0.139	0.165	0.192
Indian Ocean Eastern - High seas Areas	1233	shark	0.138	0.164	0.19
Pacific Northwest - High seas Areas	1258	shark	0.133	0.157	0.183
Russia Pacific	858	shark	0.124	0.147	0.171
Pacific Southeast - High seas Areas	1263	shark	0.119	0.141	0.164
Mauritania	628	shark	0.115	0.136	0.158
Indonesia (Eastern)	473	shark	0.113	0.134	0.156
Western Sahara (Morocco)	973	shark	0.113	0.134	0.156
Korea South	548	shark	0.111	0.131	0.153
Chile	168	shark	0.111	0.131	0.153
Peru	778	shark	0.11	0.131	0.152
South Africa	953	shark	0.108	0.128	0.149
Bangladesh	58	shark	0.106	0.126	0.146
Indonesia (Western)	478	shark	0.105	0.124	0.145
Guinea	428	shark	0.104	0.124	0.144
Japan Outer Isl.	523	shark	0.104	0.124	0.144
USA East Coast	1118	shark	0.104	0.123	0.144
Taiwan	193	shark	0.102	0.121	0.141
Korea North	543	shark	0.102	0.121	0.141
Spain	968	shark	0.101	0.12	0.14
United Kingdom	1068	shark	0.1	0.119	0.138
Mexico	638	shark	0.098	0.116	0.136
Philippines	783	shark	0.098	0.116	0.135
Greece	398	shark	0.098	0.116	0.135
Namibia	673	shark	0.097	0.114	0.133
Indian Ocean Western - High seas Areas	1238	shark	0.096	0.114	0.133
Norway	733	shark	0.096	0.113	0.132
Senegal	918	shark	0.094	0.112	0.13
Brazil	88	shark	0.094	0.111	0.129
Pacific Eastern Central - High seas Areas	1248	shark	0.093	0.11	0.128
Madagascar	588	shark	0.092	0.109	0.127
France	328	shark	0.086	0.101	0.118
Italy	503	shark	0.085	0.101	0.117
Tunisia	1033	shark	0.085	0.101	0.117
Malaysia Sarawak	613	shark	0.081	0.096	0.112
Australia	33	shark	0.08	0.095	0.111
Iceland	458	shark	0.08	0.095	0.11
Atlantic Eastern Central - High seas Areas	1198	shark	0.08	0.095	0.11
Atlantic Southwest - High seas Areas	1218	shark	0.079	0.094	0.11
Malaysia East	598	shark	0.079	0.093	0.109
Thailand	1003	shark	0.077	0.091	0.106
Canada	148	shark	0.076	0.09	0.105
Canary Isl.(Spain)	963	shark	0.075	0.089	0.104
Atlantic Western Central - High seas Areas	1223	shark	0.074	0.088	0.102
Malaysia West	593	shark	0.073	0.086	0.101
Algeria	8	shark	0.073	0.086	0.1
Gambia	368	shark	0.073	0.086	0.1
Turkey Mediterranean Sea	1038	shark	0.072	0.086	0.1
Croatia	243	shark	0.071	0.084	0.098
Malaysia Sabah	603	shark	0.07	0.083	0.096
Sierra Leone	928	shark	0.07	0.083	0.096
Ecuador	278	shark	0.069	0.081	0.095
Angola	18	shark	0.068	0.081	0.094

Nigeria	718	shark	0.067	0.079	0.092
Libya	573	shark	0.067	0.079	0.092
Pakistan	763	shark	0.065	0.077	0.089
Pacific Southwest - High seas Areas	1268	shark	0.064	0.076	0.089
Egypt	1063	shark	0.064	0.076	0.088
Galapagos Isl.(Ecuador)	283	shark	0.063	0.075	0.087
Ireland	493	shark	0.063	0.075	0.087
Atlantic Northeast - High seas Areas	1203	shark	0.062	0.073	0.085
Ghana	383	shark	0.061	0.072	0.084
New Zealand	708	shark	0.06	0.071	0.083
Cameroon	143	shark	0.06	0.071	0.083
Portugal	798	shark	0.059	0.07	0.081
Atlantic Northwest - High seas Areas	1208	shark	0.059	0.07	0.081
Papua New Guinea	773	shark	0.057	0.068	0.079
Atlantic SouthEast - High seas Areas	1213	shark	0.057	0.068	0.079
USA West Coast	1113	shark	0.057	0.067	0.079
Russia Barrents Sea	843	shark	0.057	0.067	0.078
Cambodia	138	shark	0.056	0.067	0.078
Faeroe Isl.(Denmark)	303	shark	0.056	0.066	0.077
Guyana	433	shark	0.054	0.064	0.075
Denmark	263	shark	0.054	0.064	0.075
Oman	668	shark	0.054	0.064	0.075
USA Golf Of Mexico	1123	shark	0.054	0.064	0.074
Somalia	948	shark	0.053	0.063	0.073
Iran	483	shark	0.053	0.062	0.073
Yemen	1158	shark	0.052	0.062	0.072
J. Fernandez, Felix and Ambrosio Isl. (Chile)	183	shark	0.051	0.061	0.071
Alaska	1083	shark	0.051	0.061	0.07
Argentina	28	shark	0.051	0.06	0.07
Gabon	358	shark	0.05	0.059	0.069
Maldives	608	shark	0.049	0.058	0.068
Malta	618	shark	0.048	0.057	0.066
Colombia	208	shark	0.048	0.057	0.066
Suriname	983	shark	0.047	0.056	0.065
Cuba	248	shark	0.047	0.055	0.064
Tanzania	1078	shark	0.045	0.053	0.062
Venezuela	1138	shark	0.044	0.052	0.06
Lebanon	558	shark	0.043	0.051	0.06
Uruguay	1133	shark	0.043	0.051	0.059
Netherlands	683	shark	0.042	0.049	0.057
Cote d'Ivoire	508	shark	0.041	0.049	0.057
United Arab Emirates	1028	shark	0.041	0.049	0.057
Sri Lanka	163	shark	0.04	0.048	0.056
Montenegro	1163	shark	0.041	0.048	0.056
Solomon Isl.	108	shark	0.04	0.048	0.055
Andaman & Nicobar Isl. (India)	468	shark	0.04	0.047	0.055
Sweden	993	shark	0.04	0.047	0.055
Israel	498	shark	0.039	0.047	0.054
Jamaica	513	shark	0.038	0.045	0.053
Azores Isl.(Portugal)	808	shark	0.038	0.045	0.052
Albania	3	shark	0.037	0.044	0.051
Congo Republic	223	shark	0.037	0.044	0.051
Greenland	403	shark	0.036	0.042	0.049
Cyprus	253	shark	0.035	0.042	0.049
Haiti	438	shark	0.035	0.042	0.048
Hong Kong	453	shark	0.035	0.041	0.048
Gaza Strip	373	shark	0.034	0.041	0.047
Mauritius	633	shark	0.034	0.04	0.046
Madeira Isl.(Portugal)	803	shark	0.033	0.04	0.046
Channel Isl.(UK)	1073	shark	0.033	0.04	0.046
Panama	768	shark	0.033	0.039	0.046
Dominican Rep.	273	shark	0.033	0.039	0.046
Cape Verde	153	shark	0.033	0.039	0.045
Kiribati	393	shark	0.033	0.039	0.045
Syria	998	shark	0.032	0.038	0.045
Pacific Northeast - High seas Areas	1253	shark	0.032	0.038	0.045
Mozambique	663	shark	0.032	0.038	0.045
Desventuradas Isl.(Chile)	178	shark	0.032	0.038	0.044
Germany	378	shark	0.032	0.037	0.044
French Polynesia	348	shark	0.031	0.037	0.043

Fiji	318	shark	0.03	0.036	0.041
Svalbard Isl. (Norway)	988	shark	0.03	0.035	0.041
Mayotte (FR)	218	shark	0.03	0.035	0.041
Congo	228	shark	0.029	0.035	0.04
Sudan	978	shark	0.029	0.034	0.04
Liberia	568	shark	0.029	0.034	0.04
French Guyana	343	shark	0.028	0.034	0.039
Saudi Arabia Red Sea	908	shark	0.028	0.034	0.039
Brunei	118	shark	0.026	0.031	0.036
Brit. Virgin Isl.(UK)	113	shark	0.026	0.03	0.035
Saudi Arabia Persian Gulf	913	shark	0.025	0.029	0.034
Honduras	448	shark	0.024	0.029	0.033
Martinique	623	shark	0.024	0.028	0.033
Trinidad & Tobago	1023	shark	0.024	0.028	0.033
Micronesia	748	shark	0.023	0.028	0.032
Kenya	538	shark	0.023	0.027	0.032
Trindade & Matin Isl (BR)	93	shark	0.023	0.027	0.032
Guinea-Bissau	813	shark	0.023	0.027	0.031
Togo	1008	shark	0.023	0.027	0.031
Falkland Isl. (Malvinas) (Disputed)	308	shark	0.023	0.027	0.031
Sao Tome & Principe	903	shark	0.023	0.027	0.031
Benin	258	shark	0.023	0.027	0.031
Guadeloupe (FR)	413	shark	0.022	0.026	0.03
Costa Rica	238	shark	0.022	0.026	0.03
Singapore	933	shark	0.022	0.026	0.03
Lord Howe Isl. (Australia)	43	shark	0.021	0.025	0.029
Belgium	68	shark	0.021	0.024	0.028
Macau (China)	583	shark	0.021	0.024	0.028
Haiwaii Main Isl.	1088	shark	0.02	0.024	0.028
Christmas Isl.(Australia)	198	shark	0.02	0.024	0.028
Haiwaii NorthWest Isl.	643	shark	0.02	0.024	0.028
New Caledonia	698	shark	0.02	0.024	0.027
St Lucia	888	shark	0.02	0.023	0.027
Cocos Isl.(Australia)	203	shark	0.019	0.023	0.027
Bahrain	53	shark	0.019	0.023	0.027
Easter Isl.(Chile)	173	shark	0.019	0.023	0.027
Equatorial Guinea	293	shark	0.019	0.023	0.027
Dominica	268	shark	0.019	0.023	0.026
Poland	793	shark	0.019	0.022	0.026
Puerto Rico (US)	823	shark	0.019	0.022	0.026
El Salvador	288	shark	0.018	0.022	0.025
Marshall Isl.	753	shark	0.018	0.022	0.025
Vanuatu	703	shark	0.018	0.022	0.025
Comoros Isl.	213	shark	0.018	0.022	0.025
Antigua & Barbuda	23	shark	0.018	0.021	0.025
Anguila (UK)	883	shark	0.018	0.021	0.025
Seychelles	923	shark	0.018	0.021	0.024
Timor Leste	818	shark	0.017	0.021	0.024
Eritrea	133	shark	0.017	0.02	0.024
Kuwait	553	shark	0.017	0.02	0.024
Bosnia	78	shark	0.017	0.02	0.023
St Pierre & Miquelon (FR)	893	shark	0.017	0.02	0.023
Finland	323	shark	0.017	0.02	0.023
Monaco	648	shark	0.017	0.02	0.023
Norfolk Isl. (Australia)	728	shark	0.016	0.02	0.023
Bahamas	48	shark	0.016	0.019	0.023
Tuvalu	1053	shark	0.016	0.019	0.022
Jan Mayen Isl. (Norway)	738	shark	0.016	0.019	0.022
Nicaragua	713	shark	0.016	0.019	0.022
Palau	758	shark	0.015	0.018	0.021
Latvia	563	shark	0.015	0.018	0.02
Qatar	828	shark	0.015	0.017	0.02
Russia Baltic Sea Kaliningrad	853	shark	0.014	0.017	0.02
Grenada	408	shark	0.013	0.016	0.018
Mozambique Channel Isl. (FR)	333	shark	0.013	0.015	0.018
St Vincent & The Grenadines	898	shark	0.013	0.015	0.018
Bermuda (UK)	73	shark	0.013	0.015	0.017
Brit. Indian Oce (UK)	103	shark	0.012	0.015	0.017
Estonia	298	shark	0.012	0.014	0.017
Wallis & Futuna (FR)	1148	shark	0.012	0.014	0.016

St Kitts & Nevis	878	shark	0.012	0.014	0.016
Windward Netherlands Antilles	688	shark	0.011	0.014	0.016
Nauru	678	shark	0.011	0.013	0.015
Cook Isl.(New Zealand)	233	shark	0.011	0.013	0.015
Ascencion Isl.	1128	shark	0.011	0.013	0.015
Montserrat (UK)	653	shark	0.011	0.013	0.015
Palmyra Atoll & Kingman Reef (US)	1098	shark	0.011	0.013	0.015
Djibouti	353	shark	0.011	0.013	0.015
Lithuania	578	shark	0.011	0.013	0.015
Leeward Netherland Antilles	693	shark	0.01	0.012	0.014
Tromelin Isl.(FR)	338	shark	0.01	0.012	0.014
Guam (US)	418	shark	0.01	0.012	0.014
Cayman Isl.(UK)	158	shark	0.01	0.012	0.014
Northern Marianas (US)	743	shark	0.01	0.011	0.013
Reunion (FR)	833	shark	0.009	0.011	0.013
Slovenia	943	shark	0.009	0.011	0.013
Johnston Atoll (US)	528	shark	0.009	0.011	0.013
St Paul & Amsterdam (FR)	1168	shark	0.009	0.011	0.012
Barbados	63	shark	0.009	0.01	0.012
Tonga	1018	shark	0.009	0.01	0.012
Belize	98	shark	0.008	0.01	0.012
Clipperton Isl.(FR)	1183	shark	0.008	0.009	0.011
American Samoa	13	shark	0.008	0.009	0.011
Guatemala	423	shark	0.008	0.009	0.011
Tokelau (NZ)	1013	shark	0.007	0.008	0.009
Jarvis Isl.(US)	1103	shark	0.007	0.008	0.009
Iraq	488	shark	0.007	0.008	0.009
Samoa	1153	shark	0.006	0.007	0.008
Jordan	533	shark	0.006	0.007	0.008
Pitcairn (UK)	788	shark	0.005	0.006	0.007
St Helena (UK)	873	shark	0.004	0.005	0.006
Howland & Baker Isl.(US)	1108	shark	0.004	0.005	0.006
Crozet Isl.(FR)	1173	shark	0.003	0.004	0.004
Kerguelen Isl. (FR)	1178	shark	0.003	0.004	0.004
Prince Edward Isl. (SA)	958	shark	0.003	0.003	0.004
Indian Ocean Antarctic - High seas Areas	1228	shark	0.003	0.003	0.004
South Georgia & Sandwich Isl. (UK)	313	shark	0.002	0.003	0.003
Turkey Black Sea	1043	shark	0.002	0.002	0.002
Atlantic Antarctic - High seas Areas	1193	shark	0.001	0.001	0.001
Macquarie Isl.(Australia)	38	shark	0	0	0
Bouvet Isl.(Norway)	83	shark	0	0	0
Bulgaria	123	shark	0	0	0
Georgia	363	shark	0	0	0
Gibraltar (UK)	388	shark	0	0	0
Heard & McDonald Isl.(Australia)	443	shark	0	0	0
Niue (NZ)	723	shark	0	0	0
Romania	838	shark	0	0	0
Russia Black Sea	848	shark	0	0	0
Russia Siberia	863	shark	0	0	0
Russia Baltic Sea St Petersburg	868	shark	0	0	0
Turks & Caicos Isl (UK)	1048	shark	0	0	0
Ukraine	1058	shark	0	0	0
Navassa Isl. (Haiti)	1093	shark	0	0	0
Wake Isl.(US)	1143	shark	0	0	0
Arctic Sea - High seas Areas	1188	shark	0	0	0
Pacific Antarctic - High seas Areas	1243	shark	0	0	0

Table 36 - High Seas FAO areas EEZ sorted by their contribution in the different exposures for all pinnipeds and otters sorted by IUCN weighted exposure

EEZ, High Seas FAO area	Overall rank	Family	Overlap index	Un-weighted exposure index	IUCN weighted exposure index
Chile	169	marine mammals other	0.172	0.203	0.242
Peru	779	marine mammals other	0.124	0.147	0.152
Greece	399	marine mammals other	0.065	0.077	0.149
Algeria	9	marine mammals other	0.053	0.063	0.122
Argentina	29	marine mammals other	0.085	0.101	0.114
Tunisia	1034	marine mammals other	0.047	0.055	0.107
Turkey Mediterranean Sea	1039	marine mammals other	0.046	0.055	0.106
Croatia	244	marine mammals other	0.043	0.051	0.099
Norway	734	marine mammals other	0.136	0.162	0.063
Montenegro	1164	marine mammals other	0.027	0.032	0.062
Iceland	459	marine mammals other	0.114	0.135	0.052
United Kingdom	1069	marine mammals other	0.095	0.112	0.043
Sweden	994	marine mammals other	0.081	0.096	0.037
Russia Barrents Sea	844	marine mammals other	0.075	0.089	0.035
Denmark	264	marine mammals other	0.074	0.088	0.034
Madeira Isl.(Portugal)	804	marine mammals other	0.014	0.017	0.033
Canada	149	marine mammals other	0.069	0.081	0.032
Faeroe Isl.(Denmark)	304	marine mammals other	0.067	0.079	0.031
Bosnia	79	marine mammals other	0.012	0.015	0.028
Poland	794	marine mammals other	0.061	0.072	0.028
Ireland	494	marine mammals other	0.06	0.072	0.028
Russia Pacific	859	marine mammals other	0.058	0.068	0.026
Finland	324	marine mammals other	0.054	0.064	0.025
France	329	marine mammals other	0.051	0.06	0.023
Albania	4	marine mammals other	0.01	0.012	0.023
Germany	379	marine mammals other	0.048	0.057	0.022
Netherlands	684	marine mammals other	0.048	0.057	0.022
Latvia	564	marine mammals other	0.048	0.056	0.022
USA East Coast	1119	marine mammals other	0.046	0.054	0.021
Russia Baltic Sea Kaliningrad	854	marine mammals other	0.045	0.054	0.021
Cyprus	254	marine mammals other	0.008	0.01	0.018
Estonia	299	marine mammals other	0.039	0.046	0.018
Alaska	1084	marine mammals other	0.038	0.045	0.017
Greenland	404	marine mammals other	0.035	0.041	0.016
Lithuania	579	marine mammals other	0.034	0.04	0.016
Svalbard Isl. (Norway)	989	marine mammals other	0.032	0.038	0.015
Japan Main Isl.	519	marine mammals other	0.031	0.037	0.014
Channel Isl.(UK)	1074	marine mammals other	0.03	0.035	0.014
Ecuador	279	marine mammals other	0.025	0.03	0.012
Uruguay	1134	marine mammals other	0.024	0.028	0.011
Belgium	69	marine mammals other	0.02	0.024	0.009
USA West Coast	1114	marine mammals other	0.019	0.023	0.009
St Pierre & Miquelon (FR)	894	marine mammals other	0.019	0.022	0.009
Mexico	639	marine mammals other	0.018	0.021	0.008
Falkland Isl. (Malvinas) (Disputed)	309	marine mammals other	0.017	0.02	0.008
Brazil	89	marine mammals other	0.015	0.018	0.007
Atlantic Southwest - High seas Areas	1219	marine mammals other	0.013	0.015	0.006
American Samoa	14	marine mammals other	0	0	0
Angola	19	marine mammals other	0	0	0
Antigua & Barbuda	24	marine mammals other	0	0	0
Australia	34	marine mammals other	0	0	0
Macquarie Isl.(Australia)	39	marine mammals other	0	0	0
Lord Howe Isl. (Australia)	44	marine mammals other	0	0	0
Bahamas	49	marine mammals other	0	0	0
Bahrain	54	marine mammals other	0	0	0
Bangladesh	59	marine mammals other	0	0	0
Barbados	64	marine mammals other	0	0	0
Bermuda (UK)	74	marine mammals other	0	0	0
Bouvet Isl.(Norway)	84	marine mammals other	0	0	0
Trindade & Matin Isl (BR)	94	marine mammals other	0	0	0

Belize	99	marine mammals other	0	0	0
Brit. Indian Oce (UK)	104	marine mammals other	0	0	0
Solomon Isl.	109	marine mammals other	0	0	0
Brit. Virgin Isl.(UK)	114	marine mammals other	0	0	0
Brunei	119	marine mammals other	0	0	0
Bulgaria	124	marine mammals other	0	0	0
Myanmar	129	marine mammals other	0	0	0
Eritrea	134	marine mammals other	0	0	0
Cambodia	139	marine mammals other	0	0	0
Cameroon	144	marine mammals other	0	0	0
Cape Verde	154	marine mammals other	0	0	0
Cayman Isl.(UK)	159	marine mammals other	0	0	0
Sri Lanka	164	marine mammals other	0	0	0
Easter Isl.(Chile)	174	marine mammals other	0	0	0
Desventuradas Isl.(Chile)	179	marine mammals other	0	0	0
J. Fernandez, Felix and Ambrosio Isl. (Chile)	184	marine mammals other	0	0	0
China	189	marine mammals other	0	0	0
Taiwan	194	marine mammals other	0	0	0
Christmas Isl.(Australia)	199	marine mammals other	0	0	0
Cocos Isl.(Australia)	204	marine mammals other	0	0	0
Colombia	209	marine mammals other	0	0	0
Comoros Isl.	214	marine mammals other	0	0	0
Mayotte (FR)	219	marine mammals other	0	0	0
Congo Republic	224	marine mammals other	0	0	0
Congo	229	marine mammals other	0	0	0
Cook Isl.(New Zealand)	234	marine mammals other	0	0	0
Costa Rica	239	marine mammals other	0	0	0
Cuba	249	marine mammals other	0	0	0
Benin	259	marine mammals other	0	0	0
Dominica	269	marine mammals other	0	0	0
Dominican Rep.	274	marine mammals other	0	0	0
Galapagos Isl.(Ecuador)	284	marine mammals other	0	0	0
El Salvador	289	marine mammals other	0	0	0
Equatorial Guinea	294	marine mammals other	0	0	0
South Georgia & Sandwich Isl. (UK)	314	marine mammals other	0	0	0
Fiji	319	marine mammals other	0	0	0
Mozambique Channel Isl. (FR)	334	marine mammals other	0	0	0
Tromelin Isl.(FR)	339	marine mammals other	0	0	0
French Guyana	344	marine mammals other	0	0	0
French Polynesia	349	marine mammals other	0	0	0
Djibouti	354	marine mammals other	0	0	0
Gabon	359	marine mammals other	0	0	0
Georgia	364	marine mammals other	0	0	0
Gambia	369	marine mammals other	0	0	0
Gaza Strip	374	marine mammals other	0	0	0
Ghana	384	marine mammals other	0	0	0
Gibraltar (UK)	389	marine mammals other	0	0	0
Kiribati	394	marine mammals other	0	0	0
Grenada	409	marine mammals other	0	0	0
Guadeloupe (FR)	414	marine mammals other	0	0	0
Guam (US)	419	marine mammals other	0	0	0
Guatemala	424	marine mammals other	0	0	0
Guinea	429	marine mammals other	0	0	0
Guyana	434	marine mammals other	0	0	0
Haiti	439	marine mammals other	0	0	0
Heard & McDonald Isl.(Australia)	444	marine mammals other	0	0	0
Honduras	449	marine mammals other	0	0	0
Hong Kong	454	marine mammals other	0	0	0
India	464	marine mammals other	0	0	0
Andaman & Nicobar Isl. (India)	469	marine mammals other	0	0	0
Indonesia (Eastern)	474	marine mammals other	0	0	0
Indonesia (Western)	479	marine mammals other	0	0	0
Iran	484	marine mammals other	0	0	0
Iraq	489	marine mammals other	0	0	0
Israel	499	marine mammals other	0	0	0
Italy	504	marine mammals other	0	0	0
Cote d'Ivoire	509	marine mammals other	0	0	0
Jamaica	514	marine mammals other	0	0	0
Japan Outer Isl.	524	marine mammals other	0	0	0
Johnston Atoll (US)	529	marine mammals other	0	0	0

Jordan	534	marine mammals other	0	0	0
Kenya	539	marine mammals other	0	0	0
Korea North	544	marine mammals other	0	0	0
Korea South	549	marine mammals other	0	0	0
Kuwait	554	marine mammals other	0	0	0
Lebanon	559	marine mammals other	0	0	0
Liberia	569	marine mammals other	0	0	0
Libya	574	marine mammals other	0	0	0
Macau (China)	584	marine mammals other	0	0	0
Madagascar	589	marine mammals other	0	0	0
Malaysia West	594	marine mammals other	0	0	0
Malaysia East	599	marine mammals other	0	0	0
Malaysia Sabah	604	marine mammals other	0	0	0
Maldives	609	marine mammals other	0	0	0
Malaysia Sarawak	614	marine mammals other	0	0	0
Malta	619	marine mammals other	0	0	0
Martinique	624	marine mammals other	0	0	0
Mauritania	629	marine mammals other	0	0	0
Mauritius	634	marine mammals other	0	0	0
Haiwaii NorthWest Isl.	644	marine mammals other	0	0	0
Monaco	649	marine mammals other	0	0	0
Montserrat (UK)	654	marine mammals other	0	0	0
Morocco	659	marine mammals other	0	0	0
Mozambique	664	marine mammals other	0	0	0
Oman	669	marine mammals other	0	0	0
Namibia	674	marine mammals other	0	0	0
Nauru	679	marine mammals other	0	0	0
Windward Netherlands Antilles	689	marine mammals other	0	0	0
Leeward Netherland Antilles	694	marine mammals other	0	0	0
New Caledonia	699	marine mammals other	0	0	0
Vanuatu	704	marine mammals other	0	0	0
New Zealand	709	marine mammals other	0	0	0
Nicaragua	714	marine mammals other	0	0	0
Nigeria	719	marine mammals other	0	0	0
Niue (NZ)	724	marine mammals other	0	0	0
Norfolk Isl. (Australia)	729	marine mammals other	0	0	0
Jan Mayen Isl. (Norway)	739	marine mammals other	0	0	0
Northern Marianas (US)	744	marine mammals other	0	0	0
Micronesia	749	marine mammals other	0	0	0
Marshall Isl.	754	marine mammals other	0	0	0
Palau	759	marine mammals other	0	0	0
Pakistan	764	marine mammals other	0	0	0
Panama	769	marine mammals other	0	0	0
Papua New Guinea	774	marine mammals other	0	0	0
Philippines	784	marine mammals other	0	0	0
Pitcairn (UK)	789	marine mammals other	0	0	0
Portugal	799	marine mammals other	0	0	0
Azores Isl.(Portugal)	809	marine mammals other	0	0	0
Guinea-Bissau	814	marine mammals other	0	0	0
Timor Leste	819	marine mammals other	0	0	0
Puerto Rico (US)	824	marine mammals other	0	0	0
Qatar	829	marine mammals other	0	0	0
Reunion (FR)	834	marine mammals other	0	0	0
Romania	839	marine mammals other	0	0	0
Russia Black Sea	849	marine mammals other	0	0	0
Russia Siberia	864	marine mammals other	0	0	0
Russia Baltic Sea St Petersburg	869	marine mammals other	0	0	0
St Helena (UK)	874	marine mammals other	0	0	0
St Kitts & Nevis	879	marine mammals other	0	0	0
Anguila (UK)	884	marine mammals other	0	0	0
St Lucia	889	marine mammals other	0	0	0
St Vincent & The Grenadines	899	marine mammals other	0	0	0
Sao Tome & Principe	904	marine mammals other	0	0	0
Saudi Arabia Red Sea	909	marine mammals other	0	0	0
Saudi Arabia Persian Gulf	914	marine mammals other	0	0	0
Senegal	919	marine mammals other	0	0	0
Seychelles	924	marine mammals other	0	0	0
Sierra Leone	929	marine mammals other	0	0	0
Singapore	934	marine mammals other	0	0	0
Vietnam	939	marine mammals other	0	0	0

Slovenia	944	marine mammals other	0	0	0
Somalia	949	marine mammals other	0	0	0
South Africa	954	marine mammals other	0	0	0
Prince Edward Isl. (SA)	959	marine mammals other	0	0	0
Canary Isl.(Spain)	964	marine mammals other	0	0	0
Spain	969	marine mammals other	0	0	0
Western Sahara (Morocco)	974	marine mammals other	0	0	0
Sudan	979	marine mammals other	0	0	0
Suriname	984	marine mammals other	0	0	0
Syria	999	marine mammals other	0	0	0
Thailand	1004	marine mammals other	0	0	0
Togo	1009	marine mammals other	0	0	0
Tokelau (NZ)	1014	marine mammals other	0	0	0
Tonga	1019	marine mammals other	0	0	0
Trinidad & Tobago	1024	marine mammals other	0	0	0
United Arab Emirates	1029	marine mammals other	0	0	0
Turkey Black Sea	1044	marine mammals other	0	0	0
Turks & Caicos Isl (UK)	1049	marine mammals other	0	0	0
Tuvalu	1054	marine mammals other	0	0	0
Ukraine	1059	marine mammals other	0	0	0
Egypt	1064	marine mammals other	0	0	0
Tanzania	1079	marine mammals other	0	0	0
Haiwaii Main Isl.	1089	marine mammals other	0	0	0
Navassa Isl. (Haiti)	1094	marine mammals other	0	0	0
Palmyra Atoll & Kingman Reef (US)	1099	marine mammals other	0	0	0
Jarvis Isl.(US)	1104	marine mammals other	0	0	0
Howland & Baker Isl.(US)	1109	marine mammals other	0	0	0
USA Golf Of Mexico	1124	marine mammals other	0	0	0
Ascencion Isl.	1129	marine mammals other	0	0	0
Venezuela	1139	marine mammals other	0	0	0
Wake Isl.(US)	1144	marine mammals other	0	0	0
Wallis & Futuna (FR)	1149	marine mammals other	0	0	0
Samoa	1154	marine mammals other	0	0	0
Yemen	1159	marine mammals other	0	0	0
St Paul & Amsterdam (FR)	1169	marine mammals other	0	0	0
Crozet Isl.(FR)	1174	marine mammals other	0	0	0
Kerguelen Isl. (FR)	1179	marine mammals other	0	0	0
Clipperton Isl.(FR)	1184	marine mammals other	0	0	0
Arctic Sea - High seas Areas	1189	marine mammals other	0	0	0
Atlantic Antarctic - High seas Areas	1194	marine mammals other	0	0	0
Atlantic Eastern Central - High seas Areas	1199	marine mammals other	0	0	0
Atlantic Northeast - High seas Areas	1204	marine mammals other	0	0	0
Atlantic Northwest - High seas Areas	1209	marine mammals other	0	0	0
Atlantic SouthEast - High seas Areas	1214	marine mammals other	0	0	0
Atlantic Western Central - High seas Areas	1224	marine mammals other	0	0	0
Indian Ocean Antarctic - High seas Areas	1229	marine mammals other	0	0	0
Indian Ocean Eastern - High seas Areas	1234	marine mammals other	0	0	0
Indian Ocean Western - High seas Areas	1239	marine mammals other	0	0	0
Pacific Antarctic - High seas Areas	1244	marine mammals other	0	0	0
Pacific Eastern Central - High seas Areas	1249	marine mammals other	0	0	0
Pacific Northeast - High seas Areas	1254	marine mammals other	0	0	0
Pacific Northwest - High seas Areas	1259	marine mammals other	0	0	0
Pacific Southeast - High seas Areas	1264	marine mammals other	0	0	0
Pacific Southwest - High seas Areas	1269	marine mammals other	0	0	0
Pacific Western Central - High seas Areas	1274	marine mammals other	0	0	0

Table 37 - High Seas FAO areas EEZ sorted by their contribution in the different exposures for all turtles sorted by IUCN weighted exposure

EEZ, High Seas FAO area	Overall rank	Family	Overlap index	Un-weighted exposure index	IUCN weighted exposure index
India	465	turtle	0.221	0.262	0.422
Vietnam	940	turtle	0.219	0.26	0.42
Myanmar	130	turtle	0.217	0.257	0.415
China	190	turtle	0.182	0.216	0.347
Indonesia (Eastern)	475	turtle	0.178	0.21	0.34
Mauritania	630	turtle	0.158	0.187	0.323
Pacific Western Central - High seas Areas	1275	turtle	0.163	0.193	0.319
Bangladesh	60	turtle	0.165	0.196	0.316
Indonesia (Western)	480	turtle	0.164	0.194	0.313
Morocco	660	turtle	0.137	0.162	0.295
Western Sahara (Morocco)	975	turtle	0.129	0.153	0.277
Mexico	640	turtle	0.134	0.159	0.269
Philippines	785	turtle	0.138	0.164	0.264
United Kingdom	1070	turtle	0.118	0.14	0.254
Malaysia Sarawak	615	turtle	0.127	0.15	0.243
Senegal	920	turtle	0.12	0.143	0.241
Malaysia East	600	turtle	0.123	0.146	0.235
Thailand	1005	turtle	0.12	0.143	0.23
Japan Main Isl.	520	turtle	0.116	0.138	0.224
Japan Outer Isl.	525	turtle	0.117	0.138	0.224
Korea South	550	turtle	0.114	0.135	0.219
Malaysia West	595	turtle	0.114	0.135	0.218
Spain	970	turtle	0.101	0.12	0.217
Pacific Northwest - High seas Areas	1260	turtle	0.112	0.132	0.212
Korea North	545	turtle	0.111	0.132	0.211
Malaysia Sabah	605	turtle	0.109	0.129	0.209
Madagascar	590	turtle	0.109	0.129	0.208
Indian Ocean Eastern - High seas Areas	1235	turtle	0.109	0.13	0.208
Nigeria	720	turtle	0.104	0.124	0.2
USA East Coast	1120	turtle	0.093	0.11	0.2
France	330	turtle	0.091	0.108	0.196
Sierra Leone	930	turtle	0.102	0.121	0.196
Guinea	430	turtle	0.102	0.121	0.195
Pakistan	765	turtle	0.101	0.12	0.193
Taiwan	195	turtle	0.1	0.118	0.191
Venezuela	1140	turtle	0.092	0.109	0.187
Atlantic Eastern Central - High seas Areas	1200	turtle	0.093	0.11	0.185
Namibia	675	turtle	0.096	0.114	0.184
Brazil	90	turtle	0.095	0.112	0.182
Cameroon	145	turtle	0.093	0.111	0.178
Angola	20	turtle	0.093	0.11	0.178
South Africa	955	turtle	0.093	0.11	0.178
Papua New Guinea	775	turtle	0.089	0.105	0.17
Denmark	265	turtle	0.079	0.093	0.17
Cambodia	140	turtle	0.088	0.104	0.168
Canary Isl.(Spain)	965	turtle	0.078	0.092	0.167
Atlantic Western Central - High seas Areas	1225	turtle	0.083	0.099	0.166
Tunisia	1035	turtle	0.078	0.092	0.166
Peru	780	turtle	0.087	0.103	0.165
Guyana	435	turtle	0.085	0.101	0.162
Oman	670	turtle	0.084	0.099	0.159
Yemen	1160	turtle	0.083	0.098	0.158
Somalia	950	turtle	0.083	0.098	0.158
Iran	485	turtle	0.083	0.098	0.157
Indian Ocean Western - High seas Areas	1240	turtle	0.08	0.095	0.154
Norway	735	turtle	0.071	0.084	0.153
Ireland	495	turtle	0.071	0.084	0.152
Italy	505	turtle	0.072	0.085	0.151
Pacific Eastern Central - High seas Areas	1250	turtle	0.077	0.091	0.147

Canada	150	turtle	0.074	0.088	0.146
Russia Pacific	860	turtle	0.072	0.085	0.145
Colombia	210	turtle	0.073	0.086	0.145
Suriname	985	turtle	0.074	0.087	0.141
Gambia	370	turtle	0.073	0.087	0.14
Ghana	385	turtle	0.073	0.087	0.14
USA Golf Of Mexico	1125	turtle	0.065	0.077	0.139
Gabon	360	turtle	0.072	0.086	0.138
Australia	35	turtle	0.071	0.084	0.136
Pacific Southeast - High seas Areas	1265	turtle	0.071	0.084	0.135
Atlantic Southwest - High seas Areas	1220	turtle	0.068	0.08	0.131
Portugal	800	turtle	0.06	0.071	0.13
United Arab Emirates	1030	turtle	0.068	0.081	0.129
Saudi Arabia Persian Gulf	915	turtle	0.066	0.078	0.124
Cote d'Ivoire	510	turtle	0.064	0.076	0.123
Pacific Southwest - High seas Areas	1270	turtle	0.063	0.074	0.123
Andaman & Nicobar Isl. (India)	470	turtle	0.062	0.074	0.119
Tanzania	1080	turtle	0.062	0.073	0.118
Alaska	1085	turtle	0.065	0.076	0.117
Netherlands	685	turtle	0.054	0.064	0.116
Sudan	980	turtle	0.06	0.071	0.115
Germany	380	turtle	0.053	0.063	0.114
Saudi Arabia Red Sea	910	turtle	0.059	0.07	0.112
Libya	575	turtle	0.054	0.064	0.112
Solomon Isl.	110	turtle	0.057	0.067	0.112
Algeria	10	turtle	0.054	0.063	0.111
Fiji	320	turtle	0.056	0.067	0.111
New Zealand	710	turtle	0.057	0.067	0.11
Egypt	1065	turtle	0.057	0.068	0.109
Jamaica	515	turtle	0.056	0.066	0.109
Chile	170	turtle	0.056	0.066	0.108
Sri Lanka	165	turtle	0.057	0.067	0.108
Cape Verde	155	turtle	0.052	0.061	0.108
Greece	400	turtle	0.053	0.063	0.106
Haiti	440	turtle	0.055	0.065	0.104
Cuba	250	turtle	0.052	0.062	0.101
Ecuador	280	turtle	0.053	0.063	0.101
Malta	620	turtle	0.047	0.055	0.099
Trinidad & Tobago	1025	turtle	0.049	0.058	0.099
Dominican Rep.	275	turtle	0.052	0.061	0.099
Atlantic Northeast - High seas Areas	1205	turtle	0.047	0.056	0.098
Bahrain	55	turtle	0.052	0.061	0.098
Sweden	995	turtle	0.044	0.052	0.096
Congo Republic	225	turtle	0.05	0.059	0.096
Maldives	610	turtle	0.05	0.059	0.096
Faeroe Isl.(Denmark)	305	turtle	0.045	0.053	0.093
Galapagos Isl.(Ecuador)	285	turtle	0.049	0.058	0.093
Atlantic SouthEast - High seas Areas	1215	turtle	0.047	0.056	0.092
Hong Kong	455	turtle	0.047	0.056	0.09
Azores Isl.(Portugal)	810	turtle	0.041	0.049	0.088
Channel Isl.(UK)	1075	turtle	0.04	0.048	0.088
Kuwait	555	turtle	0.046	0.054	0.086
Kiribati	395	turtle	0.043	0.051	0.085
French Guyana	345	turtle	0.044	0.052	0.084
Mozambique	665	turtle	0.044	0.052	0.084
Atlantic Northwest - High seas Areas	1210	turtle	0.04	0.048	0.082
Panama	770	turtle	0.041	0.049	0.079
Brunei	120	turtle	0.041	0.049	0.078
Turkey Mediterranean Sea	1040	turtle	0.039	0.046	0.077
Madeira Isl.(Portugal)	805	turtle	0.036	0.042	0.076
Congo	230	turtle	0.04	0.047	0.076
Croatia	245	turtle	0.038	0.045	0.076
Mayotte (FR)	220	turtle	0.039	0.046	0.075
Qatar	830	turtle	0.039	0.046	0.074
Liberia	570	turtle	0.038	0.045	0.073
USA West Coast	1115	turtle	0.04	0.047	0.072
Martinique	625	turtle	0.037	0.044	0.07
Eritrea	135	turtle	0.036	0.042	0.069
Togo	1010	turtle	0.035	0.042	0.068
Uruguay	1135	turtle	0.033	0.039	0.068

Sao Tome & Principe	905	turtle	0.035	0.042	0.067
Benin	260	turtle	0.035	0.042	0.067
Honduras	450	turtle	0.033	0.039	0.065
Singapore	935	turtle	0.034	0.04	0.065
Brit. Virgin Isl.(UK)	115	turtle	0.034	0.04	0.064
Mauritius	635	turtle	0.033	0.04	0.064
Iceland	460	turtle	0.03	0.036	0.063
French Polynesia	350	turtle	0.032	0.038	0.062
Guadeloupe (FR)	415	turtle	0.032	0.038	0.062
Micronesia	750	turtle	0.031	0.037	0.061
Kenya	540	turtle	0.031	0.037	0.06
St Lucia	890	turtle	0.031	0.036	0.059
Grenada	410	turtle	0.028	0.034	0.057
Costa Rica	240	turtle	0.03	0.035	0.057
Dominica	270	turtle	0.03	0.035	0.057
Puerto Rico (US)	825	turtle	0.029	0.035	0.056
Trindade & Matin Isl (BR)	95	turtle	0.029	0.034	0.056
Equatorial Guinea	295	turtle	0.029	0.034	0.056
Pacific Northeast - High seas Areas	1255	turtle	0.03	0.036	0.055
New Caledonia	700	turtle	0.028	0.033	0.054
Christmas Isl.(Australia)	200	turtle	0.028	0.034	0.054
Macau (China)	585	turtle	0.028	0.033	0.053
Guinea-Bissau	815	turtle	0.028	0.033	0.053
Timor Leste	820	turtle	0.027	0.032	0.052
Vanuatu	705	turtle	0.026	0.031	0.052
El Salvador	290	turtle	0.027	0.031	0.051
Lord Howe Isl. (Australia)	45	turtle	0.026	0.031	0.051
St Vincent & The Grenadines	900	turtle	0.025	0.03	0.051
Tuvalu	1055	turtle	0.024	0.029	0.048
Belgium	70	turtle	0.022	0.027	0.048
J. Fernandez, Felix and Ambrosio Isl. (Chile)	185	turtle	0.024	0.029	0.048
Lebanon	560	turtle	0.024	0.028	0.047
Comoros Isl.	215	turtle	0.024	0.029	0.046
Seychelles	925	turtle	0.024	0.028	0.046
Antigua & Barbuda	25	turtle	0.024	0.028	0.045
Leeward Netherland Antilles	695	turtle	0.022	0.027	0.045
Anguila (UK)	885	turtle	0.023	0.028	0.045
Marshall Isl.	755	turtle	0.023	0.027	0.044
Palau	760	turtle	0.023	0.027	0.044
Nicaragua	715	turtle	0.023	0.027	0.044
Norfolk Isl. (Australia)	730	turtle	0.022	0.026	0.043
Wallis & Futuna (FR)	1150	turtle	0.022	0.026	0.043
Montenegro	1165	turtle	0.021	0.025	0.043
Israel	500	turtle	0.021	0.025	0.043
Bahamas	50	turtle	0.02	0.024	0.041
Albania	5	turtle	0.02	0.023	0.039
Cyprus	255	turtle	0.019	0.023	0.038
Desventuradas Isl.(Chile)	180	turtle	0.019	0.023	0.038
Cocos Isl.(Australia)	205	turtle	0.02	0.024	0.038
Gaza Strip	375	turtle	0.018	0.022	0.036
Argentina	30	turtle	0.018	0.021	0.036
Syria	1000	turtle	0.017	0.021	0.035
St Kitts & Nevis	880	turtle	0.018	0.021	0.035
Mozambique Channel Isl. (FR)	335	turtle	0.018	0.021	0.034
Poland	795	turtle	0.017	0.02	0.034
Windward Netherlands Antilles	690	turtle	0.018	0.021	0.034
Iraq	490	turtle	0.018	0.021	0.034
Tonga	1020	turtle	0.017	0.02	0.033
Montserrat (UK)	655	turtle	0.017	0.02	0.032
Djibouti	355	turtle	0.017	0.02	0.032
Easter Isl.(Chile)	175	turtle	0.016	0.019	0.031
Finland	325	turtle	0.014	0.017	0.03
Bermuda (UK)	75	turtle	0.014	0.016	0.029
Cayman Isl.(UK)	160	turtle	0.015	0.018	0.029
Belize	100	turtle	0.013	0.016	0.029
Guam (US)	420	turtle	0.014	0.017	0.028
Ascencion Isl.	1130	turtle	0.014	0.016	0.027
American Samoa	15	turtle	0.014	0.016	0.027
Nauru	680	turtle	0.013	0.016	0.026
Barbados	65	turtle	0.014	0.016	0.026

Cook Isl.(New Zealand)	235	turtle	0.013	0.016	0.026
Tromelin Isl.(FR)	340	turtle	0.014	0.016	0.026
Greenland	405	turtle	0.012	0.014	0.025
Brit. Indian Oce (UK)	105	turtle	0.013	0.015	0.024
Haiwaii NorthWest Isl.	645	turtle	0.013	0.016	0.024
Haiwaii Main Isl.	1090	turtle	0.013	0.015	0.024
St Pierre & Miquelon (FR)	895	turtle	0.011	0.014	0.023
Jordan	535	turtle	0.012	0.014	0.023
Palmyra Atoll & Kingman Reef (US)	1100	turtle	0.012	0.014	0.023
Latvia	565	turtle	0.011	0.013	0.023
Samoa	1155	turtle	0.011	0.013	0.022
Guatemala	425	turtle	0.011	0.013	0.022
Northern Marianas (US)	745	turtle	0.01	0.012	0.02
Estonia	300	turtle	0.009	0.011	0.019
Tokelau (NZ)	1015	turtle	0.01	0.011	0.019
Reunion (FR)	835	turtle	0.01	0.012	0.019
Monaco	650	turtle	0.009	0.011	0.018
Russia Baltic Sea Kaliningrad	855	turtle	0.009	0.01	0.018
Bosnia	80	turtle	0.009	0.011	0.018
Johnston Atoll (US)	530	turtle	0.008	0.01	0.016
Jarvis Isl.(US)	1105	turtle	0.008	0.009	0.015
Clipperton Isl.(FR)	1185	turtle	0.007	0.008	0.013
Slovenia	945	turtle	0.006	0.008	0.013
Lithuania	580	turtle	0.006	0.007	0.013
Howland & Baker Isl.(US)	1110	turtle	0.006	0.007	0.012
Pitcairn (UK)	790	turtle	0.006	0.007	0.011
St Helena (UK)	875	turtle	0.006	0.007	0.011
St Paul & Amsterdam (FR)	1170	turtle	0.005	0.006	0.011
Falkland Isl. (Malvinas) (Disputed)	310	turtle	0.003	0.004	0.006
Crozet Isl.(FR)	1175	turtle	0.003	0.003	0.005
Prince Edward Isl. (SA)	960	turtle	0.002	0.003	0.005
Indian Ocean Antarctic - High seas Areas	1230	turtle	0.001	0.002	0.003
Macquarie Isl.(Australia)	40	turtle	0	0	0
Bouvet Isl.(Norway)	85	turtle	0	0	0
Bulgaria	125	turtle	0	0	0
South Georgia & Sandwich Isl. (UK)	315	turtle	0	0	0
Georgia	365	turtle	0	0	0
Gibraltar (UK)	390	turtle	0	0	0
Heard & McDonald Isl.(Australia)	445	turtle	0	0	0
Niue (NZ)	725	turtle	0	0	0
Jan Mayen Isl. (Norway)	740	turtle	0	0	0
Romania	840	turtle	0	0	0
Russia Barrents Sea	845	turtle	0	0	0
Russia Black Sea	850	turtle	0	0	0
Russia Siberia	865	turtle	0	0	0
Russia Baltic Sea St Petersburg	870	turtle	0	0	0
Svalbard Isl. (Norway)	990	turtle	0	0	0
Turkey Black Sea	1045	turtle	0	0	0
Turks & Caicos Isl (UK)	1050	turtle	0	0	0
Ukraine	1060	turtle	0	0	0
Navassa Isl. (Haiti)	1095	turtle	0	0	0
Wake Isl.(US)	1145	turtle	0	0	0
Kerguelen Isl. (FR)	1180	turtle	0	0	0
Arctic Sea - High seas Areas	1190	turtle	0	0	0
Atlantic Antarctic - High seas Areas	1195	turtle	0	0	0
Pacific Antarctic - High seas Areas	1245	turtle	0	0	0

6. Survey

Table 38 - Gillnet survey form addressed to each jurisdiction

DATA REQUESTED
Fishery
Fishery name
Fishing season (starting month,ending month)
Fishery target species for up to five main target species
Target 1
Target 2
Target 3
Target 4
Target 5
Vessels
Number of vessels in the fishery
Vessel length (m)*
Vessel type (artisinal/industrial)
Number of crew
Effort
Effort (km/h/yr)*
number of sets/yr (note that catch data are not requested)
Distance from the coast fished (km)* (or please join an effort map if available)
Spatial descriptors of fishing effort
Does the fishery occur exclusively within the EEZ, straddling this boundary or in high seas exclusively?
Fishing gear
Gear type (name)
Net length (m)*
Setting depth (m)*
Mesh size (cm)*
Net height (m)*
Soak time (min)*
Fishery gear setting details
Depth of water fished (m)*
Depth from the bottom fished (categories: pelagic, epipelagic, middle-depths, epibenthic, benthic)
Mitigation
Are mitigation strategies used to avoid non-target species captures (see species list for species of interest in the study)?
a) turtles – what and how are they deployed
b) sharks - what and how are they deployed
c) marine mammals - what and how are they deployed
d) seabirds - what and how are they deployed

**** specify the unit if different***

Table 39 - Gillnet fisheries survey results. Better printed in A3

ISO	Fishery Code	Fishery Name	min Fishing distance from	max Fishing distance from	Fishing Scale	Avg Boat Size (m)	Avg Boat HP	min boat GRT	max boat GRT	Number of Vessels in the Fishery	Set Gillnet/Bottom Gillnet (GN)	Driftnet (GND)	Encircling Gillnet (GNC)	Fixed Gillnet (GNF)	Trammel Net (GTR)	Combined gillnets-trammel	most Likely	Gear Type/Fishery Comment	Zones (0:pelagic-)	Main Targets	Avg fish length(cm)	Common Fish habitat Min	Common Fish habitat Max Depth Range	min Mesh size (mm)	max Mesh size (mm)	Avg Mesh Size (mm)	min net Length (m)	max net length (m)	Avg Net Length (in m)	Min Net Height (m)	max net height(m)	Avg Net Height (m)	min Setting Depth(m)	max Setting depth(m)	Avg Setting Depth	Fishing Season Start	Fishing Season End	Av Soak Time (hours)
MALAYSIA																																						
MYS	**MY1**	**Pelagic Fishery**	**9**		**SSF**			**0**	**40**		**b**		**b**	**b**				**Gillnet/Driftnet widely used for pelagic fishing and mostly in coastal waters**							**65**	**101**												
MYS	MY1																			*Rastrelliger spp.*	0	25	20	90													
MYS	MY1																			*Scomberomorus spp.*	0	120	10	70													
MYS	MY1																			*Ilisha elongata*	0	30	5														
MYS	MY1																			*Anodontostoma chacunda*	0	14	0	50													
MYS	MY1																			*Megalaspis cordyla*	0	45	20	100													
MYS	MY1																			*Selar crumenopthalmus*	4	24	2	10													
MYS	MY1																			*Chirocentrus spp.*	1	60	0	150													
MYS	MY1																			*Thunnus tonggol*	1	70	10														
MYS	MY1																			*Euthynnus affinis*	1	60	0	200													
MYS	**MY2**	**Demersal Fishery**	**9**		**SSF**			**0**	**40**		**b**	**b**	**b**					**Marine Catfish and Jewfish also uses set gillnet. Fishing operations in coastal waters**																			
MYS	MY2																			*Croakers*	2															
MYS	MY2																			*Sea Catfish*	2															
MYS	**MY3**	**Prawn Fishery**	**9**		**SSF**			**0**	**40**		**b**		**b**			**b**		**The prawn drift and gill nets are actually trammel nets. Fishing operations in coastal waters**																			
MYS	MY3																			*prawns*	2															
MYS	**MY4**	**Other Fisheries**	**9**		**SSF**			**0**	**40**		**b**							**Sharks and Rays**																			
MYS	MY4																			*Himantura spp./ Gymnura spp. / Myliobatis spp./ Aetobatus spp./Carcharhinus spp./Sphyrna spp.*																	

REFERENCES : (Squires et al. 2003) (Project Global 2011) (SEAFDEC Stats 2011) (DoF Malaysia 2006) (SEAFDEC Framework 2008)

TURKEY																																						
TUR	**TR1**	**Turkey Gillnet Fishery**			**SSF**	**9**				**15201**						**b**		**mostly small scale fishing.**							**38**	**70**				**200**			**10**					
TUR	TR1																			*Sarda Sarda*	0	50	80	200													
TUR	TR1																			*Pomatomus saltatrix*	1	60	0	200													
TUR	TR1																			*Sparus auratus*	2	35	1	30													
TUR	TR1																			*Dicentrarchus labrax*	2	50	10	100													

REFERENCES : (Sextant Turkey Survey 2011)

ICELAND																																						
ISL	**IS1**	**Bottom Gillnet Fishery**			**SSF**							**b**						**Bottom Gillnet is widely used by small-intermediate boats to catch the Atlantic Cod in the S/SW of iceland.**																	**50**	**500**				
ISL	IS1																			*Gadus morhua*	5	100	150	200	140	204									1	5		
ISL	IS1																			*Melanogrammus aeglefinus*	2	35	10	200	140	150												
ISL	IS1				SSF/LSF															*Cyclopterus lumpus.*	5	35	50	150	180	270												
ISL	IS1																			*Hippoglossus hippoglossus*	2		50	2000	460	460												
ISL	IS1																			*other Flatfishes*	2				165	200												

REFERENCES : (Icelandic Fisheries 2011)

SWEDEN																																						
SWE	**SE1**	**Cod Fishery Baltic Sea**			**SSF**	**9.14**				**299**		**b**						**Mostly Artisanal Fishery**							**90**											**1**	**1**		
SWE	SE1																			*Gadus morhua*	5	100	150	200														
SWE	SE1																			*other Flatfishes*	2																
SWE	**SE2**	**Herring Fishery Baltic Sea**			**SSF**	**8.7**				**127**		**b**						**Mostly Artisanal Fishery**																		**1**	**1**		
SWE	SE2																			*Clupea harengus.*	5	30	0	200														
SWE	**SE3**	**Demersal Skagerrak/Kattegatt**			**SSF**	**9.06**				**66**		**b**						**Mostly Artisanal Fishery**							**90**											**1**	**1**		
SWE	SE3																			*Gadus morhua*	5	100	150	200														
SWE	SE3																			*Pollachius virens*	2	60	37	364														
SWE	**SE4**	**Pelagic Skagerrak/Kattegatt**			**SSF**	**8.62**				**32**		**b**						**Mostly Artisanal Fishery**																		**1**	**1**		
SWE	SE4																			*Scomber scombrus.*	0	30	0	200														
SWE	SE4																			*Clupea harengus.*	5	30	0	200														

REFERENCES : (Sextant Sweden Survey 2011)

MAURITIUS

MUS	**MU1**	**Mauritius Gillnet Fishery**		**SSF**	**7**	**6**	**b**				**Artisanal and Costal Fishery.**							**110**	**250**		**2.5**		**3**	**3**	**9**	**11**
MUS	MU1										*Lethrinus nebulosus*	4	70	10	75											
MUS	MU1										*Lethrinus mahsena*	4	40	2	100											
MUS	MU1										*Siganus sutor*	4	30	20	50											
MUS	MU1										*Mugil cephalus*	5	50	0	120											
MUS	MU1										*Valamugil seheli*	4	40													

REFERENCES : (Sextant Mauritius Survey 2011)

BELGIUM

BEL	**BE1**	**Sole and Cod Fishery, zone IVC**			**13.5**	**6**	**b**																**1**	**1**		
BEL	BE1										*Gadus morhua*	5	100	150	200		140									
BEL	BE1										*Solea solea*	2	35	10	60		90									
BEL	**BE2**	**Sole and Cod Fishery, zone VIID**			**13.5**	**2**	**b**																**10**	**11**		
BEL	BE2										Gadus morhua	5	100	150	200		140									
BEL	BE2										Solea solea	2	35	10	60		90									

REFERENCES : (Sextant Belgium Survey 2011)

FRANCE

FRA	**FR1**	**France Atlantic Set Nets**	**50**	**SSF**	**10.5**	**1200**	**b**		**b**											**1.5**	**2.5**	**2**	**10**	**200**	**1**	**1**	
FRA	FR1										*Solea solea*	2	35	10	60											
FRA	FR1										*Lophius sp.*	2														
FRA	FR1										*Maja Squinado*	2		0	75											
FRA	**FR2**	**France Mediterranean Set Nets**	**30**	**SSF**	**8**	**742**	**b**	**b**	**b**	**b**													**10**	**400**	**1**	**1**	
FRA	FR2										*Sparus aurata*	2	35	1	30											
FRA	FR2										*Solea solea*	2	35	10	60											
FRA	FR2										*Merluccius merluccius*	2	45	70	400											
FRA	FR2										*Mullus surmuletus*	2	25	5	409											
FRA	FR2										*Mullus barbatus*	2	20	100	300											
FRA	FR2										*Palinurus elephas*	3	40	10	70											

REFERENCES : (Sextant France Survey 2011)

MALTA

MLT	**MT1**	**Set Gillnet Fishery**		**SSF**	**5.89**	**34**	**b**											**11**	**45**		**150**		**12**	**0**	**100**	**1**	**12**	**10**
MLT	MT1										*Auxis thazard*	0	60	50													
MLT	MT1										*Seriola dumerili*	4	100	18	72												
MLT	MT1										*Oblada melanura*	5	20		30												
MLT	MT1										*Boops boops*	2	20	0	100												
MLT	MT1										*Auxis Rochei Rochei*	0		10													
MLT	**MT2**	**Combined Gillnet/Trammel Fishery**		**SSF**	**6.4**	**23**			**b**									**22**	**40**		**153**		**6.6**	**20**	**100**	**1**	**12**	**11**
MLT	MT2										*Sepia officinalis*	2		100	200												
MLT	MT2										*Mullus surmuletus*	2	25	5	409												
MLT	MT2										*Boops boops*	2	20	0	100												
MLT	MT2										*Scorpaena spp.*	2															
MLT	**MT3**	**trammel Net Fishery**		**SSF**	**6.39**	**603**			**b**									**22**	**45**		**150**		**1.6**	**20**	**100**	**1**	**12**	**11**
MLT	MT3										*Scorpaena spp.*	2															
MLT	MT3										*Sepia officinalis*	2		100	200												
MLT	MT3										*Mullus surmuletus*	2	25	5	409												

REFERENCES : (Sextant Malta Survey 2011)

AUSTRALIA

AUS	**AU1**	**Shark Gillnet and Shark Hook Sectors**				**44**	**b**				**Demersal Fishing. West Coast Tasmania, Set Depth can not exceed 130m**							**152.4**		**4200**				**183**	**5**	**4**	
AUS	AU1										*Callorhinchus milii*	2	75	0	227											
AUS	AU1										*Mustelus antarcticus*	2			80											
AUS	AU1										*Pristiophorus cirratus*	2	125	37	146											
AUS	AU1										*Pristiophorus nudipinnis*	2		37	165											
AUS	AU1										*Galeorhinus galeus*	5	160	2	470											

REFERENCES : (Wilson et al. 2010)

VANUATU

VUT	**VU1**	**Coastal Reef Fishery**		**SSF**			**b**				**Reef Associated Fisheries by coastal communities..Drifnet is banned.**																

REFERENCES : (Sextant Vanuatu Survey 2011)

St HELENA

SHN	**SH1**																						

no gill-net fishery is carried out within the EEZ's of St Helena

REFERENCES : (Sextant St Helena Survey 2011)

BANGLADESH

BGD	**BD1**	**Mechanised Gillnetters Fishery**		**SSF**			**18,992**	**b**															
BGD	BD1																						
BGD	BD1																						
BGD	**BD2**	**Non-Mechanised Gillnetters Fishery**		**SSF**			**6,377**	**b**															
BGD	BD2																						
BGD	BD2																						
BGD	**BD3**	**Trammel Net Fishery**		**SSF**			**1,103**			**b**													

Main Target is the pelagic Tenualosa ilisha

Tenualosa ilisha 0 36 200
promfret,jewfish,catfish,ray,sharks

Main Target is the pelagic Tenualosa ilisha

Tenualosa ilisha 0 36 200
promfret,Bambay Duck,jewfish,ray,sharks

Main Targets are jewfish and shrimps

promfret,shrimp,jewfish,catfish,ray,sharks

Please note that driftnet are used for Hilsha shad, large Mesh drift net for the indian salmon, bottom gillnet for shrimps, croakers, ribon fish, bombay duck and Mullet gillnet for grey mullet.

REFERENCES : (Hossain 2004) (DoF Bangladesh 2007)

THAILAND

THA	**TH1**	**Indian Ocean Driftnet Fishery**	**22**	**LSF**	**10.5**	**5**			**b**													**60**	**100**
THA	TH1																						
THA	**TH2**	**Indian Ocean Encircling Gillnet Fishery**	**22**	**LSF**	**12**	**5**				**b**												**40**	**45**
THA	TH2																						
THA	**TH3**	**Indian Ocean Trammel Net Fishery**	**22**	**SSF**	**9.5**	**5**					**b**											**40**	**260**
THA	TH3																						
THA	**TH4**	**Indian Ocean Other Gillnet Fishery**	**22**	**SSF**		**5**	**b**	**b**															
THA	TH4							**b**															
THA	TH4				**7.5**			**b**														**40**	**85**
THA	TH4				**11**				**b**														
THA	TH4				**11**				**b**													**100**	**120**
THA	TH4				**11**				**b**													**90**	**95**
THA	TH4				**11**				**b**													**25**	**30**
THA	**TH5**	**Gulf of Thaillan Other Gillnet Fishery**	**22**	**SSF**		**5**	**b**	**b**															
THA	TH5							**b**															
THA	TH5				**7.5**			**b**														**40**	**85**
THA	TH5				**11**				**b**														
THA	TH5				**11**				**b**													**100**	**120**
THA	TH5				**11**				**b**													**90**	**95**
THA	TH5				**11**				**b**													**25**	**30**
THA	**TH6**	**Gulf of Thailland Driftnet Fishery**		**22**	**LSF**	**10.5**	**5**				**b**											**60**	**100**
THA	TH6																						
THA	**TH7**	**Gulf of Thailland Encircling Gillnet Fishery**		**22**	**LSF**	**12**	**5**					**b**										**40**	**45**
THA	TH7																						
THA	TH7																						
THA	**TH8**	**Gulf of Thailland Trammel Net Fishery**		**22**	**SSF**	**9.5**	**5**						**b**									**40**	**260**
THA	TH8																						

Pelagic fish mostly

Scomberomorus guttatus 0 55 20 90
Indo Pacific Mackerel,Scad,dorad wolf-hering,croaker,Fourfingers threadfin,spanish mackerel,sardine,pomfret,mullet

Main Target Indo-Pacific mackerel

Scomberomorus guttatus 0 55 20 90
prawns, drums & croakers, indo-pacific mackerel, anchovies, swimming crabs, red snapper, indian mackerel

Indo-Pacific mackerel, swimming crab, Sillago Whitings, mullet, sardine
Fourfingers threadfin, mullet, sardine
seabass,mangrove crabs,red snapper,spinny lobster,threadfin,snapper,emperor,red frog crab,seabass
swimming crabs
giant queenfish
whiting

Main Target Indo-Pacific mackerel

Indo-Pacific mackerel, swimming crab, mangrove crabs, Sillago Whitings, Threadfin, mullet, sardine, indian mackerel
Fourfingers threadfin, mullet, sardine
seabass,mangrove crabs,red snapper,spinny lobster,threadfin,snapper,emperor,red frog crab,seabass
swimming crabs
giant queenfish
whiting

Pelagic fish mostly

Longtail Tuna, Eastern Little Tuna, Narrow-barred king mackerel, Trash Fish, Indo-Pacific mackerel, indian mackerel

Main Target Indo-Pacific mackerel

Scomberomorus guttatus 0 55 20 90
Jacks, Cavalla, Trevallies, Trash Fish

prawns, Narrow-barred king mackerel, crabs

REFERENCES : (SEAFDEC Stats 2011) (SEAFDEC Framework 2008) (SEAFDEC Monograph 2011)

VIETNAM

VNM	**VN1**	**Driftnet Fisheries**		**SSF**	**15**	**40**			**b**			**Mostly pelagic targets**								**2**	**20**	**0**	**6**	**12**
VNM	VN1												*Sardine, Flying Fish*	**30**	**50**									
VNM	VN1			**SSF/LSF**								some large scale fishing in the Da Nang province.	*Tuna and Mackerel*	**70**	**105**									
VNM	**VN2**	**Drift Bottom Gillnet Fisheries**		**SSF**		**40**		**b**	**b**					**48**	**400**									
VNM	VN2												*grouper, croaker, bream, swimming crab*											
VNM	**VN3**	**Bag Gillnet Fisheries**		**SSF**	**13**	**40**	**b**					**Bag Gillnet**												
VNM	VN3												*Crabs, Blue swimming crab, Tigertooth croake*											
VNM	**VN4**	**Trammel Net Fisheries**		**SSF**	**10**	**40**				**b**		**Operated mostly in shallow waters**											**20**	
VNM	VN4												*Tiggertoothed Croaker,Lobster*											
VNM	VN4												*Shrimps*	**44**	**800**									
VNM	VN4												*Cuttlefish*	**75**	**480**									

REFERENCES : (SEAFDEC Stats 2011) (SEAFDEC Framework 2008) (SEAFDEC Monograph 2011)

PHILIPPINES

PHL	**PH1**	**Surface Gillnet Fisheries**	**15**	**SSF**	**8**	**3**	**b**					**pelagic fishing**											
PHL	PH1												*Long torn,big-eye Scad*										
PHL	PH1												*anchovy*			**14.5**							
PHL	PH1												*Sardine/Mackerel*	**30**	**42**								
PHL	PH1												*Garfish*	**40**	**45**								
PHL	PH1												*Flying Fish*			**30**							
PHL	**PH1**	**Driftnet Fisheries**	**15**	**SSF**	**10**	**3**			**b**					**25**	**90**									
PHL	PH2												*Black Fin Mullet, Big-Eye/Yellowstripe/Round Scad, FLying Fish, Fresh water Herring,Skipjack, Tuna, Blue Marlin, Spanish/Indian/Stripped/Short-bodied/Frigate Mackerel,Leather Jacket, Squid, Milkfis*											
PHL	PH2												*Manta Ray*			**650**						**30**	
PHL	**PH3**	**Bottom Gillnet Fisheries**	**15**	**SSF**		**3**		**b**						**30**	**150**									
PHL	PH3												*crabs, nimipterids, lizard fish, slipmouths, hairtail, snapper, white shrimp, prawn*										
PHL	**PH4**	**Trammel Net Fisheries**	**15**	**SSF**	**8.5**	**3**				**b**														
PHL	PH4												*halfbeak fish, Spotted halfbeak,*	**38.1**	**76.2**								
PHL	PH4												*garfish*	**43.5**	**60.9**								
PHL	**PH5**	**Encircling Gillnet Fisheries**	**15**	**SSF**	**9**	**3**					**b**			**28**	**40**							**16**	**24**	
PHL	PH5												*Mackerel,Milkfish,Round Scad, Herring, Scad, Sting Ray, Shark, Sardine*										

REFERENCES : (SEAFDEC Stats 2011) (SEAFDEC Framework 2008) (SEAFDEC Monograph 2011)

BRUNEI

BRN	**BN1**	**Bottom Gillnet Fisheries**	**5.5**	**SSF**	**7.5**	**5**		**b**				**Demersal and small pelagic fishes**		**51**	**76**								**7**
BRN	BN1												*pony fish, hard-tail scads, croakers, etc*										
BRN	**BN2**	**Trammel Net Fisheries**	**5.5**	**SSF**	**6**	**2**		**b**				**Mostly Shrimps**		**35**	**270**	**270**	**460**						**1.5**	
BRN	BN2												*Schrimps and Crabs*											
BRN	**BN3**	**Crab Gillnet Fisheries**	**5.5**	**SSF**			**b**																	
BRN	BN3												*Crabs*											
BRN	**BN4**	**Trammel Net Fisheries**	**5.5**	**SSF**	**7.66**	**2**			**b**			**pelagic fish**												
BRN	BN4												*pomfret,bonito,scomberoides*											
													Scomberomorus commerson	**0**	**120**	**10**	**70**						

REFERENCES : (SEAFDEC Stats 2011) (SEAFDEC Framework 2008) (SEAFDEC Monograph 2011)

CAMEROON

CMR	**CM1**	**Gillnet Fisheries**	**3.2**	**SSF**			**b**	**b**	**b**			**70-80% pelagic feishing, 20-30% Demersal**											
CMR	CM1				**9**				**b**				*Ethmalosa fimbriata*	**0**	**25**	**0**	**50**	**40**	**45**	**600**	**800**	**14**	
CMR	CM1				**9**				**b**				*Sardinella maderensis*	**0**	**25**	**0**	**80**	**35**	**40**	**600**	**800**	**12**	
CMR	CM1				**7.5**			**b**					*Pseudotolithus senegalensis*	**2**	**50**	**0**	**70**	**35**	**90**	**100**	**300**	**6**	
CMR	CM1				**7.5**			**b**					*Pseudotolithus typus*	**2**	**50**	**0**	**150**	**35**	**90**	**100**	**300**	**6**	
CMR	CM1				**7.5**			**b**					*Galoides/Pentanemus/Polydactylus*	**2**				**35**	**90**	**100**	**300**	**6**	

REFERENCES : (Project Global 2011)

SOUTH

AFRICA

ZAF	**ZA1**	**Shark Gillnet Fisheries**	**0.4**	**SSF**			**15**	**b**	**b**					**Fishery to protect swimmers from shark attack**												
ZAF	ZA1														*Sharks*	**510**	23400	**214**		**6**	**10**	**14**		**1**	**1**

REFERENCES : (Kwazulu-Natal Sharks Board 2011)

DENMARK

DNK	**DK1**	**Kattegat Gillnet Fisheries**		**SSF**	**10.9**	**96.1**		**b**																		
DNK	**DK1**														*Sole*	**90**	**110**									
DNK	**DK1**														*Cod*	**130**										
DNK	**DK2**	**Baltic Gillnet Fisheries**		**SSF**	**10.9**	**96.1**		**b**																		
DNK	DK2														*Cod*	**110**										

REFERENCES : (Project Global 2011)

SLOVENIA

SVN	**Sl1**	**Gillnet Fisheries**		**SSF**				**b**	**b**	**b**	**b**	**b**	**b**		***European Pilchard, Comomon Sole, European Flounder***											
							41		**b**							**50**		**775.77**		**6.9**						15
							4			**b**						**52**		**1018.43**		**11.8**						6
							1				**b**					**38**		**600**		**2**						10
							46					**b**				**62**		**710.56**		**1.1**						18
							1						**b**			**80**		**600**		**3**						18

REFERENCES : (Sextant Slovenia Survey 2011)

GUINEA

GIN	***GN1***	***Gillnet Fisheries***		***SSF***				***b***	***b***	***b***																
GIN	GN1								**b**						*Bonga shads*											
GIN	GN1									**b**					*Bonga Shads,Otholtis*											
GIN	GN1							**b**	**b**	**b**					*Leptocharias smithii,Rhinobatos cemiculus, Sphyrna lewini,Rhinobatos rhinobatos*											

REFERENCES : (Diop et al. 2009)

JAPAN

JPN	**JP1**	**Gillnet Fisheries**		**SSF**				**b**																		
JPN	JP1														*skipjack tuna,yellowfin tuna,bigeye tuna,Pacific bluefin tuna,Albacore*											

REFERENCES : (WCPFC 2010)

MOZAMBIQUE

MOZ	**MZ1**	**Gillnet Fisheries**		**SSF**	**6**			**b**	**b**	**b**																
MOZ	MZ1								**b**						*Grouper, sea bream, sharks*											
MOZ	MZ1									**b**					*Sardines*											

REFERENCES : (Faife 2003) (FAO Profile)

PERU

PER	***PE***	***Shark and Ryas Driftnet Fisheries***		***SSF***						***b***																
PER	PE1														*Sphyrna zygaena*	1	335	0	200							
PER	PE1														*Myliobatis spp.*											
PER	PE1														*Prionace glauca*	1	335	1	350							
PER	PE1														*Isurus oxyrinchus*	1	270	0	740							
PER	PE1														*Alopias vulpinus*	1	450	0	550							
PER	**PE**	**Salaverry and San Jose Gillnet Fisheries**		**SSF**						**b**																
															Paralonchurus peruanus	2	30	10								
															Genypterus maculatus	2	50									
															Mustelus whitneyi	2		16	221							

REFERENCES : (Ayala 2008) (Mangel et al. 2009)

SPAIN

ESP	**ES1**	**Anglerfish Gillnet Fisheries**		**SSF**						**b**				**Operates in ICES Div. VIIIc**						**280**				**200**	**900**	
ESP	ES1														*Lophius piscatorius*	2	100	20	1000							
															Lophius budegassa	2	50	300	1013							

REFERENCES : (Costas et al. 2007)

EU																											
		EU deep sea gillnet fisheries	**SSF**			**b**	**b**																				
		Hake Gillnet Fisheries		**43**				fishing in ICES sub area IVa, VII, VIII, Ixa	*Merluccius merluccius*	2	45	30	1075		**120**			**1500**	**2500**	**12**	**100**	**600**		**1**	**1**	**16**
		Monkfish Tangle net Fisheries		9				fishing in ICES sub area IIa, IVa,b, VI, VII, VIII	*Lophius spp.*	2		20	1000		**250**			**7000**	**22500**	**3.64**	**100**	**800**				**84**
		Deepwater Shark Gillnet Fisheries		2				fishing in ICES sub area VI, VII, VIII, IX, X, XII	*Centrophorus squamosus*	2		145	2400		**220**			**6500**	**9000**	**6.4**	**800**	**1600**				**84**
		Crab Tangle Net fisheries						fishing in ICES sub area IVa, Vb, VI,VII, VIII, XII	*Chaceon affinis*	3		130	2047		**220**					**3.64**	**600**	**1200**				

REFERENCES : (STECF 2006)

CAMBODIA																											
KHM	***KH1***	***Shrimp Trammel Fisheries***					***b***								***38***	***100***											
KHM	KH1								*Shrimp. Catfish, sivler and black pomfrets*																	
KHM	**KH2**	**Mackerel Gillnet Fisheries**				**b**		No fishing allowed between 15 january and 31 march		**1**																	
KHM	*KH2*								*Mackerel*																		
KHM	**KH3**	**Scomberomorus Gillnet Fisheries**				***b***	***b***			***2***							***1000***	***10000***									
KHM	KH3		SSF					Boats less of 90HP	*Scomberomorus, scads and shack.*														9		20		
KHM	KH3		LSF					Boats greater than 90HP	*Scomberomorus, scads and shack.*														18				
KHM	***KH4***	***Crab Gillnet Fisheries***				***b***				***2***				***40***	***100***												
KHM	KH4							Fishing mostly operates in the shallow or inshore water	*Portunus spp., Scylla serrata*																		
KHM	***KH5***	***Clupea Gillnet Fisheries***				***b***				***2***						***35***	***150***	***200***							***1***	***1***	
KHM	KH5							Fishing mostly operates in the shallow or inshore water	*Clupea*																		

REFERENCES : (SEAFDEC Stats 2011) (SEAFDEC Framework 2008) (SEAFDEC Monograph 2011)

	CHILE																										
CHL	**CL1**	**Industrial Swordfish Driftnet Fisheries**		**LSF**			**b**	Boats are greater than 18m in length, typically 21m-62m						**510**	**560**			**2470**					**60**			**8**	
CHL	CL1								*Xiphias gladius*	1	300	0	800														
CHL	**CL2**	**Artisanal Swordfish Driftnet Fisheries**		**SSF**	**15**		**b**	Boats are less than 18m in length.						**510**	**560**				**1100**			**9**	**60**	**30**			
CHL	CL2								*Xiphias gladius*	1	300	0	800														
CHL	CL2								*Merluccius australis*	5	80	28	1000														
CHL	CL2								*Merluccius gayi*		50	50	500														
CHL	**CL3**	**Artisanal Coastal Gillnet Fisheries**	**3.2**	**SSF**			**b**	Boats are less than 18m in length.								**200**											
									jack mackerel,Sardines,Anchovies																			

REFERENCES : (SEAFDEC Stats 2011) (SEAFDEC Framework 2008) (SEAFDEC Monograph 2011)

MOROCCO																													
MAR	**MA1**	**Artisanal Gillnet Fisheries**			**SSF**	**6**			**b**																				
MAR	MA1											catch are sold directly for fresh consumption	*Target small fish species*																
MAR	**MA2**	**Deep-sea Gillnet Fisheries**			**LSF**		**173**	**177**			**b**										**6500**	**14000**	**6800**	**25**	**30**	**27.5**			**12**
												This Fishery is being phased out.	*Swordfish*																

REFERENCES : (Tudela et al. 2005) (Franquesa et al. 2001) (WWF 2011)

ARGENTINA																													
ARG	**AR1**	**Set Gillnet Fisheries**			**SSF**	**13.5**			**b**	**b**								**120**	**140**		**30**	**50**		**1.8**	**2.5**				**12**
ARG	AR1											Each fisherman with a permit is allowed to operate up to 12 nets, each with 30 to 50m length and 1.8 to 2.5m height.	*Patagonian blenny, silverside, parona leatherjack, southern king crab*																

REFERENCES : (Project Global 2011)

	BRAZIL																												
BRA	**BR1**	**Port of Ubatuba Driftnet Fisheries**		**80**	**LSF**	**13**		**12**			**b**							**100**	**160**		**2000**	**6860**		**8.5**	**16**				**12**
BRA	BR1												hammerhead sharks and bony fishes																
BRA	**BR2**	**Ports of Itajaí, Navegantes, Porto Belo and Laguna Drifnet Fisheries**			**LSF**	**18.75**		**40**			**b**							**300**	**400**		**2000**	**7400**		**8**	**30**				**12**
BRA	BR2												*hammerhead sharks and bony fishes*																
BRA	***BR3***	***Bottom Set Gillnet Fisheries***			***LSF***	***20***				***b***								***140***	***400***					***4.5***	***27***				
BRA	BR3												*croaker, weakfish, and lobster*																
BRA	BR3	ports of Itajaí, Navegantes, Porto Belo and Laguna				19		>150					*Micropogonias furnieri*	2	45	20	40	130	140		1850	25928				3.06			

REFERENCES : (Project Global 2011)

	ERITREA																												
ERI	**ER1**	**Artisanal pelagic gillnet fisheries**			**SSF**				**b**									**60**	**270**										
													Sardines and Anchovies																
ERI	**ER2**	**Artisanal Shark Gillnet fisheries**			**SSF**				**b**																				
													Coastal Shark																

REFERENCES : (Project Global 2011)

COSTA RICA																													
CRI	**CR1**	**Artisanal gillnet fisheries**			**SSF**	**8**			**b**																				

REFERENCES : (Project Global 2011)

	INDIA																												
IND	**IN1**	**India gillnet fisheries**							**b**																				
IND	IN1	Kakinada Gillnet Fisheries	4	10		9	25		b	b	b		*seerfish, perches*					40	70		1000	1500				6	20	100	5
IND	IN1	Chenai Gillnet Fisheries	20	70		12.5	79		b		b		*seerfish, sharks, carangids, tuna*							60	1000	6000		8	12		30	200	7
IND	IN1	Mangalore Gillnet Fisheries				12.5	75		b				*seerfish, sharks, carangids*					25	75		500	1500					25	70	8

REFERENCES : (Yousuf et al. 2008)