

## **ANALYSIS OF MARITIME TRAFFIC SPEED IN 2023 IN THE NW MEDITERRANEAN PSSA: ESTABLISHING A BASELINE TO MONITOR PROGRESS IN COMPLYING WITH IMO RECOMMENDATIONS FOR SPEED IN THE PSSA**

### **Issue: Maritime traffic**

#### **1. Action requested**

The Scientific Committee is invited to:

- a. **consider** the analysis of maritime traffic speed in 2023 in the NW Mediterranean PSSA,
- b. **discuss** this issue.

#### **2. Background**

The ACCOBAMS Secretariat received the "Analysis of maritime traffic speed in 2023 in the NW Mediterranean PSSA: Establishing a baseline to monitor progress in complying with IMO recommendations for speed in the PSSA" from OceanCare.

## **Analysis of maritime traffic speed in 2023 in the NW Mediterranean PSSA: Establishing a baseline to monitor progress in complying with IMO recommendations for speed in the PSSA**

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By Resolution MEPC.380(80)<sup>1</sup> of 7 July 2023, the Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) designated the North-Western Mediterranean Sea as a Particularly Sensitive Sea Area (PSSA).

This PSSA was jointly proposed by France, Italy, Monaco and Spain *“in order to protect cetaceans from the risk of ship collisions, ship-generated pollution and to increase awareness in a critically important area for the fin whale and the sperm whale”*.<sup>2</sup>

The decision of the IMO MEPC to declare this PSSA is in recognition of the fact that ship strikes are the main cause of death of fin whales and sperm whales in the north-western Mediterranean. This PSSA is particularly relevant because it is the first one proposed and approved by the IMO with the objective of reducing the risk of ship strikes on endangered whales.

In the aforementioned Resolution, the MEPC also expresses its recognition that the North-Western Mediterranean Sea area meets the multiple criteria for PSSA designation - i.e., encompassing ecological criteria (uniqueness or rarity; critical habitat; dependency; productivity; spawning and breeding grounds; fragility; biogeographical criteria), social or economic criteria (social or economic dependency) and scientific and educational criteria (research; education)<sup>3</sup> of the North-Western Mediterranean Sea area - as well as its vulnerability to damage caused by international shipping activities.

With regard to the latter, we need to take into account that, as expressed in Annex 3 of Resolution MEPC.380(80): *“The Mediterranean Sea is one of the busiest shipping areas in the world, being the gateway between the European continent and Asia via the Suez Canal. With an estimated 220,000 merchant ships per year, commercial shipping is particularly intense in the Western Mediterranean, especially in relation to passenger transport. Commercial activity concerns the transport of passengers or goods by ships often exceeding 100 m in size, sailing at between 14 and over 20 knots (ferries, cargo ships, tankers, container ships, etc.) and up to more than 35 knots for high-speed craft (HSC), which are mainly used to serve the islands. From the mid-1990s to the mid-2000s, the Mediterranean Sea has seen a 58% increase in transit capacity, coupled with a 30% increase in vessel size since 1997. Maritime transport in the Mediterranean basin is expected to increase in the coming years, both in number of routes and in intensity, especially in connection with the enlargement of the Suez Canal”*.

In the North-Western Mediterranean area several ports are active in traffic of goods (Valencia, Tarragona, Barcelona, Marseille, Genoa, La Spezia, Leghorn) or passengers (Toulon, Sète, Nice, Savona, and the ports of Corsica, Sardinia and the islands of Balearic or Tuscan Archipelagos). Ferry and cruise services are largely developed, with traffic increasing significantly during the summer period. The Mediterranean is also a major route for oil tankers and an oil loading and unloading centre.

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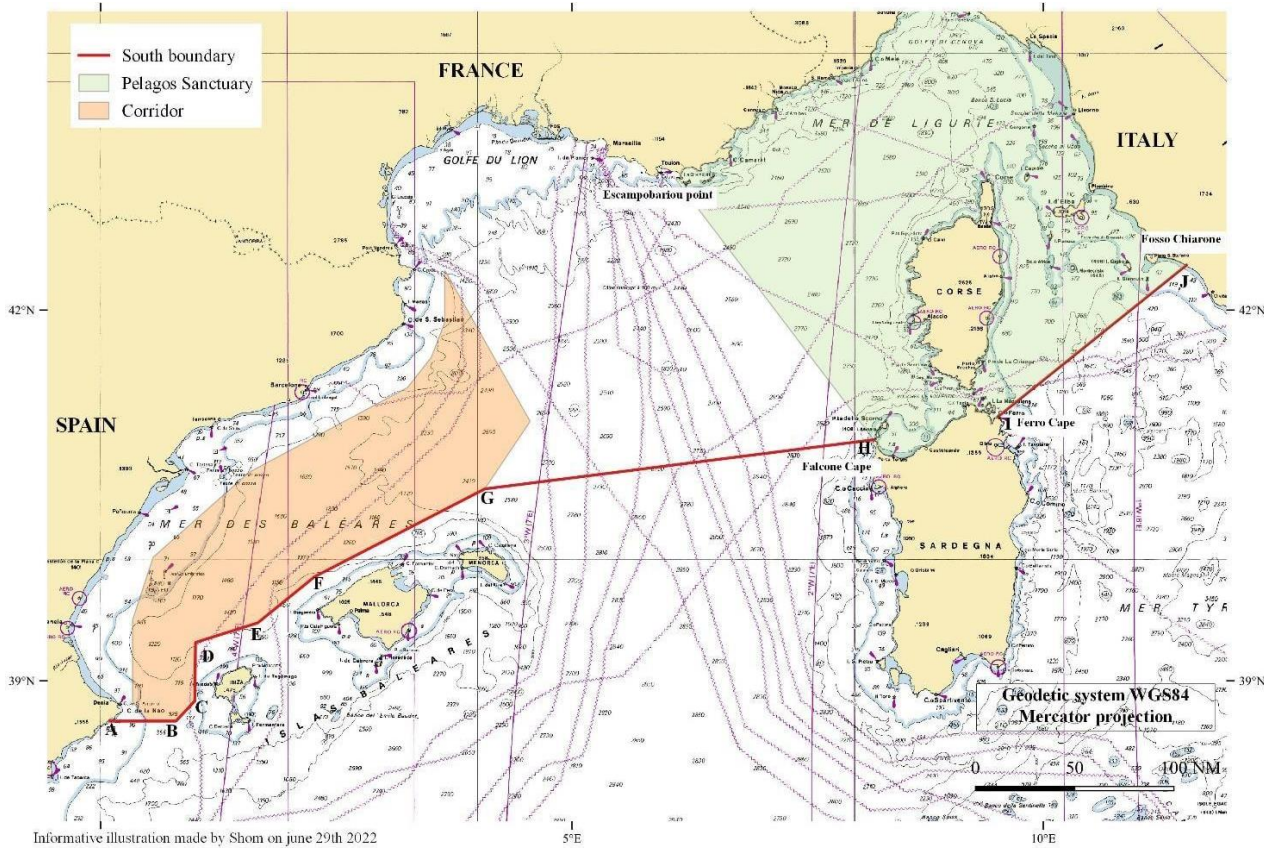
<sup>1</sup> IMO (2023). Designation of the north-western Mediterranean Sea as a Particularly Sensitive Sea Area. Resolution MEPC.380(80), adopted July 7, 2023.

<sup>2</sup> IMO (2022). Designation of a particular sensitive sea area in the North-Western Mediterranean Sea to protect cetaceans from international shipping. Submitted by France, Italy, Monaco and Spain. MEPC 79/10 of 9 September 2022.

<sup>3</sup> T. Scovazzi (2024). The North-Western Mediterranean Particularly Sensitive Sea Area. Mepielan e-Bulletin. Available under: <https://ebulletin.mepielan.gr/articles/2024/the-north-western-mediterranean-particularly-sensitive-sea-area/>

### Environmental value of the area included in the NW Mediterranean PSSA

The NW Mediterranean PSSA is geographically defined in Annex 1 to Resolution MEPC.380(80) (see the map below). It comprises the waters between Valencia and Genoa, defined by cetacean researchers as critical habitat for fin whales and sperm whales, and includes areas of extreme environmental value.



This PSSA includes, among other protected areas, the waters of two Specially Protected Area of Mediterranean Importance (SPAMIs) established under the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (Barcelona, 1995), namely the “Pelagos sanctuary for the conservation of marine mammals”<sup>4</sup> in the Ligurian Sea and the “Mediterranean Cetacean Migration Corridor”<sup>5</sup>, located between the coast of Catalonia and Valencia and the Balearic Islands, as well as the Important Marine Mammal Areas (IMMAs) called “Gulf of Lyon Shelf” and “Slopes and Canyons System of the North-Western Mediterranean Sea”.

The environmental relevance of the area in question is evidenced by the large amount of international recognitions relating to portions of its waters, including eleven SPAMIs, two Ecologically or Biologically Significant Marine Areas (EBSAs), identified according to Decision IX/20 of 2008 of the Conference of the Parties to the Convention on Biological Diversity (Rio de Janeiro, 1992), and three Important Marine Mammal Areas (IMMAs), identified by the Marine Mammal Protected Area Task Force of the International Union for Conservation of Nature (IUCN). Several marine protected areas have been established under the national legislation of the bordering States.<sup>6</sup> The identification of several Important Bird and Biodiversity Areas (IBAs) by Birdlife International and of Important Shark and Ray Areas (ISRAs) by the IUCN Shark Specialist Group further emphasises its ecological importance.

<sup>4</sup> The sanctuary was established under an agreement concluded in 1999 by France, Italy, and Monaco. Covering a total area of 87,500 km<sup>2</sup>, it is a SPAMI since November 2002.

<sup>5</sup> The Cetacean Migration Corridor, which is totally located within waters falling under Spanish jurisdiction, was established as a Marine Protected Area under Royal Decree No. 699/2018 of 29 June 2018 (Boletín Oficial del Estado No. 158 of 30 June 2018), and it is a SPAMI under the framework of UNEP/MAP since December 2019. It covers a total area of 46,385 km<sup>2</sup>

<sup>6</sup> T. Scovazzi (2024). *Op. cit.*

The North-Western Mediterranean Sea is one of the world's 10 biodiversity hot spots, and although it represents only 1% of the total surface area of the oceans, it is home to around 10% of the world's recorded species.<sup>7</sup> The global importance of the area has been considered thoroughly under a number of policy frameworks on natural heritage and socio-economic elements of the marine environment, including under the Convention on Biological Diversity (CBD) and the Barcelona Conventions (UNEP/MAP), and European Union policies (e.g. Marine Spatial Planning, Marine Strategy Framework Directive, Common Fishery Policy, Habitats Directive) and the General Fisheries Commission for the Mediterranean (GFCM).<sup>8</sup>

The geomorphological and oceanographic characteristics of the different areas within the North-Western Mediterranean Sea favour productivity levels of extraordinary biological and ecological importance. The area hosts the habitats of endangered or vulnerable cetacean species, such as the fin whale (*Balaenoptera physalus*), the sperm whale (*Physeter macrocephalus*), the Cuvier's beaked whale (*Ziphius cavirostris*), the bottlenose dolphin (*Tursiops truncatus*) and the Risso's dolphin (*Grampus griseus*). The presence of cetaceans often depends on the distribution of prey, in particular the zooplankton species of Atlantic krill (*Meganyctiphanes norvegica*). The preservation of cetaceans is essential for maintaining the ecological balance in the Mediterranean Sea and contributes to the mitigation of climate change. All cetacean species are listed in Annex IV (animal and plant species of Community interest that require strict protection) of European Union Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.<sup>9</sup>

The populations of fin whales and sperm whales in the Mediterranean Sea have experienced an inferred continuing decline in the number of mature individuals. The latest ACCOBAMS Survey Initiative (ASI), promoted by the Agreement on the Conservation of Cetaceans of the Black Sea, the Mediterranean Sea and the Contiguous Atlantic Area (ACCOBAMS), revealed that the number of fin whales in the region has decreased from an estimated 3,500 in the 90s to 1,800 between 2018 and 2019.<sup>10</sup> Based on existing research, the Mediterranean is predicted to have a population of sperm whales ranging from 500 to 5,000 individuals, with the number of mature whales estimated to be between 250 and 2,500.<sup>11</sup>

The International Union for Conservation of Nature maintained the sperm whale's classification on the Red List as "endangered" in its most recent assessment in December 2021, whereas the fin whale's status in the Mediterranean was altered from "vulnerable" to "endangered".<sup>12</sup>

Ship strikes are the primary source of human-induced mortality in the northern Mediterranean for these two species.<sup>13</sup> This region has high and growing levels of marine traffic, as has been mentioned above. According to navigation data analysis (AIS), commercial vessels sailing in 2023 in this area travel more than 80% of the total distance at average speeds exceeding 10 knots.

Ship collisions with sperm whales and fin whales contribute significantly to the continued decline in the number of individuals of these two species. Their populations, given their slow growth and low reproductive rates, cannot replace

<sup>7</sup> IMO (2023). *Op. Cit.*

<sup>8</sup> IMO (2023). *Op. Cit.*

<sup>9</sup> T. Scovazzi (2024). *Op.cit.*

<sup>10</sup> ACCOBAMS Survey Initiative (2021). Estimates of abundance and distribution of cetaceans, marine mega-fauna and marine litter in the Mediterranean Sea from 2018-2019 surveys. Available under: <https://accobams.org/wp-content/uploads/2021/11/ASI-Med-Report-updated.pdf>.

<sup>11</sup> E Pirota, E Carpinelli, A Frantzis, P Gauffier, C Lanfredi, D.S Pace, L.E Rendell (2021). *Physeter macrocephalus* (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2021: e.T16370739A50285671. Available under: <https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T16370739A50285671.en>.

<sup>12</sup> S Panigada, P Gauffier, G Notarbartolo di Sciara (2021). *Balaenoptera physalus* (Mediterranean subpopulation). The IUCN Red List of Threatened Species 2021: e.T16208224A50387979. Available under: <https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T16208224A50387979.en>.

<sup>13</sup> S Panigada & R Leaper (2009). Ship strikes in the Mediterranean Sea: assessment and identification of conservation and mitigation measures. *Journal of Cetacean Research and Management*.

individuals quickly enough to compensate for these losses, so there is a risk that collisions will end up being the determining factor that causes these species to disappear in this marine region.

As reflected in Annex 3 of Resolution MEPC.380(80), analysis of records of collisions between ships and the Mediterranean fin whale population over the period 1971-2001 showed that more than 80% of fatal ship strikes occurred in the North-West Mediterranean. According to scientific models, it is estimated that collisions alone would prevent the restoration of the fin whale subpopulation within 100 years. Furthermore, there is almost a 10% chance that ship strike mortality could trigger a subpopulation decline.<sup>14</sup>

ACCOBAMS Resolution 7.12 (2019)<sup>15</sup> states that *“the speed, rather than the shape or displacement, of vessels is the most significant factor in ship strikes”* and it further confirms that *“the only effective measures to avoid serious injury and death of cetaceans from ship strikes at present are (a) avoidance by ships of areas or times with high density of whales, including the establishment of shipping lanes or non-shipping zones, and (b) speed reductions in such areas or times, slowing ships down to speeds below 10-12 knots”*.

Scientific studies have concluded that the presence of these two cetaceans species extends throughout the northwestern Mediterranean Sea. In this particular region of the Mediterranean, it is not feasible to anticipate the specific locations where these large whales may be found at any given time. Consequently, the possibility of ships altering their courses to prevent collisions with these whales is not a viable option. Therefore, the sole feasible solution to effectively avoid lethal ship collisions with these marine mammals is for ships to decrease their speed.

Along the same lines, ACCOBAMS Resolution 8.18 (2022)<sup>16</sup> reaffirms this: *“where routing to keep whales and vessels apart is not possible, the only demonstrated measure to reduce fatal collisions with most large whales is to reduce speed”*.

Based on the most reliable scientific evidence, it is quite unlikely for a whale to suffer lethal impacts if the ship's speed remains below 10 knots.<sup>17</sup> This speed could therefore be considered as a kind of ‘safety threshold’ for determining what would be a safe ship speed for whales.

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<sup>14</sup> IMO (2023). *Op. Cit.*

<sup>15</sup> ACCOBAMS (2019). Resolution 7.12 on Ship strikes. ACCOBAMS-MOP7/2019/Doc38/Annex15/Res.7.12.

<sup>16</sup> ACCOBAMS (2022). Resolution 8.18 on ship strikes. ACCOBAMS-MOP8/2022/Doc31/Annex13/Res8.18. [https://accobams.org/wp-content/uploads/2023/01/MOP8.Doc31\\_Annex13\\_Res8.18.pdf](https://accobams.org/wp-content/uploads/2023/01/MOP8.Doc31_Annex13_Res8.18.pdf).

<sup>17</sup> Vanderlaan, A. S. and Taggart, C. T. 2007. Vessel collisions with whales: the probability of lethal injury based on vessel speed. *Marine Mammal Science* 23:144-156; D Laist, A Knowlton, D Pendleton D (2014). Effectiveness of mandatory vessel speed limits for protected North Atlantic right whales. *Endangered Species Research*. Vol. 23. Doi: 10.3354/esr00586; R Constantine, M Johnson, L Riekkola, S Jervis, L Kozmian-Ledward, T Dennis, L Torres, N Aguilar de Soto (2015). Mitigation of vessel-strike mortality of endangered Bryde’s whales in the Hauraki Gulf, New Zealand. *Biological Conservation*. Vol 186. Available under: <https://doi.org/10.1016/j.biocon.2015.03.008>.



Vessel speed reduction is a measure that is addressed in the work of the IMO,<sup>18</sup> the Convention on Biological Diversity,<sup>19</sup> the International Whaling Commission (IWC),<sup>20</sup> the EU,<sup>21</sup> and in the Spanish national framework,<sup>22</sup> with the ACCOBAMS, the IUCN, and the IWC recommending a speed restriction of 10-12 knots.<sup>23</sup>

This measure must have a mandatory character to be truly effective: in regions where ship speed reduction measures have been implemented, it has been shown that voluntary compliance with these measures is limited and ineffective.<sup>24</sup> In order to achieve optimal results, it is necessary that speed reduction measures are made compulsory and applicable to all vessels, without any exemptions.<sup>25</sup> Moreover, it is crucial to enforce this through surveillance of mandatory speed restrictions in order to ensure adherence.

One advantage of implementing mandatory ship speed restrictions is the establishment of fair and equitable conditions for all shipping companies. This ensures that all companies are subjected to the same restrictions and that their adherence to these regulations does not result in any competitive disadvantages. This level playing field cannot be achieved through mere recommendations or voluntary measures, as confirmed by Resolution 8.17 (2022) ACCOBAMS.<sup>26</sup> This resolution acknowledges that “*applying mandatory measures provides an equal playing field level for the private sector*”.

Slowing down the speed of ships yields several environmental benefits. Research has demonstrated that, out of the different operational strategies that can be used, decreasing the velocity of ships is the most cost-effective method for mitigating the environmental consequences of marine transportation. This measure effectively and immediately reduces emissions of greenhouse gases and atmospheric pollutants, including sulphur oxides (SOx), nitrogen oxides (NOx), and black carbon. It also mitigates underwater noise and reduces the risk of collision with marine fauna. In this regard, the aforementioned ACCOBAMS Resolution 8.17 (2022)<sup>27</sup> encourages contracting parties to: “*promote the application of vessel speed reductions (e.g., slow steaming) as an operational measure that results into multi-environmental benefits, including the reduction of underwater noise and greenhouse gases emissions, as well as of the risk of ships strikes, and to promote such measures in the context of the proposal of Particularly Sensitive Sea Area in the North-western Mediterranean*”.

Underwater noise is an issue of increasing concern. Underwater radiated noise (URN) has steadily increased in the Mediterranean over the past 50 years, as shipping traffic increased and doubled between 2014 and 2019 in EU

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<sup>18</sup> IMO (2023). Revised Guidelines for the reduction of underwater radiated noise from shipping to address adverse impacts on marine life. MEPC.1/Circ.906. paras. 6.23-6.25; IMO (2009). Guidance document for minimizing the risk of ship strikes with cetaceans. MEPC.1/Circ.674. para. 12.1.

<sup>19</sup> S Harding, N Cousins (2022). Review of the Impacts of Anthropogenic Underwater Noise on Marine Biodiversity and Approaches to Manage and Mitigate them. Technical Series No. 99. Secretariat of the Convention on Biological Diversity. CBD Technical Series No. 99. Available under: <https://www.cbd.int/doc/publications/cbd-ts-99-en.pdf>.

<sup>20</sup> IWC (March 2022). Strategic Plan to Mitigate the Impacts of Ship Strikes on Cetacean Populations: 2022-2032’ 19858 IWC.

<sup>21</sup> European Commission (UE). Commission notice Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (October 12, 2021) COM (2021) 7301 final. para (2-80).

<sup>22</sup> Royal Decree 150/2023, of February 28, which approves the maritime space management plans of the five Spanish marine demarcations. Table 28, OEM5.

<sup>23</sup> ACCOBAMS (2019). Recommendations from the joint IWC-IUCN-ACCOBAMS workshop to evaluate how the data and process used to identify important marine mammal areas (IMMAS) can assist in identifying areas of high risk for ship strikes. ACCOBAMS-MOP7/2019/Doc38/Annex15/Res.7.12.

<sup>24</sup> J Morten, R Freedman, J Adams et al. (2022). Evaluating adherence with voluntary slow speed initiatives to protect endangered whales. *Frontiers in Marine Science*. Vol. 9. Available under: <https://doi.org/10.3389/fmars.2022.833206>.

<sup>25</sup> Oceana (2023). Go slow, Whales below: Vessel strikes continue to threaten north Atlantic right whales. Available under: <https://oceana.org/reports/go-slow-whales-below-vessel-strikes-continue-to-threaten-north-atlantic-right-whales/>.

<sup>26</sup> ACCOBAMS (2022). Resolution 8.17 Underwater noise. ACCOBAMS-MOP8/2022/Doc31/Annex13/Res8.17.

<sup>27</sup> Ibid.

waters<sup>28</sup>. The pressure it causes on marine mammals is assessed and identified at the EU<sup>29</sup>, Barcelona Convention<sup>30</sup> and IMO<sup>31</sup> levels.

Ships typically emit low-frequency sounds when underway. The primary cause of this is cavitation generated by the propellers. Cavitation refers to the creation of tiny vapour bubbles in the water, which then implode, resulting in audible pressure waves. Cavitation from propellers can result in component damage and reduced performance, in addition to generating significant noise.

The underwater noise produced by shipping creates a permanent and constantly increasing “acoustic fog”, which contributes to an effect called “masking” in receivers, i.e., in animals trying to listen or communicate. This “acoustic fog” masks natural sounds of importance to marine animals, compromising their social behaviour, foraging, orientation, physiology, and ability to detect hazards. It can interfere with the sounds used by various types of whales, dolphins, seals, fish and other marine animals, impacting their vital activities, such as obscuring the calls of mates, or their ability to detect prey or predators. All these impacts, together with stress, displacement from important habitat, and disorientation, can affect reproduction and growth rates, in turn influencing even the long-term welfare of populations.

There are several options for reducing underwater noise, with the most effective being to reduce noise emissions at the source. When it comes to continuous noise from shipping, the primary focus must be on reducing cavitation caused by the propeller (optimising propeller design, properly adapting it to the hull and the usual operating conditions, improving wake flow around the hull ahead of the propeller, and proper maintenance), which frequently also improves efficiency. Nevertheless, the most efficient and readily implementable solution is to practise slow steaming. By decreasing the speed of ships, there will be a corresponding decrease in underwater noise emissions, along with other positive environmental advantages.

#### ***The Associated Protective Measures for the North-Western Mediterranean Sea Particularly Sensitive Sea Area***

Resolution MEPC.380(80) states that mariners should exercise extreme care when navigating in the area bounded by the geographical coordinates of the PSSA area in order to minimize the risk of ship strikes on cetaceans, reduce ship-generated pollution, and to protect the area's unique and threatened species as well as to preserve, as far as practicable, its critical habitat and diversity.

According to Annex 4 to Resolution MEPC.380(80), the associated protective measures (APMs) adopted for the North-Western Mediterranean PSSA are “recommendatory in nature” and “are deemed to be applied by any commercial ships and pleasure yachts from 300 gross tonnage and upwards”. Their application to warships and other governmental ships operated for non-commercial purposes is explicitly excluded.

The APMs approved are the following:

*“1. Mariners should navigate with particular caution within the new NW Med PSSA, in areas where large and medium cetaceans are detected or reported, and reduce their speed to between 10 and 13 knots as voluntary speed reduction (VSR). However, a safe speed should be kept, so that proper and effective action could be taken to avoid collision and any possible negative impacts on ship’s manoeuvrability.*

*2. Mariners should keep an appropriate safety distance or speed reduction measure from any large and medium cetaceans observed or detected in close quarter situations. The safety distance or speed reduction measure should be adapted to the actual navigation circumstances and conditions of the ship.*

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<sup>28</sup> European Environment Agency (2021), European Maritime Transport Environmental Report (EMTER).

<sup>29</sup> In the Marine Strategy Framework Directive (MSFD), indicator 11, as well as in the Fauna-Flora-Habitat Directive (FFH).

<sup>30</sup> Through the Ecosystem Approach (EcAp) process.

<sup>31</sup> IMO (2023). *Op. cit.*

3. *Mariners should broadcast on VHF or other available means on scene, the position of medium and large cetaceans observed or detected within the designated PSSA and transmit the information and the position to a designated coastal Authority or Authorities.*

4. *Mariners should report any collision with cetaceans to a designated coastal Authority or Authorities, which should forward this information to the International Whaling Commission (IWC) global cetacean ship strikes database”.*

All these APMs –speed reduction, safety distance, broadcasting the position of medium and large cetaceans observed and reporting of collisions– are only recommended and do not have a mandatory character. According to the analysis of prestigious jurists,<sup>32</sup> IMO has preferred a bottom-up approach, based on voluntary involvement, rather than a top-down one, based on a binding regime. The results of the choice depend on whether the environmental awareness of shipowners will prevail over self-interest and desire to overcome competitors through faster services.

A PSSA is intended to function as *“a comprehensive management tool at the international level that provides a mechanism for reviewing an area that is vulnerable to damage by international shipping and determining the most appropriate way to address that vulnerability”*.<sup>33</sup>

In this context, the quantitative monitoring of compliance with the above-mentioned Associated Protective Measures, in particular the reduction of speed to between 10 and 13 knots, by each vessel operating within the boundaries of the PSSA in the North-Western Mediterranean, will make it possible to know the degree of compliance with these APMs, to assess their effectiveness and whether the objective for which the PSSA was declared is being achieved.

To have an objective and accurate knowledge of the behaviour, in terms of distance travelled and speed of navigation, of vessels of different categories sailing in the NW Mediterranean PSSA, OceanCare commissioned the specialised company Quiet Oceans to carry out an analysis of maritime traffic throughout the year 2023 in the entire geographical area of this PSSA.

Understanding current speed practices and identifying those vessels and vessel categories that pose most risk to the great whales of the Mediterranean Sea enables more effective work with the shipping industry to identify ways to reduce vessel speeds to protect these oceanic giants.

### ***Presentation of the results of the analysis of maritime traffic in NW Mediterranean PSSA in 2023***

#### ***Methodology***

The analysis of maritime traffic in the NW Mediterranean PSSA in 2023 was supported by the digital platform OceanPlanner developed by Quiet-Oceans. OceanPlanner has been inspired by previous regional studies on ship strikes risks<sup>34</sup> and was designed to address the needs of governmental agencies, maritime authorities, marine protected areas and Natura 2000 (in EU) managers, and harbour managers. The tool provides tangible regional assessment on the current status and on the key characteristics of the shipping. It can identify the activities and the places where actions must be carried out in priority and inform the national and regional road maps for the preservation of the marine environment.

OceanPlanner is supported by the best available marine and maritime data and integrates algorithms to predict shipping patterns based on current routes. The platform allows the user to define dedicated management measures at local or regional scales. The tool includes options like the partial or complete regulation of maritime activities, seasonal or permanent measures, speed limitations, exclusion areas, traffic separation schemes, and vessel sound level limitations.

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<sup>32</sup> T. Scovazzi (2024). *Op.cit.*

<sup>33</sup> IMO (2006). Guidance document for submission of PSSA proposals to IMO (MEPC.1/Circ.510) of 10 May 2006), para. 1.2.

<sup>34</sup> Jakob, T., Folegot, T., Gallou, R., and Ody, D., (2016), Characteristics of maritime traffic in the Pelagos Sanctuary and analysis of collision risk with large cetaceans, WWF Report, France, 2016



The primary source of shipping data used is the Automatic Identification System (AIS). This system is operated as an aid to navigation and maritime safety by enabling ships to be mutually aware in terms of speed, course, category, vessel name, identification, current position and several other important attributes. It is mandatory for vessels over 300 GRT, and recommended (but not compulsory) for smaller vessels such as fishing and leisure craft (IMO 2004). The most recent AIS data serves as reference of the actual maritime situation and input to the algorithms that analyses the environmental and shipping characteristics in any user defined area.

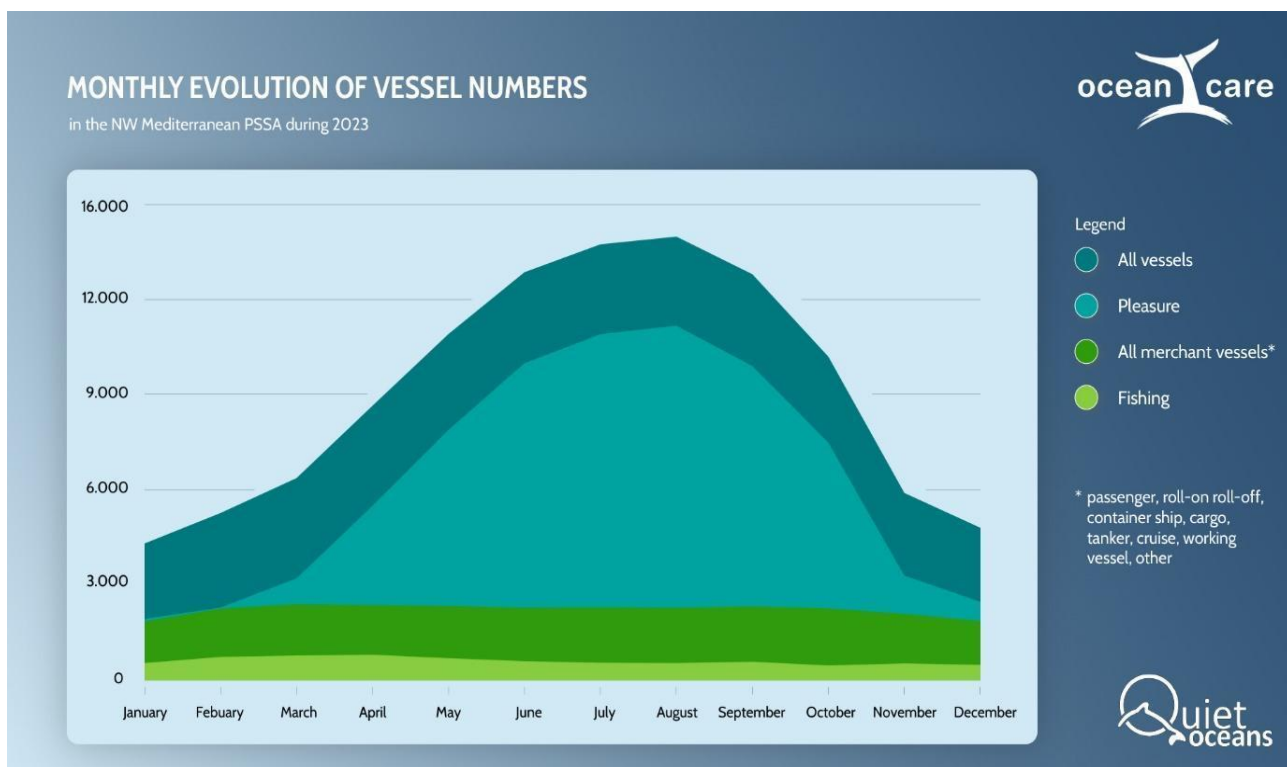
OceanPlanner assesses the risks related to ship strikes, underwater noise, emission of CO<sub>2</sub>. Therefore, and provides metrics including ship density, cumulative travelled distances, and speeds, since those three parameters directly influence the levels of risks. The risk assessments are made for all vessels globally, but also along the following maritimes activities: passenger vessels, roll-on roll-off vessels, container ships, cargo vessels, tanker vessels, cruise vessels, pleasure vessels, working vessels, and fishing vessels.

Analysis of data on the distance travelled at different speed ranges by vessels transiting the North-Western Mediterranean Particularly Sensitive Sea Area (PSSA) in 2023 leads to the conclusion that there is a serious risk of collisions of vessels with large whales (fin and sperm whales) in this area, with lethal effects for the latter.

The data show that of the nearly 48 million kilometres travelled by all ships sailing in the waters of the aforementioned PSSA in 2023, 57% of the total distance travelled was at speeds above 10 knots. Speed up to 10 knots are considered to be the safe speed limit for whales. In the same year, all merchant ships travelled almost 80% of their 27.8 million kilometres in the PSSA at more than 10 knots.

#### **Evolution of the number of vessels along the year in the NW Med PSSA**

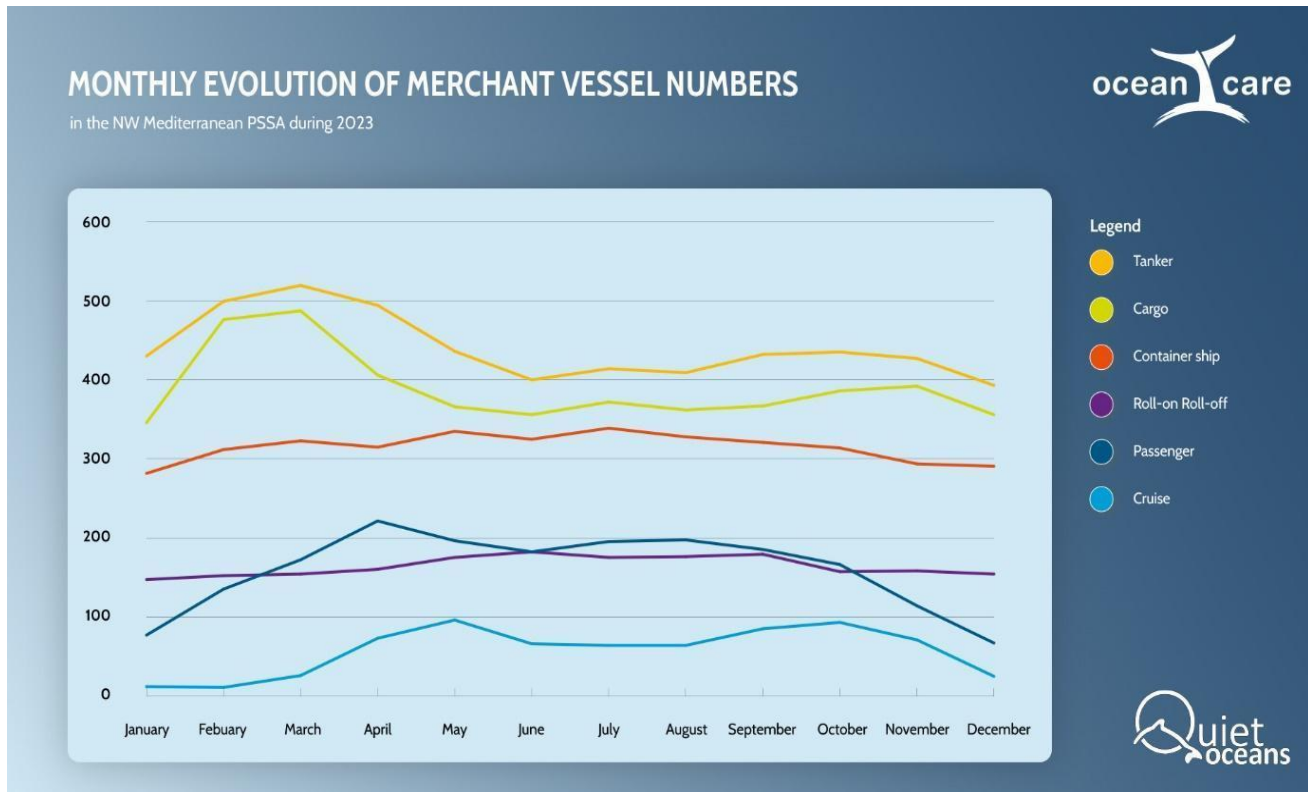
As can be seen in **Figure 1** below, the number of merchant ships and fishing vessels remains relatively constant throughout the year. However, there is a significant increase in recreational vessels from May to October, which further aggravates the risk of collisions (and other impacts, such as emissions) with cetaceans during that period of the year.



**Figure 1: Monthly evolution of vessel numbers in the NW Mediterranean PSSA in 2023**

The monthly evolution over the year of the number of vessels of all categories of merchant vessels (**Figure 2**) shows that passenger vessels, including cruise ships, and roll-on-roll-off vessels (Ro-Ro ferries) are the ship types with the smallest number of vessels, compared to the main categories of freight vessels (cargo tanker and container ship).

In the case of tankers and cargo ships, their quantity reaches its maximum in the winter months (especially February and March) while the number of passenger transport ships and cruise ships experiences a clear increase from the beginning of spring and experience a sharp decline at the end of the tourist season, starting in October.



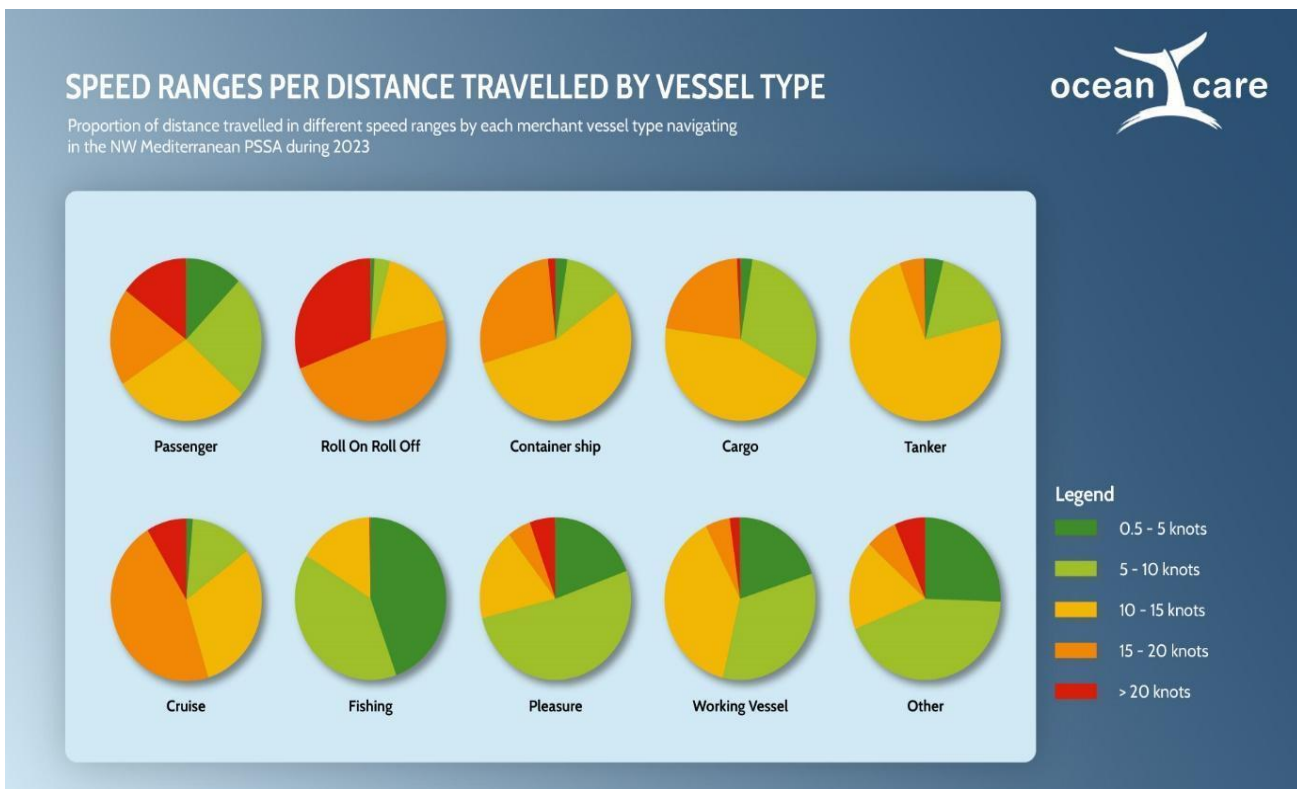
**Figure 2**

### ***Distance travelled by speed ranges by vessel type***

**Figure 3** shows that the vessels that consistently maintain the highest speeds throughout their journeys in the NW Mediterranean PSSA, are “passenger only transport” ships and “Roll-on roll-off” vessels. Hence, all categories of passenger ferries and additionally cruise ships navigate at the highest speed in the region, covering a significant portion of the distance at speeds exceeding 20 knots. This is particularly evident in the case of Ro-Ro vessels, as illustrated in the graph.

The main types of cargo vessels (container ships, cargo ships and tankers) also travel most of their journey at more than 10 knots. However, the majority of their distance covered falls within the range of 10 to 15 knots, which is particularly so in the case of tankers.

The graph further shows that the majority of the distance travelled by fishing vessels and pleasure craft is done at speeds below 10 knots. However, within the pleasure craft category, somewhat more than a quarter of the distance travelled is at speeds above 10 knots, with a significant portion transiting at speeds above 20 knots.



**Figure 3**

**Figure 4** and **Figure 5** give us another view of the situation.

Pleasure boats travel a considerable distance in the area, since their activity as well as their number increases considerably in the months of milder weather. Although the majority of this distance is travelled at less than 10 knots, a significant number of kilometres is covered at higher speeds, sometimes well in excess of 20 knots.

On the other hand, although fishing boats cover a considerable distance in the area, they travel the majority of their journey at speeds below 10 knots.

It is concerning to observe that Ro-Ro vessels, the second longest-travelling type of ship in the PSSA of the western Mediterranean, spend the majority of their journey at speeds exceeding 10 knots. This means that they are far away from the safest speed range for whales (10-12 knots), as recommended by ACCOBAMS resolutions based on scientific knowledge.

**Figure 5** focuses only on the 6 main categories of merchant vessels. Container ships, cargo vessels, and tankers traverse most of their travelled distance at velocities ranging from 10 to 15 knots. For these particular vessel types, reducing their speeds to 10 knots, to minimise as much as possible the risk of collisions with lethal effects for the whales, would not imply a substantial modification of their activity. This would also make it possible to mitigate their adverse effects on marine biodiversity, also in terms of underwater noise, emissions of greenhouse gases, and atmospheric pollutants. Roll-on roll-off vessels not only account for the total majority of distance covered in the area, but also travel most of the time at speeds exceeding 15 and even 20 knots.

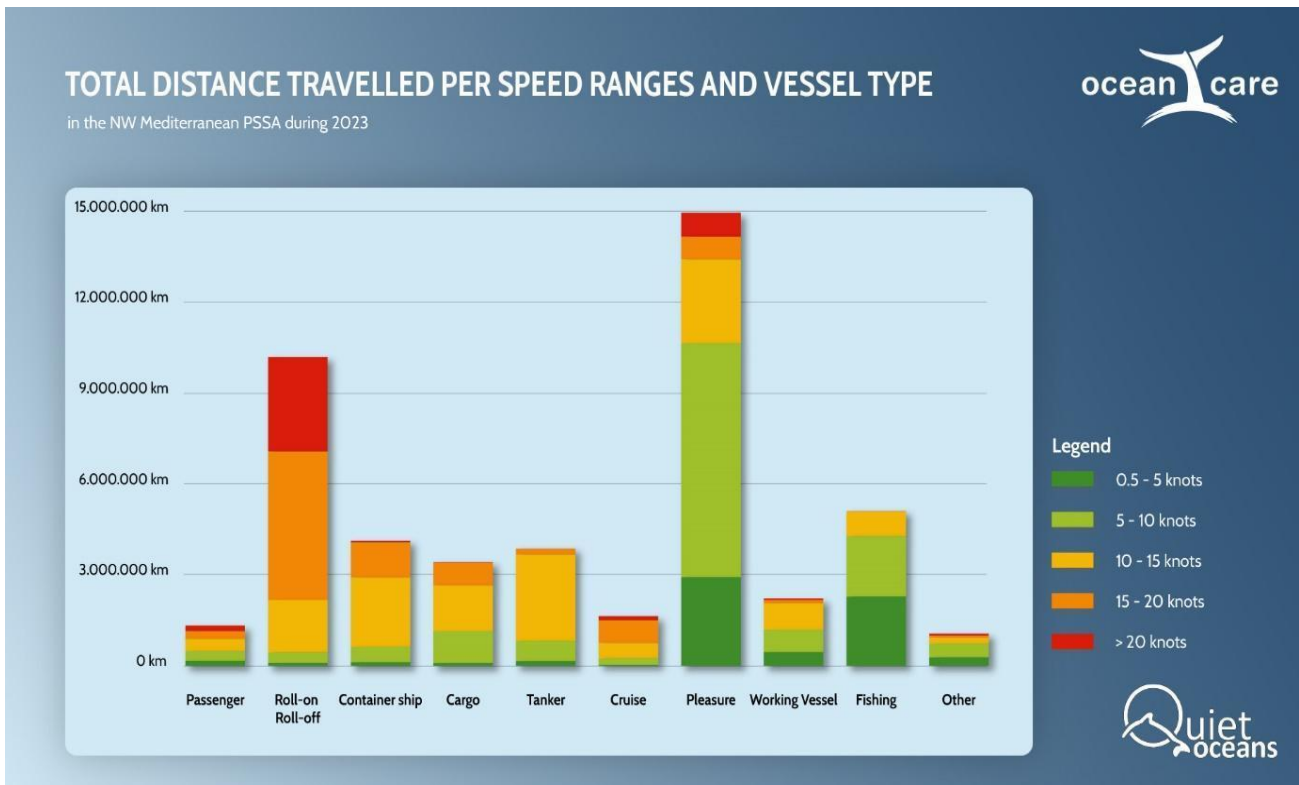


Figure 4

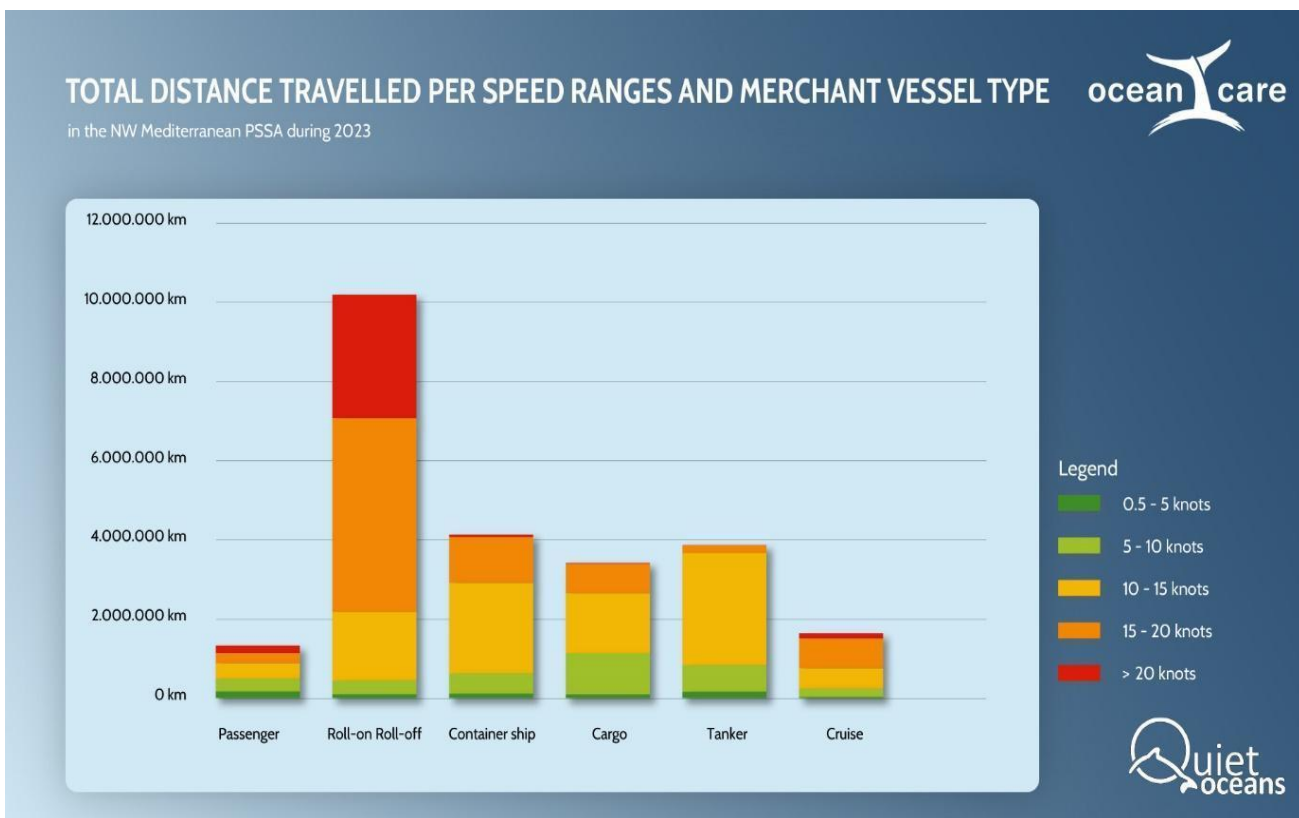
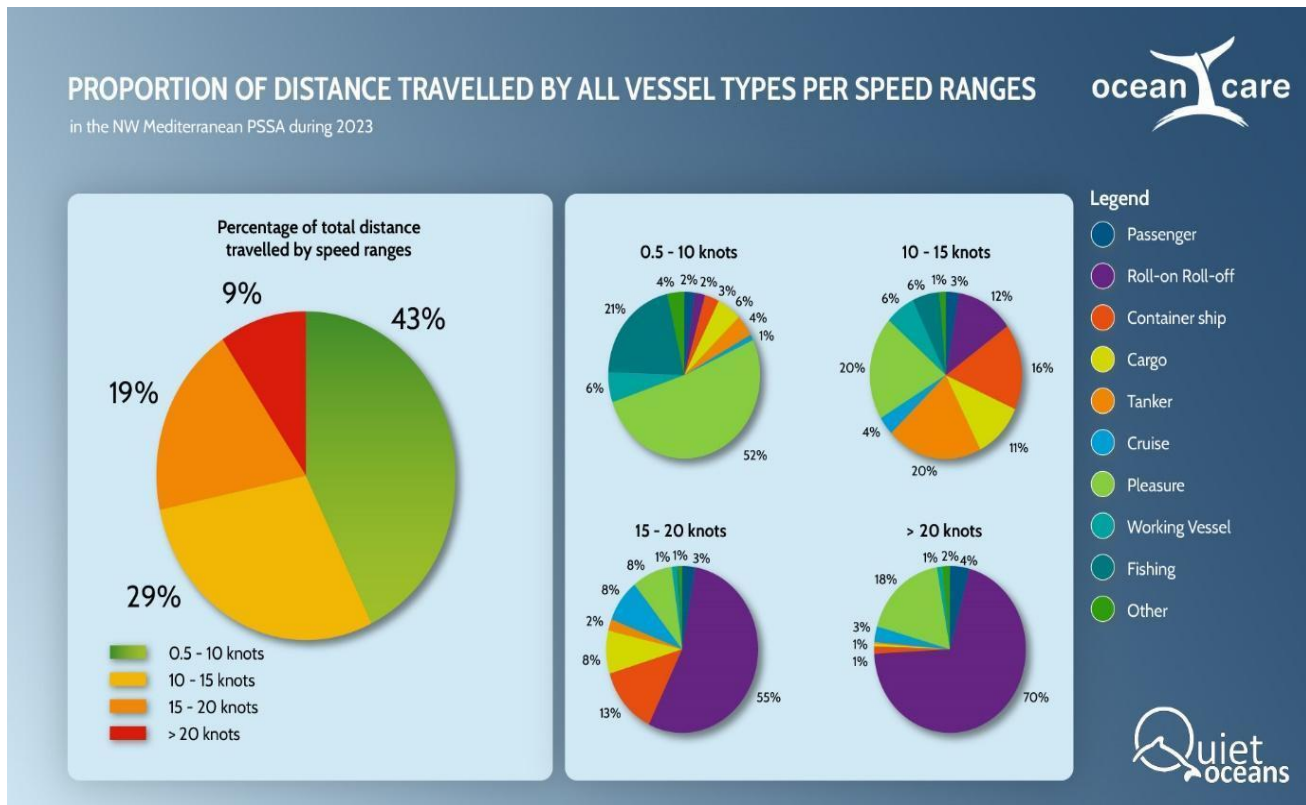


Figure 5

### Proportion of distances travelled by different kind of vessels per speed ranges

When considering all types of boats together (represented at the left side of the graph in **Figure 6**), and despite the statistical effect that occurs when including in the calculation pleasure boats and fishing vessels (which tend to travel at speeds below 10 knots for a significant portion of their voyage), it is evident that 57% of the total distance navigated by all vessels in the NW Med PSSA in 2023 was travelled at speeds greater than 10 knots, which entails serious risks for fin whales and sperm whales.

The right part of the graph in **Figure 6** demonstrates the considerable share of pleasure boats that navigate in the PSSA all year round, as indicated by the substantial proportions of the total distance travelled by this type of vessel in each speed category. Roll-on Roll-off vessels, although much less numerous, cover the longest total distance among all types of boats in the speed range of 15 to 20 knots and over 20 knots.



**Figure 6**

The same type of information as in the previous figure, but only referring to the 6 main categories of merchant vessels, is shown in **Figure 7**. It clearly shows (see pie chart on the left side of the graph) that merchant ships travelling at speeds exceeding 10 knots account for 85% of the total distance travelled by these ships in the NW Mediterranean PSSA during 2023. The majority of the distance covered (37%) occurs within the speed range of 10-15 knots, making it quite feasible to minimise its impact on marine life by just dropping a few knots.

Additionally, 48% of the distance is covered at speeds greater than 15 knots, with 15% of that distance being at speeds greater than 20 knots. These speeds are significantly higher than the recommended safe speed range for whales, which is clearly not consistent with the conservation goal of maintaining endangered large whale populations.

Merely 15% of the distance travelled by the 6 main merchant vessel categories would be considered as “safe speeds” for marine biodiversity in terms of collision risk.

As can be seen in the pie chart on the right side of the same graph, as speed increases, Ro-Ro ferries emerge as the ship type with the largest proportion of distance travelled in the higher speed ranges, being clearly predominant in the 20+ knot speed range.



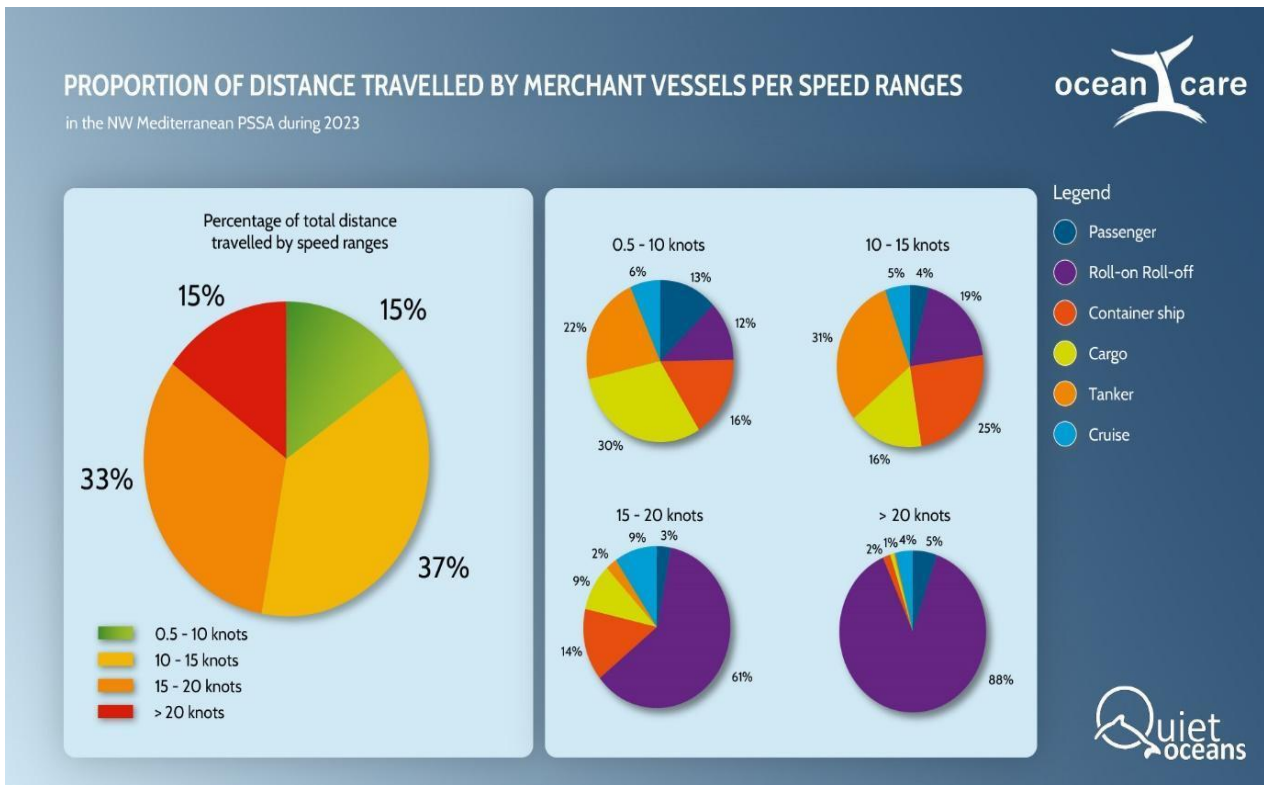


Figure 7

**Shares of travelled distance vs. speed**

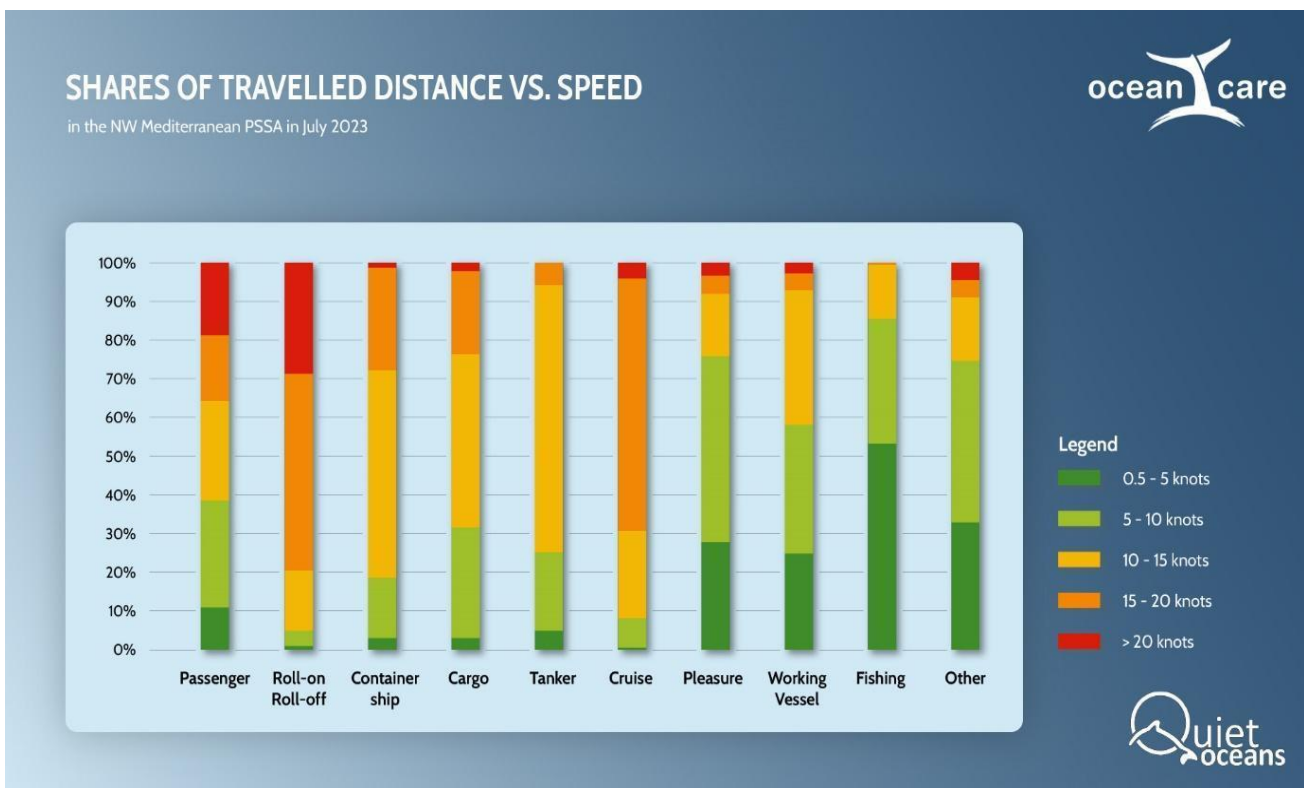


Figure 8

In a different perspective, **Figure 8** above, leads us to similar conclusions. Roll-on roll-off vessels have the smallest percentage of distance travelled at speeds below 10 knots, which are considered safe for marine biodiversity in terms of collisions. They are followed by cruise ships which travel most of their journey at speeds between 15-20 knots. The



majority of fishing vessels travel at safe speeds for approximately 85% of their route, therefore a speed limit would have minimal influence on them.

### **Conclusion**

As mentioned above, the presence of fin whales and sperm whales extends throughout the northwestern Mediterranean Sea. Therefore, in this particular region of the Mediterranean it is not feasible to anticipate the specific locations where these large whales may be found at any given time. According to the first of the APMs included in the NW Med PSSA statement, mariners should navigate with particular caution within the boundaries of the NW Med PSSA and reduce their speed to between 10 and 13 knots. However, it is currently just a recommendation, as a voluntary speed reduction measure.

The present analysis of vessel traffic speed in the NW Mediterranean PSSA in 2023 provides a thorough baseline demonstrating that intense efforts are required to achieve the recommended APM to reduce vessel speed to decrease the risk of collisions with endangered whales in the area. The analysis further provides a detailed analysis of the numerous vessel sectors and their respective speeds. The results clearly demonstrate that the IMO recommendations for this PSSA in relation to vessel speed are yet to be met and, if not changed by now, have apparently and practically not truly come into force yet as maritime traffic is far from compliance with them. At the same time this dataset will allow a comparison with the years to come, specific to vessel categories, enabling an assessment of whether vessel speed reduction is being implemented, and complied with, and by whom in this area.

This will allow us to check whether the various sectors of the maritime industry are really committed to reducing the speed to between 10 and 13 knots when transiting in this area and thus help to meet the objective of the NW Med PSSA.