2024 CALL FOR TECHNICAL AND SCIENTIFIC CONSULTANCY

OF THE PELAGOS AGREEMENT

Short Interim Report

April 2025

Project title	**ToR 2 –** **"Monthly distribution of recreational maritime traffic in small ports and marinas"** **and** **"Mitigation and control measures implemented in the area of the Pelagos Sanctuary** **and** **Meeting on "Good practices for sustainable commercial and recreational boating"**
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GLOSSARY

Berth: The space assigned to or taken up by a vessel when stopped alongside a wharf, jetty or other structure in order to undertake cargo operations and services.

Mail online survey: Data collected through questionnaires created at a web platform and sent to recipients (ports and marinas) by email asking for information about recreational vessel activities and marina/port services.

Marinas: refers to quite different situations, from small ports belonging to the oldest part of a town to large and modern infrastructure able to host thousands of boats and provide all types of services to tens of thousands of boaters (CPMR and MedWaves, 2022). In this study, the words “marina” and “port” are used interchangeably.

Recreational fishing: Means a non-commercial fishing activity exploiting marine living resources for recreation, tourism or sport (GFCM/45/2022/12).

Recreational vessels: Watercraft intended for sports and leisure purposes having a hull length from 2,5 m to 24 m, regardless of the means of propulsion (EU Directive - 2013/53).

Spatial mitigation measure: Spatial regulations restricting or guiding behavior of recreational boaters. These include anchoring prohibitions and restrictions, restrictions on recreational fishing (e.g. spearfishing), scuba diving, and entry restrictions or prohibitions to certain zones.

Introduction

Vessel traffic has been widely recognized as a significant factor impacting marine mammal populations, with both short-term and long-term effects (Nowacek et al., 2001; Lusseau, 2005). Numerous studies have demonstrated that vessel presence can disrupt key behaviors such as foraging, resting, and socializing in cetaceans, leading to potential consequences for population health and stability. Some species actively avoid approaching vessels, while others face increased risks of ship strikes—a well-documented concern for large whales but also increasingly reported for dolphins encountering tour and recreational boats (Ritter, 2012). Additionally, vessel traffic contributes to noise pollution, which can cause chronic auditory damage, and exposes marine mammals to exhaust emissions with potentially severe health effects (Piwetz, 2019; White et al., 2023).

Engine noise from watercraft from recreational boats and tour operators is a well-documented source of disturbance to small odontocetes (Jensen et al., 2009; Rako et al., 2013; Marley et al., 2017). The medium-frequency sound energy generated by high-speed vessel propeller turbulence can overlap with the communication frequency range of dolphins, potentially leading to significant behavioral disruptions (Erbe, 2019). Such disruptions may contribute to habitat abandonment, as observed in multiple studies documenting the impact of vessel noise on marine mammal populations (Rojano-Doñate et al, 2024; Erbe et al, 2019).

The Mediterranean is one of the world's primary destinations for recreational boating and yachting. Vessels ranging from 2.5 to 24 meters in length account for more than 90% of the total fleet in the region. The construction of recreational boats in European Mediterranean countries has experienced continuous annual growth, averaging 10% since 2008 (CPMR and MedWaves, 2022; González et al. , 2020). Motorboats dominate the leisure fleet, making up 87%, followed by sailboats at 11%, with the remaining 2% consisting of other vessel types such as inflatable boats and canoes (Carreño et al., 2019).

The Western Mediterranean is also a major hub for superyachts, hosting 56% of global large yacht charter contracts. Approximately 50% of the world's large yachts spend eight months of the year in Mediterranean waters, reflecting the region's central role in the global yachting industry (CPMR and MedWaves, 2022). Additionally, trends indicate a shift in preference from yacht and recreational boat ownership to rental, while the overall number and size of yachts and boats continue to increase.

At the Pelagos Sanctuary, several studies have highlighted the negative effects of this rise on vessel presence, not only from large ships but also from smaller recreational boats, on various cetacean species. Coastal traffic surveys in the French Riviera indicate that vessel traffic often exceeds one boat per minute during the summer months (Gannier et al., 2022). Underwater recordings have further shown that inshore noise levels are significantly higher than those in the open sea, largely due to motorboat activity. These findings suggest that intense recreational boating is a major contributor to local noise pollution, and it represented a significant stressor

on the coastal populations of striped dolphins (*Stenella coeruleoalba*) in the region leading to increased stress and potential displacement to other areas (Gannier et al., 2022). Research in Sardinia has further demonstrated that the presence of more than three recreational boats at one location causes bottlenose dolphins, Tursiops truncatus, to cease feeding and socializing activities (Pennino et al., 2016; Manna et al., 2020). Additional studies in the Pelagos Sanctuary and other regions in the Mediterranean have also provided links on recreational boat traffic causing changes on the behavioral and acoustic responses in bottlenose dolphin and shifts in their distribution and seasonal abundance particularly in and around MPAs and other Natura 2000 sites. These findings highlighted the need for additional potential measures and updates of conservation boundaries to mitigate the impact of vessel traffic on marine mammals (Rako et al., 2013; Manna et al., 2020; 2023). Additionally, depredation behaviors among bottlenose dolphins such as those observed around fishing and aquaculture facilities further indicate the need for further research and mitigation efforts.

As recreational vessel traffic continues to increase within the Pelagos Sanctuary, it becomes essential to assess both the spatial and temporal patterns of boat activity to determine its impact on both resident and migratory marine mammal populations and inform effective management strategies. This study aims to provide a more in-depth analysis of recreational boating in the region, with a focus on coastal waters, ports, and marinas.

The specific objectives of the consultancy were:

- Develop GIS maps illustrating the monthly distribution of recreational maritime traffic in small ports and marinas within the Pelagos area.
- Create an interactive GIS map detailing the mitigation and control measures implemented in the Pelagos Sanctuary.
- Organize a meeting on sustainable commercial and recreational boating, presenting a roadmap for adopting measures to mitigate disturbances and collisions. This will be based on a summary document from the Pelagos Focus Group on Collision & Shipping, along with scientific recommendations from the Pelagos Scientific and Technical Committee meeting on PSSA.

Methods

Research approach and questionnaire design

To analyze the spatial aspects of recreational boating in the Pelagos Sanctuary, a questionnaire was developed in Italian, French, and English and distributed online to all recreational ports and marinas in the region. While questionnaires have been a valuable method used in other regions, their scope is widely acknowledged as naturally limited. Nonetheless, they can serve as an exploratory tool, providing preliminary insights into recreational boating activity and capturing spatial information. Additionally, they can help link coastal boating spatial patterns with other key variables, such as social awareness and knowledge, thereby contributing to a more comprehensive and multidimensional spatial dataset (Ukic Boljat et al., 2021).

The questionnaire aimed to assess the coastal distribution and density of boating activity by collecting information on vessel accommodation capacities, occupancy rates, vessel types, boating habits, daily and annual port berths, and seasonal occupation (see Annex 1). It was designed in a brief way with a total of 24 questions divided into key sections: basic information on ports and marinas and charter yachting activities, and an additional section on environmental services, provision of appropriate local guidelines/code for vessel users and awareness of the Pelagos Sanctuary.

The database of recreational ports and marinas to be contacted was extracted from a database provided by the Pelagos Secretariat by filtering to touristic ports and excluding Provence Alpes Cote d'Azure, resulting in 194 ports. Ports of the French Department 6 – Alpes-Maritimes, were contacted by a specific. The database contained email addresses for each port, which were used to distribute the survey to ports in a round of emails (07.02.2025 and 14.02.2025).

To enhance the response rate, follow-up telephone calls were made to a subset of random marinas (38 call attempts, 16 conversations). During the first follow-up calls, it became apparent that email addresses in the database needed to be updated. This update was done by web search, and a third round of emails was sent to the revised email addresses on 26.02.2025, after which more follow-up calls were conducted. Survey results from the French Department 6 – Alpes-Maritimes, which is the subject of a specific consultancy, were combined with the results from the rest of the areas for the analysis.

Table 1. Available datasets used in the analysis of recreational boats

Dataset	Data used	Format	Source
Marinas – Pelagos Sanctuary	Location, name, capacity, type, Pelagos Charter Adoption, Environmental Certificates	.xlsx	Pelagos Sanctuary Secretariat
Marinas – ETC-UMA	Location, name, capacity	.shp	Portbooker.com, 2022; Plan Bleu,2014
NUTS 3: small regions	Boundaries, name	.shp	GISCO (Eurostat), 2023
Traffic data	Vessel density, 2017-2023	.tif	EMODnet – Human activities (Collecte Localisation Satellites)
Regulations in MPAs France	Boundaries, Regulation types	.shp	https://www.amp.milieumarinfrance.fr/accueil-fr
Protected Seas: Regulations in Italian waters	Boundaries of zones with Anchoring, Navigation, Diving and Recreational fishing regulations	.shp	Navigator Data Download, ProtectedSeas®, https://protectedseas.net/mpa-download-data (19/12/2024)
MAPAMED: Protected areas	Boundaries of Marine Protected Areas, Critical Cetacean Habitats, Strait of Bonifacio PSSA	.gpkg	MAPAMED, the database of Marine Protected Areas in the Mediterranean. 2019 edition. [1]
Important Marine Mammal Areas (IMMAs)	Boundaries of IMMAs	.shp	IUCN MMPATF (2024) Global Dataset of Important Marine Mammal Areas (IUCN-IMMA). Downloaded Jan/2025. [2]

[1] © 2020 by SPA/RAC and MedPAN. Licensed under CC BY-NC-SA 4.0. Available at: https://www.mapamed.org/

[2] Made available under agreement on terms and conditions of use by the IUCN Joint SSC/WCPA Marine Mammal Protected Areas Task Force and accessible via the IMMA e-Atlas http://www.marinemammalhabitat.org/imma-eatlas

The database of recreational ports was analyzed and visualized using Geographic Information System tools (QGIS and R). The database was joined with a port database hosted at ETC-UMA, created based on data from Plan Bleu (2014, port locations) and portbooker.com (2022, number of berths). Ports present in both databases were identified by matching names as well as a visual analysis in GIS to avoid the creation of duplicate entries.

Recreational ports and marinas are specifically built for mooring sports and recreational boats providing transit and permanent (year-round) berths for the vessels.

On this study we distinguish main port facilities for pleasure boating as:

- Marinas/ports: Facilities on land and at sea in order to serve only or mainly pleasure boating and yachting, also through the provision of complementary services.
- Mooring points: Marine areas equipped with temporary facilities that are intended for the mooring, launching, and storage of small boats and pleasure crafts.

The field "Touristic port type" in the database from the Pelagos Sanctuary Secretariat was used to distinguish marinas ("Tourist port") and mooring points ("bay", "canal harbour", "Mooring buoys" and "small landing place"). The 14 sites that were added to the database from the database at ETC-UMA were categorized based on Internet search using the definition above.

Analysis of recreational boating

Maps were created for the entire Pelagos Sanctuary to illustrate the capacities of recreational marinas and mooring points, the maximum boat length, the adoption of the Pelagos Partnership Charter and the environmental certificates awarded to the ports, where such information was available.

Seasonal changes in recreational boating were analysed based on survey responses. Additionally, to better characterize recreational boating activity, the analysis was supplemented with data from the European Marine Observation and Data Network (EMODnet). EMODnet provides vessel traffic density maps using historical Automatic Identification system (AIS) data, estimating the density of vessels over a predefined grid, expressed in hours per square km over a month. These maps are updated on a yearly basis and are available for a number if ship types, according to AIS specifications. In this study, data for two categories, pleasure crafts and sailing vessels, was used. Vessel density data from EMODnet was used to visualize recreational boat movement patterns on traffic density maps. These maps could help identify congested areas in the future and offer essential information for surveillance and management.

The analysis of port use by recreational boats was based on survey responses. Respondents were asked to provide data for various pleasure craft segments based on the size, on propulsion and type: motor units and sailing units. This classification is similar to the one reported by the Italian nautical tourism statistics (Pubblicazioni - La Nautica In Cifre) where vessels for entertainment, sport, and recreation are classified as motor yachts, sailboats (with or without engine), and superyachts. A motor yacht is a vessel equipped with an engine; a sailboat is a vessel of which the main power is the wind; and superyachts those over 24m length. We also included other vessels like watercrafts (e.g. Jet Skis)/Inflatables.

Spatial mitigation measures related to recreational boating were mapped together with protected areas and important habitats for cetaceans based on the databases described in Table 1. Finally, an optional, second part of the survey contained questions related to environmental awareness and awareness on the Pelagos Sanctuary.

Survey respondents

A total of 13 ports completed the survey. These covered a range of sizes in terms of area (Figure 1), capacity (Figure 2), maximum length allowed (Figure 3 3) and management type (Figure 4). Despite the small sample size of our survey, even 2 ports answered that they will likely increase their area over the next 5 years, suggesting that size increases of ports may be common over the next few years.

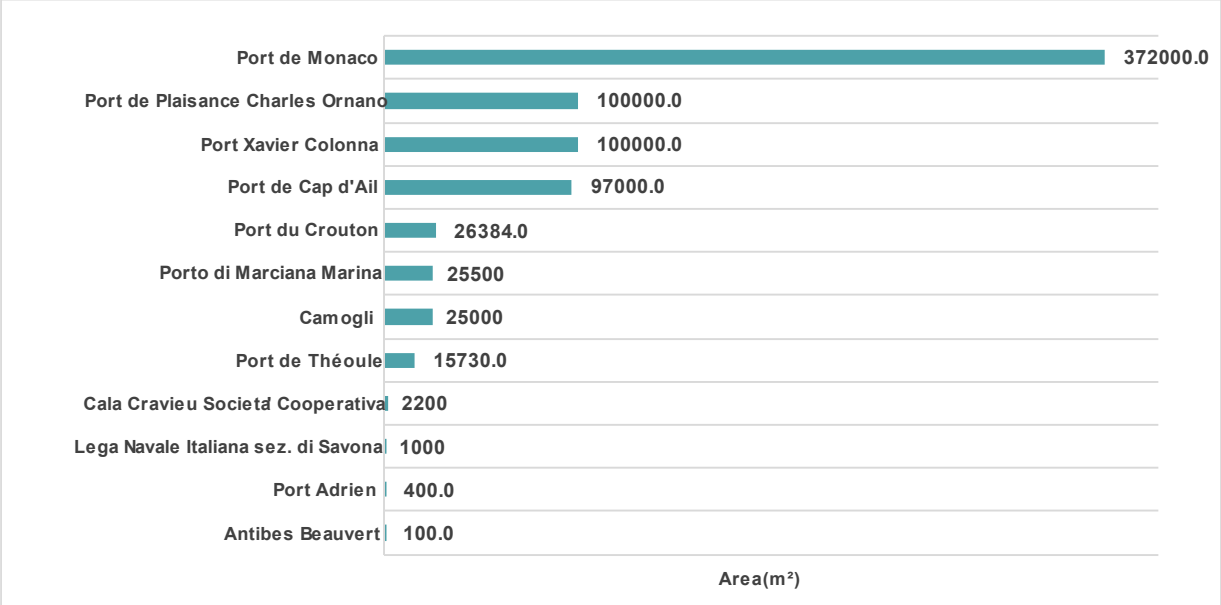

Figure 1 Data on total area of port (land and water) in m^2 provided by survey respondents.

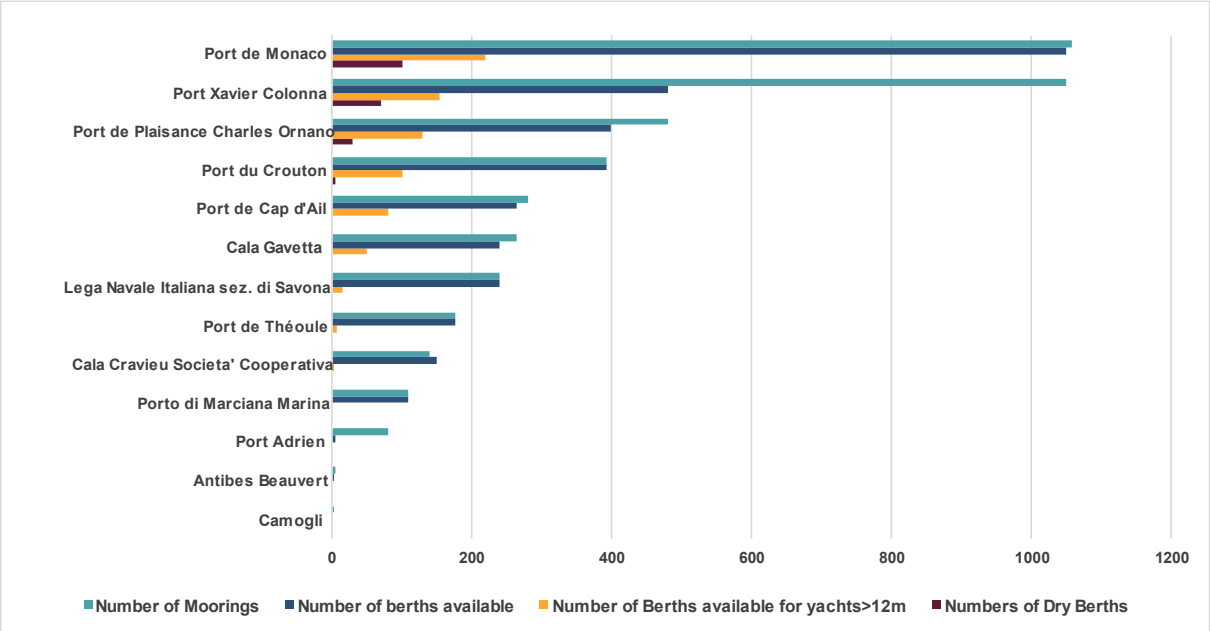

Figure 2 Data on capacity provided by survey respondents.

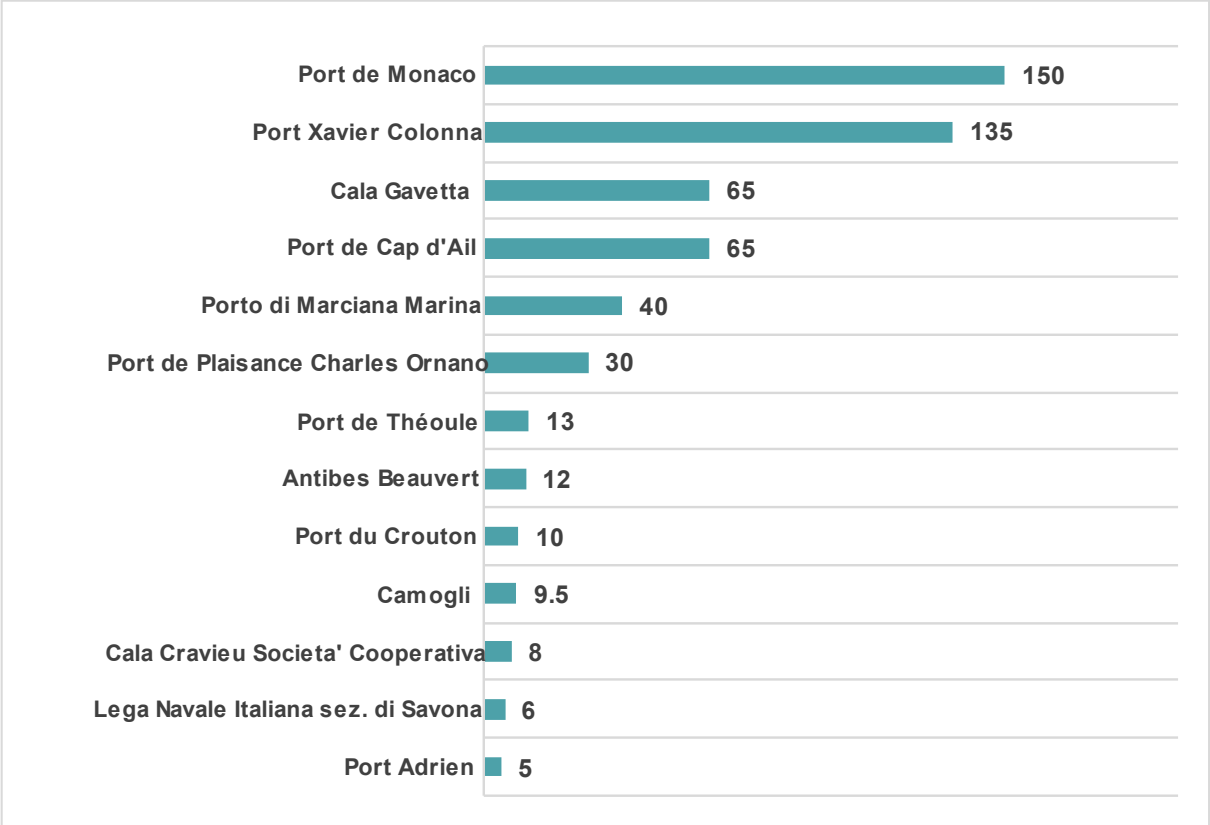

Figure 3 3Data on maximum length allowed provided by survey respondents.

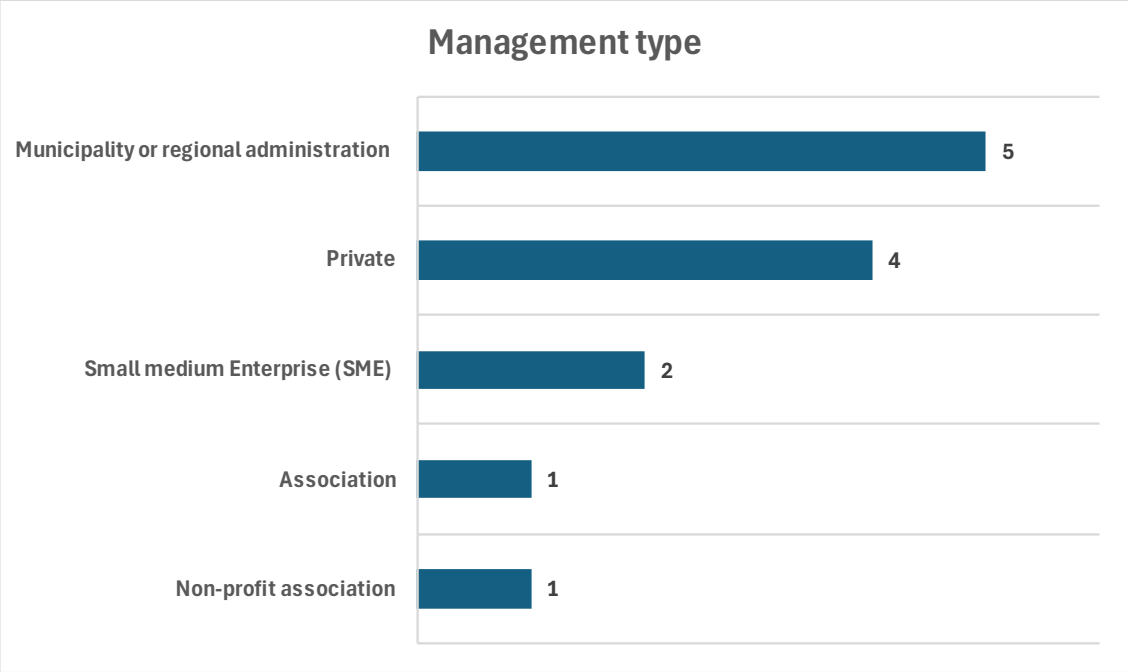

Figure 44 Number of responses indicating different management types in their ports.

Results

Recreational boats in small ports and marinas

The availability of ports and berthing facilities for recreational boats is essential not only for coastal tourism but also for identifying areas of high maritime traffic and potential interactions with cetaceans. Table 2 provides a summary of the total capacity and ports across various administrative regions (NUTS level) in France, Monaco and Italy. The data highlight regional differences in marina capacity, with some areas (Alpes-Maritimes, Var, Livorno and Sassari) hosting a significantly higher number of berths and ports. These variations can be attributed to geographical factors, demand for recreational boating, and historical maritime infrastructure development. According to the available data, the total number of recreational ports in Pelagos Sanctuary is 257 and the total capacity is 90,965.

Table 2. Summary table of marinas, ports and berth boating facilities by region (admin). Port of Monaco is included under the NUTS Alpes-Maritime (FRL03).

Country	NUTS Name	NUTS ID	Total capacity	Total number of ports
FR	Alpes-Maritimes	FRL03	18741	34
FR	Var	FRL05	15108	23
FR	Haute-Corse	FRM02	3707	14
FR	Corse-du-Sud	FRM01	3671	18
IT	Grosseto	ITI1A	5618	17
IT	Lucca	ITI12	2040	3
IT	Massa-Carrara	ITI11	390	4
IT	Livorno	ITI16	9103	36
IT	Pisa	ITI17	2768	4
IT	Imperia	ITC31	4707	16
IT	Savona	ITC32	5441	10
IT	Sassari	ITG2D	9564	41
IT	Genova	ITC33	6620	19
IT	La Spezia	ITC34	3487	18

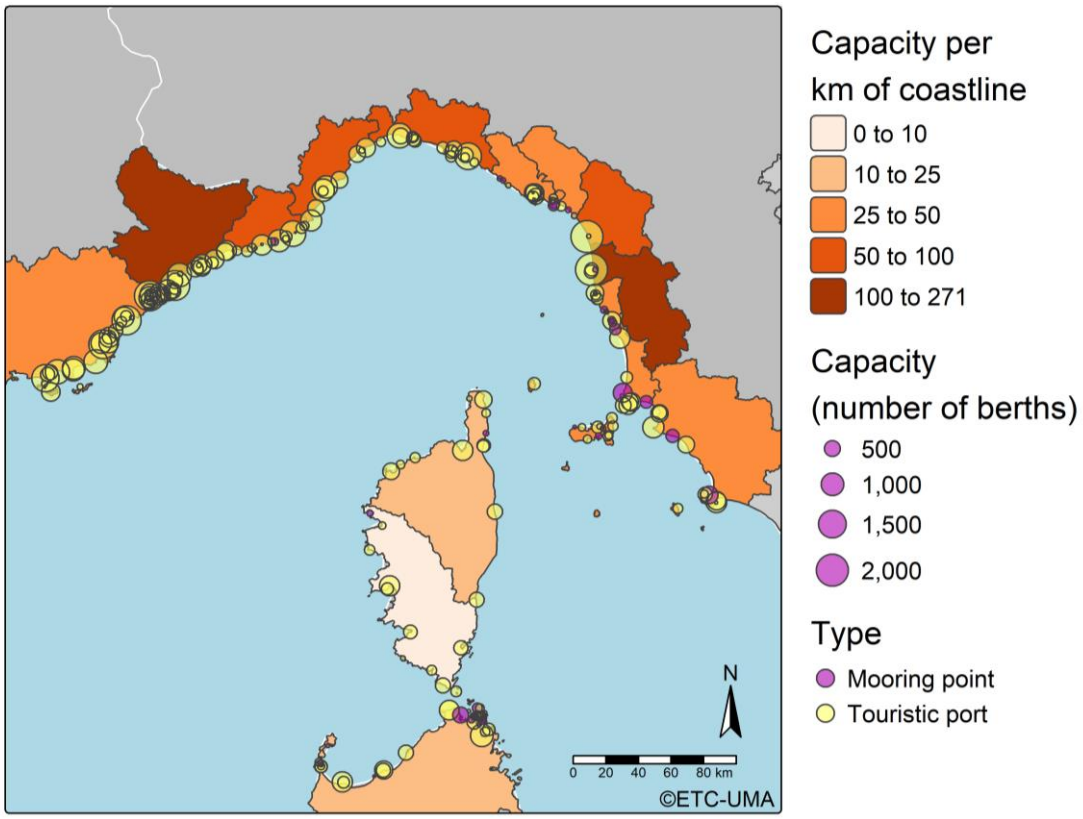

Figure 55 Location of ports and mooring points with a certain capacity (berths/moorings) and moorings (including berths) per km of coastline for NUTS3 administrative units. Source: Pelagos Sanctuary Secretariat (port data), NUTS3 boundaries by GISCO.

Figure 5 presents the capacity and geographic distribution of ports as well as mooring points along the coastline, presenting a spatial overview of maritime infrastructure with the variations in the density of moorings. In Var distric and Pisa district, marina port capacities in number of moorings per kilometre of coastline reach very high numbers of up to 100 moorings per kilometre.

Most ports in the database are designed to accommodate vessels of intermediate size, typically ranging from 25 to 50 meters in length (Figure 6). Additionally, a significant number of ports are dedicated to either small boats (<10 meters) or large vessels (50–100 meters), including superyachts. However, only a limited number of touristic ports have the capacity to accommodate vessels exceeding 100 meters. These specialized facilities are found in those several coastal destinations along Pelagos (Port of Niza, Portpo Lotti, Marina Genova, Antibes-Port Vauban, Marina Molo Vecchio and port of Talamone) attract luxury yachts and mega yachts, requiring deeper berths, advanced docking infrastructure, and exclusive services.

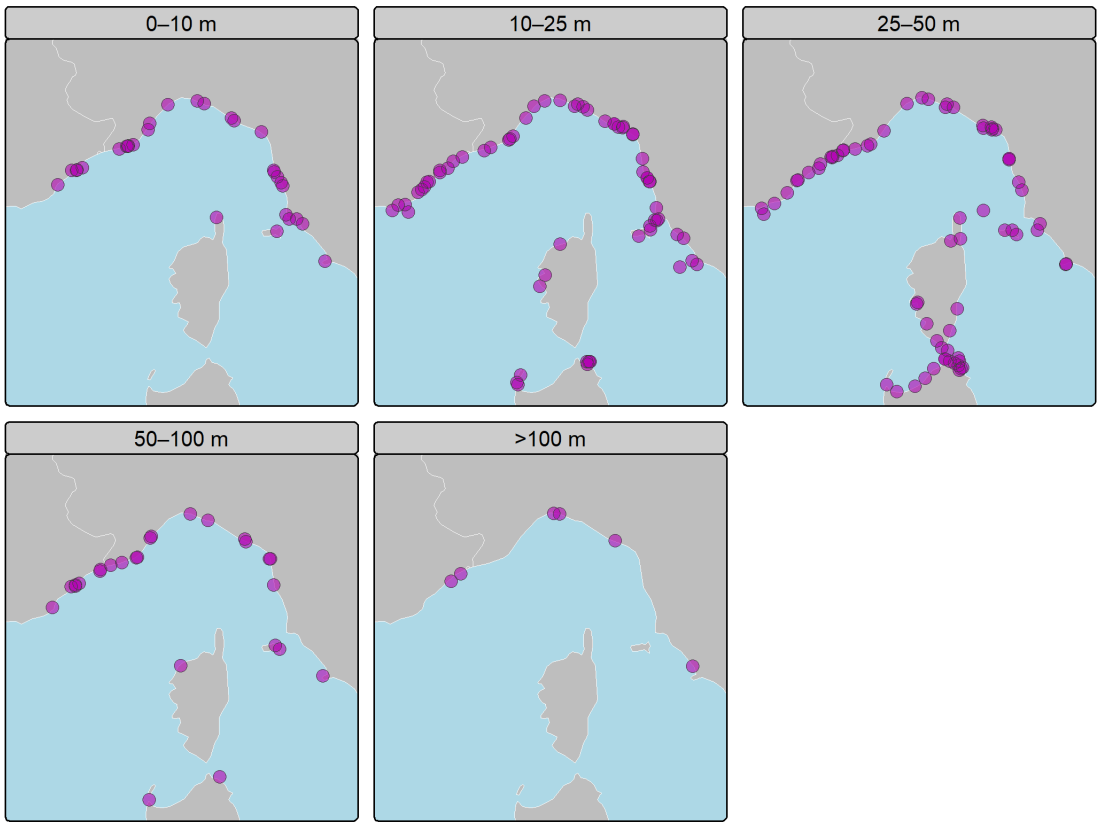

Figure 66 Location of ports with a certain maximum vessel length. Source: Pelagos Sanctuary Secretariat.

When illustrating the ports that have adopted the Pelagos Partnership Charter—committing to measures that reduce marine pollution, minimize disturbances to marine mammals, and

promote sustainable maritime activities (Figure 7)—we observed a relatively uneven distribution across key coastal regions within the Pelagos Sanctuary. The adoption of the charter is particularly prominent in regions with high maritime activity (all of the French Mediterranean and the regions Imperia, Savona, Livorno and Pisa), where boating and yachting are central to the local economy.

Despite this overall distribution, some areas with dense recreational boating activity show lower adoption rates of the Pelagos Partnership Charter, indicating potential gaps in environmental commitment or logistical challenges in implementation.

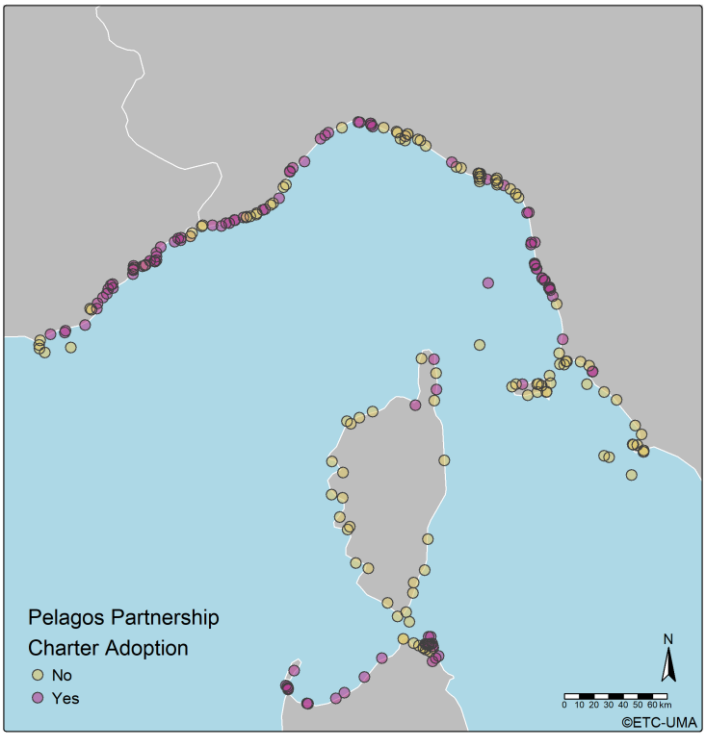

Figure 77 Location of ports that have adopted the Pelagos Partnership Charter. Source: Pelagos Sanctuary Secretariat.

Several ports in the region have been awarded the Blue Flag environmental certification, which recognizes marinas that meet high environmental, safety, and service standards (Figure 8).

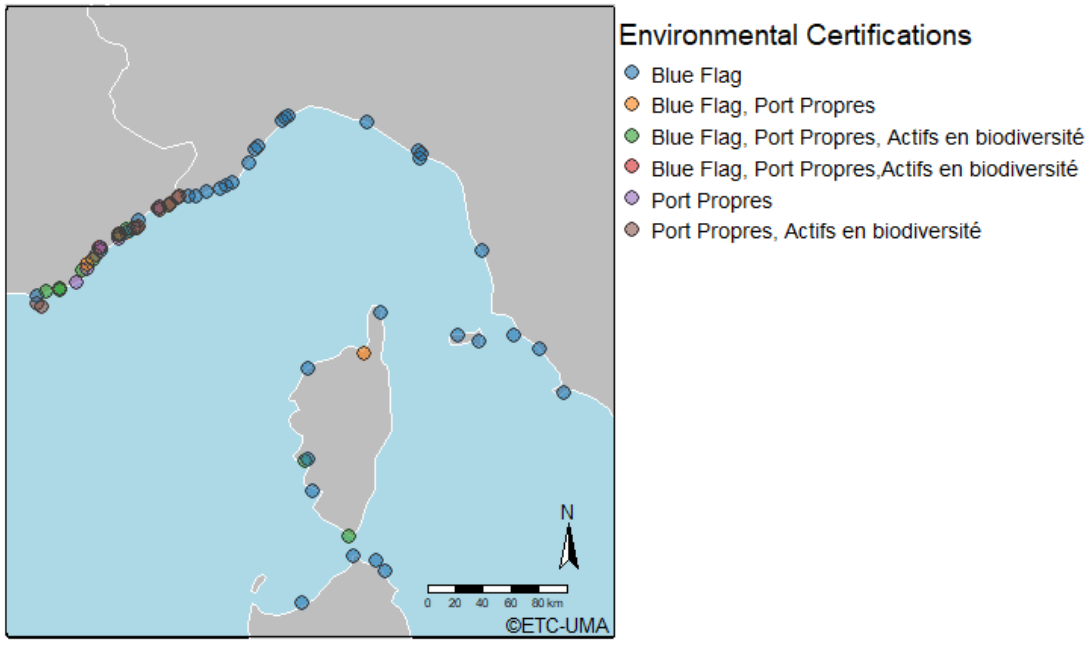

Figure 8 8 Location of ports with environmental certifications, such as the Blue Flag from 2024. Source: Pelagos Sanctuary Secretariat.

Seasonal and yearly trends in recreational boating activities

Marina survey respondents were asked to provide information on the seasonal usage of their ports. However, due to the limited number of responses, only 7 out of 13 participants provided data regarding the number of vessels (1 from Italy, 5 from France, and the Port of Monaco), while 8 respondents reported data on the number of berths (3 from Italy, 4 from France, and the Port of Monaco) conclusions drawn from this dataset should be interpreted with caution, as the sample size may not fully represent broader trends across all ports. Additionally, inconsistencies in how respondents interpreted and reported the data suggest potential challenges in standardizing seasonal usage metrics.

In the summary Table 3, we assume that the reported values represent the number of daily visits. Regarding berth rentals, there are notable inconsistencies in how respondents interpreted the question. Ports that reported lower figures (20–30% of the total number of berths, even during the high season) likely understood the question as referring to the number of berths occupied at any given time within the season. In contrast, ports that provided numbers exceeding their actual berth capacity likely reported the cumulative total for the season. Additionally, one port reported seasonal berth rentals despite indicating in a separate question (Q6) that it had no berths, only moorings (Q7). While we included this port's data in the calculation of the mean number of berth rentals, we excluded it when calculating ratios relative to the total number of berths. Due to these discrepancies, the table should be interpreted as an indicative trend rather than an exact measurement.

As anticipated, the number of visiting vessels exhibits a strong seasonal trend, with mid-season visits approximately doubling compared to the low season. However, the difference between mid-season and high season was less pronounced for most respondents, except for one port (Calvi - Port Xavier Colonna, Corsica) that reported a doubling of visits between these periods.

Regarding berth rentals, four out of the eight respondents reported consistent rental numbers across all seasons, suggesting that a fixed number of berths are permanently rented out. The remaining four respondents indicated a significant increase in rentals from the low to mid-season. Trends between mid-season and high season varied: one respondent reported a sharp increase, one noted a slight increase, and two observed slight decreases in berth rentals.

Table 3 Summary of survey answers regarding the seasonal number of visiting vessels and berth rents, in comparison to the total number of berths

	Low season (Nov- April)	Mid-season (May-June, Sept- Oct)	High season (July – August)
Visiting vessels (mean number)	344.17	766.43	906.54
Visiting vessels as a ratio to total number of berths (calculated value)	0.10-0.4 (2 ports: 2.6 – 3.9 %)	0.50-1 (3 ports: 2, 3 and 11)	0.50-3.4 (1 port: 15)
Berth rents (mean)	204.38	267.63	338
Berth rents as a ratio to total number of berths (calculated value)	1 port: 0.05 (mistake?) 4 ports: 0.2-0.3 2 ports: 0.75-1	2 ports: 0.2-0.3 5 ports: 0.7-1.2	2 ports: 0.2-0.3 5 ports: 0.5-1.1 1 port: 6.4

Vessel density and spatial distribution

The analysis of vessel density based on EMODnet data reveals several high-density areas along all the coastal area of Pelagos, including notable concentrations in regions such as Corsica and Sardinia (Figure 9). All these areas are characterized by high maritime activity, with both recreational and commercial vessels contributing to the overall density. The area of the Critical Cetacean Habitats in the North Western Area of Sardinia and the Tuscany Archipelago are similarly affected. Another key region of high vessel density is the area between the western part of Corsica and mainland France, which includes the Northern portion of the North West Mediterranean Sea, the Slope and Canyon System Important Marine Mammal Area (IMMA). Notably, this excludes the Western Ligurian Sea and Genoa Canyon IMMA region, where densities are comparatively lower. Additionally, the waters between the Tuscan Archipelago and northeastern Corsica are also marked by high vessel density. The spatial distribution of sailing vessels generally mirrors that of motorized crafts, though it tends to be more concentrated in specific areas, reflecting higher activity levels in certain regions (Figure 999).

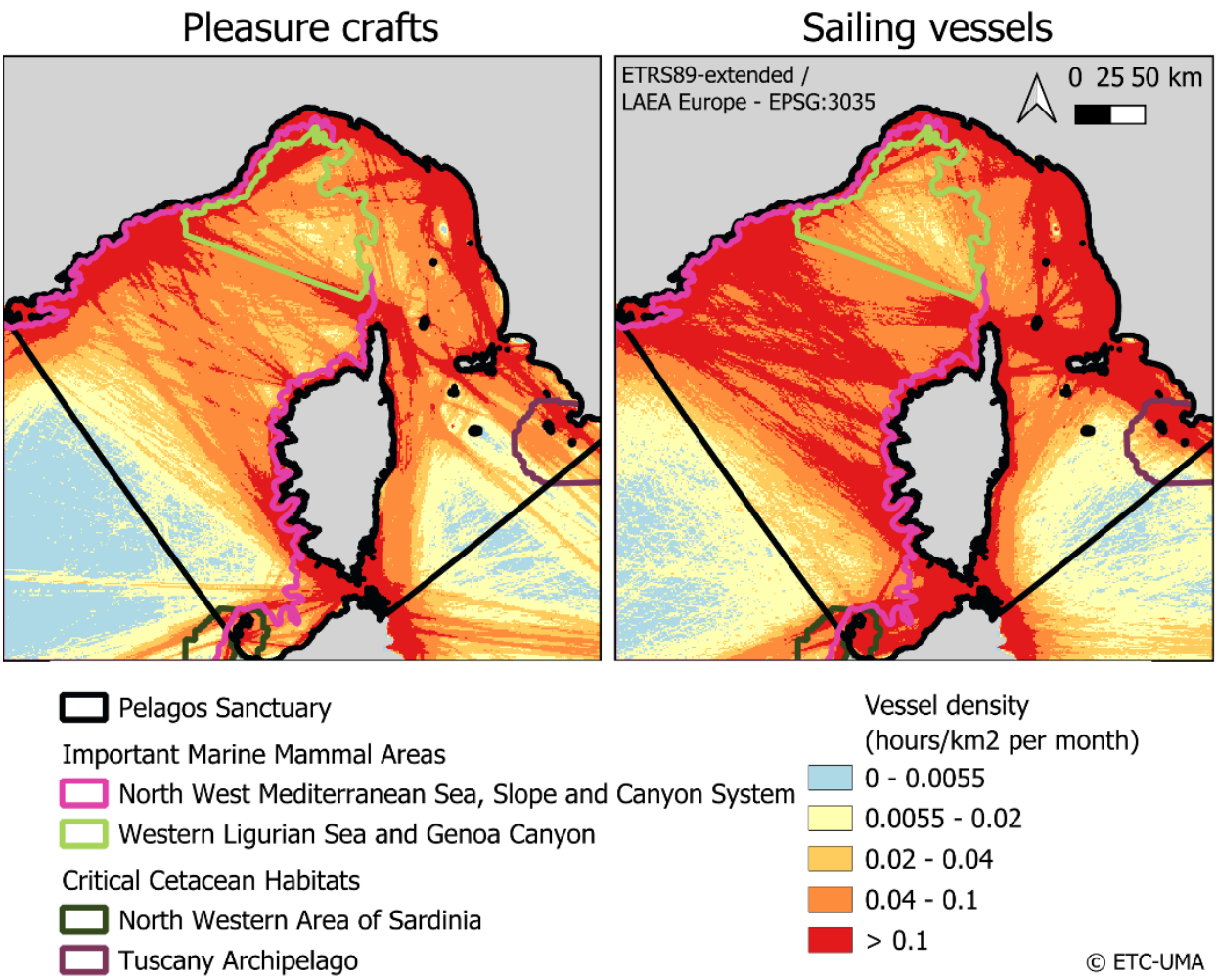

Figure 99 Average vessel density across all years and months for pleasure crafts (left) and sailing vessels (right) from the EMODnet database, as well as the location of the the Pelagos Sanctuary, Important Marine Mammal Areas and Critical Cetacean Habitats in the region.

The results also show a clear increase in vessel density over the years, both for motorized crafts crafts (Figure 10) and sailing vessels (Figure 11).

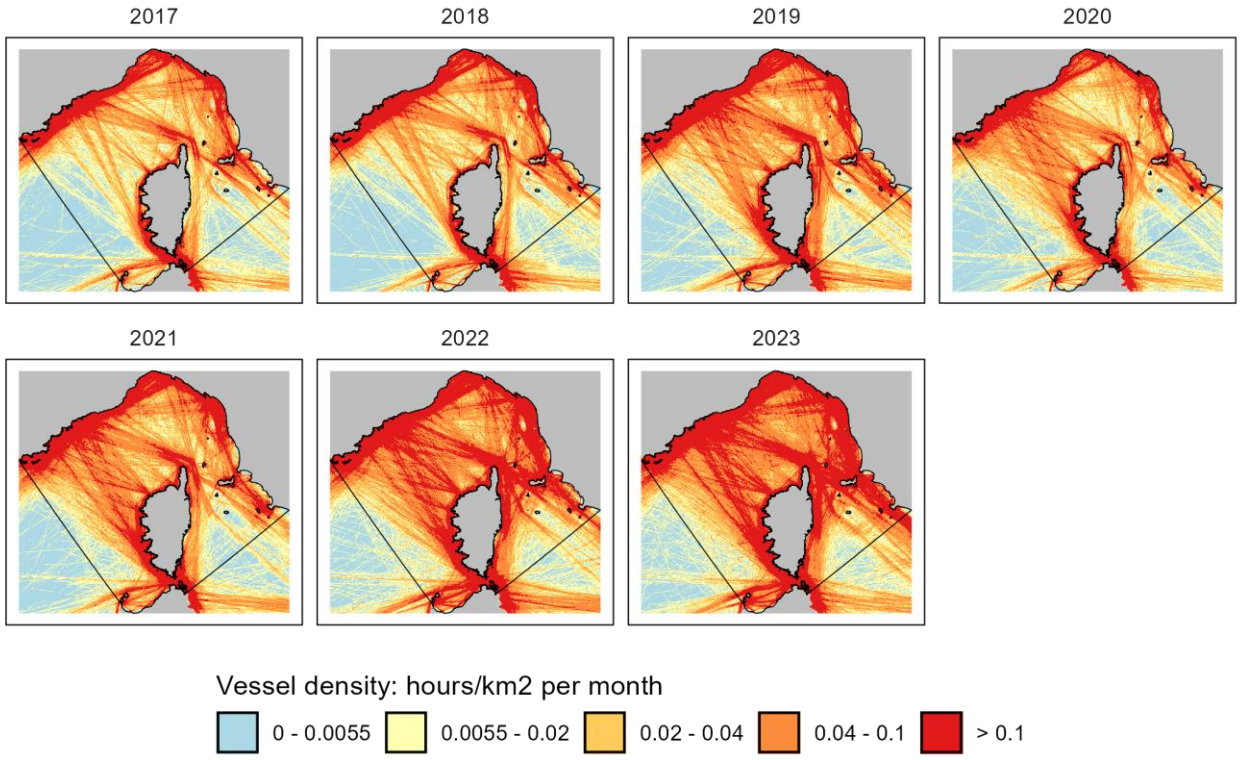

Figure 10 10 Average vessel density over a year for pleasure crafts based on EMODnet data.

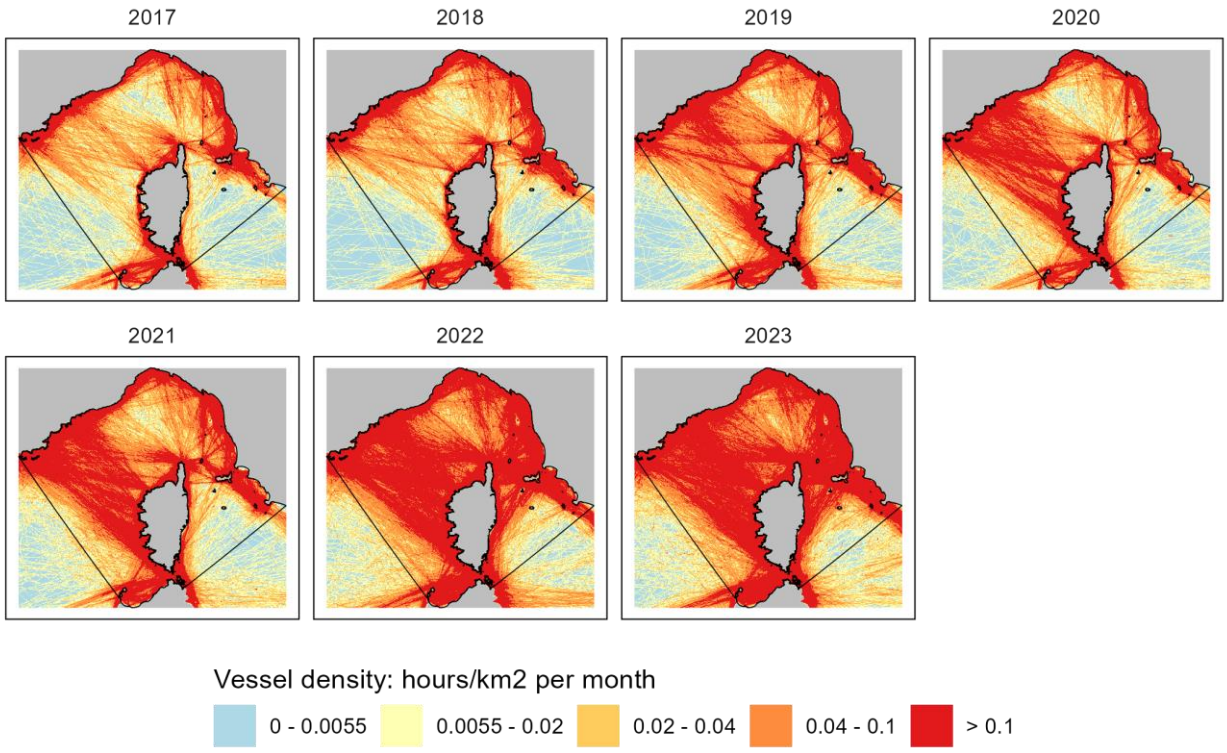

Figure 1111 Average vessel density over a year for sailing vessels based on EMODnet data.

The seasonal trend in recreational boating, as discussed earlier based on the questionnaire responses, is further supported by a comparison of vessel density across seasons. **Averaging over the years and the entire area of the Pelagos Sanctuary, vessel density increases by 58.5% from the low season to the mid-season, followed by a smaller 13% increase between the mid-season and high season.** When examining seasonal differences across the years for both vessel types (Figure 12, Figure 13), it becomes evident that the gap between the mid-season and high season is narrowing.

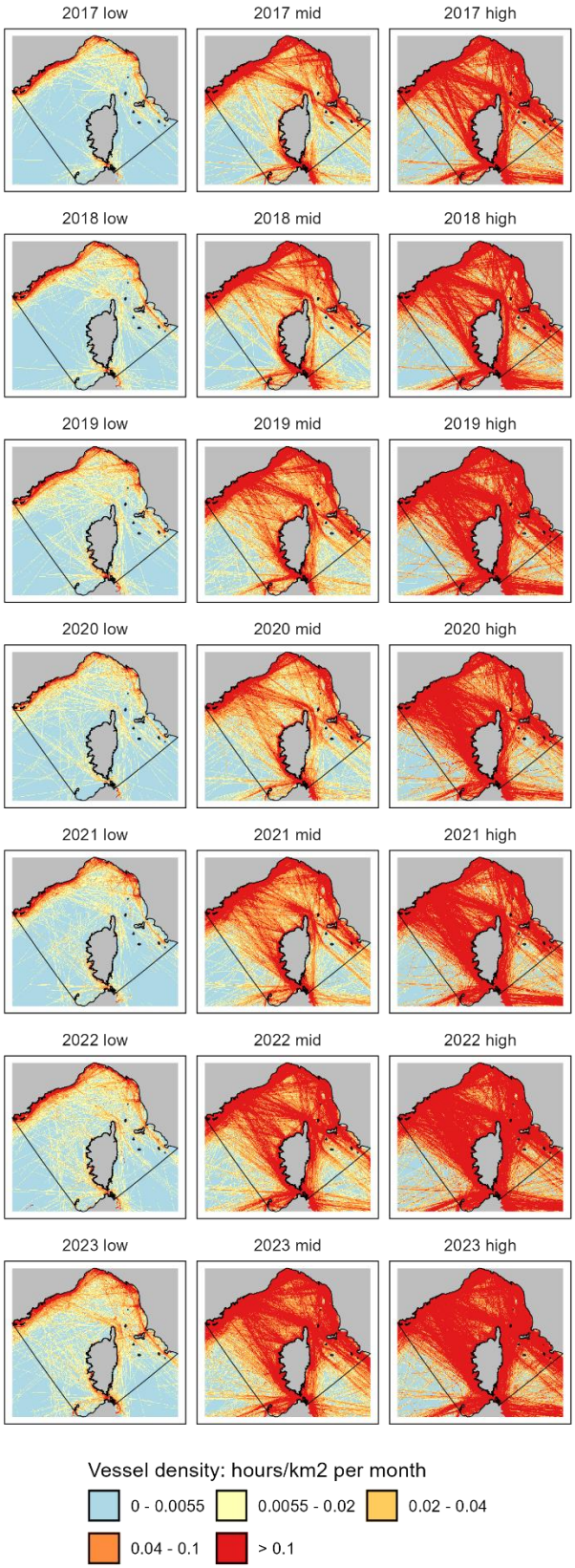

Figure 1212 Average vessel density for the low season (November - April), mid-season (May- June and September- October) and high season (July- August) in different years for pleasure crafts based on EMODnet data.

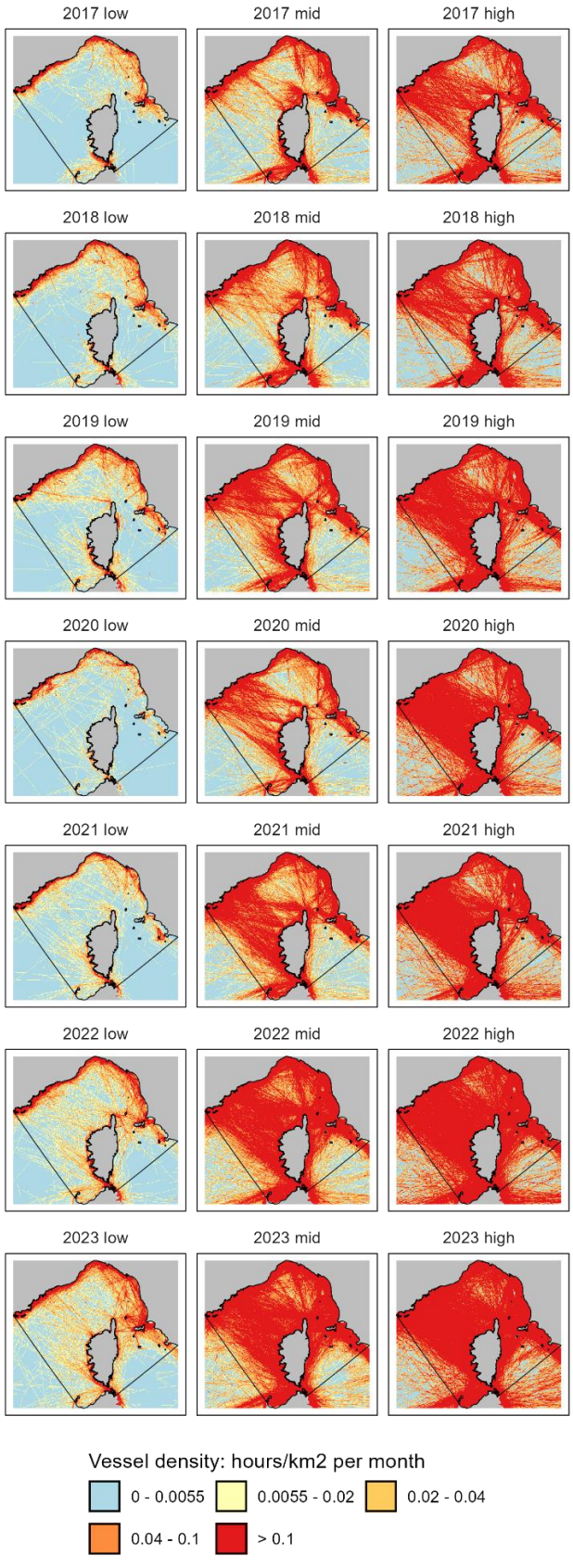
2017 low
2017 mid
2017 high
2018 low
2018 mid
2018 high
2019 low
2019 mid
2019 high
2020 low
2020 mid
2020 high
2021 low
2021 mid
2021 high
2022 low
2022 mid
2022 high
2023 low
2023 mid
2023 high
Vessel density: hours/km2 per month
0 - 0.0055
0.0055 - 0.02
0.02 - 0.04
0.04 - 0.1
> 0.1

Figure 1313 Average vessel density for the low season (November - April), mid-season (May- June and September- October) and high season (July- August) in different years for sailing vessels based on EMODnet data.

Port use by different types of boats according to questionnaire

Regarding port usage by different types of boats, there were two distinct groups of respondents based on the proportion of international boaters. Nine respondents reported that only 0-25% of their visitors are international boaters. In contrast, the remaining four ports showed a higher proportion of international visitors, with two ports indicating 51-75% international visitors, and two others reporting 76-100% international visitors. When considering the frequency of trips made by resident boats, responses varied. Approximately half of the respondents (6) indicated that resident boats typically undertake only 1-10 trips per year. The other half reported that resident boats make between 11-30 trips annually. Only one respondent noted that resident boats undertake more than 31 trips per year. This suggests a general trend of limited boating activity among residents, with most boats used for occasional trips.

The survey included several questions about activities organized by port businesses. Eight marinas reported hosting businesses that offer boat rentals. The types of rented boats varied and included catamarans, powerboats, boats under 10 meters, semi-rigid boats, and small open boats. The estimated number of rental trips per day during the high season was generally between 1-10 trips (reported by 3 respondents) and 11-30 trips (reported by 2 respondents). In addition, five marinas indicated that they offer scuba diving activities, typically with 1-2 boats involved. However, the Port of Calvi (Port Xavier Colonna) was notable, reporting a significantly higher number of boats—12 in total. Furthermore, four respondents mentioned offering **whale or dolphin-watching activities in their ports** (Antibes Beauvert, Port Adrien, Port de Monaco, and Camogli). For most of these, only one boat was involved, except for Antibes Beauvert, which reported 5 boats engaged in the activity. This highlights the diversity of recreational and eco-tourism activities available in these ports.

Only two respondents reported the existence of **businesses offering fixed charter routes**. Port Adrien to Girons operates 4 trips per year, covering an average distance of 700 km, while Cala Gavetta offers routes to the islands of the Archipelago. Additionally, Port de Plaisance Charles Ornano reported 400 charter trips, and Port di Marciana Marina indicated 1,000 charter trips, each with an average distance of 100 km. However, more comprehensive information is needed to fully capture the extent of charter activities across all ports, as this data is currently limited to only a few respondents.

Respondents were asked to provide information on the number of different types of boats using their marinas. Three ports indicated that they could not provide such statistics, meaning the data in Table 4 is based on only ten responses, limiting the ability to draw strong conclusions. However, the results suggest that a significant number of both year-round and visiting boats are outboard and inboard motorboats under 12 meters. This finding is particularly relevant for

cetacean conservation, as these boats may generate substantial underwater noise, yet their movements are unlikely to be captured by AIS transmitters.

According to respondents, small boats under 12 meters typically undertake only daily trips, while travel distances tend to increase with boat size across all vessel types (Table 5). Additionally, all sizes of sailing boats and large motorboats participate in racing trips, as reported by 1-4 respondents depending on boat type. Given the small sample size of the survey, this is a noteworthy number. Racing trips pose an increased risk of collisions with cetaceans, highlighting the need for further monitoring and mitigation measures.

Table 4 Number of different types of boats present all year round or as visitors as well as their average length of stay, according to survey responses (n = 10).

Type of boat	Number of boats present all year round in 2023-24 (mean number across respondents)	Number of visiting boats in 2023-24 (mean number across respondents)	Average length of stay of visitors in 2024
Outboard Motorboats (<12 m)	107.9	273.2	34.5
Inboard Motorboats (<12m)	21.9	0 for all ports, except Port Adrien (1) and Porto di Marciana Marina (200)	2.5
Outboard Motorboats (12-23.9m)	23.8	85.9	11.33
Inboard Motorboats (12-23.9 m)	10.6	240.1	12.67
Motorboats (24+ m)	0 for all except Port of Monaco: 476	0-6, except Porto di Marciana Marina (100), Port of Monaco: 817	9.83
Sailing boats (<12 m)	15.6	0-10, except Porto di Marciana Marina (3500), Port de Plaisance Charles Ornano: 2098	4.25
Sailing boats (12-23.9 m)	0, except Port de Plaisance Charles Ornano: 100	0-1, except Porto di Marciana Marina (1500), Port de Plaisance Charles Ornano: 1437	3.67
Sailing boats (24+ m)	0	0, except Porto di Marciana Marina (50), Port de Plaisance Charles Ornano: 10	4
Personal Watercraft (e.g. Jet Skis)/Inflatables	1.81	0-1, except Porto di Marciana Marina (50), Camogli (12)	1.34
Other (Please specify)	1 port: 2 (diving boats) 1 port: 1 (inflatable duck)	1 port: 2 (diving boats)	-

Table 5 Types of journeys undertaken by different types of boats. The numbers shown are the number of respondents indicating that the given type of trip is undertaken by the given type of vessel.

Type of boat/Journey	Day trip	Few days	Long trip (one further destination)	Tour (multiple further destinations)	Racing trip
Outboard Motorboats (<12 m)	11	2			
Inboard Motorboats (<12 m)	10	2	1		
Outboard Motorboats (12-23.9m)	3	6	1	1	
Inboard Motorboats (12-23.9 m)	4	6	1	2	
Motorboats (24+ m)	3	3	3	3	1
Sailing boats (<12 m)	8	3	2	1	3
Sailing boats (12-23.9 m)	4	5	2	2	4
Sailing boats (24+ m)	3	3	2	4	2
Personal Watercraft /Inflatables	5	1	1		

Marine activity regulations within the Pelagos Sanctuary's MPAs and restricted zones

Regulations governing marine activities on recreational boating within the Pelagos Sanctuary, particularly along the French Mediterranean coast and around Corsica, are outlined in data from Milieu Marine France[1] and shown in Figure 14. These regulations impose various restrictions on anchoring, fishing, navigation, and scuba diving to protect sensitive marine environments.

Anchoring Restrictions

Anchoring is prohibited for large vessels (>20 or 24m) in extensive areas along the French Mediterranean coast and around Corsica. Additionally, vessels over 12 meters are not permitted to anchor in the waters between the Island of Porquerolles and Giens (National Park, NP).

Recreational Fishing Restrictions

Recreational fishing is restricted in several key areas, including Port-Cros NP, as well as *Plateau des Bruzzi, Plateau des Cerbicale,* and *Iles Lavezzi* in southern Corsica (that include areas of Bonifaccio Nature Reserve). Several smaller areas, such as *Saint-Raphaël (Cap le Roux), Cap*

[1] www.amp.milieumarinfrance.fr/accueil-fr

d'Ail, and *Baie de Solana* in Corsica, enforce complete bans on all types of fishing, including recreational.

Navigation Restrictions

Motorized vessels are prohibited from entering the core zone of the *Parc National de Port-Cros*, which includes parts of *Porquerolles Island* and *Port-Cros Island*, as well as the *Rivière de Noyalo Natura 2000* area. Navigation is also restricted in the *Gulf of Porto* on Corsica's western coast. Additionally, superyachts (>24m) are subject to specific navigation regulations around Corsica, including mandatory anchoring zones.

Scuba Diving Restrictions

Scuba diving is subject to seasonal prohibitions, particularly along the southern coast of *Port-Cros Island* and in various designated areas around Corsica.

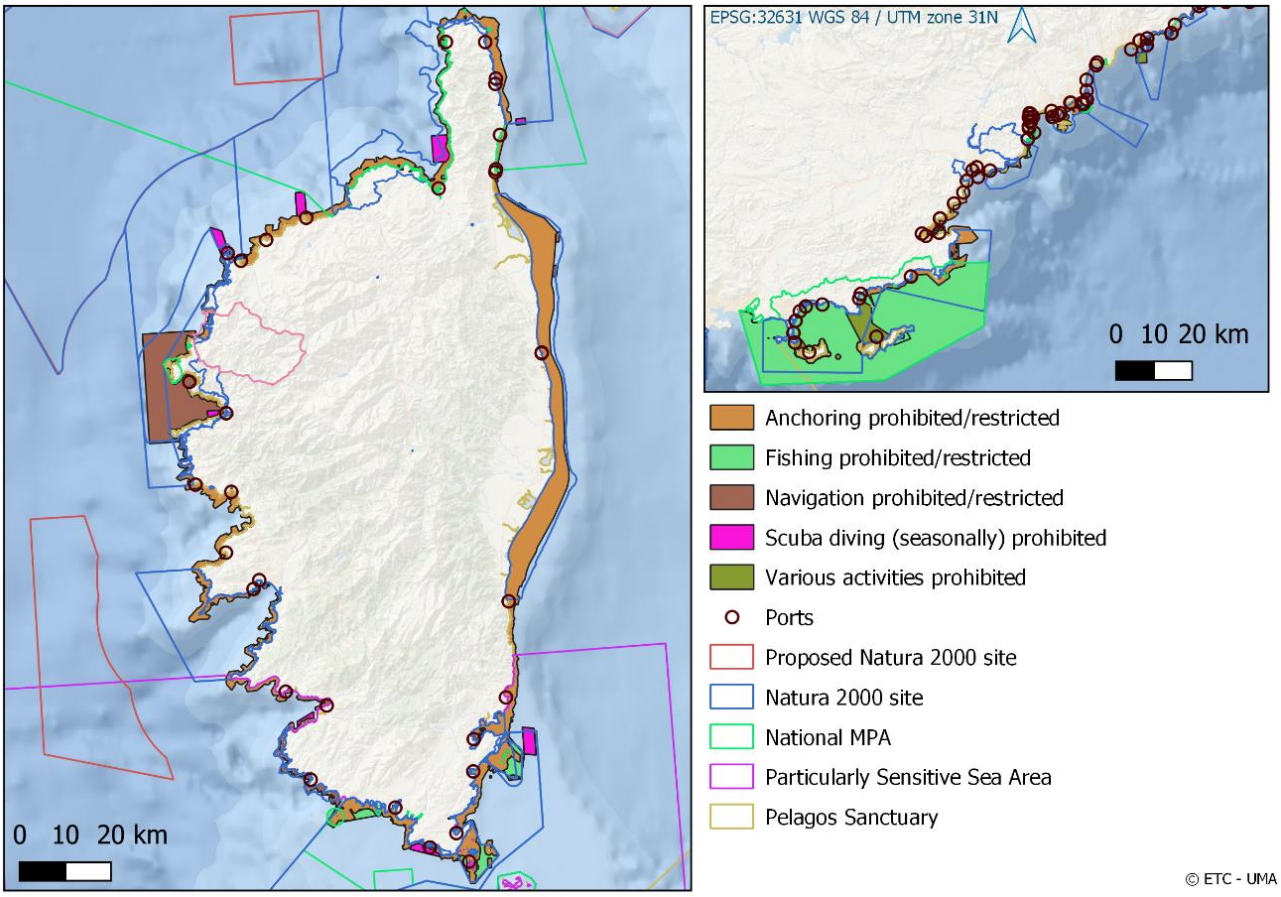

Figure 1414 Regulations according to Milieu Marin France, locations of ports (database produced in this work) and the boundaries of the Pelagos Sanctuary, Marine Protected Areas (proposed and designated) and the Strait of Bonifacio Particularly Sensitive Sea Area (based on the MAPAMED database). Background map: ESRI Ocean.

For Italy, directly accessible official spatial data on maritime recreational activity regulations—similar to the French database—was not available. Instead, we relied on indirect data from the

several databases (e.g. Mapamed, Protected Seas Navigator [2]) to illustrate regulatory restrictions in Italian waters.

Various recreational activities, including anchoring, scuba diving, and recreational fishing, are restricted in certain zones. In Marine Protected Areas, however, the total surface area alone does not determine the actual level of protection, which depends on the specific zoning regulations within each area. Typically, *Zone A* of MPAs prohibits access except for scientific research and bans all removal or harvesting of marine organisms. In *Zone B*, human access is generally allowed but may be subject to permit-based restrictions on activities such as boating and diving. Recreational fishing in these areas is often not allowed.

Various recreational activities, including anchoring, scuba diving, and recreational fishing, are restricted in certain zones (Figures 15-17). the total surface area of MPAs alone does not determine the actual level of protection, which is closely linked to the zoning regulations within each area. Zone A of MPAs usually prohibit access except for scientific research and prohibit all removal or harvest of plants and animals. Generally in Zone B, human access is allowed but can be limited by permits for boating and diving, for instance; fishing is restricted to recreational fishing.

In the core zones of the National Parks, all navigation and access are forbidden (Figure 18). Within the MPA of Tavolara in northern Sardinia pleasure crafts may navigate, but only on restricted routes and under a speed limit. On the the biosphere reserves of the Tuscan Archipelago, the La Maddalena Archipelago and the Natura 2000 sites Capo Figari, Cala Sabina, Punta Canigione, Isola Figarolo and Isola dell'Asinara navigation is restricted around the colonies of seabirds within a radius of 100 meters from the colonies in the breeding season.

[2] protectedseas.net

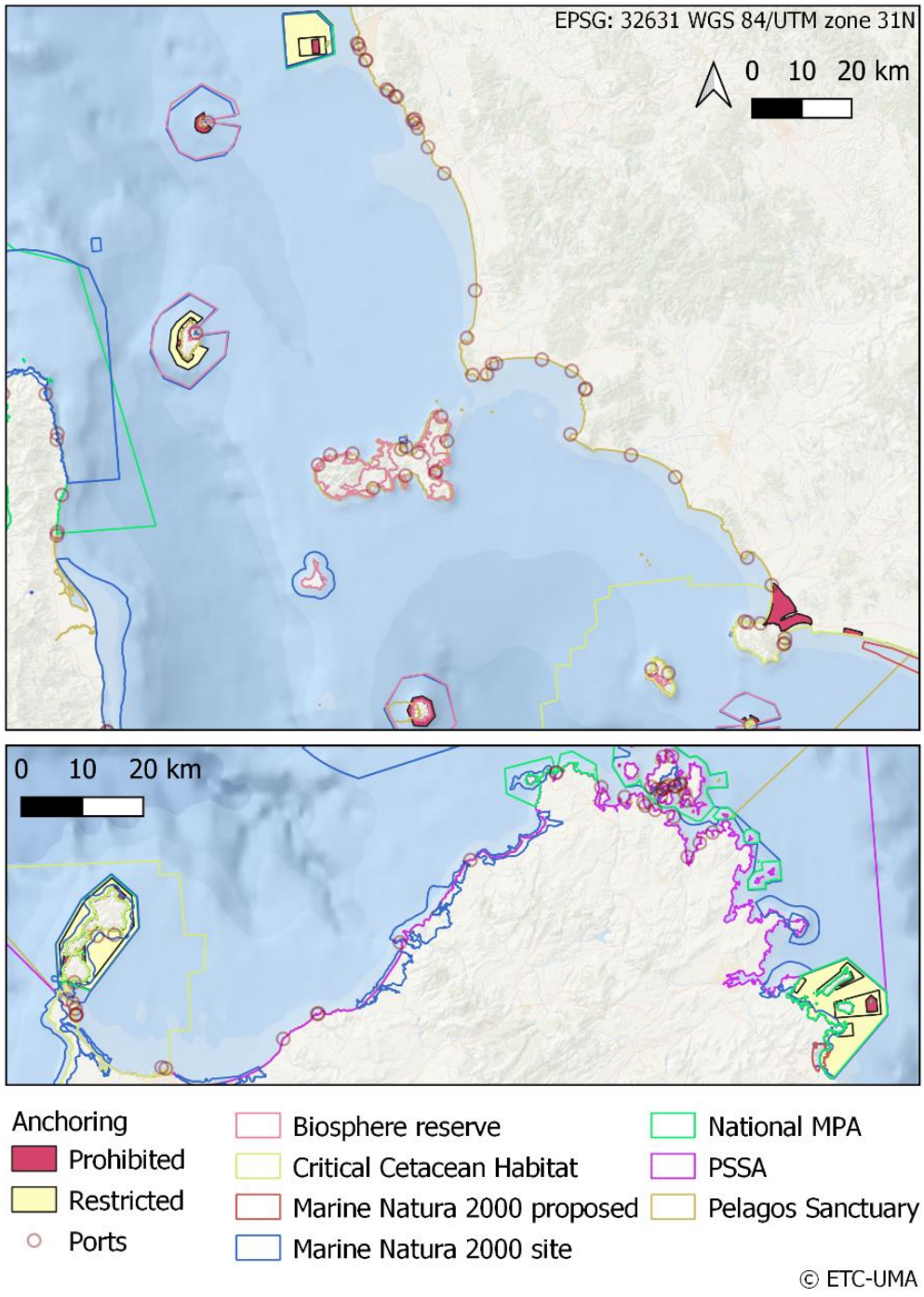

Figure 1515 Anchoring restrictions in Italian waters (based on the ProtectedSeas database), locations of ports (database produced in this work) and the boundaries of the Pelagos Sanctuary, Marine Protected Areas (proposed and designated), Critical Cetacean Habitats the Strait of Bonifacio Particularly Sensitive Sea Area (based on the MAPAMED database). Background map: ESRI Ocean.

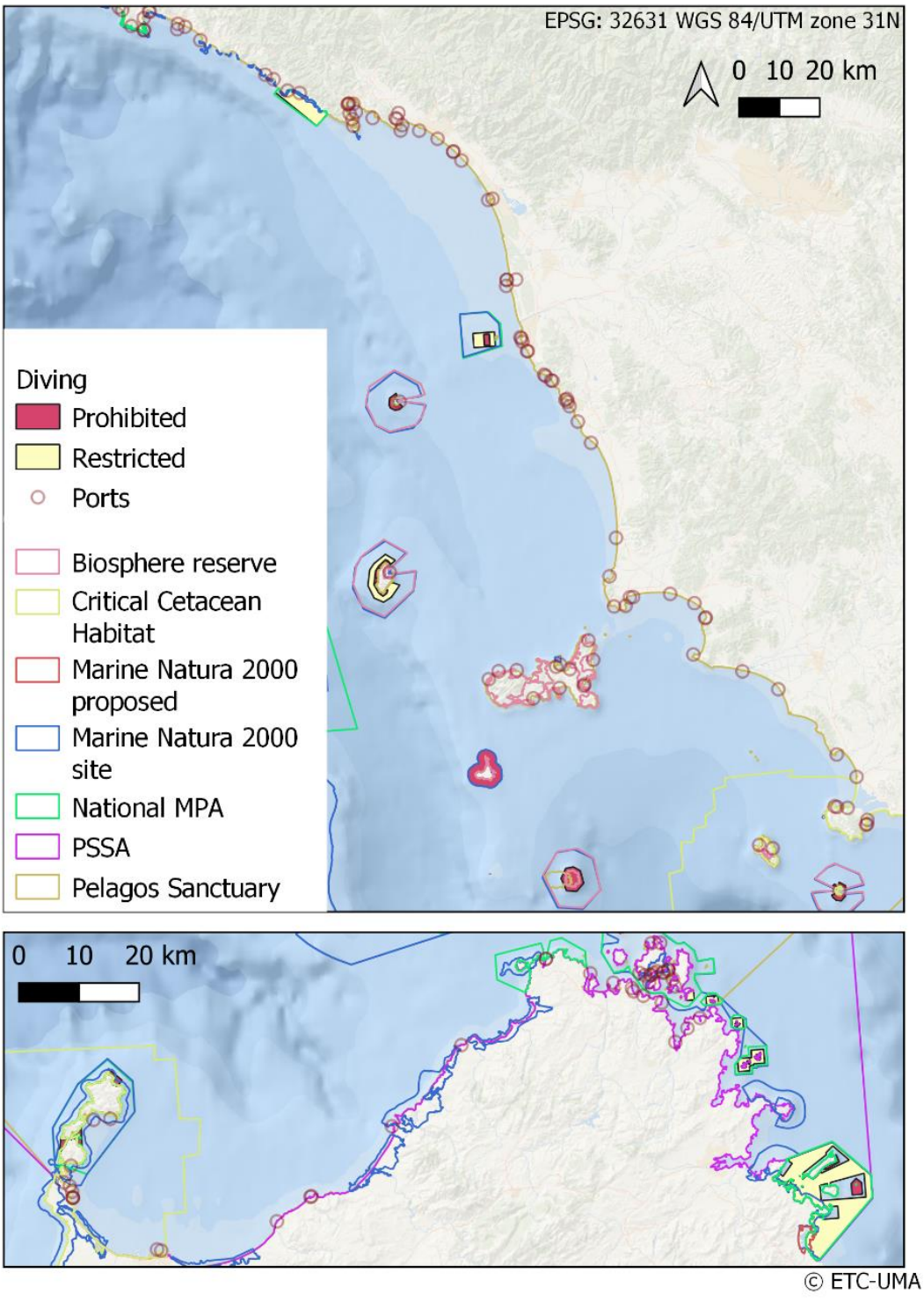

Figure 1616 Diving restrictions in Italian waters (based on the ProtectedSeas database), locations of ports (database produced in this work) and the boundaries of the Pelagos Sanctuary, Marine Protected Areas (proposed and designated), Critical Cetacean Habitats the Strait of Bonifacio Particularly Sensitive Sea Area (based on the MAPAMED database). Background map: ESRI Ocean.

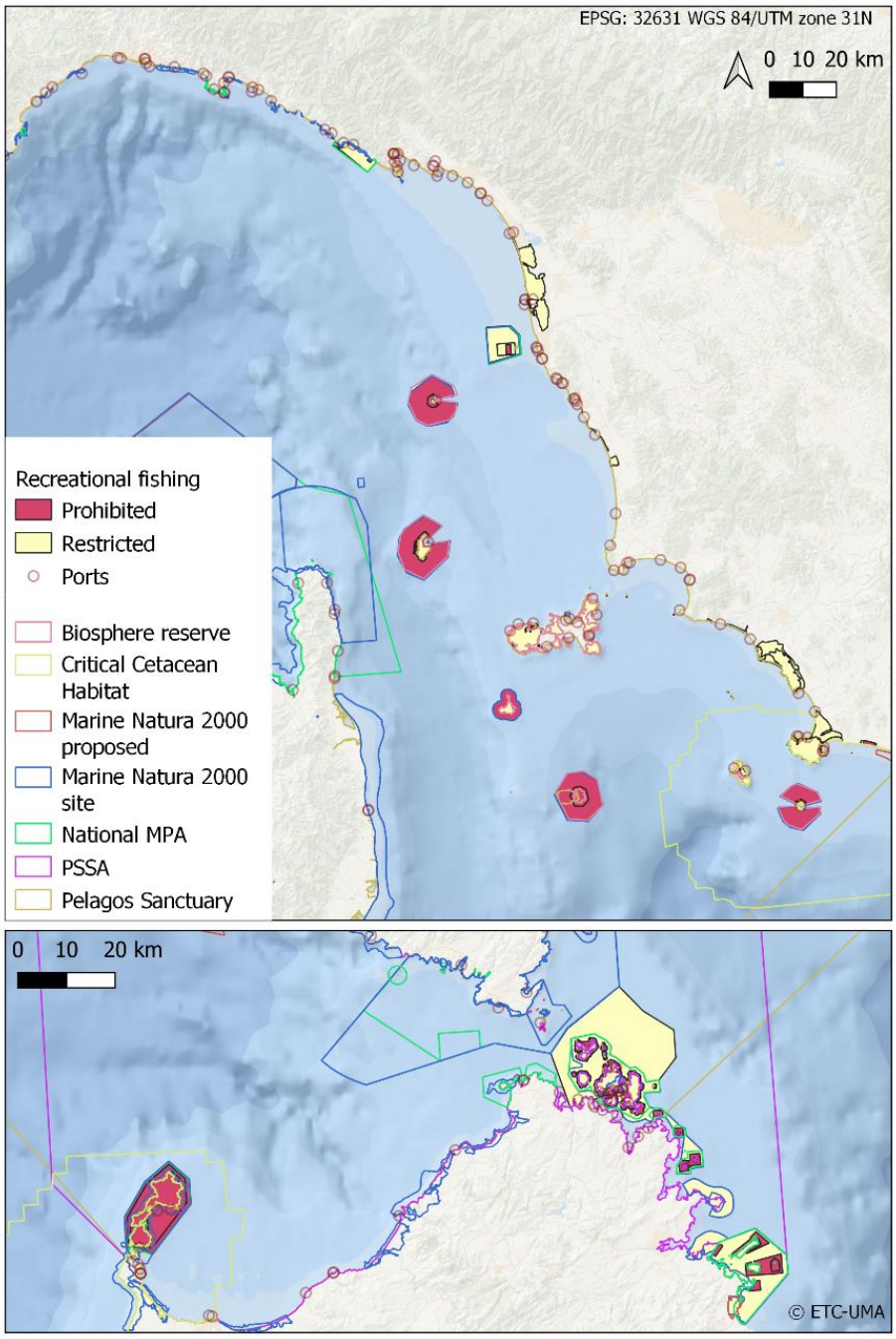

Figure 1717 Recreational fishing restrictions in Italian waters (based on the ProtectedSeas database), locations of ports (database produced in this work) and the boundaries of the Pelagos Sanctuary, Marine Protected Areas (proposed and designated), Critical Cetacean Habitats the Strait of Bonifacio Particularly Sensitive Sea Area (based on the MAPAMED database). Background map: ESRI Ocean.

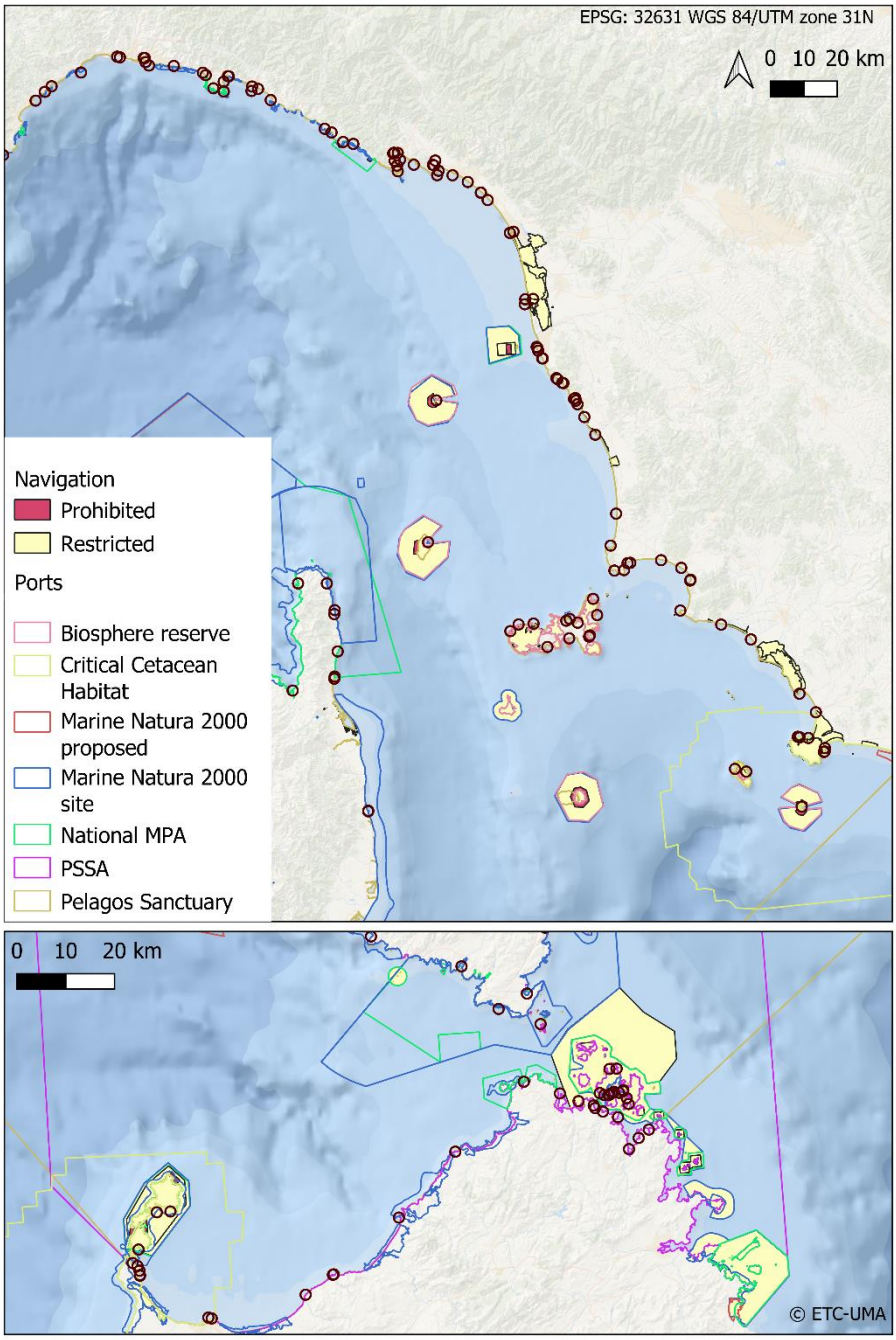

Figure 1818 Navigation restrictions in Italian waters (based on the ProtectedSeas database), locations of ports (database produced in this work) and the boundaries of the Pelagos Sanctuary, Marine Protected Areas (proposed and designated), Critical Cetacean Habitats the Strait of Bonifacio Particularly Sensitive Sea Area (based on the MAPAMED database). Background map: ESRI Ocean.

Environmental information from the questionnaire

Understanding the environmental practices implemented at ports is essential for assessing sustainability efforts within the Pelagos Sanctuary. The second part of the survey focused on understanding the environmental measures and awareness regarding the Sanctuary undertaken by ports. As with other results from the survey questionnaire, the limited number of responses necessitates caution when generalizing the findings to the entire region.

All respondents except one (Camogli) filled out this section, providing responses from 12 ports. The most common environmental measures reported included various types of disposal facilities for oils, black and grey water, and waste recycling (Figure 19). Other enviromental practices mentioned by ports were:

- *Directions with environmental signs (Porto di Marciana Marina)*
- *Display of environmental information and awareness of reception staff (Charles Ornano, Port du Crouton, Cala Cravieu)*
- *Environmental regulations sent by email before visitors' arrival, signage, direct contact (Port de Monaco)*
- *Service facilities provided by Ekkopol, a boat that collects waste and robots that clean the port (Calvi Port)*
- *Consumption monitoring on service vessels (Port de Cap d'Ail)*
- *Mobile pump for grey and black water, with options for selective sorting for household waste (Port de Theoule)*

Additionally, nine respondents reported having signage and verbal exchanges with boaters to promote general good environmental practices within the port. Port Cap d'Ail also hosts eco-friendly campaigns during the high season, such as Seaplastics reception and the "I sail, I sort" campaign. Seven respondents noted that their staff receives training on the prevention of contamination.

However, only five respondents indicated that they provide guidance to boaters on good environmental practices while cruising, highlighting a gap in raising awareness of pro-environmental behaviors on the water.

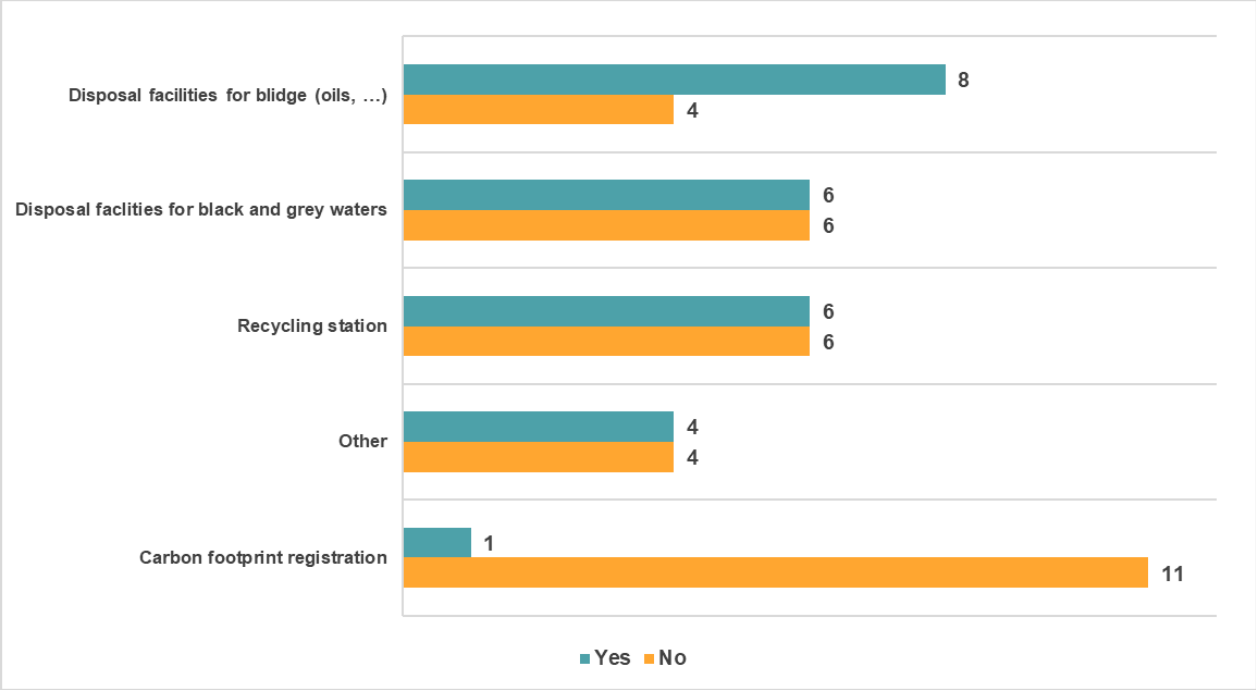

Figure 19 Data on measures promoting environmentally responsible boating provided by survey respondents.

Further questions explored port respondents' familiarity with the Pelagos Sanctuary's conservation goals and regulations. All but one respondent indicated they were “very familiar” or “somewhat familiar” with these regulations (Figure 20). Eight respondents reported providing boaters with information about marine mammals and the Pelagos Sanctuary through displays, flyers, or email. Two ports organize training courses for boaters. Five ports offer information on rules and guidelines, such as voluntary speed limits, via training courses or flyers. One port, Port de Cap d’Ail, mentioned it would like to provide such information but lacks sufficient knowledge on the Pelagos Sanctuary.

The majority of respondants expressed that raising awareness about the Pelagos Sanctuary's conservation goals among sea users is "very important." And have interest in receiving more information or participating in initiatives that promote sustainable boating practices.

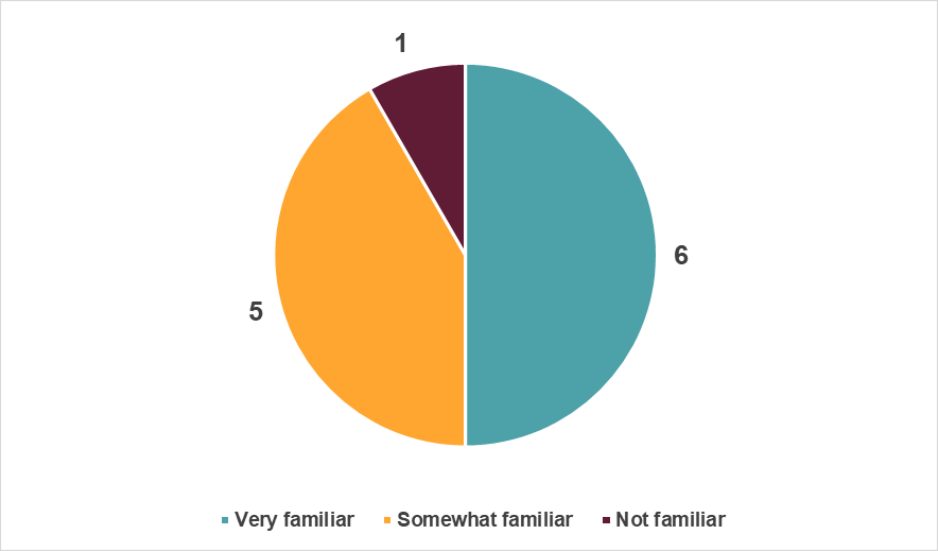

Figure 20 Responses to the question: "How familiar are you with conservation regulations within the Pelagos Sanctuary?"

Regarding recommendations to enhance awareness-raising efforts and monitoring, suggestions included distributing weatherproof, UV-resistant brochures at marinas to inform daily visitors. Additionally, it was recommended to gather surveys and data from fishing cooperatives and charter companies for monitoring purposes. **A concern was the lack of sufficient information about the Pelagos Sanctuary, which prevents informed discussions with boaters regarding its conservation issues, action plans, and results**.

Strengths and limitations of the methodology

The use of questionnaires serves as an effective tool to gather detailed, localized information on the operations of ports and marinas, including boat usage, environmental practices, and the specific activities taking place within these facilities. By directly engaging port managers and staff, questionnaires can provide a clearer understanding of port usage patterns, the types of boats operating, the distances they travel, and the environmental measures in place to promote sustainability. This approach not only aids in understanding the current state of operations but also provides an opportunity to identify areas for improvement in environmental practices and regulations, helping to support more informed and effective management decisions. Importantly, it is also a step towards building contacts to ports in the area.

However, there are notable limitations to this survey approach. The response rate to the online questionnaire was low, and many ports were difficult to reach by phone. To overcome these challenges, alternative methods such as conducting surveys by engaging ports through their

umbrella organizations (e.g., “Union des ports de plaisance du Corse” or “Marine della Toscana”) could be explored. Additionally, collaboration with national port and coastal guard authorities may help improve outreach and response rates in the future.

A second major limitation of the survey is that survey managers often do not have, or are unable to provide, the requested information (e.g., usage statistics by different types of boats, digital reporting). This can hinder the ability to gain comprehensive data on boat traffic and specific activities within the individual marinas.

Additionally, the survey does not capture spatial information beyond the location of the port itself. Incorporating participatory mapping tools could address this gap, allowing boaters, port managers, and other users (e.g., charter companies) to mark areas of usage, providing a more detailed picture of activity patterns within and around the port. The feasibility and potential benefits of including such mapping tools could be explored in future surveys.

Furthermore, while the survey offers detailed insights on various topics, this complexity also makes the data time-consuming to process and summarize in a way that is useful for analysis and informing the Action Plan of Pelagos Sanctuary. One challenge in this regard is the inconsistent format of the responses, which complicates the analysis. To improve the process, future surveys should provide clearer guidance on how to fill out the survey, establish stricter rules for data entry, and include more robust quality assurance measures.

In comparison to the survey, the EMODnet vessel density data offers a significant advantage by providing openly accessible, processed information across the entire Pelagos Sanctuary. This data is updated annually and accounts for satellite noise and errors (processed data). However, a key limitation is that it only includes vessels equipped with AIS, which excludes smaller recreational boats—the most numerous category of this type of leisure users. Additionally, the data does not provide information on vessel speed and direction, which would be critical for conducting a more comprehensive environmental risk assessment related to recreational boating activities.

Recommendations for the periodic assessment and monitoring of recreational boating

Monitoring on a broad spatial scale

The European Union established the Recreational Craft Directive (RCD 2013/53/EU) to define design standards for most recreational boats ranging from 2.5 to 24 meters. This directive categorizes vessels into four design categories based on seaworthiness, considering wave height and wind speed. While these classifications help quantify new boat registrations, they provide limited insights into the underlying factors influencing marine space usage, interactions with marine mammals, or broader environmental impacts.

A thorough analysis of recreational boating would require integrating multiple data sources to capture a more detailed picture of its impact. This includes:

- Vessel counts and movement patterns – Tracking the number, type, and size of boats, as well as their temporal trends (e.g., peak activity periods, associated noise levels).
- Traffic distribution mapping – Identifying routes, preferred destinations, home and transit ports/marinas.
- User behavior analysis – Assessing demographics, awareness levels, and perceptions regarding recreational boatings' impact on the marine environment and marine mammals.

Monitoring parameters for achieving these objectives are specified on several publications (Plan Bleu 2022; Grati et al., 2021, Carreño et., 2019; Accobams, 2019; Font et al., 2012) and supported by most relevant EU measures, which can be directly or indirectly linked to the recreation and tourism sector, particularly the the Marine Strategy Framework Directive (Directive 2008/56/EC) and the Marine Spatial Planning Directive (Council Directive 2014/89/EU).

Compilation efforts by national authorities on ports and marina-related data could support the Pelagos Sanctuary monitoring efforts, encompassing information on infrastructure capacity, occupancy rates, yachting itineraries, rental practices, seasonal variations in boat traffic as well as environmental services and Pelagos Sanctuary Awareness **following the data survey developed** (Annex 1). This study found that the existing databases on ports and marinas are different and varied in terms of data coverage, names and the type of information they contain. This variability posed challenges for integrating data across different sources, and **further work is required on port and marinas data harmonization and coordination to ensure consistency in monitoring and conservation efforts within the sanctuary.** Moreover, following the recent GFCM adaptive measure for sustainable recreational fisheries (Recommendation GFCM/45/2022/12), which mandates **a licensing or registry scheme for all recreational fishers—**including tourists and those with time-limited licenses—there is an

opportunity to enhance data collection and enforcement in the Pelagos Sanctuary. Integrating this licensing framework with existing port and marina databases could improve the tracking of recreational boating activities, ensure better compliance with environmental regulations, and contribute to a more coordinated approach to managing this type of activities within the sanctuary.

A future strategy could involve close collaboration with the tech industry and representatives from the nautical sector to explore how emerging innovations—such as AI-powered analytics, automated reporting, and enhanced satellite monitoring—can further refine data collection and inform sustainable maritime policies. Sensors (IoT Sensors and Telematics Solutions) already installed on many recreational vessels continuously monitor factors such as engine performance, fuel consumption, and environmental conditions as well as vessel movement while detecting potential hazards. By integrating this data information with AI-powered analytics and automated reporting a more comprehensive and adaptive monitoring framework could be developed to support sustainable maritime policies and conservation efforts in the Sanctuary.

Race boat events present a valuable opportunity for awareness-raising efforts, especially when combined with strategies to engage participants in environmental stewardship. Depending on the nature of the event, race boat events could be integrated with citizen science initiatives, where participants could contribute valuable environmental observations during the race. For example, boats could be equipped with data collection tools to monitor cetacean sightings and traffic routes by different vessels. This information could be crowdsourced and allow large amounts of data from multiple locations be collected and useful for management.

Monitoring recreational boat monitoring using Radar with AIS data

To enhance monitoring efforts across the Pelagos Sanctuary, integrating processed vessel density maps from EMODnet with real-time AIS tracking, remote sensing, and in-situ monitoring technologies would enable a comprehensive spatial assessment of recreational boating activity. This combined approach would improve the detection of heavy-traffic areas, assess potential environmental impacts, and support enforcement measures, ensuring better protection of the sanctuary's marine species.

Several studies indicate that the actual pressure from recreational boat traffic may be significantly higher than AIS-based analyses alone suggest, as many smaller vessels do not use AIS transmitters (Hermanssen et al. 2019; Venturini et al., 2021).

To address this gap, AIS data analysis could be complemented with Synthetic Aperture Radar (SAR) data from ground-based coastal platforms. Unlike AIS, which relies on voluntary transmission from leisure boats, radar passively detects all objects within its range (e.g. up to 5 nm offshore), including small vessels without AIS. Radar systems can also differentiate vessel

types based on their radar cross-section, movement patterns, and reflectivity (Pieralice et al. 2014, Zucchetta et al. 2025). However, additional filtering and data processing are necessary to distinguish recreational boating activity from other maritime traffic, such as commercial vessels and environmental elements (e.g., waves) (del-Rey-Maestre et al. 2025, Ruciński et al. 2023).

In the extensive area of the Pelagos Sanctuary, integrating radar with AIS data could significantly improve the monitoring of recreational vessels on the coastal waters, particularly by addressing gaps left by non-AIS-equipped boats and not shown on the EMODnet database. This approach could also support further assessments, including mapping traffic density nearshore, identifying high-risk areas for cetacean interactions, and informing management strategies for sustainable management on coastal areas.

Regarding motor noise, almost every type of vessel (excluding sailboats and modern electric engines) contributes to this impact. **Monitoring underwater noise levels** is crucial for assessing the disturbance caused particularly to cetaceans, which rely on acoustic signals for communication, navigation, and foraging. Implementing real-time noise monitoring systems, such as hydrophones deployed in key areas of the Pelagos Sanctuary as in Capo Caccia-Isola Piana MPA in Sardinia, can help identify high-risk zones and inform mitigation measures (La Manna et al, 2021). Additionally, following the interest of the industry (Rynkiewicz 2024) promoting the adoption of quieter propulsion technologies on recreational boat vessels (e.g. electric motors), enforcing speed limits in sensitive areas, and establishing seasonal or spatial restrictions could significantly reduce noise pollution and its effects on cetaceans on important marine mammal areas.

Monitoring recreational boat traffic on sensitive areas for cetaceans

In high-sensitivity areas for cetaceans, small recreational boat movements can be analyzed using high-resolution optical satellite images (40–50 cm resolution) from commercial providers such as Pleiades, WorldView, and GeoEye (MAXAR: DigitalGlobe; AIRBUS: Intelligence-AirbusDS). These satellites offer high spatial and temporal resolution, enabling the assessment of boat distribution and activity patterns through data processing and analysis.

However, the high cost of these commercial sensors, along with their limitations—particularly cloud coverage, which can affect image availability and clarity —necessitates careful planning. Optimizing image acquisition for the area is essential to manage costs, ensure adequate coverage of the study period, and address cloud-masked areas. Additionally, aligning data collection with the seasonality of maritime activities and the study's objectives is crucial. Therefore, any study using this technology should take into account the selection of a satellite platform and key factors such as sensor type, resolution, and revisit time, to maximize efficiency, as these determine data availability (Zucchetta et al., 2025). Moreover, it should consider the final goal of the data analysis as if to assess boat distribution and activity patterns or be used for establishing baseline analyses or supplementing open-access data.

Since satellite imagery provides only discrete snapshots of recreational boat traffic at specific times, a multi-method approach could improve the accuracy of boat distribution studies at a broader scale. Combining remote sensing, land-based observations, vessel registration data, and questionnaires to ports and marinas as well as recreational boat users may offer a more comprehensive understanding of recreational boating activity.

When available, vessel registration data and continuous monitoring systems such as AIS (or VMS) could enhance tracking efforts. Additionally, land-based observations using fixed cameras or laser rangefinders might help record boat presence and speeds, refining data accuracy when monitoring cetacean interactions in nearshore areas as coastal MPAs (Fraser et al. 2020; Wilson et al 2022; Zucchetta et al., 2025). Integrating these diverse monitoring methods would provide deeper insights into recreational boat distribution, movement patterns, and vessel typology.

Spatial monitoring and surveillance of recreational boats in the Pelagos Sanctuary

Effective spatial monitoring and surveillance of recreational boats within the Pelagos Sanctuary are essential to ensuring compliance with established regulations and maintaining the good conservation status of cetaceans and the overall ecosystem health of this protected area. While regulatory measures can be impactful when properly implemented, their success ultimately depends on active enforcement and continuous monitoring.

A crucial step in strengthening compliance is **ensuring that boat users are well-informed about temporal and spatial restrictions** throughout the Sanctuary, including those established within Marine Protected Areas (MPAs) and other regulatory efforts such as fisheries management measures and Particularly Sensitive Sea Areas (PSSAs). This is especially important around marinas and ports, where recreational boaters—including those renting vessels that do not require a navigation license or permit—can have a higher environmental impact due to insufficient navigation experience. These users often lack essential knowledge of navigation and anchoring rules, making them more prone to accidents and negative ecological impacts (Carreño et al., 2019; Carreño, 2021).

Given also that some MPAs have **different zoning regulations** with varying levels of protection and permitted activities, ensuring that this information is **easily accessible** to all recreational boat users is crucial. Examples of successful implementations include the Scandola MPA (France), where navigation and mooring of vessels over 45 meters in length are prohibited, the Portofino MPA (Italy), which restricts navigation and mooring for boats over 24 m in length or in National Park of Port-Cros (France) where speed limits are applied (PN Port-Cros et Porquerolles; Venturini et al., 2016, 2018).

At a Pelagos regional level, the **compiled database from this study on the areas specifically prohibited for recreational boats and regulatory measures in place requires further**

information and updates, particularly regarding Italy's zoning applications and MPA-specific zoning restrictions as well as designated areas for recreational fishing restrictions under national and/or local legislation on the Pelagos. Strengthening this database with up-to-date regulatory measures from the contracting parties (CPs) would improve spatial monitoring efforts and compliance enforcement.

Beyond information dissemination, **direct compliance monitoring is necessary to track and regulate recreational boating activity**. Some MPAs in the region for example have already tested and implemented innovative technological systems that provide real-time alerts to boaters, notifying them when they enter restricted waters or areas with specific operational limitations and advising them to follow a designated protocol supervised by the Coast Guards (e.g. Project Arion). Expanding these experiences across the Pelagos Sanctuary by integrating video surveillance, radar systems, and AIS (Automatic Identification System) technologies to track and control boat usage in and around mooring zones could significantly enhance monitoring efforts.

Alignment of efforts with existing regional efforts on data collection and monitoring

Enhancing the monitoring and management of recreational boating activity within the Pelagos Sanctuary would benefit from better alignment with existing regional, national, and local data collection initiatives. Several frameworks already gather or are beginning to collect relevant information on recreational vessel activities, offering opportunities for collaboration, data integration, and the design of more effective control measures. Strengthening these efforts can support the development of long-term regional management plans and marine spatial planning, ensuring a more coordinated approach to conservation and compliance.

A study on yachting and its environmental impacts in the RAMOGE Agreement area highlighted the need for a sustainable management strategy for the growing yachting and cruise industries. In response to this expansion, the Agreement aims to develop an action plan in collaboration with key stakeholders to ensure the long-term sustainability of recreational boating activities and to mitigate their environmental footprint (RAMOGE Agreement, 2003).

Furthermore, efforts should be aligned with the work on 'Whale Watching Hotspots in the ACCOBAMS Area', ensuring that specific legislation and monitoring is implemented in accordance with the 'Guidelines for Commercial Cetacean Watching Activities in the ACCOBAMS Area' to regulate and mitigate the impact of whale-watching activities on marine mammal populations (ACCOBAMS-MOP8/2022/Doc31/Annex13/Res8.19).

A few MPAs within the Pelagos Sanctuary and across the Mediterranean have established long-term monitoring programs to track recreational boat movements, anchoring activities, and/or user compliance with regulations. Networking examples include Rete Parchi Marini in Liguria

(REMARE) and the Posidonia Network, both of which focus on protecting sensitive marine habitats and ensuring responsible boating practices.

Additionally, the General Fisheries Commission for the Mediterranean (GFCM) has adopted minimum sustainability rules for recreational fisheries (Recommendation GFCM/45/2022/12) and developed a dedicated research program on marine recreational fisheries in the Mediterranean and the Black Sea. This initiative includes the publication of harmonized guidelines for sampling and survey monitoring, which will also improve the scientific, technical, and socioeconomic understanding of recreational fisheries and contribute to better management decisions at the Pelagos Sanctuary (Grati et al., 2021).

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Annex 1. Questionaire

FRENCH SURVEY

Section 1 - Enquête de base

Informations générales:

*Nom du Port /de la Marina

*Surface totale du port (terrestre et marine)

*Unità di area

Autres ha km² m²

*Expansion probable de la surface marine durant les 5 prochaines années?

Oui

Non

*Type de gestion

Privée

Associative

Municipale ou régionale

Mixte

Capacité d'accueil et utilisation:

*Nombre d'emplacements disponibles

* Nombre de postes d'amarrage

* Nombre de places à sec

* Nombre de postes d'amarrage pour les bateaux >12m

* Longueur maximale possible (LOA)

*Quel pourcentage des bateaux visiteurs sont des plaisanciers internationaux?

0-25 %

26-50 %

51-75 %

76-100 %

Nombre de bateaux visiteurs par année/saison

Number of	Basse saison *(Nov-Avril)*	Moyenne saison *(Mai-Juin, Sept-Oct)*	Haute saison *(Juillet-Août)*
* Bateaux visiteurs			
* Places à louer			

Quels sont les types de bateaux de plaisance dans votre marina/port?

Type de bateau	Nombre de bateaux présents à l'année en 2024	Nombre de bateaux visiteurs séjournant au moins une nuit en 2024	Durée moyenne de séjour d'un visiteur en 2024
* Bateaux à moteur hors-bord (<12 m)			
* Bateaux à moteur in-board (<12m)			
* Bateaux à moteur hors-bord (12-23.9m)			
* Bateaux à moteur in-board (12-23.9 m)			
* Motorboats (≥ 24 m)			
* Voiliers (<12 m)			
* Voiliers (12-23.9 m)			
* Voiliers (≥ 24 m)			
* VNM (e.g. Jetskis)/Gonflables?			
* Autres			

Si vous avez répondu «Autre», prière de préciser

Types de navigation et activités liées à la plaisance:

*Organisation annuelle d'événements ou de salons nautiques de plaisance dans votre marina/port

Oui

Non

*Votre marina héberge-t-elle des entreprises de location de bateaux?

Oui

Non

*Y-a-t-il dans votre marina des entreprises qui proposent des voyages vers des destinations fixes?

Oui

Non

*Le nombre annuel de sorties de charters

*Distance moyenne des itinéraires charter

*Y-a-t-il dans votre marina/port une activité de plongée sub-aquatique touristique?

Oui

Non

*Y-a-t-il dans votre marina-port une activité d'éco-tourisme?

Oui

Non

*Y-a-t-il dans votre marina-port une activité de whale/dolphin-watching?

Oui

Non

Quels genres de navigation effectuent les différents types de bateaux de plaisance dans votre marina/port?

Types de sortie selon les bateaux	**À la journée**	**Quelques jours**	**Sortie longue** (vers une destination)	**Croisière** (destinations multiples)	**Régate**	**N/A**
*Bateaux à moteur hors-bord (<12 m)	☐	☐	☐	☐	☐	☐
*Bateaux à moteur in-board (<12m)	☐	☐	☐	☐	☐	☐

*Bateaux à moteur hors-bord (12-23.9m)	☐	☐	☐	☐	☐	☐
*Bateaux à moteur in-board (12-23.9 m)	☐	☐	☐	☐	☐	☐
*Motorboats (≥ 24 m)	☐	☐	☐	☐	☐	☐
*Voiliers (<12 m)	☐	☐	☐	☐	☐	☐
*Voiliers (12-23.9 m)	☐	☐	☐	☐	☐	☐
*Voiliers (≥ 24 m)	☐	☐	☐	☐	☐	☐
*VNM (e.g. Jetskis)/Gonflables?	☐	☐	☐	☐	☐	☐
*Autres	☐	☐	☐	☐	☐	☐

*Nombre de sorties moyennes annuelles par bateau résident?

- ○ 1-10
- ○ 11-30
- ○ 31+

Section 2 - Sensibilisation à l'environnement et au sanctuaire Pelagos

Services environnementaux dans la marina

* Le cas échéant, quelles sont les mesures que prend votre marina pour faciliter la navigation éco- responsable?

Mesures	Oui	Non
Station de recyclage	○	○
Dispositifs de stockage des eaux noires et grises	○	○
Dispositifs de stockage pour les résidus (huiles, …)	○	○
Enregistrement d'empreinte carbone	○	○
Autres	○	○

*Quelle est l'information disponible pour que les clients respectent l'environnement lorsqu'ils sont au port?

*Quelle est l'information disponible pour que les clients respectent l'environnement lorsqu'ils sont en navigation?

*Les employés de la marina/du port reçoivent-ils une formation sur la prévention des contaminations?

Sensibilisation et impact du Sanctuaire Pelagos:

Les règlements de protection applicables au sein du Sanctuaire Pelagos vous sont-ils ...?

- Très familiers
- Assez familiers
- Pas familiers

Fournissez-vous des informations pour que les plaisanciers aient une connaissance générale du Sanctuaire Pelagos et des mammifères marins, lesquelles?

Fournissez-vous aux plaisanciers des informations sur les règlements et codes de bonne conduite au sein du Sanctuaire Pelagos (limitation volontaire de vitesse …)?

A votre avis, améliorer chez les usagers de la mer la prise de conscience du Sanctuaire Pelagos et de ses objectifs de protection ...

- C'est très important
- C'est assez important
- Ce n'est pas très important
- Je ne sais pas

Est-ce que votre marina/port souhaiterait recevoir plus d'information sur la pratique de la plaisance durable dans le Sanctuaire Pelagos, ou participer à des initiatives pour promouvoir ces pratiques?

- Oui
- Non
- Peut-être, cela dépend de l'initiative

Veuillez fournir une adresse e-mail de contact:

ITALIAN SURVEY

Sezione 1 - Sondaggioi di base

Informazioni generali:

* Nome del porto/Marina

*Surface totale du port (terrestre et marine)

*Unità di area

Altro ha km² m²

*Probabile espansione dello spazio marino nei prossimi 5 anni?

Sì

No

*Tipo di gestione

Piccola media impresa (PMI)

Associazione senza scopo di lucro

Comune o amministrazione regionale

Mista

Capacità di attracco e occupazione:

* Numero di posti barca disponibili

* Numero di ormeggi

* Numero di posti barca a secco

* Numero di posti barca disponibili per yacht >12m

* Lunghezza massima (LOA) disponibile

* Quale percentuale dei vostri visitatori è composta da diportisti stranieri?

0-25 %

26-50 %

51-75 %

76-100 %

Numero di imbarcazioni in visita all'anno/stagionalmente

Numero dei	Bassa stagione *(Nov. – Aprile)*	Metà stagione *(Mag.-Giugno, Sett. – Ott.)*	Alta stagione *(Luglio – Agosto)*

*Navi in visita			
*Affitto posto barca			

Quels sont les types de bateaux de plaisance dans votre marina/port?

Tipo di barca	**Numero di imbarcazioni presenti nel 2024** *(con un posto barca nel porto tutto l'anno)*	**Numero di imbarcazioni in visita nel 2024** *(presenti temporaneamente, per più di un giorno)*	**Durata media di permanenza di una imbarcazione in visita nel 2024**
*Motoscafi fuoribordo (<12 m)			
*Motoscafi entrobordo (<12m)			
*Motoscafi fuoribordo (12-23,9 m)			
*Motoscafi entrobordo (12-23,9 m)			
*Motoscafi (24+ m)			
*Barche a vela (<12 m)			
*Barche a vela (12-23,9 m)			
*Imbarcazioni a vela (24 + m)			
*Moto d'acqua / gommoni			
*Altro			

Se la risposta è "Altro", specificare

Itinerari di navigazione e tipologia di attività nautiche:

*Organizzazione annuale di eventi o fiere di nautica da diporto nel vostro porto turistico/marina

- Sì
- No

*Il vostro porto / marina ospita attività commerciali che offrono il noleggio di imbarcazioni?

- Sì
- No

*Tipi di imbarcazioni disponibili per il noleggio

*Numero stimato di uscite per imbarcazioni a noleggio al giorno in alta stagione

- 1-10
- 11-30
- 31+

*Esistenza di attività commerciali che offrono rotte charter fisse dal vostro porto / marina

- Sì
- No

*Numero di viaggi charter all'anno

*Distanza media delle rotte charter

*Il vostro porto / marina ospita attività commerciali che offrono immersioni subacquee per turisti?

- Sì
- No

*Nel vostro porto / marina si svolgono attività di ecoturismo?

- Sì
- No

*Nel vostro porto / marina si svolgono attività di whale/dolphin-watching?

- Sì
- No

Che tipo di viaggi effettuano più spesso le diverse tipologie di imbarcazioni da diporto nel vostro porto/marina?

Tipo di barca/Viaggio	Gita di un giorno	Pochi giorni	Viaggio lungo *(un'altra destinazione)*	Crociera *(più destinazioni aggiuntive)*	Regata	N/A
*Motoscafi fuoribordo (<12 m)	☐	☐	☐	☐	☐	☐
*Motoscafi entrobordo (<12 m)	☐	☐	☐	☐	☐	☐
*Motoscafi fuoribordo (12-23,9 m)	☐	☐	☐	☐	☐	☐
*Motoscafi entrobordo (12-23,9 m)	☐	☐	☐	☐	☐	☐
*Motoscafi (24+ m)	☐	☐	☐	☐	☐	☐
*Barche a vela (<12 m)	☐	☐	☐	☐	☐	☐
*Barche a vela (12-23,9 m)	☐	☐	☐	☐	☐	☐
*Barche a vela (24+ m)	☐	☐	☐	☐	☐	☐
*Moto d'acqua/Gommone	☐	☐	☐	☐	☐	☐
*Altro	☐	☐	☐	☐	☐	☐

* Numero di viaggi in media all'anno per imbarcazione residente?

- ○ 1-10
- ○ 11-30
- ○ 31+

Sezione 2 - Consapevolezza ambientale e del Santuario Pelagos

Servizi ambientali sul porto turistico

* Quali misure, se presenti, adotta il vostro porto turistico per promuovere una nautica da diporto ecosostenibile?

Misure	Sì	No
Stazione di riciclaggio	○	○
Impianti di smaltimento delle acque nere e grigie	○	○
Impianti di smaltimento per i rifiuti di sentina (oli,...)	○	○
Registrazione delle emissioni di carbonio	○	○
Altro	○	○

*Quali informazioni sono a disposizione dei clienti per promuovere pratiche ambientali in porto?

*Quali informazioni sono a disposizione dei clienti per promuovere pratiche ambientali durante la navigazione?

*Il personale del porto turistico/marina riceve una formazione sulla prevenzione dei possibili fattori inquinanti?

Consapevolezza e impatto del Santuario Pelagos:

Quanto conosci le norme di conservazione presenti all'interno del Santuario Pelagos?

- ○ Bene
- ○ Poco
- ○ Per niente

Presso il vostro porto / marina, fornite informazioni ai diportisti al fine di promuovere una conoscenza generale del Santuario Pelagos e dei mammiferi marini?

Presso il vostro porto / marina, fornite informazioni ai diportisti sulle regole e le linee guida del codice di buona condotta in seno al Santuario Pelagos (limiti di velocità volontari...)?

Quanto è importante sensibilizzare gli amanti del mare sulla questione del Santuario Pelagos e sui suoi obiettivi di conservazione?

- ○ Molto importante
- ○ Abbastanza importante
- ○ Non importante
- ○ Non so

Il tuo porto/marina sarebbe interessato a ricevere maggiori informazioni o a partecipare a iniziative che promuovono pratiche di navigazione sostenibile all'interno del Santuario Pelagos?

- ○ Sì
- ○ No
- ○ Forse, a seconda dell'iniziativa

Si prega di fornire un indirizzo email di contatto: