



## From Knowledge to Action: Towards Sustainable Tourism Governance in the Pelagos Sanctuary

Workshop report from the Adapt-Pelagos event held on 18 March 2026 at the University of Toulon

### KEY POINTS

- The Mediterranean welcomes around 400 million tourists per year – a figure expected to exceed 500 million by 2030 – while the tourism sector contributes 8 to 11% of global GHG emissions, exacerbating the warming of a region already heating 20% faster than the global average.
- The Pelagos Sanctuary is particularly affected by these pressures: decline of Posidonia seagrass beds, coastal erosion, disruption to cetaceans, and growing strain on water resources.
- Tools deployed on the Mediterranean scale (Blueprint for Tourism Climate Action Plans, Climate Action Toolkit, Mediterranean Consortium for Ecotourism) converge on the imperative to break down silos between tourism, conservation, and urban planning policies.
- The ICZM Protocol of the Barcelona Convention provides the Mediterranean legal reference framework; the Climagine method, co-developed with Plan Bleu, is its operational participatory tool, integrating the timeframe of climate change into planning processes.
- At the national level, the Mediterranean DSF translates these integrated management requirements into enforceable objectives, supported by a set of collective actions already underway.
- Field experiences highlight the effectiveness of a combined approach using regulation, contractual agreements, spatial management and awareness-raising, as well as a new definition of load capacity based on the quality of the visitor experience.
- On flows: strengthening monitoring systems is a prerequisite for any regulation.
- On financing: immediate priority is to map existing under-utilised resources, evaluate the cost of inaction, then deploy innovative tools (environmental taxation, green bonds, Pelagos Fund).
- Social acceptance requires a shared sustainability language, the establishment of professional charters and digital flow-redirection tools.
- Decongestion strategies must be adapted to local contexts and supported by environmental education efforts targeting all audiences.
- Thirty indicators were co-constructed and prioritised using an Urgency/Feasibility matrix, covering socio-economic, circular economy, biodiversity, climate and governance dimensions.
- The most actionable indicators rely on existing regulatory data; the most difficult to activate require inter-State coordination.



## Introduction

In light of the increasing tourism activity along the Mediterranean coast and the growing impact of climate change on coastal and marine ecosystems, the issue of sustainable tourism within the Pelagos Sanctuary has become a major concern for the bordering countries of France, Monaco, and Italy. With around 400 million international tourists visiting the Mediterranean each year—a figure expected to exceed 500 million by 2030—the pressure on biodiversity has never been stronger and will continue to intensify. This trend is all the more concerning given that the tourism sector itself accounts for 8 to 11% of global greenhouse gas emissions and that the Mediterranean is warming 20% faster than the global average, exposing coastal areas to climate-related disruptions: coastal erosion, water shortages, more frequent extreme weather events, and the erosion of biodiversity.

It is therefore essential to engage in deep transformation, moving away from a resource-intensive tourism model towards one that is sustainable, integrated into local territories and respectful of the environment. Sustainability cannot be limited to the existence of legal norms: it requires making complex impacts measurable, through the development of indicators that enable public decision-making and help establish a balanced governance framework between economic development, environmental protection and local expectations.

The Pelagos Sanctuary, established by a tripartite agreement between France, Monaco and Italy, embodies this approach. Its strategic management plan seeks to reconcile biodiversity protection with human activities compatible with conservation. It promotes low-impact responsible tourism practices, such as sustainable recreational navigation through the High-Quality Whale Watching® (HQWW®) label, and the enhancement of natural and cultural heritage. The concept of 'slow tourism' is central to this approach, promoting longer stays, better integration into local dynamics, and sustainable economic benefits.

To strengthen this cooperation and put the Pelagos Agreement into practice, the Pelagos Consortium was launched in June 2025 at the third United Nations Ocean Conference. Structured around four pillars – advocacy, communication, stakeholder engagement and scientific innovation – its goal is to improve the regulatory frameworks governing tourism and shipping, with the goal of effectively protecting ecosystems by 2029.

This summary note follows the workshop held on March 18, 2026, at the University of Toulon and aims to summarize the discussions that took place regarding the challenges, adaptation strategies, and available tools for reconciling sustainable tourism, climate change adaptation, and integrated coastal zone management (ICZM) within the Sanctuary area. Based on feedback from institutional stakeholders, marine protected area managers, and regional representatives, it aims to identify the potential synergies between countries and stakeholders, priority areas for improvement, and a first set of indicators for more integrated and sustainable governance of coastal tourism in the Mediterranean.



## 1. Climate Change Challenges for Coastal Tourism in the Pelagos Sanctuary

Climate change is following trajectories that have now been well modelled by the IPCC, varying from optimistic scenarios to more pessimistic projections. Even if international targets are met, projections indicate that temperatures in the Mediterranean could rise by as much as 3 to 4°C by 2100, requiring major adaptation efforts across all regions. Achieving carbon neutrality by 2050 is a crucial goal, although certain effects of climate change—such as sea-level rise—are already irreversible on a multi-century timescale.

These trends are leading to heightened risks: an increase in extreme weather events, the development of urban heat islands, growing pressure on resources, and health impacts on people, wildlife, and plant life. Within the Pelagos Sanctuary area, they also manifest through ecosystem changes, including species migration and the introduction of invasive species.

In this context, the top priority is to strengthen the robustness of these regions, as resilience only comes into play when a shock is experienced. However, this concept remains insufficiently integrated into the tourism sector, which struggles to fully commit to a path of adaptation. This requires a deep rethinking of territorial organisation and coastal space identity, taking into account specific characteristics, vulnerabilities and prevailing dynamics.

Integrating tourism into territorial strategies is therefore essential, building on existing planning tools and territory-based projects led by local actors. To develop more sustainable tourism models adapted to climate challenges, regions have significant scope for innovation, particularly through experimental initiatives such as the “Territoires engagés pour la Méditerranée” certification, a joint initiative led by the Direction interrégionale de la mer Méditerranée (DIRM-MED), the Provence-Alpes-Côte d’Azur Region, and the Centre national de la fonction publique territoriale (CNFPT).

## 2. Overview of Tools Presented

### 2.1 Tourism in the Face of Climate Change: What Adaptation Strategies for the Pelagos Sanctuary Area?

This first roundtable highlighted the high vulnerability of Mediterranean coastal regions, whose appeal to tourists depends directly on the quality of their marine and coastal ecosystems. Rising temperatures, marine heatwaves with an increase in surface water temperatures of +0.65 degrees per decade over the past 30 years in the Bay of Villefranche-sur-Mer, and ocean acidification are causing habitat degradation (species mortality, proliferation of invasive species), while coastal erosion—exacerbated by the increasing frequency of extreme weather events (flooding, medicanes, etc.)—threatens certain emblematic beaches. In the Cap Ferrat MPA, the gradual disappearance of Èze Beach, the loss of 36 hectares of Posidonia seagrass beds in the Beaulieu-sur-Mer Bay, and the growing pressure from recreational boating activities concretely illustrate these tensions—which are all the more acute given that this coastline hosts prestige tourism sensitive to landscape quality but which itself generates major impacts on ecosystems, particularly through large-scale recreational boating.

In Sardinia, these tensions manifest as increased competition for water access among tourism, agriculture, and energy production, as well as significant impacts on fisheries, aquaculture, and agricultural systems. In light of these interdependencies, the Region of Sardinia has developed an **impact value chain approach**, which makes it possible to map interactions between sectors and highlight the ripple effects of pressure exerted on a single part of the chain. This method is particularly useful for promoting integrated adaptation strategies to decision-makers accustomed to thinking in silos.

Several key tools at the Mediterranean scale were presented: the [Blueprint for Tourism Climate Action Plans](#), a step-by-step methodological guide designed to assist public tourism stakeholders (regional authorities and destination management organizations) in developing a climate action strategy—it helps move from simple commitments to concrete actions; and its [Climate Action Toolkit](#), an operational planning tool; and the Mediterranean Consortium for Ecotourism, a multi-level organization bringing together MPA managers, regional tourism departments, NGOs, and associations to develop an ecotourism offer and foster



cooperation at the regional level. These tools share a common vision, supported by feedback from pilot areas: destinations that involve citizens and local politicians in their participatory processes succeed in significantly reducing the cost of managing their resources, precisely because they anticipate crises rather than merely enduring them.

At the local level, feedback from the Cap Ferrat AMP has illustrated how these principles translate into concrete strategies, organized around three key areas of work. The first concerns the preservation and promotion of coastal identity. Given the threat of coastal erosion—a major climate-related hazard that is gradually endangering the region's emblematic beaches—local governments are facing significant costs associated with beach replenishment, a short-term solution that does not address the root causes of the problem. In this context, the protection and restoration of *Posidonia* seagrass beds—and especially of stranded *Posidonia* mats—emerge as Nature-Based Solutions (NBS), which are both more sustainable and less expensive: by stabilizing sediments and limiting erosion, *Posidonia* acts as a natural beach protector that permanent infrastructure cannot replace in the long term. This is the approach the Cap Ferrat MPA aims to adopt, drawing inspiration from the experience of the Balearic Islands, which have made this seagrass meadow a powerful symbol of their identity and a key element of their marketing. The second focus concerns the organization of marine uses, with the establishment of Low-impact Mooring Zones and ecological buoys for diving. This approach still faces resistance from a strong culture of freedom at sea and concerns about the landscape, but it can draw on the support of divers, particularly in projects to monitor flora and fauna. The third axis is to raise awareness among tourism stakeholders (tourist offices, hotels, service providers, etc.) to turn them into ambassadors for the Sea, promoting responsible practices, giving priority to those who are already participating in voluntary initiatives such as the diving charter.

Finally, the discussions emphasized that one of the main challenges lies in the ability to get sectors that too often operate in silos to work together—ecosystem preservation, tourism development, and urban planning, each following distinct approaches and timelines, without any structural coordination mechanism. This is precisely one of the functions of the Blueprint presented by Flora Leroy: by offering a step-by-step methodology applicable to all stakeholders in a destination, it provides a common framework to bring together stakeholders who, without this tool, would

not naturally have the opportunity to collaboratively develop a coherent adaptation strategy.

## 2.2. Reconciling Tourist Uses and Coastal Conservation Objectives through ICZM

The second roundtable highlighted the structuring role of the [Integrated Coastal Zone Management \(ICZM\) Protocol](#), adopted under the Barcelona Convention as the Mediterranean's legal reference framework. Its value lies in its scope: measures can only be planned at the scale of the entire Mediterranean, which implies reconciling terrestrial and maritime areas traditionally treated separately in public policies. Its implementation underscores, above all, the need to bring all stakeholders to the same table.

The [Climagine](#) method, co-developed with Plan Bleu, provides a structuring operational framework. Based on four stages – the identification of issues, shared vision development, the monitoring of indicator development and production of recommendations – it enables all stakeholders to participate in collective and integrated process. Its specific contribution lies in taking into account the timescale of climate change, which complicates planning processes but is essential for developing robust strategies.

At the French national level, these principles are embodied in the [Document stratégique de façade Méditerranée \(DSF\)](#), which consolidates the [marine strategy framework directive \(MSFD\)](#) and the [maritime spatial planning directive \(MSPD\)](#) into a single operational document. Developed through a consultation process bringing together nearly eighty stakeholders twice a year, the DSF sets enforceable environmental and socio-economic objectives for the Mediterranean coast. On the environmental front, these objectives translate into a set of collective actions already underway: prefectural decrees regulating noise and light pollution, a mooring strategy and a strategy for the sustainable management of diving sites, a strategy and charter for sustainable cruising, as well as certification and awareness-raising initiatives such as the Eco-gestes campaigns, Operation Bateau Bleu, the Ports Propres and Ports Propres actifs pour la biodiversité certifications, the Charter for Characteristic Beaches, and the *Posidonia* Alliance. The public consultation phases revealed a particular strong interest in overtourism issues. The DSF's 2050 prospective vision draws heavily on Plan Bleu's research, illustrating the operational value of research in nourishing public policies.



At local level, the Port-Cros National Park experience provides particularly instructive insights. The first lesson is conceptual: **load capacity** should not be measured by visitor volume alone, but by visitor satisfaction – and it is from the threshold at which visitors begin to experience overtourism, where their experience is degraded by the behaviour of others, that genuine overload is identified. This approach based on **experience quality**, rather than flow quantity, renews the way managers define their regulation objectives.

The second lesson is methodological: effective flow management relies on a combination of several complementary measures, not on regulation alone. **Regulating** – through the 2021 “Bignon” law on overcrowding, which enabled the implementation of passenger limits on ferry services to Porquerolles as part of a Public Service Delegation led by the Toulon Provence Méditerranée Metropolis and a collective charter for boat operators –; **contractualising** – through diving regulations that make access contingent on a specific permit issued by the Park, thereby guiding behavior and involving divers in monitoring efforts –; **managing space** – via six Low-impact Mooring Zones and mooring regulations around Porquerolles –; finally, **incentivising, informing and monitoring** constitute levers that only reach full effectiveness through their combination within a coordinated governance framework.

Finally, the discussions brought to light a fundamental tension that sustainable tourism strategies cannot overlook. As Associate Professor Olivier Saissi pointed out, the tourism region is riven by a contradiction: while the destination attracts economic actors whose interest is to intensify tourist production – a logic inherited from the development of mass tourism in the 19th century – it also brings together residents who no longer wish to bear its externalities, or who even reject the tourist destination itself. Any sustainability strategy that ignores this social tension risks missing its target. Tourist responsibility-raising through education can only constitute a partial response: it must be combined with structural regulation of uses and a governance framework that fully integrates the expectations of resident populations.



### 3. Priority Recommendations – Summary of Interactive Sessions



#### 3.1 Workshop 1 – Identifying Priority Action Areas

Workshop 1, organised in a World Café format, brought together about twenty participants across four thematic tables – flow management and planning, financial constraints, social acceptance, and environmental impacts – each led by a Plan Bleu team member. The results were summarized and plotted on an Urgency/Feasibility matrix; analysing the data across this matrix allows us to identify not only priorities for action but also points of tension and disagreements that any strategy will need to address.

- **Flow management and tourism planning**

The discussions identified a logical sequence of action: before regulating flows, one must first understand them. **Strengthening monitoring** – via digital maritime tracking tools, shared indicators and training local stakeholders in slow tourism and sustainability – is the indispensable prerequisite for any action plan. **Maritime spatial planning (MSP)** is identified as a key medium-term lever, provided it is coupled with operational monitoring tools. Decongestion solutions were also

discussed: destination diversification, a modal shift toward low-carbon transport, integrated urban port calls, and artificial intelligence for flow forecasting.

The question of de-marketing was raised and deliberately left open: its theoretical relevance was acknowledged while its politically sensitive and economically risky nature for local actors was emphasized.

- **Financial tools and resources mobilisation**

The financial working group has identified three levels of action based on their degree of urgency and feasibility. First and foremost, the priority is to **map already available financial resources** – European funds, national schemes, project funding – which remain under-utilised due to a lack of detailed knowledge about their existence and eligibility requirements. This action is considered both the most urgent and the most rapidly feasible, precisely because it does not create new resources but activates what already exist.

Second, **assessing the cost of inaction** appears to be a powerful and under-utilised analytical lever. The Mediterranean region is rich in technical and academic



resources; what is lacking is the translation of these capacities into economic arguments able of influencing political decisions. Putting a price on environmental degradation – as illustrated by the Marseille Maritime Tribunal ruling on Posidonia seagrass – opens a path in this direction.

Third, **innovative financing instruments** – taxes on polluting activities, green bonds, creation of a 'Pelagos Fund' – are deemed urgent but more difficult to implement, as they require harmonization across multiple levels of governance and the involvement of private actors whose support cannot be guaranteed.

- **Commitment, social acceptance and governance**



The discussions stressed that stakeholders' appropriation of the issues cannot rely solely on top-down information. Four levers were identified as priorities. The first lever for action involves **developing awareness tools and harmonising knowledge**: so that the various stakeholders can truly take responsibility of conservation issues; it is crucial to create a shared language, particularly through the dissemination of a common glossary on the sustainability of the blue economy. This harmonization of discourse must be accompanied by an effort to explain specific, locally situated risks in accessible terms. Furthermore, the group emphasizes the need to leverage cultural factors and local ecological knowledge to promote and reintegrate practices that are historically sustainable.

The second lever focuses on **digital innovation and gamification**. To actively engage the public, the group suggests creating a mobile app that would redirect tourist flows to less crowded areas while connecting them to businesses and activities run by local residents. In addition, to specifically target young people, the educational approach must be transformed through "gamification"—that is, the development of interactive educational trails, paths, and games that facilitate learning the rules for protecting the sanctuary.

The third lever targets **accountability among socio-professional actors and inclusion of residents**. The goal is to actively engage the private sector by developing **standardized professional engagement charters**, while ensuring that these align with existing initiative such as the **DIRM-MED cruise charter**, and ensuring local fairness through preferential rates for residents.

The fourth lever concerns **coastal infrastructure adaptation**. The goal is to develop nature-based solutions as an accessible, less costly and more durable entry point than hard engineering solutions, alongside strengthening enforcement mechanisms for existing regulations.

A methodological issue was also raised on the side-lines of the discussions: the absence of private-sector tourism stakeholders in the room was noted as a limit to the exercise. The recommendation was made to present workshop conclusions directly to these stakeholders and collect their feedback, to avoid the identified actions remaining purely institutional.



- **Environmental impacts and monitoring**

Various courses of action emerged from discussions regarding the response to the pressures exerted on the sanctuary's ecosystems by the tourism sector.

**Firstly, the strict regulation of maritime uses and the recognition of ecological damage** were identified as priority actions. The group emphasizes the need to better regulate activities at sea, such as recreational boating, cruise tourism, and maritime traffic, notably through the wider deployment of zoning measures or Low-impact Mooring Zones recognized for their effectiveness, in order to reduce pressures on priority habitats such as Posidonia seagrass meadows, coralligenous habitats, and rocky reefs. To concretely support this regulation, a key initiative involves establishing an economic value for environmental degradation. Drawing inspiration from a groundbreaking decision by the Marseille Maritime Court in November 2024 regarding the destruction of seagrass beds, this legal analysis aims to strengthen the effectiveness of protection policies by assigning a tangible cost to the degradation of the Pelagos Sanctuary's ecosystems.

**Communication strategies to discourage visitors from saturated sites** are judged urgent and feasible, but with an important caveat: their effectiveness is highly context-dependent. What works at the Marseille Calanques cannot be mechanically transposed to Italian or Sardinian territories where relationships to collective marine uses differ. **This territorial heterogeneity must be integrated into any Sanctuary-wide strategy.**

**Integrating environmental issues into educational pathways** was identified as urgent but complex: educating younger generations is insufficient if the adults with whom they live perpetuate contrary behaviours. Durable transformation of practices requires simultaneous education of all generations, rather than a strategy that bets solely on generational renewal.

**Vulnerability studies on sensitive sites** are fundamental as a policy basis, but less urgent in the short term, as their production takes time and their results do not directly feed into immediate decisions.

## 3.2 Workshop 2 – Indicators: Building a Measurable Sustainability Trajectory



The afternoon was devoted to a collaborative exercise on sustainability indicators. The challenge was not only technical: as Sophie Perez recalled at the start of the day, an indicator is not simply a measurement tool – it is an instrument of governance. Choosing what to measure is already choosing what to steer and, thereby, defining what is considered a matter of public responsibility. Participants worked to identify, reformulate and prioritise relevant indicators for measuring the trajectory of sustainable tourism in the Pelagos Sanctuary, across five categories: Climate-Biodiversity, Circular Economy, Socio-economic, and Governance.

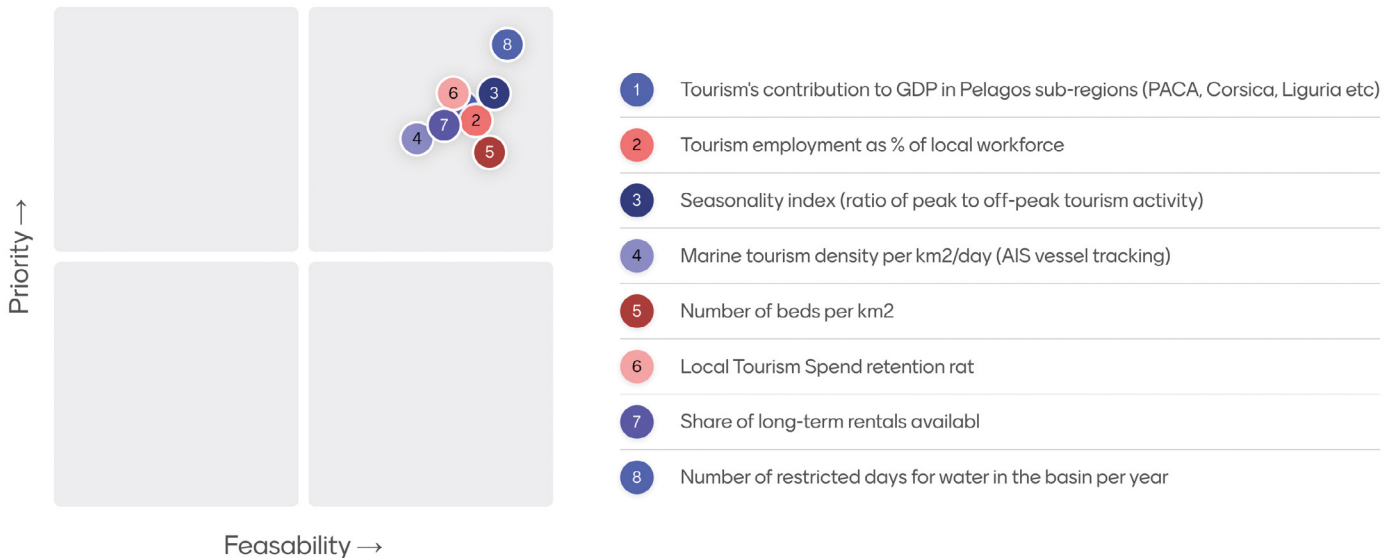
Following a general introduction, participants split into four thematic tables. Each facilitator presented pre-identified indicators, outlined their limitations, then guided the group through a process of reformulating and enriching them. The workshop concluded with a collective prioritisation phase via Mentimeter, during which participants ranked indicators on an Urgency/Feasibility matrix.



## Socio-economic indicators

The 8 selected **socioeconomic** indicators are as follows:

1. Tourism's contribution to GDP in the Pelagos subregions (PACA, Corsica, Liguria, etc.)
2. Tourism employment as a percentage of the local workforce
3. Seasonality index (ratio of peak to off-peak tourism activity)
4. Marine tourism density per km<sup>2</sup>/day (vessel tracking via AIS)
5. Number of beds per km<sup>2</sup>
6. Local tourism spend retention rate (percentage of tourist spending that remains in the local economy)
7. Percentage of available long-term rentals (impact on the accommodation and rental market)
8. Number of days of water access restriction in the area per year (regulation and protection of marine areas)



The prioritisation is consistent with Workshop 1 findings on financing: the most feasible indicators rely on existing regulatory data. **Indicator 8 – number of days of water access restriction** – stands out as the flagship: an existing regulatory data point, directly linked to Sanctuary protection and immediately feasible. **Indicator 3 (seasonality)** ranks second: central to diagnosing Mediterranean tourism sustainability, but requiring continuous time series. Indicators 2, 5 and 6

– employment, bed density and expenditure retention – form a homogeneous 'economic pressure' sub-cluster, both prioritised and operationalizable. **Indicator 1 (GDP contribution)** presents the lowest feasibility, due to the need to consolidate comparable regional accounting data across three national jurisdictions – a difficulty that mirrors, at indicator level, the same tripartite governance obstacles facing the Sanctuary more broadly.



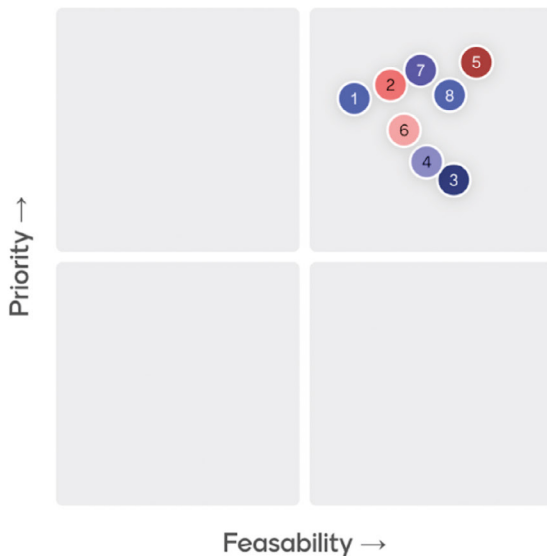
## Circular economy indicators

The 8 **circular economy** indicators retained for the Pelagos Sanctuary are:

1. Volume of waste generated per tourist overnight stay and the proportion of waste that is actually recycled, beyond simple initial sorting.
2. Ratio of water consumption in liters per tourist overnight stay to local water availability
3. Percentage of tourism stakeholders (accommodation providers, tour operators, restaurants, etc.) holding a recognized environmental certification verified by independent third parties or an equivalent public accreditation. The inclusion of accreditation allows small structures without resources for full certification to be included.
4. Number of hotel establishments that have formally banned single-use plastics from their operations (prior to the various phases of applicable legislation)

**For marine operators:**

5. Percentage of water produced directly on board by marine operators, relative to total onboard consumption
6. Proportion of greywater and blackwater actually treated on board, relative to the total volume of water produced
7. Volume difference between water treated during peak season and off-season by onshore treatment facilities
8. **Additional indicator:** Percentage of supplies for tourism operators (restaurants, lodging, cruise lines, etc.) sourced from local producers, in connection with agritourism and local agriculture sectors



- 1 Volume of waste generated per tourist night and proportion of waste effectively recycled, beyond simple initial sorting.
- 2 Ratio of water consumption in litres per tourist night relative to local water availability.
- 3 Share of tourism stakeholders holding a recognised environmental certification audited by independent parties audited by independent third parties
- 4 Share of tourism stakeholders holding a recognised environmental equivalent public accreditation
- 5 Number of hotels that have formally banned single-use plastics from their operations, ahead of the various phases of applicable legislation.
- 6 Share of water produced directly on board by maritime operators, relative to total water consumption on board
- 7 Proportion of grey water and black water effectively treated on board, relative to total water produced.
- 8 Difference in treated water volumes between peak and off-peak seasons at onshore treatment facilities.

The 8 indicators cover two key dimensions: **resource management** (waste, water, plastics) and **stakeholder certification**. Indicators 5 and 7 stand out as priorities. The first because it involves concrete and visible action by accommodation providers that goes beyond regulatory requirements, and the second because it directly impacts the quality of the protected marine environment. Indicators 1 and 2 form an essential foundation for measurement, but their implementation remains complex (data collection, defining the scope).

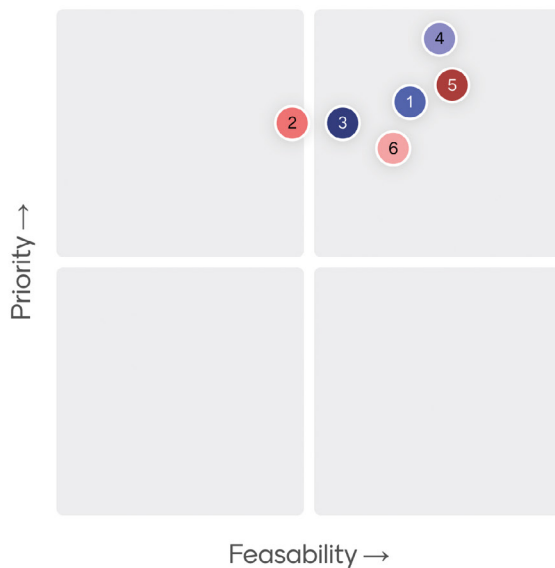
The indicators related to certification (3 and 4) are relevant for structuring the sector in the long term, but their low feasibility in the short term for small-scale operations places them lower on the list despite their strategic importance. The additional indicator on local sourcing (8) and those related to maritime operators (5 and 6) are innovative but more difficult to standardize, which explains their intermediate positioning in the matrix.



## Climate indicators

The 6 **climate** indicators selected for the Pelagos Sanctuary are as follows:

1. Mortality rate of key species (e.g., coralligenous species)
2. Carbon footprint of the tourism sector (transportation, lodging, dining, activities) in each protection zone (CP) of the Pelagos Agreement (tons of CO<sub>2</sub> equivalent)
3. Average GHG emissions per tourist (emissions from the tourism sector // annual number of tourist arrivals in the Pelagos region (PACA, Corsica, Liguria, Tuscany))
4. Annual coastal retreat (meters/year) measured at major tourist beaches and infrastructure sites
5. Annual number of heat waves, storms, and floods causing tourism disruptions or damage to facilities
6. Thermal comfort index: composite indicator (temperature, humidity, wind, sunshine) measuring outdoor thermal comfort for tourism activities



- 1 Mortality rate of keystone species (coralligenous)
- 2 Carbon footprint of tourism sector (transport, accommodation, Hospitality, activities) in each CP of Pelagos Agreement (tonnes CO<sub>2</sub>eq)
- 3 Average GHG emissions per tourist arrival (tourism sector emissions // by annual tourist arrivals in Pelagos region (PACA, Corsica, Liguria, Toscana,
- 4 Annual shoreline retreat (meters/year) measured at key tourism beaches and infrastructure locations
- 5 Annual count of heat waves, storms, flooding events causing tourism disruption or facility damage
- 6 Thermal comfort index : Composite indicator (temperature, humidity, wind, sunshine) measuring outdoor thermal comfort for tourism activities

The mortality rate indicator for key species in the Mediterranean, notably gorgonians, was proposed by the working group on environmental impacts. It measures the impact of climate change, and particularly the increase in surface water temperatures and marine heatwaves on marine ecosystems and enables

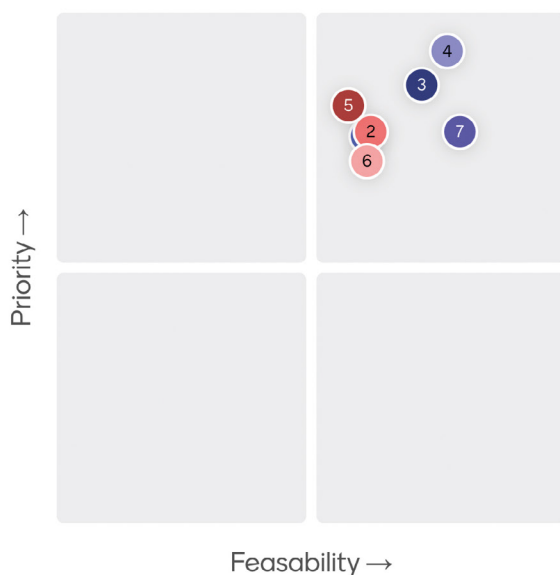
tracking of underwater landscape evolution, allowing subsequent evaluation of socio-economic impacts on tourism-related activities, particularly scuba diving.



## Biodiversity indicators

The 7 **biodiversity** indicators retained are:

1. Primary production and environmental variables
2. Biodiversity index, species richness (including the positive impact of Nature-based Solutions and restoration activities)
3. Changes in cetacean populations (abundance – annual census data and spatial distribution patterns of key species)
4. Coverage and health status of *Posidonia oceanica* seagrass beds (surface area and vitality indicators)
5. Number of litter items per km<sup>2</sup> per beach transect, categorised by type and source
6. Number of collisions with commercial vessels and disturbance incidents involving marine mammals
7. Percentage of whale-watching operators accredited and certified under the HQWW<sup>®</sup> label



- 1 Primary production and environmental variables
- 2 Add Biodiversity index, species richness (including NbS and restoration activities)
- 3 Cetacean population trends (abundance - Annual census data and spatial distribution patterns of key species)
- 4 *Posidonia oceanica* meadow coverage and health (Surface area and vitality indicators)
- 5 Number of litter items per km<sup>2</sup> or per beach transect, categorized by type and source
- 6 Number of tourist vessel strikes and disturbance incidents involving marine mammals - This is a disturbance - related indicator
- 7 Percentage of licensed whale-watching operators certified with HQWW<sup>®</sup> Label

The indicator on primary production and environmental variables was proposed by the group working on environmental impacts. This indicator enables seasonal monitoring of the health of coastal marine waters based on fundamental ecological processes. The group also proposed to include in the indicator "Coverage and health status of *Posidonia oceanica* seagrass beds (area and vitality indicators)" the consideration of biodiversity

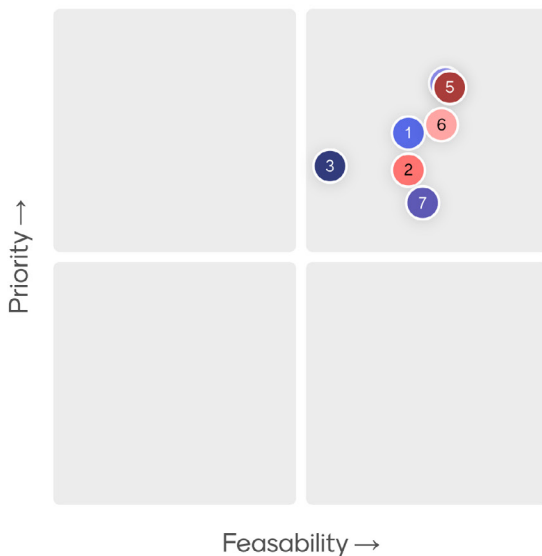
indices/species abundance (Shannon indices, EBQI— including consideration of the positive impact of NbS implementation and restoration activities) to assess the overall health of seagrass beds. This will ensure the robustness of this indicator.



## Governance indicators

The 7 **governance** indicators retained for the Pelagos Sanctuary are:

1. Existence of a cross-border coastal and marine management plan for the Pelagos Sanctuary (possible answers: yes / existence of national management plans / existence of harmonized national management plans / no)
2. Number of signatories to the Pelagos Charter that have incorporated the charter's objectives into their internal strategy
3. Percentage of tourism revenue allocated to adaptation measures (e.g., seagrass bed restoration, etc.)
4. Number of sites reporting overcrowding
5. Number of training initiatives and individuals trained on sustainable tourism issues
6. Number of awareness-raising initiatives and materials on marine mammal protection
7. Number of consultation meetings for which reports have been submitted



- 1 Existence d'un plan de gestion de transfrontalier de l'espace côtier et maritime pour le sanctuaire pelagos. (Reponse A: IL y a un plan, B: il y a des
- 2 Nombre d'adhérents à la Charte Pelagos ayant traduit dans leur stratégie interne les objectifs de la charte
- 3 % of tourism revenue dedicated to adaption measures (Préciser le type de mesures - restauration herbier ext)
- 4 Nombre de sites qui estiment être en situation de surfréquentation
- 5 Nombre d'actions de formation et de personnes formées aux enjeux du tourisme durable
- 6 Nombre d'actions de sensibilisation et de supports sur la protection des mammifères marins
- 7 nombre de réunion de concertation ayant fait l'objet d'une reddition des comptes

The prioritization exercise using the matrix helped identify which indicators to implement first and which require a longer-term effort. Participants highlighted as particularly urgent the indicator on the cross-border management plan (1), considered crucial for overall governance; the alignment of Charter signatories (2); the reporting of overcrowded sites (4); as well as indicators related to training (5) and public awareness (6).

In terms of feasibility, the operational indicators measuring overcrowding (4), training initiatives (5), and public awareness campaigns on marine mammals (6) stand out clearly and are perceived as the most readily implementable in the short term. The indicators on the integration of the Charter (2) and sites

experiencing overcrowding (4) fall into the intermediate feasibility category, as they require specific support or data definition work. Similarly, the development of a cross-border management plan (1) involves complex international coordination and depends on agreements between states, making it a longer-term objective. Conversely, according to participants, allocating a percentage of tourism revenue to adaptation (3) is difficult to implement quickly due to the budgetary and fiscal implications and the multiple levels of decision-making it requires.



## Funded by



FONDATION  
PRINCE ALBERT II  
DE MONACO



## PLAN BLEU

Regional Activity Centre of UN Environment/MAP  
Marseille, France

[planbleu@planbleu.org](mailto:planbleu@planbleu.org) - [www.planbleu.org](http://www.planbleu.org)

Publishing Director: **Antoine Lafitte** Authors: **Milena Penalba** (Université de Toulon) & **Chloé Martin**

Contributors: **Constantin Tsakas**, **Eloise Leguérinel** & **Arnaud Terrisse**

Graphic Design : **Christelle El Selfani**, **Saif Salmi** & **Éric CHAUZU** (Université de Toulon)

Legal deposit : **N° ISSN 1954 9164**



Mediterranean  
Action Plan  
Barcelona  
Convention

