National Strategic Plan for Coastal Protection Considering the Effects of Climate Change

Following request from the Spanish Ministry for the Ecological Transition and the Demographic Challenge (MITECO), Government of Spain

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National Strategic Plan for the Protection of the Spanish Coast considering the Effects of Climate Change. Following the request of the Ministry for the Ecological Transition and the Demographic Challenge (MITECO), Government of Spain. December 2022.

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For more information:

https://www.miteco.gob.es/es/costas/temas/proteccion-costa/estrategias-proteccion-costa/

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National Strategic Plan for Coastal Protection Considering the Effects of Climate Change

TABLE OF CONTENTS

GLOSSARY OF TERMS AND LIST OF ACRONYMS

The present glossary of terms is based on the concepts of the IPCC[1] and the National Strategy on Green Infrastructure and Ecological Connectivity and Restoration[2].

- **Adaptation (to climate change):** The process of adjusting to actual or projected climate and its effects. In human systems, adaptation seeks to moderate damages or take advantage of beneficial opportunities. In natural systems, human intervention can facilitate adjustment to projected climate and its effects.
- **Management cycle:** Period between the current situation (reference year 2022) until 2045, in which the National Strategic Plan is in force.
- **Short-term:** Period between the current situation (reference year 2022) and 2029. It corresponds to the beginning of the current management cycle.
- **SWOT:** (Strengths, Weaknesses, Opportunities, Threats).
- **Defence (of the coast):** Action of maintaining the defence lines of the coast in a specific position. These lines of defence must be understood in a broad sense, as they may coincide with the coastline, coastal dunes foot, seawalls foot on the backshore, and the foot or top of cliffs, among others.
- **DG REFORM:** Directorate-General for Structural Reform Support of the European Commission.
- **DGCM:** Directorate-General of the Coast and the Sea of MITECO.
- **DPMT:** Maritime-Terrestrial Public Domain.
- ***e.g.:*** *exempli gratia (for example).*
- **EUCC:** Coastal & Marine Union.
- **Coastal strip:** Area that includes the part of the Maritime-Terrestrial Public Domain (DPMT) that is landward of the coastline boundary and its Influence zone, as well as areas excluded from the DPMT (e.g. harbours or military areas) that are on the coast.
- **IHCantabria:** Institute of Environmental Hydraulics of the University of Cantabria.
- **IU-ECOAQUA:** University Institute for Research in Sustainable Aquaculture and Marine Ecosystems of the University of Las Palmas de Gran Canaria (ULPGC).
- **Long-term:** Period between 2038 and 2045, corresponding to the end of the current management cycle.
- **Medium-term:** Period between 2030 and 2037, located between short and long-term.
- **MITECO:** Ministry for the Ecological Transition and the Demographic Challenge (MITECO), Third Vice Presidency, Government of Spain.
- ***National Strategic Plan*:** National Strategic Plan for Coastal Protection considering the Effects of Climate Change.
- **Prevention (of coastal risks):** Action of anticipating a hazard to avoid or reduce its negative impacts.

1 IPCC, 2019: Annex I: Glossary [Weyer, N.M. (ed.)]. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)]. In Press

2 Valladares, F., Gil, P. y Forner, A. (coord.). 2017. Bases científico-técnicas para la Estrategia estatal de infraestructura verde y de la conectividad y restauración ecológicas. Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente. Madrid. 357 pp.

- **Coastal protection:** Coastal erosion risk management within the competences of the DGCM, seeking synergies with flood risk management and incorporating climate change adaptation.
- **Environmental rehabilitation:** See ecological restoration.
- **Resilience:** Capacity of a social-ecological system to cope with a hazardous event or disturbance by responding or reorganizing itself in such a way that maintains its essential function, identity, and structure, while retaining the capacity for adaptation, learning and transformation.
- **Ecological restoration:** Process through which the recovery of an ecosystem that has been degraded, damaged, or destroyed is promoted.
- **Risk (of coastal erosion and flooding):** Potential negative consequences derived from a certain hazard. To transfer this concept to the risk of coastal erosion and flooding, it is assumed that the negative consequences refer to the potential impacts of these hazards on the coastal system and, more specifically, on the elements of value it contains.
- **EU:** European Union.
- **Analysis Units (AUs):** Each one of the 25 regions into which the Spanish coast is divided following an administrative criterion, according to the limits marked by provincial or autonomous city boundaries. The 25 Units of Analysis include 4 uniprovincial autonomous communities, 19 provinces of multi-provincial autonomous communities and 2 autonomous cities.
- **Zone of influence (of the DPMT):** An area at least 500 metres wide from the inner (landward) edge of the seashore.

EXECUTIVE SUMMARY

The ***National Strategic Plan for coastal protection, considering the effects of climate change*** *(hereinafter, National Strategic Plan),* funded by the European Union's Structural Reform Support programme, and implemented in collaboration with EUCC and its partners, and the European Commission, aims to provide a coherent approach at the national level, to ensure regional harmonisation and the application of the most appropriate coastal protection measures for the entire Spanish coast. This encompasses all interventions for the management and protection of the coast that fall within the competencies entrusted to the Ministry for the Ecological Transition and the Demographic Challenge (MITECO), Directorate-General of the Coast and the Sea (DGCM), mainly in relation to the management of the risk of coastal erosion, but also seeking synergies with flood risk management and incorporating adaptation to climate change.

The *National Strategic Plan* is an internal document of the DGCM that does not respond to a legal imperative, but rather to a need to identify and prioritize strategic interventions, observing the content of the *Strategy for Coastal Adaptation to the Effects of Climate Change* and in the light of current legislation on coastal protection. In this sense, the *National Strategic Plan* for the Protection of the Coast follows the guidelines set by the *Strategy for the Adaptation of the Coast to the effects of Climate Change* and constitutes the basis and sets the principles to which the *Strategies for the Protection of Coastal Stretches* must conform.

In the first phase of the preparation of the *National Strategic Plan*, the **Integrated Diagnosis** was completed to identify and characterize the key issues related to coastal protection and management carried out by the DGCM. To this end, based on the objective analysis of the basic information collected, the analysis of the hazards derived from coastal erosion and flooding was carried out together with the analysis of the vulnerability of the coastal system's valuable elements exposed to these threats, including the effects of climate change. Finally, an analysis from the subjective perception of coastal problems by concerned stakeholders in a **first consultation process** was incorporated.

In this *Integrated Diagnosis*, 47 **key issues** were identified and classified according to a SWOT analysis (weaknesses, threats, strengths, and opportunities) and grouped into 6 **critical themes**:

1. Definition and occupation of the DPMT.
2. Governance framework.
3. Sediment imbalance.
4. Conservation of the coastal natural environment.
5. Human use of the coast.
6. Recovery and revision after erosive events.

And in 3 **cross-cutting subjects**:

- Availability of information.
- Training and knowledge acquisition.
- Climate Change.

Once the diagnosis phase was completed, the first step of the proposal phase of interventions at national level for the management and coastal protection was addressed. It consisted in the definition of the **strategic and specific objectives** of the *National Strategic Plan*, which derived from the critical themes, cross-cutting subjects and the key issues identified in the diagnosis phase, based on a clearly defined **vision**, **mission**, and **overall objective**.

Specifically, the **overall objective of adaptation to climate change** fits with one of the cross-cutting subjects identified in the *Integrated Diagnosis* (climate change). To this overall objective, **seven strategic objectives** were defined, as follows:

1. Review of the Maritime-Terrestrial Public Domain (DPMT).
2. Improvement of the governance framework.
3. Restoration of the sedimentary balance.
4. Recovery of the coastal natural elements.

5. Managed realignment.
6. Post-event recovery and review.
7. Strengthening the capacity to understand.

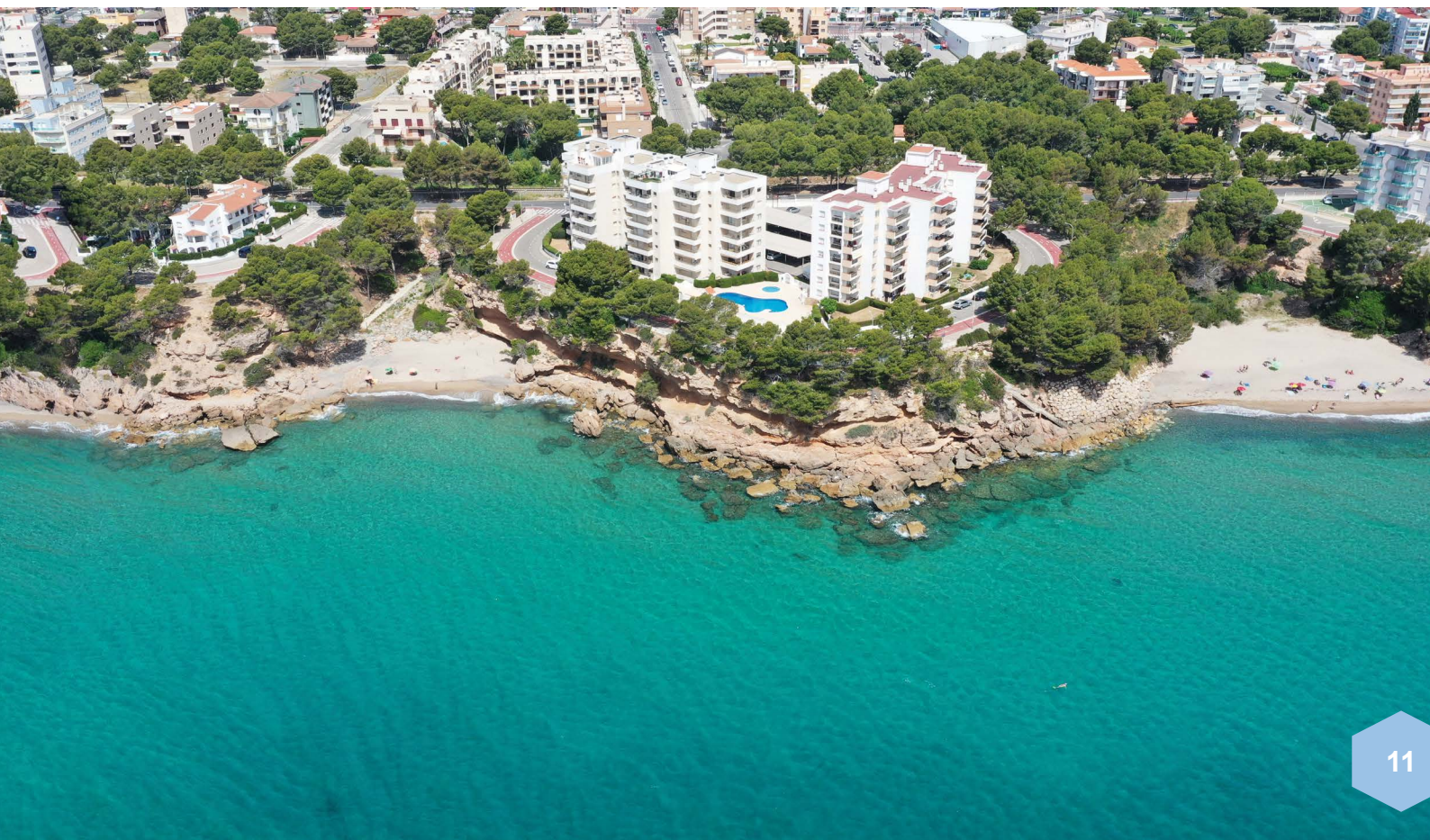
On the other hand, **forty-seven specific objectives** are established to address each of the key issues identified through the SWOT analysis of the *Integrated Diagnosis*, in order to, specifically, correct eleven weaknesses, reduce eighteen threats, enhance ten strengths, and promote eight opportunities.

All these objectives are aligned with **the vision** of the Directorate-General of the Coast and the Sea (DGCM), which aims to increase the naturalness of the Spanish coast and thereby foster the **natural resilience** of the coastal physical environment as a fundamental means for the **prevention of the risk of coastal erosion** and **for adaptation to climate change**. Thus, the protective function of coastal ecosystems over permitted assets and uses is enhanced while increasing the biodiversity and richness of the natural environment.

The **mission** of the *National Strategic Plan* is to **guide decision-making** to order the actions to be carried out by the DGCM at the national level during **the current management cycle**, from now (reference year 2022) **until 2045**, on its competency framework about the **management of the risk of coastal erosion** (coastal protection), maximizing synergies with **flood risk management** and incorporating **climate change adaptation**.

Then, linked to each of the strategic and specific objectives established, a proposal for 80 **specific interventions** was elaborated, which are organized into the following 13 **strategic interventions**, arranged in the following 5 **intervention programmes**:

- P1. Programme for integrated management promotion and improvement of governance framework.
    - A1.1 Review of regulations and procedures.
    - A1.2 Adoption of agreements for coordination between administrations.
    - A1.3 Attracting external resources.
    - A1.4 Development of instruments for strategic planning.
    - A1.5 Development of instruments for the public participation consolidation in the management of the coast.



- P2. Programme for the reduction of anthropic pressure on the coast.
  - A2.1 Design and implementation of a DPMT management system.
  - A2.2 Development of tools for the defence lines management.
- P3. Programme for the promotion of the natural resilience of the coast.
  - A3.1 Design and implementation of a coastal sediment management system.
  - A3.2 Development of instruments for coastal protection through ecological restoration.
- P4. Programme for enhanced reconstruction.
  - A4.1 Development of instruments for an enhanced reconstruction.
- P5. Programme for strengthening the capacity to understand.
  - A5.1 Design and implementation of a coastal monitoring system.
  - A5.2 Establishment of a maintained capacity building and training project for DGCM staff according to professional profiles.
  - A5.3 Establishment of a project to improve the state of the art in coastal protection.

The content of these intervention programmes incorporates the recommendations of an International Panel of Experts and was reviewed by relevant national stakeholders invited to participate in the **second consultation process**.

Lastly, the **roadmap** of the *National Strategic Plan* was drawn up with the aim of streamlining the implementation of the interventions finally approved after the consultation process. To this end, these interventions were organized into **implementation itineraries** according to six **goals** that will be developed throughout the current management cycle, corresponding to the years 2025, 2029, 2033, 2037, 2041 and 2045. To define each itinerary, the specific interventions proposed were prioritized and organized according to the objectives to which they contribute, assigning urgency (short, medium, or long term) and importance (high or normal) to the strategic and specific objectives, respectively.

Thus, the proposed roadmap provides a guide for the temporal sequencing of the implementation of the proposed intervention programmes, resulting in a robust *National Strategic Plan* that is coherent with the established objectives and their prioritization.

1. BACKGROUND

Spain has more than 10,000 km of coastline. A third of the Spanish population lives on the coastal strip, although it consists of only 6.7% of the territory. During the first years of the XXI century, the resident population in coastal municipalities has grown at a higher rate in comparison with the national average (1.9%, compared to 1.6% overall). The coasts are also a key attraction for one of the country's main economic activities: tourism.

In addition to the hazards caused by coastal erosion, there are also those arising from climate change, including an increase in the frequency and intensity of coastal storms, permanent flooding due to sea level rising and loss of coastal ecosystems, all of which are aggravated by rapid population growth and coastal urbanization.

It is necessary to properly address this issue and, being in a position to do so, the **Secretary of State for the Environment**, to guarantee the well-being of current and future generations, has promoted the following initiatives:

- Strategy for Coastal Adaptation to the Effects of Climate Change.
- The National Strategic Plan for Coastal Protection considering the Effects of Climate Change.
- Strategies for the Protection of Coastal Stretches:
    - Maresme (Barcelona).
    - South of Castellón (Port of Castellón – Port of Sagunto).
    - South of Valencia (Port of Valencia – Port of Denia).
    - Andalusia.
    - Balearic Islands.
- Plans for Coastal Protection:
    - Mar Menor.
    - Ebro Delta.

From these documents, only the drafting of the first one derives from the fulfilment of a legal imperative (see section 1.1). The rest of the documents (see sections 1.2, 1.3 and 1.4) are planning instruments, guides or tools that aim to help the decision-making process, in a harmonized and coherent way, for the **Directorate-General for the Coast and the Sea (DGCM)** of the **Ministry for Ecological Transition and the Demographic Challenge (MITECO)**, due to great variety and singularities of the different coastal fronts.

The objectives and status of these documents are briefly described below, to clarify their hierarchy and to provide more context for the **National Strategic Plan For Coastal Protection Considering the Effects of Climate Change**, which is presented in this document

1.1 Strategy for Coastal Adaptation to the Effects of Climate Change

Law 2/2013, of 29 May, on the protection and sustainable use of the coast and modification of Law 22/1988, of 28 July, of Coast, introduced specific regulation to guarantee action against climate change effects on the coast.

Among other issues, its eighth Additional Provision establishes the obligation of the (on that moment) Ministry of Agriculture, Food and Environment to draw up a **Strategy for Coastal Adaptation to the Effects of Climate Change**. It also provides that this strategy would be subject to a Strategic Environmental Assessment, which would indicate different coastline vulnerability and risk degrees and it would propose measures to deal with its possible effects.

The *Strategy for Coastal Adaptation to the Effects of Climate Change* was approved by Resolution of 24 July 2017, following a Strategic Environmental Assessment procedure, so as to establish a common methodology for analysing and assessing vulnerability of the Spanish coast to the impacts to climate change, identifying the most vulnerable areas and differentiating management units, in order to identify the associated risks.

The aim is to improve planning and promote a coordinated, consistent, and integrated decision-making process, helping to ensure that public and private sectors have the knowledge, tools, training, and capacity to manage climate change risks.

Another objective is to increase the resilience of coastal and marine ecosystems to the effects of climate change, enclosing the necessary measures for their adaptation. For this purpose, adaptation options for the Maritime-Terrestrial Public Domain are identified, planned, and implemented with efficiency and sustainability criteria, introducing a territorial planning framework for the coastline to minimize its exposure and vulnerability to the impacts of climate change.

A final objective is to promote research on climate change, especially in those areas that provide knowledge on climate factors affecting the coast and on impact assessment, both on natural coastal systems and on observed and projected socio-economic frameworks.

1.2 National Strategic Plan for Coastal Protection considering the Effects of Climate Change

The **National Strategic Plan for Spanish Coastal Protection considering the effects of climate change** (henceforth ***National Strategic Plan***) aims to provide a coherent approach at national level, ensuring regional harmonization and the application of the most appropriate coastal protection measures for the entire Spanish coastline. These are understood as all those interventions for the management and coastal protection that belong to the functions of the Directorate-General for the Coast and the Sea (DGCM), fundamentally in relation to coastal erosion risk management, but also looking for synergies with flood risk management and incorporating climate change adaptation.

Consequently, the European Commission's Directorate-General for Structural Reforms (DG REFORM) entrusted Coastal & Marine Union (EUCC), the Environmental Hydraulics Institute of the University of Cantabria (IHCantabria) and the University Institute for Research in Sustainable Aquaculture and Marine Ecosystems (IU-ECOAQUA) of the University of Las Palmas de Gran Canaria (ULPGC), to develop the *National Strategic Plan*, in response to the request of the Ministry for Ecological Transition and the Demographic Challenge (MITECO).

The *National Strategic Plan* is an internal document of the DGCM that does not respond to a legal imperative, but rather to the necessity of identifying and prioritizing strategic interventions, noticing the content of the *Strategy for adaptation to climate change of the Spanish coast* and in the light of current legislation on coastal protection. In this sense, the *National Strategic Plan* for Coastal Protection follows the guidelines given by the *Strategy for Coastal Adaptation to the Effects of Climate Change* and constitutes the basis and sets out the principles to be followed by the *Strategies for the Protection of Coastal Stretches* (see Figure 1).

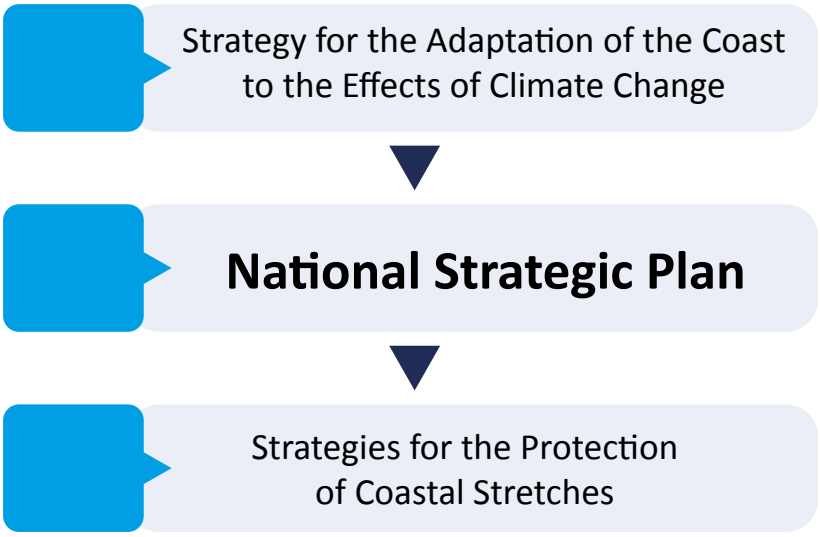


Figure 1. Hierarchy of documents in relation to the National Strategic Plan.

1.3 Strategies for the Protection of Coastal Stretches

With the **Strategies for the Protection of Coastal Stretches**, the Directorate-General of the Coast and the Sea (DGCM) aims to increase the naturalness of the coast and, in consequence, the natural resilience of the coastal physical environment as a fundamental vehicle for prevention of the risk of coastal erosion and for adaptation to climate change. Thus, the protective function of coastal ecosystems over the permitted assets and uses is enhanced while increasing the biodiversity and richness of the natural environment.

Its mission is to guide the decision-making process to organize the possible implemented interventions on a certain coastline stretch by the DGCM, within the framework of its coastal management and protection competences, understood, as in the *National Strategic Plan* (see section 1.2), as interventions for coastal erosion risk management, looking for synergies with flood risk management and incorporating climate change adaptation.

The availability of these strategies allows the implementation of interventions based on a preliminary planning, improving their effectiveness and efficiency, and attending to the characteristics of the entire stretch, so the effects of each intervention may have on the environment are taken into consideration.

To date, in those areas with higher erosion problems, the following projects have been finalized and implemented:

- Strategy for coastal protection in the Maresme Coast (from the port of Barcelona to the border with the province of Girona).
- Strategy for coastal protection in the South Coast of Castellón (from the port of Castellón to the port of Sagunto).
- Strategy for coastal protection in the South Coast of Valencia (from the port of Valencia to the port of Denia).
- Strategy for coastal protection in Granada.
- Strategy for coastal protection in Huelva.
- Strategies for coastal protection in Almeria, Malaga and Cadiz, considering the Effects of Climate Change.
- Strategy for coastal protection in the Balearic Islands, considering the effects of Climate Change.

As well as the *National Strategic Plan*, the last two were funded by the EU's Structural Reform Support Programme.

1.4 Plans for Coastal Protection

The **Plans for Coastal Protection** aim to identify the necessary interventions to be implemented in special singularity coastal areas. Nowadays, the Coastal Protection Plans of Mar Menor (Murcia) and Delta del Ebro (Tarragona) have been drafted and are in public consultation phase, and their objectives are as follows:

- Mar Menor:
  - Identification of interventions to be implemented by the Directorate-General of the Coast and Sea (DGCM) for the progressive improvement of Mar Menor environment conditions.
  - Improvements of the integrated management, taking in consideration all physical, human and environmental conditioning factors.
  - Improvement of use conditions, which may affect, to one degree or another, to the future of the coastal strip.
- Ebro Delta:
  - Coastal protection against erosion and marine invasion.
  - Environmental recovery of Ebro Delta.
  - Predictions for dealing with sea level rising.
  - Permanence and sustainability of Ebro Delta over time.

2. INTRODUCTION

The development of the *National Strategic Plan* began in October 2020 and, over 27 months of work, has been organized according to the following components (see Figure 2):

1) *Integrated diagnosis*, whose objective is to improve the understanding of the problems derived from coastal erosion, coastal flooding, and the effects of climate change on them, as well as to understand the perception of coastal problems by the relevant stakeholders.

2) *Participation and communication*, which seeks to ensure the commitment, support, and knowledge of the relevant stakeholders in relation to the development and outcome of the *National Strategic Plan*, in order to promote synergies and achieve the greatest possible social consensus.

3) *Revision of European experiences*, whose objective is to incorporate the recommendations of an International Panel of Experts based on the analysis of different case studies from France, Italy, Portugal, Ireland, The Netherlands, and Spain.

4) *National Strategic Plan*, which contains the proposal of interventions at national level for the management and protection of the coast and allows ordering and guiding the decision-making in relation to the implementation of such interventions.

5) *Technical guides and complementary documents*, including:

   a. Lessons learned from European management and coastal protection practices and strategies.
   b. Guidelines for:
      i. The development of regional strategies for coastal protection, considering the effects of climate change.
      ii. Regional analysis of coastal erosion and flood risk.
   c. Legal guidance for the implementation of the *National Strategic Plan*.
   d. Coastal protection in Spain - Diagnosis of the current situation.

Figure 2. Phases and components of the preparation of the National Strategic Plan.

In the first phase of the preparation of the *National Strategic Plan*, the ***Integrated Diagnosis***[3] was completed to identify and characterize the key issues related to coastal protection and management carried out by the DGCM. To this end, based on the objective analysis of the basic information collected[4], the analysis of the hazards derived from coastal erosion and flooding was carried out together with the analysis of the vulnerability of the coastal system's valuable elements exposed to these threats, including the effects of climate change[5]. Finally, an analysis from the subjective perception of coastal problems by 95 stakeholders involved in a **first consultation process** carried out between April 20 and June 20, 2021[6] was incorporated.

Table 1. Valuable elements exposed to coastal erosion and flooding.

Erosion			
Population	Beaches, dunes, transitional waters, rocky coastline, and natural areas	Artificial coast, urban area, economic activities, licensed and unlicensed DPMT occupations	Critical transport and communication infrastructures, supply and sanitation, industry and energy, heritage
Flooding			
Population	Areas of environmental importance	Urban area, economic activities affected	Points of special importance

In this *Integrated Diagnosis*, 47 **key issues** were identified and classified according to a SWOT analysis (weaknesses, threats, strengths, and opportunities) and grouped into 6 **critical themes** and 3 **cross-cutting subjects** (see Table 2).

Table 2. Critical themes and cross-cutting subjects identified in the Integrated Diagnosis.

Critical themes	Cross-cutting subjects
• Definition and occupation of the PMTD. • Governance framework. • Sediment imbalance. • Conservation of the coastal natural environment. • Human use of the coast. • Recovery and revision after erosive events.	• Availability of information. • Training and knowledge acquisition. • Climate change

Once the diagnosis phase was completed, the first step of the proposal phase of national interventions for the management and protection of the coast was addressed, which consisted of defining the **strategic and specific objectives** of the *National Strategic Plan*, which are derived from the critical themes, cross-cutting subjects and the key issues identified in the diagnosis phase, based on a clearly defined **vision**, **mission**, and **overall objective** (see Figure 3).

3 "Diagnóstico integrado" (IHCantabria, April 2022) del *Plan Estratégico Nacional*..
4 "Informe del análisis nacional básico" (IHCantabria, November 2021) del *Plan Estratégico Nacional*.
5 "Metodología y resultados del análisis del riesgo", annex to the "Diagnóstico integrado" del *Plan Estratégico Nacional*.
6 "Informe del Análisis Nacional percibido" (IU-ECOAQUA of the ULPGC, January 2022) del *Plan Estratégico Nacional*

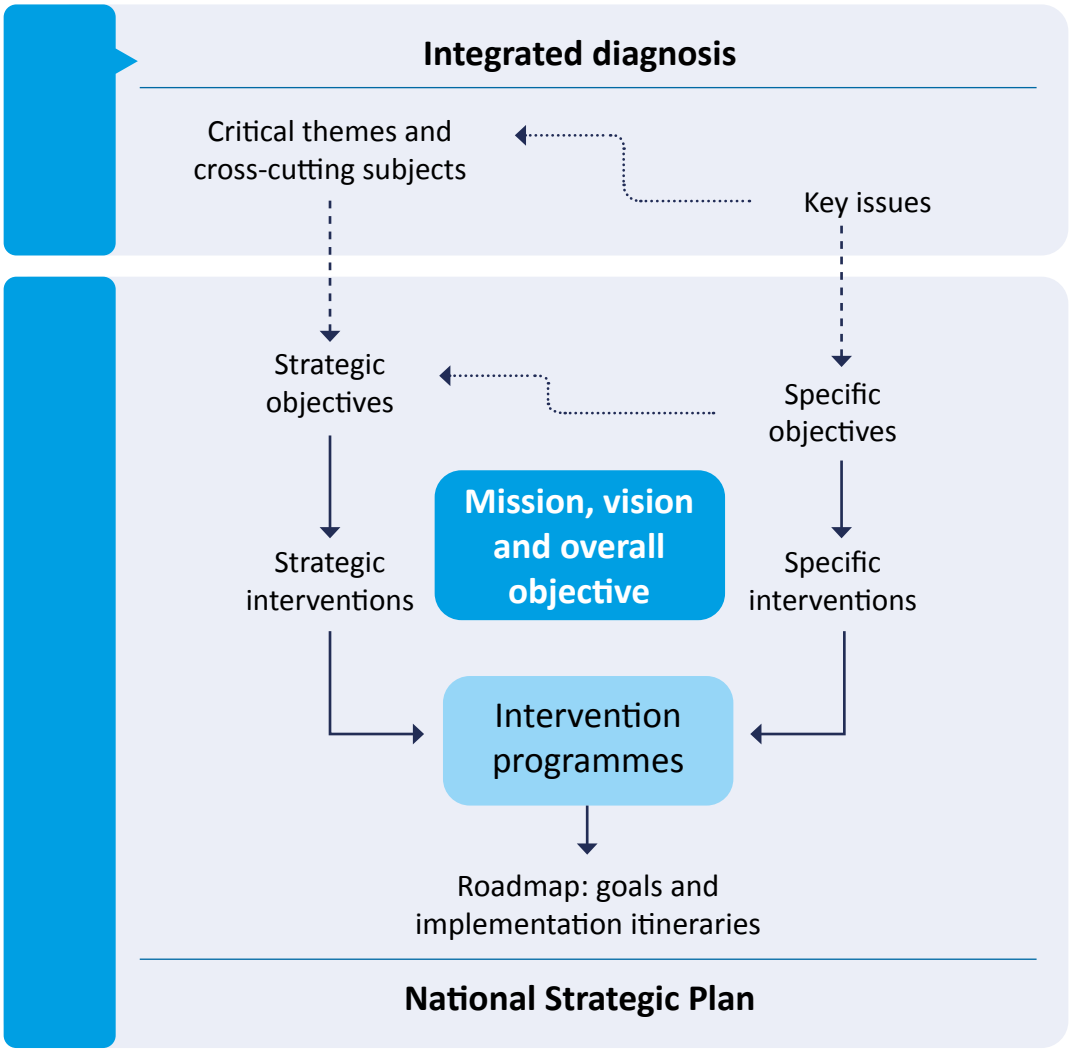


Figure 3. Diagram of the strategic approach to the development of the National Strategic Plan.

Then, a proposal for **interventions at national level** was drawn up, organized into **intervention programmes** (see Figure 3), and linked to each of the strategic and specific objectives established. The content of these intervention programmes incorporates the recommendations of an International Panel of Experts on lessons learned from case studies from Ireland-UK, Italy, France, and The Netherlands and was reviewed by national stakeholders invited to participate in the **second consultation process** between June 13 and July 22, 2022.

Lastly, the **roadmap** of the *National Strategic Plan* was drawn up (see Figure 3) with the aim of streamlining the implementation of the interventions finally approved after the aforementioned consultation process. To this end, these interventions were organized into **implementation itineraries** according to different prioritization criteria and establishing various **goals** associated with successive reference years throughout the current management cycle, which ends in 2045.

This document is organized into 8 chapters:

- **Chapter 1. Background**, which clarifies the legal context and the linkages of the *National Strategic Plan* with other DGCM planning instruments.
- **Chapter 2. Introduction**, which describes the preparation phases of the *National Strategic Plan* and its components.

- **Chapter 3. Mission, vision, and overall objective**, which details the mission of the *National Strategic Plan* and sets out the vision of the DGCM to achieve the established objectives for the management and protection of the coast.
- **Chapter 4. Integrated Diagnosis**, which describes the key issues identified for the coastal management carried out by the DGCM, organized by critical themes and according to the results of a SWOT analysis (weaknesses, threats, strengths, and opportunities).
- **Chapter 5. Strategic approach**, which details the methodology for the development of the *National Strategic Plan*, detailing the strategic and specific objectives established from the results of the Integrated diagnosis.
- **Chapter 6. Intervention programmes**, which describes the intervention programmes in terms of the strategic and specific interventions they contain.
- **Chapter 7. Roadmap**, which details the implementation itineraries until 2045 for the progressive development of the intervention programmes according to different successive goals.
- **Chapter 8. Compliance and prioritization of objectives**, which details the strategic and specific objectives to which each programme and intervention contributes, as well as the prioritization of objectives that justifies the design of the roadmap.

3. MISSION, VISION AND OVERALL OBJECTIVE

The mission of the *National Strategic Plan* is to **guide decision-making process** to organize the interventions to be implemented by the DGCM at the national level during the present management cycle, from the present time (reference year 2022) **until 2045**, within its competency framework for **coastal erosion risk management** (coastal protection), maximizing synergies with **flood risk management** and incorporating **adaptation to climate change.**

Coastal ecosystems are precious natural environments due to their rich biodiversity. Nevertheless, human settlements developed along the coast, critical infrastructures and multiple uses and activities are benefits from the protective function of these coastal ecosystems. To ensure that these ecosystems perform their protective function correctly, it is essential to preserve their good conditions. However, for decades, extensive exploitation of resources has represented a serious threat to the integrity of the coastline.

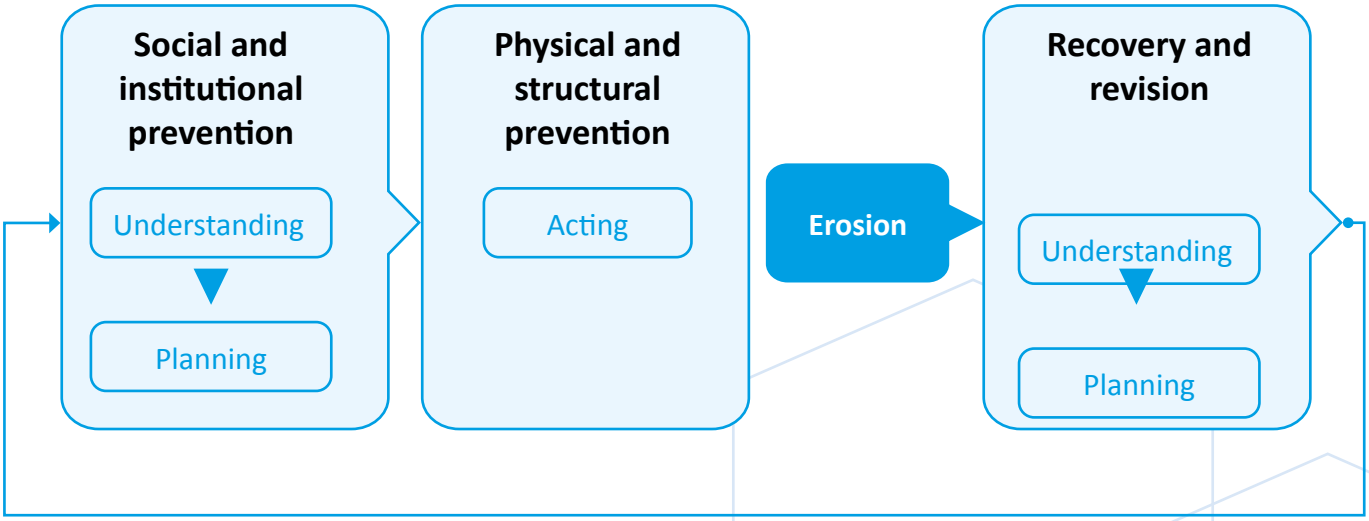
As a result of these anthropogenic pressures, the natural resistance and resilience of the coastal system has decreased in a way that is extremely fragile against the new threat of climate change.

Box 1. DGCM Vision.

The Directorate-General of the Coast and the Sea (DGCM) aims to increase the naturalness of the coast and thus the **natural resilience** of the coastal physical environment as a fundamental means for the **prevention of the risk of coastal erosion** and for **adaptation to climate change**. Thus, the protective function of coastal ecosystems over permitted assets and uses is enhanced while increasing the biodiversity and richness of the natural environment.

According to the suggested coastal erosion risk management cycle (see Figure 4), coastal protection interventions mainly respond to a **prevention strategy** (measures taken in advance to avoid risks), both **institutional and social** as well as **physical and structural**, without avoiding the **recovery and revision** strategy (to restore or improve the coastal system after being affected by erosion).

Figure 4. Coastal erosion risk management cycle: strategies and objectives.



The above figure also shows the three general objectives of "understand", "plan" and "take action" followed by the proposed management cycle. Interventions whose objective is ***understanding***, seek to improve the comprehension of the characteristics and coastal system functioning as a whole, while those

interventions whose objective is ***planning*** search to rationalize actions on the coastal system to align them with the permitted functions and uses of the coast. Finally, interventions whose objective is to ***act*** pretend to physically transform the coastal environment through soft engineering or natural process-based interventions and, as a last resort, structural measures. However, due to its national scope and scale, the *National Strategic Plan* contemplates interventions mainly focused on understanding and planning, instead of interventions focused on physical environment transformation which are usually local or, occasionally, regional.

Summarizing, the overall objective of the *National Strategic Plan* is to provide a **coherent approach**, guaranteeing **regional harmonization** and the application of appropriate coastal protection measures for the entire Spanish coastline, including all those actions that belong to the Directorate-General for the Coast and the Sea (DGCM) competences, fundamentally in relation to **coastal erosion risk management**, looking for synergies with **flood risk management** and incorporating **adaptation to climate change**.

4. INTEGRATED COASTAL DIAGNOSIS

The *Integrated Diagnosis* (IHCantabria, April 2022) focuses on the study of the *Coastal Strip*, which includes 10.400 km (approximately) of Spanish coastline, and also the terrestrial part of the Maritime-Terrestrial Public Domain (DPMT) and its Influence Zone. All information compiled in the following documents previously elaborated in the *National Strategic Plan* framework was used to carry out this study:

- "Basic National Analysis Report" (IHCantabria, November 2021), from now on, *Basic National Report*.
- Annex "Methodology and results of the risk analysis" of *Integrated Diagnosis* (IHCantabria, April 2022), from now on *Risk Analysis*.
- "Perceived National Analysis Report" (IU-ECOAQUA of the ULPGC, January 2022), hereafter, *Perceived Diagnosis*.

The **key issues** that affect the coast are principally derived from the *Risk Analysis* which provides hazard results from coastal erosion and flooding and the vulnerability of the valuable elements of the coastal system exposed to these hazards, including the effects of climate change. Other sources for these key issues are the diverse anthropogenic pressures on the coastal system and the governance issues identified by the participants in the public consultation and by the stakeholders consulted for the *Perceived national analysis report* development, as well as other relevant information gathered in the *Basic national report*.

Essentially, *Integrated Diagnosis* is articulated around the classification of each key issue identified as a **strength, weakness, opportunity, and threat**, according to the SWOT analysis (see Figure 5):

- Threats and weaknesses are key issues that compromise coastal protection.
- On the other hand, strengths and opportunities improve coastal protection.
- Weaknesses and strengths derive from the intrinsic characteristics of the DGCM at the present moment, its competences, organization, and resources.
- At the same time, threats and opportunities are the result of agents related to the physical, natural, or socio-economic environment external to the DGCM, over which, however, the DGCM can sometimes practice a certain control or influence.

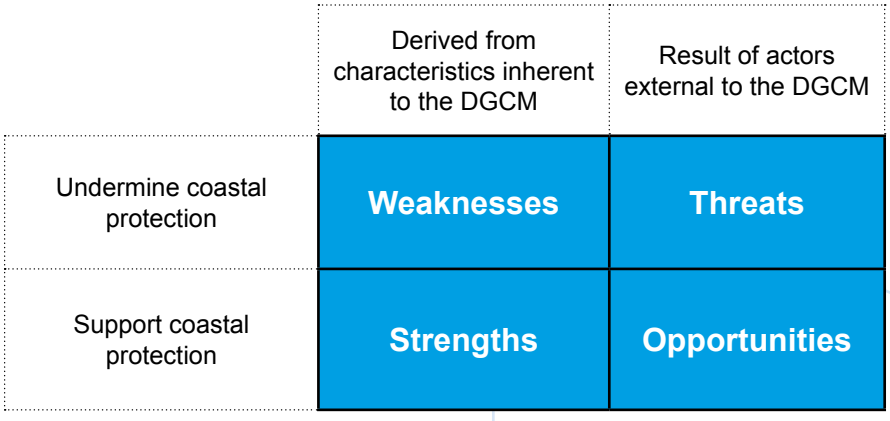


Figure 5. Criteria for classification as weakness, threat, strength or opportunity.

The key issues identified are grouped into the following **critical themes** related to the coastal management carried out by the DGCM:

1) Definition and occupation of the DPMT.
2) Governance framework.
3) Sediment imbalance.
4) Conservation of the coastal natural environment.
5) Human use of the coast.
6) Recovery and revision after erosive events.

However, several of the key issues identified can be linked, in any of the six selected critical themes, but to any of the following interest **cross-cutting subjects**:

- Availability of information.
- Training and knowledge acquisition.
- Climate change.

For each of the six critical themes mentioned above, the nature of the key issues identified in the SWOT analysis is summarized below, also indicating their linkages (if any) to the three interest cross-cutting subjects.

4.1 Definition and occupation of the DPMT

The Maritime-Terrestrial Public Domain (DPMT) is the single category of Spanish state public domain property directly individualized by the 1978 Constitution itself, without leaving it of the ordinary legislator. The Spanish Constitution notes that the maritime-terrestrial zone, beaches, inland waters, the territorial sea and the natural resources of the economic zone and the continental shelf are assets from the DPMT, and the Coastal Regulations (Law 22/1988, of 28 July, on Coastal Regulation) specify these concepts.

The determination of DPMT demarcation consists of identifying and delimiting the assets which belong to the DPMT (*e.g*. beaches, dunes). Procedure initiation can start *ex officio* or at the request of any interested party and allows the revision of an already approved demarcation. Once the file has been processed (by the execution of the survey deed, development of necessary technical studies and the drafting of the demarcation project), the file is sent to the Ministry for approval, which is notified to all interested parties and published in the Official State Gazette (BOE). The Autonomous Community and the corresponding Town Council, as well as the adjacent owners and other persons who can accredit their status as interested parties, will be heard in the proceedings. In addition, the *Peripheral Coastal Service* will publish the beginning of the procedure through the appropriate announcement in the Province Official Bulletin, on its own notice board, in a daily newspaper with a large circulation in the area, and on the Ministry's website. Within a period of one month, any interested party can appear at the procedure, examine the provisional delimitation plan on the public domain area and the protection easement and make any appropriate allegations.

All this administrative procedure is necessary to guarantee citizens' rights to enjoy these DPMT assets through the appropriate uses that do not compromise its physical integrity. This is an essential idea from the Coastal Regulations, and all the administrative authority contained in this law and all the procedures it regulates are at its service, including the demarcation of the DPMT. However, **the length of the administrative procedure for the demarcation of the DPMT** is a weakness because it can be delayed making it possible to compromise the management of the DPMT.

Moreover, in some coastal stretches, it is observed that the approved DPMT boundary does not correspond to its legal definition, which is based on a physical criterion: the DPMT extends landwards at least as

far as the waves reach in the largest known storms based on technical criteria established in Article 4 of the General Coastal Regulation (Royal Decree 876/2014, of 10 October). This **inconsistency between the approved boundary and the legal definition of the DPMT**, where it occurs, is another weakness in the management of the DPMT. However, among the preliminary data, there is no information available for coastal stretches affected by this key issue, so it is not possible to characterize its level of weakness. Due to the lack of available information in this respect, this key issue is also linked to the cross-cutting subject "Availability of information".

On the other hand, in the current context of sea level rising due to climate change and generalized coastal erosion, it is expected that the discrepancy between the DPMT legal definition and the demarcation boundary (if boundary is not updated) will increase and even affect new coastal stretches. In other words, the **changing physical environment in the current situation and in the long term** constitutes a threat that compromises the correct definition of the DPMT. In the current situation, changes in the physical environment refer to impacts of erosion on beaches, transitional waters, rocky shore, and artificial shore. In the long term, changes in the physical environment mainly refer to the effects of climate change on future erosion hazard, but also on coastal flooding, it is for this reason that fits also in the cross-cutting subject "climate change".

In relation to these effects of climate change, the Environmental Promotion Plan for Adaptation to Climate Change in the management of coasts and the associated maritime-terrestrial public domain (PIMA Adapta Costas) aims to improve knowledge and monitoring of the impacts of global change and climate change, and to minimize their risks in the management of the maritime-terrestrial public domain in Spain, increasing adaptation capacities and, finally, increasing global resilience of the system against climate change. One of the strategic areas from this plan refers to monitoring regression and evolution of the coastline. In particular, coastal autonomous communities are carrying out coastal risk studies against climate change based on information on meteorological, marine and fluvial dynamics and sectoral high-resolution geographic information at autonomous community level to assess the vulnerability and exposure of natural and

socio-economic assets. So, **all the information from climate change adaptation projects**, which has been elaborated within the framework of PIMA Adapta Costas from the Autonomous Communities, provides a necessary opportunity for updating DPMT demarcation and the occupations management. However, there is no information available in the preliminary data to characterize the opportunity level for this key issue, which is also linked to the cross-cutting subjects "availability of information" and "climate change".

Considering physical criteria that established the basis of the DPMT legal definition, it is evident that all DPMT occupations are exposed, to one degree or another, to the reach of waves and therefore, depending on their sensitivity, are susceptible to impacts from the combined erosion and flooding hazard. So, the **impacts of erosion and flooding on the DPMT occupations within the law** (with license) are considered to be a threat to the occupation of the DPMT.

In the case of illegal occupations, risk of erosion and flooding cannot be considered a threat as their removal is necessary in accordance with current legislation. However, the presence of both legal and illegal DPMT occupations represents an important anthropic pressure on the coastal system, accentuated in cases where there is a high density of licensed occupations. This pressure is normally implemented by users or actors dependent from the DPMT occupations, whose acts sometimes influence on the rational management of erosion and flood risk in a detriment of the naturalness of the Coastal Strip and oppositely to land uses compatible with existing coastal hazards. So, **the pressure from DPMT occupations on the coastal system** is also considered as a threat linked to the occupation of the DPMT.

Despite this anthropogenic pressure, the DGCM has **extensive experience implementing measures to release DPMT**, which is a strength in terms of managing the risk of erosion and flooding on DPMT occupations and on managing the anthropogenic pressure on the coastal system associated with these occupations. These measures consist principally of the removal, but also the relocation, of DPMT occupations and the experience related to their implementation is additionally linked to the cross-cutting subject of "Training and knowledge acquisition".

Finally, the Occupations Database (BDO) of the Subdirectorate-General for the Maritime-Terrestrial Public Domain (SGDPMT) contains the geographical location of those concessions for the occupation, use and exploitation of DPMT, from houses, restaurants, hotels, aquaculture, salt marshes and the rest of uses, as well as the status of the license (granted, in process, without data/not started or expired/refused). However, the BDO does not include most of the unlicensed occupations and many BDO entries belong to the "no data'' category, so a weakness related to the **lack of information on DPMT occupations** was identified, linked to this critical theme and to the cross-cutting subject "Availability of information".

The following table summarizes all the key issues (weaknesses, threats, strengths, and opportunities) previously identified under this critical theme.

Table 3. Key issues of the SWOT analysis concerning the "definition and occupation of the DPMT".

Weaknesses	Threats
• Duration of administrative procedure for DPMT demarcation. • Discrepancy between the approved demarcation and DPMT legal definition. • Lack of information on DPMT occupations.	• Changing physical environment in the current situation and in the long term. • Impacts of erosion and flooding on the DPMT occupations of the DPMT with license. • Pressure of DPMT occupations on the coastal system.
Strengths	**Opportunities**
• Experience in implementing DPMT release measures.	• Information from climate change adaptation projects.

4.2 Governance framework

The governance framework focuses on institutional coordination and procedures related to decision-making and implementation of coastal management measures within the DGCM's competencies. For the analysis of this critical theme, the results of the *Perceived national analysis report* are mainly based on the following governance problems identified: 1) participatory processes; 2) environmental awareness; 3) scientific-technical knowledge; 4) regulatory development; 5) implementation and monitoring of regulations; 6) coordination and collaboration between administrations; 7) human, material, and economic resources; and 8) strategic vision of the coast. These problems are reinterpreted in this analysis as weaknesses, threats, strengths or opportunities related to the governance framework. They are then characterized mainly on a national scale, as a comparison between Analysis Units (AUs) could lead to conclusions that do not necessarily reflect the reality of the Spanish coast. The results of the consultation carried out in the framework of the *Perceived national analysis report* would then be biased due to the heterogeneity of the participating stakeholders or could be affected by the subjectivity underlying the consultation.

Firstly, the **complexity of regulatory development, its implementation and monitoring** are a weakness of the governance framework, in line with the perception of the relevant stakeholders consulted during the *Perceived national analysis report* preparation with regards to two governance problems, related to the regulatory development, on the one hand, and to the implementation and monitoring of regulations, on the other.

Furthermore, the coastal system governance, which is highly complex in regulatory terms, is carried out through the DGCM's own resources and its annual budget allocation included in the General State Budget. **Limitation of human, material, and financial resources** also pose a threat to coastal management, as this is a conditioning factor for DGCM's ability to address governance and management problems, especially if a continuity commitment for their resolution is required. Such is the case of problems derived from climate change, as perceived by relevant stakeholders consulted in the framework of the *Perceived national analysis report* preparation, that identify a governance problem related to human, material and economic resources.

On the contrary, **capacity-building and training of DGCM staff** plays in favour of this problem's solution and is therefore considered a strength of the governance framework, while being linked to the cross-cutting subject "training and knowledge acquisition". Among the preliminary data, there is no information available to characterize the corresponding strength level, despite the fact that this strength has been evident and demonstrated in the development of the technical consultation carried out for the *Basic national report* elaboration. In this sense, the DGCM staff (particularly in the coastal districts and provincial services) have exhibited a high degree of general knowledge about the coastal system, its reality, management and governance, as well as specific knowledge in relation to their territorial scope.

In addition, the DGCM has developed in the last 10 years several coastal protection plans at local level, strategies for coastal protection at regional level, as well as the *National Strategic Plan* and other relevant strategies at national level (*e.g.*, 'Strategy for adaptation to climate change of the Spanish coast'), which aspire to be fundamental tools for coastal management with a clear strategic vision, based on coastal risk studies and other scientific-technical studies that the DGCM carries out and/or finances. All this represents a strength in terms of **strategic planning for the coastal protection based on the best scientific-technical knowledge** to address governance problems related to scientific-technical knowledge, and the coast strategic vision perceived by the relevant stakeholders consulted in the framework of the *Perceived national analysis report* preparation.

Finally, the perception by relevant stakeholders consulted in the framework of the *Perceived national analysis report* preparation on the governance problems related to environmental awareness, participatory processes and coordination and collaboration between administrations is interpreted as a clear willingness on their part to contribute to the **promotion of an inclusive coastal management culture**, which offers an opportunity to improve the governance framework in relation to the following aspects:

- **Public awareness** generates habits, sensitivities and behaviours compatible with the coastal environment conservation at the regional level, which favours citizen collaboration in the implementation of environmental rehabilitation measures, mainly in dunes and transitional waters, and in the maintenance of the coastal natural environment.
- **Participatory processes** allow the establishment of communication mechanisms between managers, other agencies interested in coastal management and the general public to share experiences related to the implementation of coastal management measures. In this regard, current legislation regulates the need to carry out participatory processes within the framework of interventions for which the DGCM is responsible.
- **Coordination and collaboration between administrations** refers to the institutional interrelationships between the DGCM and other actors with competences in the DGCM competency or influence area, which is essential to improve management efficiency, both from an interdepartmental and territorial point of view, within the framework of the complex map of competences of the administrations present in the coastal area.

The following table summarizes all the key issues (weaknesses, threats, strengths, and opportunities) previously identified under this critical theme.

Table 4. Key issues in the SWOT analysis related to the "governance framework".

Weaknesses	Threats
• Complexity of regulatory development, implementation, and monitoring.	• Limited human, material, and economic resources.
Strengths	**Opportunities**
• DGCM staff training. • Strategic planning for coastal protection based on the best scientific-technical knowledge.	• Promotion of an inclusive coastal management culture (public awareness, participatory processes and coordination and collaboration between administrations).

4.3 Sediment imbalance

The coastal system contains a volume of sediment that varies spatially and temporally depending on the morphodynamical processes that redistribute sediment and create coastal morphology, from sediment inputs and losses (sources and sinks) and from human interventions that modify these natural processes. A coastal system in equilibrium is the one in which the sediments' inputs and outputs balance on each coastal cell has a net balance tending towards zero in a medium to long term period. In general terms, this is not the case of the Spanish coastline case.

The main threat source of the sediment imbalance on the Spanish coast at the current moment is the **drainage basins regulation**. The construction of large dams and reservoirs, the extraction of sediments from watercourses and their piping has altered the fluvial dynamics of many river basins so that sedimentary inputs to the coast have been drastically reduced in recent decades. On the other hand, the **anthropogenic disruption of the coastal sediment drift** caused by the multiple existing coastal structures (*e.g*. harbours) is also an unbalancing threat for the sediment balance, upriver and downriver of these structures, and create new sediment sinks. In addition, **the complexity of the coastal physical system** is a threat itself, adding obstacles in the sediment imbalance management. In general terms, the coast is a classic example of fractal geometry where multiple unique geomorphological elements converge, some of which show very quick morphological changes in response to highly complex processes, so their management requires highly specialized knowledge and qualification.

To reduce the sediment imbalance caused by these threats, the DGCM regularly uses sediment sources that artificially increase the inputs to the coastal system. Some of this input sources of sediment are highlighted below:

- Sediments from submarine deposits.
- Alluvial sediments deposited in riverbeds and riverbanks, or kept in dams and reservoirs.
- Other sediments composed mainly by crushed aggregates from quarries.

So, **availability of sediment inputs** from these sources is the main opportunity to counteract the negative sediment balance and the **experience in sediment management** is a strength of the DGCM in the same sense, as well as is linked to the cross-cutting subject “Training and knowledge acquisition”.

However, despite the identification of many different potential sources of sediment inputs, the exploitation of these sediment sources depends on certain limitations related to the necessary coordination mechanisms and administrative procedures to allow such exploitation. These are highly complex, especially in the case of sources located outside the DPMT (*e.g*. in river basins, reservoirs or quarries), since the DGCM does not have the necessary competences to exploit many of the potential sources of sediment inputs outside the coastal system. But even in the case of sediment sources located in the DPMT, where the DGCM has competences, their exploitation is not without difficulties due to the wide variety of interests and actors with overlapping competences in the coastal and marine areas. Also, these limitations refer to the complex technical procedures and the high costs of extraction and transport of sediments inputs to the disposal areas on the coast. Therefore, **limitations to the exploitation of sediment sources** are considered a relative threat to the reduction of sediment imbalance. However, among the preliminary data, no information is available to characterize the threat level for this key issue.

On the other hand, the information currently available about the real availability of sediment in these sources, the suitability of these sediments as beach input material and the costs of their exploitation is limited and unequal. For this, the **lack of information about sources of sediment inputs** is also considered as a weakness for effective management of sediment imbalance, also linked to the cross-cutting subject “Availability of information”.

The following table summarizes all the key issues (weaknesses, threats, strengths, and opportunities) previously identified under this critical theme.

Table 5. Key issues of the SWOT analysis related to "Sediment Imbalance".

Weaknesses	Threats
• Lack of information on sediment inputs sources.	• Drainage basins regulation. • Anthropic disruption of coastal sediment drift. • Complexity of the physical coastal system. • Limitations on exploitation of sediment sources.
Strengths	**Opportunities**
• Sediment management experience.	• Availability of sediment inputs.

4.4 Conservation of the coastal natural environment

The coastal natural environment is composed of beaches and their dunes, transitional waters and rocky shores containing high ecological value ecosystems. Impacts of coastal erosion on this fragile environment can compromise the integrity and health status of these ecosystems, so the principal threat to the conservation of the coastal natural environment, in the short term, are the **impacts of erosion on the natural environment** itself in the current situation. Furthermore, the effects of climate change on sea level and coastal hydro-morphodynamics add a new threat to the conservation of the natural environment related to a **long term increase of erosion hazard in the natural environment**, which is also linked with the cross-cutting subject of "climate change". Although some concrete studies are available, currently there are no objective analyses on a national scale that provide verified and up-to-date information on coastal erosion hazard. Thus, the **lack of information on erosion hazard** is considered a weakness related to the conservation of the natural environment, also linked with the cross-cutting subject "Availability of information", although, in the preliminary data, there is no information available to characterize the suitable weakness level.

As well as threats derived from erosion, there are pressures on the natural environment from human uses on the coast (see section 4.5), which are also considered threats to its conservation. There are mainly two types of pressures: on the one hand, **pressures from the anthropic environment**, derived from population settlements on the coast, facilitating indirectly the naturalness loss of the coastal system and, on the other hand, **pressures from human activities**, referring to activities that can directly affect to the natural areas deterioration, such as pedestrians or even vehicle traffic on the dune systems, anchoring and navigation from small recreational boats which can damage the seabed, and other activities with debris generation potential, pollution and wastes on the coastal system.

As a measure to counteract these pressures, there are various protection figures declared in accordance with current legislation in the different autonomous governments and the MITECO. Spanish Regulations (Law 42/2007) provide five types of protection (Parks, Nature Reserves, Marine Protected Areas, Natural Monuments, Protected Landscapes) and regional legislation related to nature conservation increase designations, by adding to the natural spaces' typologies more than forty protection figures. Besides, there are environmental protection figures such as Natura 2000 Network and other international protection figures. These **environmental protection figures** constitute a strength for the coastal natural environment conservation.

Furthermore, DGCM has extensive **experience in environmental rehabilitation of beaches, their dunes and in cliff stabilization**, which is also a strength in terms of conservation of the coastal environment and is additionally linked to the cross-cutting subject of "Training and knowledge acquisition". These measures are composed, on the one hand, of interventions like the location of sediment traps made of wicker, esparto grass, wood or coverings, elimination of invasive flora and revegetation with native species on the primary dune, in combination or not with sediment management measures, and on the other hand,

interventions to prevent landslides of the rocky substrate by remediation, attachments, drainages, coating, metal nets or even the complete slope removal or breakwaters placement on the cliff base to prevent coastal regression. The experience related to this implementation is also linked to the cross-cutting subject of "Training and knowledge acquisition".

In the case of environmental rehabilitation measures for transitional waters, they are principally composed by the elimination of invasive flora and revegetation with native species on the transitional waters rivieras and the elimination of anthropogenic elements. A weakness related to the **limited experience in environmental rehabilitation of transitional waters** was identified, and is also linked to the cross-cutting subject "Training and knowledge acquisition".

Finally, coastal ecosystems generate multiple assets and services that grow as their state of conservation improves, creating benefits for humans. So, an opportunity in relation to the ecosystem services of the coastal natural environment linked to its conservation was identified. Specifically, coastal ecosystems provide supply services (food, sea salt), regulatory services (evaporation generation areas for rainfall, endangered species habitats, protection against erosion and flooding) and cultural services (recreational use, aesthetic, educational and scientific values), among others. However, both information available in the Spanish coastline geographical area, and the scientific knowledge status on most of these ecosystem services (*e.g*. quantification of the erosion protection service provided by seagrass meadows) is incomplete and, therefore, limit this exploitation opportunity. So, **lack of information and knowledge on ecosystem services from the coastal natural environment** is a weakness for the natural environment conservation, which is also linked with the cross-cutting subjects "Availability of information" and "Training and knowledge acquisition". Occasionally, decision-makers can counteract this lack of information and knowledge by applying the precautionary principle. This could create an irrational management of the natural environment due to overprotection, and even create social rejection in certain public sectors. Consequently, a threat is identified related to the **possible interventions for the conservation of the natural environment without an adequate basis**, that do not only improve coastal protection, but are also counterproductive in achieving a truly effective conservation of natural resources. However, in the preliminary data, there is no information available to characterize the level of weakness corresponding to the lack of information and knowledge about the ecosystem services of the coastal natural environment, or the level of threat related to inadequately informed environmental conservation interventions.

The following table summarizes all the key issues (weaknesses, threats, strengths, and opportunities) previously identified under this critical theme.

Table 6. Key issues of the SWOT analysis related to the "conservation of the coastal natural environment".

Weaknesses	Threats
• Erosion hazards lack of information. • Lack of information and knowledge on ecosystem services from the coastal natural environment. • Limited experience in environmental rehabilitation of transitional waters.	• Impacts of erosion on the natural coastal environment in the present situation. • Long term increase in erosion risk in the natural coastal environment. • Anthropic environment pressure. • Human activities pressures. • Conservation of the natural environment interventions without an adequate basis.
Strengths	**Opportunities**
• Environmental protection figures. • Experience in environmental rehabilitation of beaches, their dunes and cliff stabilization.	• Ecosystem services from the coastal natural environment.

4.5 Human use of the coast

As well as the environment, the coastal system contains important anthropic elements that must be considered in the *Integrated Diagnosis*. Throughout history, the coasts have been intensively occupied by humans, transforming them into large coastal cities with major economic activity related to maritime commerce and tourism, but also to other productive sectors (*e.g.* fishing and aquaculture or industry). So, coastal regions have developed a certain dependency on the activities from the coastal strip. Reversing the high concentration of population and valuable elements of the socio-economic environment, or critical infrastructures which are ingrained in the coastline is highly complex due to its value. As a result, **the socio-economic value of the coast** is the main threat to coastal protection in relation to the human use of the coast, due to the link between this value and human occupation of the coast.

On the other hand, **impacts of erosion and flooding on the anthropogenic coastal environment in the current situation** constitute a relative threat to the protection of the anthropogenic coastal environment, which is composed by population, urban area, economic activities, waterfront facilities and critical infrastructures. Related to population, although coastal erosion does not usually create direct damages to people's physical integrity or health, it has adverse effects on the use and enjoyment of the coasts by decreasing people's quality of life. Similarly, impacts of erosion on urban areas and economic activities are indirect. However, waterfront facilities (the artificial coast) and critical infrastructures may suffer structural damages due to direct impacts from erosion. In addition, the entire anthropogenic environment of the coastal system is directly exposed to flooding.

In addition, climate change and its effects on sea level and coastal hydro-morphodynamics produce a **long term increase in erosion and flood hazards in the anthropogenic coastal environment**, which is another threat linked to human use of the coast and the cross-cutting subject of "climate change". In this sense, although sufficiently detailed information on coastal flood hazard is available on a national scale (according to the studies developed in the framework of the *Floods Directive* implementation), no objective analysis is currently available to provide contrasted and updated information on the combined coastal erosion and flood hazard, especially in future scenarios under the effects of climate change. Therefore,

lack of information on combined erosion and flooding hazard is considered a weakness related to this critical theme that is also linked with the cross-cutting subject "Availability of information". In the last 10 years the DGCM has contributed to improve the state of the art in this respect (*e.g.* "Methodology elaboration for the probabilistic analysis of climate change impacts on the coast: flooding, erosion, combined erosion-flooding effect, coastal protection works"). However, the analysis of coastal erosion and flooding combined on a national or regional spatial scale become one of those challenges that have not yet been fully resolved. Therefore, this weakness is also linked with the cross-cutting subject "Training and knowledge acquisition". No information is available in the preliminary data to characterize the weaknesses level from this information lack.

At the current moment, waterfront facilities are the result of the implementation of structural measures for coastal protection in the coastal erosion risk management framework (*e.g.* breakwaters, coastal walls), but it is also a consequence of building coastal structures for other purposes (*e.g.* ports, harbours, promenades). All this artificial affectation of the coast **generates expectations related to coastal protection by structures as the predominant measure**, which is a weakness for erosion risk management in the anthropogenic environment, even though the current DGCM vision of erosion risk management contains a much wider range of measures.

In this sense, the current state of the art provides an opportunity to address erosion risk management with a multiple approach through **social, institutional, physical, and structural prevention**, although, in the preliminary data, there is no information available to characterize the opportunity level corresponding to this key issue. Social and institutional prevention allows the reduction of the exposure and vulnerability of the coastal system, so the erosion risk is also reduced without physical intervention on the environment, while physical prevention allows minimization of hazard and exposure to erosion through nature-based protection measures. These alternative approaches allow to complement or even replace structural physical prevention measures, which were the predominant type in the past. However, to effectively implement this multiple approach, it is essential that actors involved in the decision-making process have a thorough understanding of the different alternatives. For this reason, this opportunity is also linked to the cross-cutting subject "Training and knowledge acquisition".

Finally, the **experience in coastal protection building** is a strength of the DGCM in case of a rational use of these structures and, in the same way, the **experience in the elimination of coastal protection structures** is a strength for reversing waterfront anthropisation. Both strengths are also linked to the cross-cutting subject of "Training and knowledge acquisition".

The following table summarizes all the key issues (weaknesses, threats, strengths, and opportunities) previously identified under this critical theme.

Table 7. Key issues of the SWOT analysis related to "human use of the coast".

Weaknesses	Threats
• Lack of information on combined erosion and flood hazards. • Expectations related to coastal protection by structures as the predominant measure.	• Socio-economic value of the coast. • Impacts of erosion and flooding on the anthropogenic coastal environment in the present situation. • Long term increase in hazard of erosion and flooding in the anthropogenic coast.
Strengths	**Opportunities**
• Experience in shore protection structures building. • Experience in shore protection structures elimination.	• Social, institutional, physical, and structural prevention.

4.6 Recovery and revision after erosive events

In the present context of climate change, the strict reconstruction of each coastal structure and damaged urban areas by marine storms is not compatible with the current legislation and with the reasonable erosion risk management, which provides controlled retreat measures due to evidence of an increase in coastal erosion and flooding hazards. Therefore, recovery and review after erosion events does not refer in any case to the usual old practice of systematic reconstruction of coastal damages by these events, but rather to the analysis of these events consequences, when they occur, and to all those actions focused on restoration or improvement of the affected elements, but also focused on their possible relocation or elimination, especially if they interfere the DPMT.

Erosion events are episodes with a low probability of occurrence, which develop on a time scale of hours-days and are promoted by the marine storms action in which significant meteorological tides are combined with highly energetic waves, and, as a result, are used to bring coastal flooding phenomena. The impacts of these extreme erosion and flooding events are added to the impacts of chronic erosion in the current situation, so the attribution of these impacts to a single event is not that obvious. Therefore, it is considered that the main threat in relation with the recovery and revision after erosion events are the **impacts of erosion and flooding on the coastal system in the current situation**, which refer both to the impacts associated with events (erosion and flooding) and to the impacts in the present situation derived from chronic erosion (long term manifestations of the progressive retreat of the coastline).

Similarly, in the long term, these impacts grow because of the effects of climate change in terms of increasing future erosion hazard associated with events, but also associated with chronic erosion and flooding accompanying erosion events. This increase in the combined erosion and flood hazard levels on the coastal system between the current situation and future scenarios is analysed in the framework of the critical theme “definition and occupation of the DPMT” to characterize the changing physical environment in the long term. So, as it refers to the critical theme “recovery and revision after erosion events”, the **long term increase of the hazard associated with erosion events**, is also linked to the cross-cutting subject “climate change”, is considered as a relevant threat.

On the other hand, the coastline status previous to the erosive event largely determines the impact harshness of this event, because a coastline in a good status of maintenance and conservation is more resistant and resilient to extreme events. However, limitations in human, material, and economic resources (see section 4.2) sometimes cause a **deterioration in the state of maintenance and conservation of the coast before the erosion event**, this constitutes a weakness in order to recover after the event. However, in the preliminary data, no information is available to characterize the weaknesses level corresponding to this key issue. In fact, to know the conservation status and maintenance of the coast and, in any case, to effectively manage the erosion risk associated with erosion events, the first essential step is to understand the morphodynamical processes linked to these events and the impacts derived from them. In this sense, the development of new Earth Observation technologies, as well as advances in the exploitation of these and other techniques, provide an opportunity to **monitor the impacts after erosive events** in collaboration with different public agencies in charge of land observation tasks in Spain. Therefore, this opportunity is also linked to the cross-cutting subject “Availability of information”, although, in the preliminary data, there is no information available to characterize its corresponding level of opportunity.

When the Administration must act immediately due to catastrophic events, an exceptional regime contemplates the authorization of an **emergency processing** (article 120 of Law 9/2017, of 8 November, on Public Sector Contracts), which is considered a strength in terms of recovery and revision after erosive events. Emergency interventions to repair the damage caused to the Spanish coastline because of the stormy successive episodes that hit the Spanish coasts in 2014, 2015, 2017 and 2018 were managed in

this way. All the actions to repair the damage on the coastline originated by the storms in those years were included in the appropriate Coastal Plan. Its implementation was approved by Royal Decree and costs incurred by the General State Budget through a Contingency Fund credit enabled by the Ministers' Council. These **additional contingency funds** not only create the possibility to finance actions that return the coast to its pre-event status, but also to finance **enhanced reconstructions after erosive events**, so that erosive events serve as a trigger for the necessary transformation of the coast. In the preliminary data, no information is available to characterize the level of strength and timeliness for the key issues related to the emergency processing, additional contingency funds, and enhanced reconstruction after erosive events, respectively.

Finally, the **experience in revision and recovery after erosion events** is a DGCM strength for the implementation of this type of measures and is also linked to the cross-cutting subject "Training and knowledge acquisition".

The following table summarizes all the key issues (weaknesses, threats, strengths, and opportunities) previously identified under this critical theme.

Table 8. Key issues of the SWOT analysis related to "recovery and review after erosion events".

Weaknesses	Threats
• Deterioration of the maintenance and conservation status of the coast before the erosion event.	• Impacts of erosion and flooding on the coastal system in the current situation. • Long term increase in hazard associated with erosion events.
Strengths	**Opportunities**
• Emergency processing. • Experience in revision and recovery after erosion events.	• Impacts monitoring after erosion events. • Additional contingency funds. • Enhanced reconstruction after erosion events.

5. STRATEGIC APPROACH

The previous chapter summarizes the results of the *Integrated Diagnosis* in terms of the key issues related to coastal management carried out by the DGCM. The methodology used to develop the national interventions proposal for the management and coastal protection which creates the *National Strategic Plan* is set out below.

To this end, in line with the vision, mission and overall objective of the *National Strategic Plan* (see Chapter 3), a series of strategic and specific objectives are established, linked to the results of the *Integrated Diagnosis* (see Figure 6).

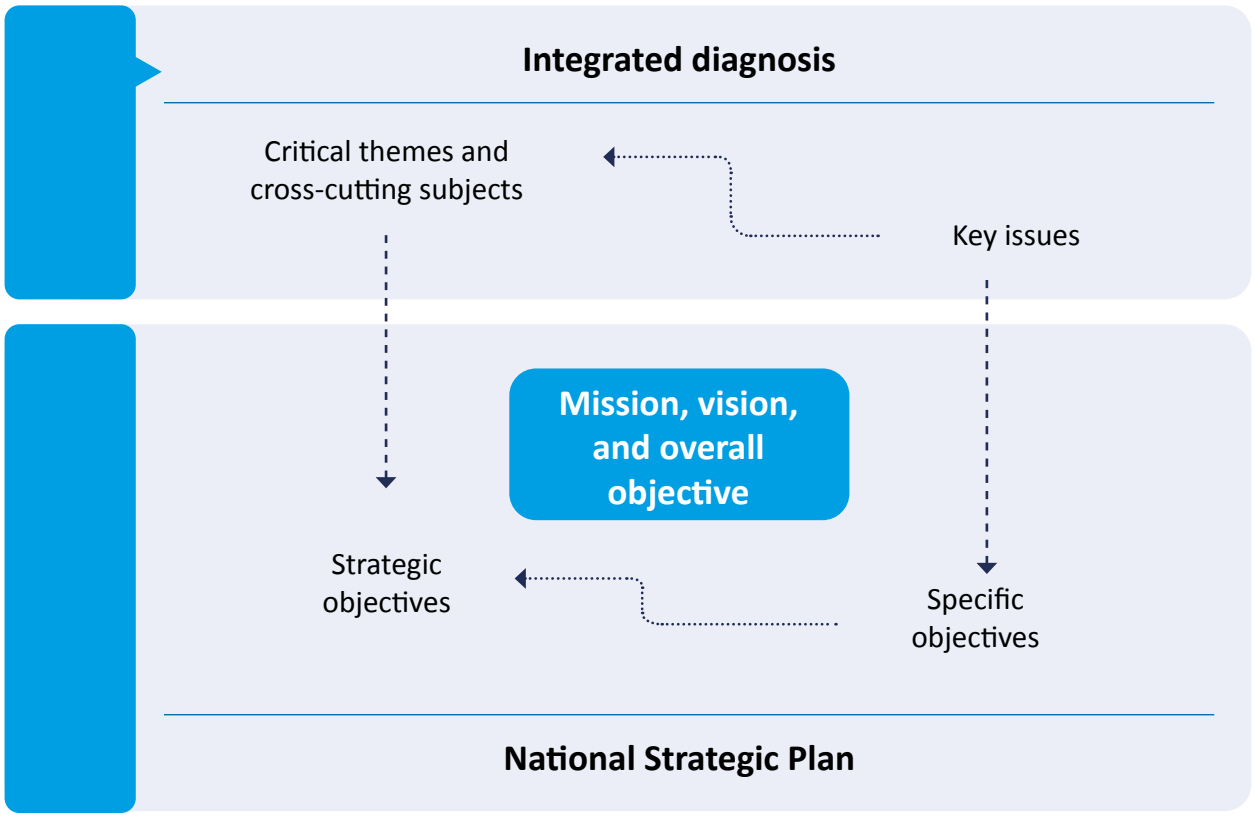


Figure 6. From the Integrated Diagnosis to the National Strategic Plan.

Specifically, the **overall objective** of adaptation to climate change is aligned with one of the cross-cutting subjects identified in the *Integrated Diagnosis* (climate change). **Seven strategic objectives** are added to this overall objective, six of them are aligned with the six critical themes identified in the *Integrated Diagnosis* and one of them is linked to two of the cross-cutting subjects of the *Integrated Diagnosis* (see Table 9, which also shows a breakdown of some of the strategic objectives).

Table 9. Overall and strategic objectives linked to critical themes and cross-cutting subjects of the Integrated Diagnosis.

Integrated Diagnosis		Strategic objectives	
Critical themes	1. Definition and occupation of the DPMT	1. Release of the Maritime-Terrestrial Public Domain (DPMT).	
	2. Governance framework.	2. Improving governance framework.	2.1. Strengthening planning capacity. 2.2. Improving communication and participation.
	3. Sediment imbalance.	3. Restoration of the sediment balance.	
	4. Conservation of the coastal natural environment.	4. Recovery of natural elements.	
	5. Human use of the coast.	5. Controlled withdrawal.	
	6. Recovery and revision after erosive events	6. Recovery and revision after erosion events.	
Cross-cutting subjects	• Availability of information	7. Strengthening the capacity to understand.	7.1. Information gathering and management. 7.2. DGCM staff training. 7.3. Improving the state of the art regarding coastal protection.
	• Training and knowledge acquisition.		
	• Climate change	**Overall objective**: Adaptation to climate change	

On the other hand, **forty-seven specific objectives** are established to address each of the key issues identified through the SWOT analysis of the *Integrated Diagnosis*, in order to, specifically, correct eleven weaknesses, reduce eighteen threats, enhance ten strengths, and promote eight opportunities (see Table 10).

Table 10. Specific objectives linked to the key issues of the Integrated Diagnosis

Critical theme	Key issues	Specific objective
1. Definition and occupation of the DPMT.	Weaknesses	1. Correct the administrative procedure length for delimitation of the DPMT.
		2. Correct the inconsistencies between the approved demarcation and the legal definition of the DPMT.
		3. Correct the lack of information on DPMT occupations.
	Threats	4. Reduce the consequences of the changing physical environment in the current situation and in the long term.
		5. Reduce erosion and flooding impacts on the DPMT occupations with license.
		6. Reduce DPMT occupation pressure on the coastal system.
	Strengths	7. Enhance the experience in the implementation of DPMT release measures.
	Opportunities	8. Promote the use of information from climate change adaptation projects.

Critical theme	Key issues	Specific objective
2. Marco de gobernanza.	Weaknesses	9. Fix the complexity of regulations development, implementation, and monitoring.
	Threats	10. Reduce limitations on human, material, and economic resources.
	Strengths	11. Enhance the capacity-building on the DGCM staff.
		12. Promote strategic planning for coastal protection based on the best scientific and technical knowledge.
	Opportunities	13. Promote an inclusive coastal management culture.
3. Desequilibrio sedimentario.	Weaknesses	14. Correct the lack of information related to sources for sediment inputs.
	Threats	15. Reduce the consequences of drainage basins regulation.
		16. Reduce the consequences of anthropogenic disruption of coastal sediment drift.
		17. Reduce the consequences of the complexity of the coastal physical system.
		18. Decrease the limitations on exploitation of sediment sources.
	Strengths	19. Enhance experience in sediment management.
	Opportunities	20. Promote the availability of sediment inputs.
4. Conservación del medio natural costero.	Weaknesses	21. Correct the lack of information on erosion hazards.
		22. Correct the lack of information and knowledge about the ecosystem services of the coastal natural environment.
		23. Correct the limited experience in environmental rehabilitation of transitional waters.
	Threats	24. Reduce erosion impacts on the natural coastal environment in the current situation.
		25. Reduce consequences of increased erosion hazard in the natural coastal environment in the long term.
		26. Reduce the anthropic environment pressure.
		27. Reduce the human activities pressure.
		28. Reduce the consequences of interventions for the natural environment conservation without an adequate basis.
	Strengths	29. Promote environmental protection figures.
		30. Promote experience in environmental rehabilitation of beaches, dunes, and cliff stabilization.
	Opportunities	31. Promote the ecosystem services of the natural coastal environment.

Critical theme	Key issues	Specific objective
5. Human use of the coast.	Weaknesses	32. Fix the lack of information on combined erosion and flood hazards.
		33. Correct expectations regarding the coastal protection through structures as the predominant measure.
	Threats	34. Reduce the consequences of the socioeconomic value of the coast.
		35. Reduce erosion and flooding impacts on the anthropogenic coastal environment in the current situation.
		36. Reduce the consequences of increased erosion and flooding hazards in the anthropogenic coastal environment in the long term.
	Strengths	37. Enhance the experience in building structures for coastal protection.
		38. Enhance the experience in the removal of structures for coastal protection.
	Opportunities	39. Promote social, institutional, physical, and structural prevention.
6. Recovery and revision after erosive events.	Weaknesses	40. Fix the deterioration of the coastal maintenance and conservation status before the erosion event.
	Threats	41. Reduce erosion and flooding impacts on the coastal system in the current situation.
		42. Reduce the consequences of increased hazard associated with erosive events in the long term.
	Strengths	43. Enhance emergency processing.
		44. Enhance the experience in review and recovery after erosive events.
	Opportunities	45. Promote impact monitoring after erosive events.
		46. Promote the acquisition of additional contingency funds.
		47. Promote an enhanced reconstruction after erosive events.

To achieve the forty-seven specific objectives, **80 specific interventions** are identified and organized into **13 strategic interventions** aligned with the strategic objectives (see Figure 7).

Figure 7. Diagram of the strategic approach to the development of the National Strategic Plan's intervention programmes.

All these strategic and specific interventions are developed through **5 intervention programmes**, whose scope and content in terms of strategic and specific interventions are detailed below in Chapter 6.

Finally, to draw up the roadmap of the *National Strategic Plan*, implementation itineraries are designed according to six goals corresponding to the years 2025, 2029, 2033, 2037, 2041 and 2045. To define each itinerary, an urgency (short, medium, or long term) and an importance (high or normal) are assigned to the strategic and specific objectives, respectively, which makes it possible to prioritize and order the specific interventions proposed according to the objectives to which they contribute (see Figure 8).

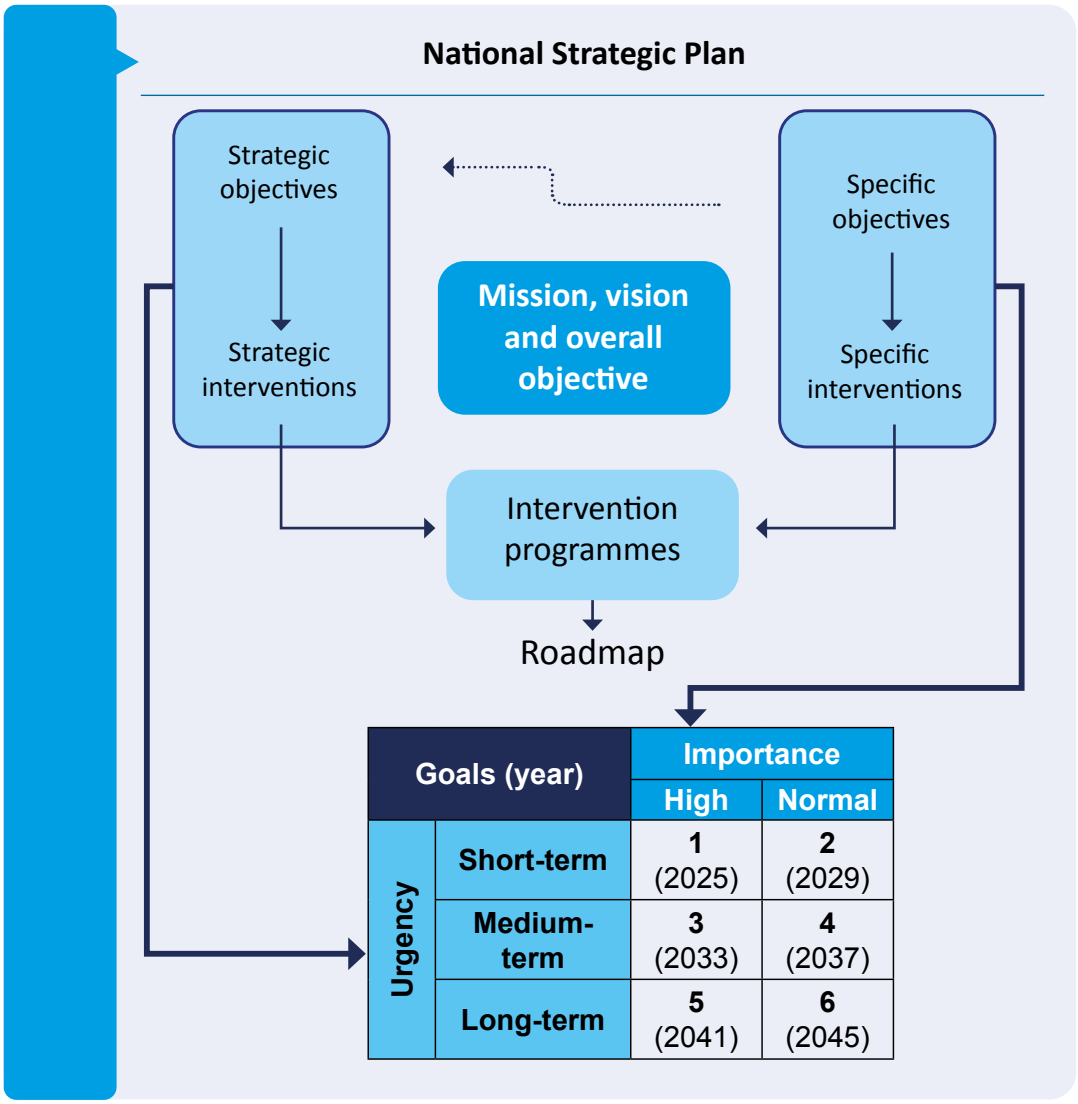


Figure 8. Diagram of the strategic approach for the definition of goals and implementation itineraries of the National Strategic Plan roadmap.

Thus, the roadmap described in Chapter 6 provides a guide for the temporal sequencing about the implementation of the intervention programmes proposal, resulting in a robust *National Strategic Plan* that is coherent with the established objectives and their prioritization, as detailed in Chapter 8 (Compliance and prioritization of objectives).

6. INTERVENTION PROGRAMMES

The five intervention programmes of the *National Strategic Plan* are developed into 13 strategic interventions (see Table 11).

Table 11. Strategic interventions of the intervention programmes.

Intervention programmes	Strategic interventions
P1. Programme for integrated management promotion and improvement of the governance framework.	A1.1 Review of regulations and procedures. A1.2 Adoption of agreements for coordination between administrations. A1.3 Attracting external resources. A1.4 Development of instruments for strategic planning. A1.5 Development of instruments for the public participation consolidation in the management of the coast.
P2. Programme for the reduction of anthropic pressure on the coast.	A2.1 Design and implementation of a DPMT management system. A2.2 Development of tools for the defence lines management.
P3. Programme for the promotion of the natural resilience of the coast.	A3.1 Design and implementation of a coastal sediment management system. A3.2 Development of instruments for coastal protection through ecological restoration.
P4. Programme for Enhanced Reconstruction.	A4.1 Development of instruments for an enhanced reconstruction.
P5. Programme for strengthening the capacity to understand.	A5.1 Design and implementation of a coastal monitoring system. monitoring system. A5.2 Establishment of a maintained capacity building and training project for DGCM staff according to professional profiles. A5.3 Establishment of a project to improve the state of the art in coastal protection.

The content of each programme is described below in terms of the strategic interventions included in them and, also, the specific interventions contained in each strategic intervention are described.

6.1 Programme for integrated management promotion and improvement of the governance framework (P1)

The "Programme for the promotion of integrated management and improvement of the governance framework" includes the following 5 strategic interventions:

- "Review of regulations and procedures" (A1.1).
- "Adoption of agreements for coordination between administrations" (A1.2).
- "Attracting external resources" (A1.3).
- "Development of instruments for strategic planning" (A1.4).
- "Development of instruments for the consolidation of public participation in coastal management" (A1.5).

These strategic interventions are composed of several specific interventions as described below.

A1.1 Review of regulations and procedures

First, this review includes the identification of those regulations and procedures which are susceptible to be simplified. Regardless of the result of this identification, which can provide additional regulations and procedures, this intervention addresses the simplification of the administrative procedure for the DPMT demarcation and also focuses on the revision of the Coastal Law and its regulations. In particular, it attends the extension of the DPMT's easement and influence zones, the use of the DPMT, prohibitions and authorisations in the DPMT easement and influence zones and infringements and penalties, focused on limit and relocate uses of the coast that provide a few or no added value at regional or national level outside the coastal strip. Finally, it also considers the review of sediment extraction procedures, their control and monitoring in the different types of potential borrow areas.

Table 12. Specific interventions of strategic intervention A1.1 "Review of regulations and procedures".

Specific interventions
SI1. Identification of regulations and procedures for simplification.
SI2. Review of the administrative procedure for the DPMT demarcation in order to simplify it.
SI3. Review of the Coastal Regulations in relation to the extension of easement and influence zones of the DPMT.
SI4. Revision of the Coastal Law and its regulations in relation to the use of the DPMT, prohibitions and authorisations in easement and influence zones of the DPMT and infringements and sanctions.
SI5. Review of the Coastal Law and its regulations in relation to limit and relocate coastal uses that add a few or no value at regional or national level outside the coastal strip.
SI6. Review of sediment extraction procedures, their control and monitoring in the different types of potential borrow areas.

A1.2 Adoption of agreements for coordination between administrations

Detailed definition of the agreements to be adopted requires, in any case, a previous mapping of the governance framework to illustrate roles, relations between institutions, deficits and overlaps. The proposed agreements adoption between administrations related to the following issues are described below:

- Use and/or incorporation into the monitoring system of information collected by other private actors or institutions, with an emphasis on regional governments and impacts after erosive events.
- The exploitation of sediment sources between the DGCM and the administrations responsible for potential borrow areas and for the designation of strategic borrow areas, with emphasis on submarine deposits.
- Conservation of the coastal natural environment carried out by other responsible administrations, based on their proven effectiveness, and the multiple synergies of nature-based measures (through the constitution of a cross-sectoral working group).

Table 13. Specific interventions of strategic intervention A1.2 "Adoption of agreements for coordination between administrations".

Specific interventions
SI7. Mapping of the governance framework to illustrate roles, relationships between institutions, deficits, and overlaps.
SI8. Adoption of agreements for the use and/or incorporation into the monitoring system of information collected by other private actors or administrations, with emphasis on regional governments and impacts after erosion events.
SI9. Adoption of agreements for exploitation of sediment sources between the DGCM and administrations with jurisdiction over potential borrow areas and for the designation of strategic borrow areas, with emphasis on submarine deposits.
SI10. Adoption of agreements for the conservation of the coastal natural environment carried out by other competent administrations, based on their proven effectiveness, and the multiple synergies of nature-based measures (through the constitution of a cross-sectoral working group).

A1.3 Attracting external resources

This intervention contemplates, first of all, the estimation of the DGCM resources deficit based on the estimation of human, material and economic resources needed, particularly in relation to the development of regulations, their implementation and monitoring by the DGCM, as well as to the monitoring of the administrative procedure of DPMT demarcation, its systematic review and updating by the DGCM, and the vigilance of penalties assigned by the DGCM.

Then, it suggests to explore the resources engagement through the elaboration of feasibility studies and legal conditions for obtaining additional contingency funds in the climate emergency context and from private sources; for incentives and penalties implementation for third parties with obligations in terms of coastal sediment management (including a program to review the technical terms of their obligations and the supervision until fulfilment); to establish shared responsibilities in terms of financing coastal protection by the direct beneficiaries of coastal ecosystem services and, in general, for engaging external funding or assets and services financed by third parties.

Table 14. Specific interventions of strategic intervention A1.3 "Attracting external resources".

Specific interventions
SI11. Estimation of the resources deficit in the DGCM based on the estimation of required human, material, and economic resources.
SI12. Estimation of human, material and economic resources required for regulatory development, implementation, and monitoring by the DGCM.
SI13. Estimation of human, material, and economic resources necessary for the monitoring of the DPMT administrative demarcation procedure, its systematic review and updating by the DGCM.
SI14. Estimation of human, material, and economic resources necessary for the supervision of the penalties assigned by the DGCM.
SI15. Preparation of a feasibility study and legal conditions about obtaining external financing or assets and services financed by third parties, in general.
SI16. Preparation of a feasibility study and legal conditions to explore the possibility of obtaining additional contingency funds from private sources in the climate emergency context.
SI17. Preparation of a feasibility study and legal conditions for the incentives and penalties implementation to third parties with coastal sediment management obligations (including a program to review the technical terms of their obligations and the supervision until fulfilment).
SI18. Elaboration of a feasibility study and legal conditions for establishing shared responsibilities in terms of financing coastal protection by the direct beneficiaries of coastal ecosystem services.

A1.4 Development of instruments for strategic planning

The development of the following three key instruments for strategic planning is contemplated:

- Catalogue of measures for prevention (implemented in advance to avoid risks) and recovery (implemented after experiencing an impact), both institutional and social (do not involve interventions on the physical environment), including soft measures (at administrative and management level) and hard measures (at regulations and laws level), as well as structural and physical measures, with an emphasis on nature-based measures.
- Strategies for coastal protection considering the effects of climate change in regions where it is unavailable, or it has become obsolete. These strategies are to be based on a thematic document of good practices and methodological guidance for decision-making processes in relation to the selection and implementation of interventions for social, institutional, physical and structural prevention on a regional scale, with emphasis on controlled rollback and nature-based measures, on

the proven effects of conservation and restoration of coastal ecosystems and ecosystem services on erosion and flood hazard, vulnerability and risk on the anthropogenic environment, which also facilitates the inclusion of climate change adaptation, and on the results of regional climate change adaptation projects.

- Specific plans for coastal protection in enclaves that require special attention, based on the identification of these singular enclaves.

Table 15. Specific interventions of strategic intervention A1.4 "Development of instruments for strategic planning".

Specific interventions
SI19. Elaboration of a catalogue of measures for prevention (implemented in advance to avoid risks) and recovery (implemented after experiencing an impact), both institutional and social (not involving action on the physical environment), including soft measures (at administrative and management level) and hard measures (at regulations and laws level), as well as structural and physical measures, with an emphasis on nature-based measures.
SI20. Elaboration of strategies for coastal protection considering the effects of climate change in regions where it is unavailable or obsolete.
SI21. Elaboration of a thematic document of good practices and methodological guidance for decision-making processes in relation to the selection and implementation of interventions for social, institutional, physical and structural prevention at regional scale, with emphasis on controlled rollback and nature-based measures, based on the proven effects of conservation and restoration of coastal ecosystems and ecosystem services on erosion and flood hazard, vulnerability and risk on the anthropogenic environment.
SI22. Incorporation into the selection and implementation of interventions for social, institutional, physical, and structural prevention of climate change adaptation based on the results of regional climate change adaptation projects.
SI23. Elaboration of specific plans for coastal protection in singular enclaves that require special attention, based on the identification of these singular enclaves.

A1.5 Development of instruments for the public participation consolidation in the management of the coast

This intervention aims to generate a paradigm shift in the public participation level that takes place in the management and protection of the Spanish coast field. Based on the revision of the current regulations, it contemplates the preparation of methodological guides for the communication development and participation plans that should accompany all the interventions for coastal protection carried out by the DGCM, allowing the incorporation of the opinions from the general public as one of the elements to be considered in the decision-making process, from the level of selection and definition of the interventions for coastal protection carried out by the DGCM.

In addition to the cited methodological guides, this intervention is complemented by the design and launch of a package of communication campaigns, which facilitate the access by the public to basic and general knowledge on fundamental issues such as coastal erosion projections, the use of the DPMT, the easement and influence areas, impacts of human activities pressure on the coastal environment, the range of coastal protection measures contemplated by the DGCM (with an emphasis on nature-based measures) and the implementation of the *National Strategic Plan* itself.

Table 16. Specific interventions of strategic intervention A1.5 "Development of instruments for the consolidation of public participation consolidation in the management of the coast".

Specific interventions
SI24. Review of current regulations, to contemplate the need to develop communication and participation plans that must accompany all interventions for coastal protection carried out by the DGCM.
SI25. Elaboration of methodological guides for the development of communication and participation plans for every coastal protection interventions carried out by the DGCM.
SI26. Incorporation of the opinions of the general public as one of the elements to be considered in decision-making processes, from the level of selection and definition of interventions for coastal protection carried out by the DGCM.
SI27. Design and implementation of a communication campaign to facilitate access to knowledge by the public on coastal erosion projections.
SI28. Design and implementation of a communication campaign that facilitates the access by the public to information about the use of the DPMT, the DPMT easement and influence areas and the impacts of human activities pressure on the coastal environment.
SI29. Design and implementation of a communication campaign that facilitates public access to the range of coastal protection measures contemplated by the DGCM, with an emphasis on nature-based measures.
SI30. Design and launch of a communication campaign related to the implementation of the *National Strategic Plan*.

6.2 Programme for the reduction of anthropic pressure on the coast (P2)

The "Programme for the reduction of anthropic pressure on the coast" includes the following two strategic interventions:

- "Design and implementation of a DPMT management system" (A2.1).
- "Development of tools for the defence lines management" (A2.2).

These strategic interventions are composed of several specific interventions as described below.

A2.1 Design and implementation of a DPMT management system

The objective of this system is to centralize the information related to both the demarcation and the occupations of the DPMT based on its graphic definition, permitting the estimation of the discordance degree between the approved demarcation and the proposed demarcation, considering over time the changes in the coastline and in accordance with the legal definition of the DPMT. For this purpose, a programme of systematic revision and updating of the approved boundary and the DGCM Occupations Database is established, which is integrated into the system itself after redefining its content in relation to the identification and characterisation of all DPMT occupations, with emphasis on unlicensed occupations and including data from the surface area occupied and other relevant characteristics. In addition, the system must be interoperable with the graphic database processing programmes and with the Registrars' Geoportal, so that the Registrars provide geo-referenced graphic representations of the DPMT, enabling to register them in the Land Registry (provided by the Public Law Corporation of Land and Mercantile Registrars of Spain).

The system is completed with the elaboration of methodological guides for, firstly, the identification of the DPMT assets, which guarantees the homogeneity of criteria in the interpretation of what is disposal in law in technical terms and, secondly, to confer DPMT occupation licenses based on measurable and objective information related to the current and future situation (under climate change scenarios) and on the basis of clear, concrete and unequivocal criteria, established in collaboration with the appropriate regional administrations. Among other possible criteria, the estimation of carrying capacity of beaches and, in general, of the coastal environment, considering their environmental sensitivity and ecological requirements, are some of the conditions to confer DPMT occupation licenses, or the identification and designation of strategic assets and services to protect, relocate or remove from the DPMT (see A2.2).

Table 17. Specific actions of strategic action A2.1 "Design and implementation of a DPMT management system".

Specific interventions
SI31. Design and implementation of a system for the systematic revision and updating of the approved demarcation of the DPMT, based on its graphic definition, which allows the estimation of the discordance degree between the approved demarcation and the proposed demarcation.
SI32. Redefinition of the content of the DGCM Occupations Database for the identification and characterisation of all DPMT occupations, with emphasis on unlicensed occupations and including data on occupied surface area and other relevant characteristics.
SI33. Incorporation into the DPMT management system of the DGCM Occupations Database, in accordance with the previous redefinition of its content, for the systematic revision and updating of the DPMT occupations.
SI34. Elaboration of methodological guides for the identification of DPMT assets, to guarantee the homogeneity of criteria in the interpretation of what is disposal in law in technical terms.
SI35. Elaboration of methodological guides to confer DPMT occupation licenses based on measurable and objective information considering the current and future situation (under climate change scenarios) and based on clear, concrete, and unequivocal criteria, established in collaboration with the appropriate regional administrations.
SI36. Incorporation of criteria based on the estimation of carrying capacity from beaches and, in general, from the coastal environment, considering their environmental sensitivity and ecological requirements, into the methodology to confer DPMT occupation licenses.

A2.2 Development of tools for the defence lines management

This intervention contemplates the identification of lines of defence and their designation as strategic lines of defence to be maintained or to be retreat in a controlled manner because of the increased risk produced, based on a feasibility study and legal conditions for the implementation of controlled retreat measures for the release of the DPMT. These lines of defence should be understood in a broad sense, as they may coincide with the coastline, coastal dunes foot, seawalls foot on the backshore, and the foot or top of cliffs, among others.

In the particular case of coastal cliffs, their erosion is part of the nature of these geomorphological elements and contributes to the granular sediment inputs to the coast. On the other hand, the cliffs stabilization for ensuring public safety against possible rockfalls is a municipal competence according to the report of May 19, 2010 of the General Council of Spanish Lawyers, which dictates that the City Councils are responsible to monitor the observance of the rules and instructions issued by the State Administration and the Autonomous Communities in terms of rescue and safety of human life on beaches and other bathing areas, as well as to adopt appropriate safety measures in these areas, assuming the responsibility resulting from their lack. Therefore, the management of defence lines on cliffs should focus on their controlled retreat, without hindering cliff stabilization measures to be considered for maintenance purposes in cases where they already exist and have been implemented by the DGCM.

In accordance with the defence lines, this intervention also contemplates the identification and designation of strategic assets and services to be defended, relocated, or removed from the DPMT.

Table 18. Specific interventions of strategic intervention A2.2 "Development of instruments for the management of lines of defence".

Specific interventions
SI37. Identification of lines of defence (understood in a broad sense) and their designation as strategic lines of defence to be maintained or retreat in a controlled manner because of the increased risk produced.
SI38. Elaboration of a feasibility study and legal conditions for the implementation of controlled rollback measures for the release of the DPMT.
SI39. Identification and designation of strategic assets and services to be defended, relocated, or removed from the DPMT.

6.3 Programme for the promotion of the natural resilience of the coast (P3)

The "Programme for the promotion of the natural resilience of the coast" includes the following two strategic interventions:

- "Design and implementation of a coastal sediment management system" (A3.1).
- "Development of tools for coastal protection through ecological restoration" (A3.2).

These strategic interventions are composed of several specific interventions as described below.

A3.1 Design and implementation of a coastal sediment management system

The objective of this intervention is to harmonize the set of maintenance and conservation plans in the critical areas identified from the results of the monitoring of coastal erosion and flooding and coastal ecosystems.

First, the system contemplates the preparation of a complete inventory and revision program of sediment sources (inside and outside the coastal system) with physical, environmental, and economic information, emphasizing the identification of new sources not yet exploited and including information on the specific limitations to the exploitation of each source. Similarly, an inventory of sediment sinks is contemplated, together with a program for their revision, with emphasis on those of anthropogenic origin. In any case, the link between the sources and sinks inventoried by Marine Spatial Plans (POEM) will be considered at the level of a DPMT reserve declaration, if appropriate, of those deposits that are considered strategic for their contribution to beaches (measure SA1 of the POEM) and to increase the geophysical studies and the characterization studies of deposits (measure SA2 of the POEM).

The inventory is complemented by the preparation of exploitation plans for the inventoried sediment inputs sources, based on the designation of strategic sediment sources and aligned with the agreements adopted between administrations (see A1.2) and with the revision of sediment extraction procedures, their control and monitoring (see A1.1).

On the other hand, strategic coastal sediment management focuses on maintaining the dry beach width to ensure the ecosystem service of protection, so the cornerstone of this management system is the identification and designation of strategic sediment management interventions, based on the estimation of the volume of sediment required to maintain beaches.

Table 19. Specific interventions of strategic intervention A3.1 "Design and implementation of a coastal sediment management system".

Specific interventions
SI40. Elaboration of a complete inventory with a review program, regarding sediment sources (inside and outside the coastal system) with physical, environmental, and economic information, with emphasis on the identification of new sources not yet exploited and including information on the specific limitations to the exploitation of each source.
SI41. Development of a sediment sinks inventory together with a program for their revision, with emphasis on those of anthropogenic origin.
SI42. Development of exploitation plans for the inventoried sediment inputs sources, based on the designation of strategic sediment sources.
SI43. Identification and designation of strategic sediment management interventions, based on the estimation of the volume of sediment required in beach maintenance, guaranteeing their ecosystem protection service.

A3.2 Development of instruments for coastal protection through ecological restoration.

The development of the following three instruments that contribute to the coastal protection regarding environmental conservation is considered:

- Elaboration of a thematic document of good practices and methodological guide for decision making processes related to the selection and implementation of interventions for the conservation of the natural environment on a regional scale based on their proven effects on erosion hazard, vulnerability and risk on the natural environment and for the exploitation of coastal ecosystem assets and services, principally the protection service against erosion and flooding of beaches and transitional waters, based on their monitoring.
- Establishment of a programme for the systematic review of the extension and coverage of environmental protection figures, in collaboration with the appropriate administrations, to ensure adaptation to the unbiased necessity of protection, so they can be both extended and reduced, and considering the review of the implementation of their management measures and their effectiveness.
- Design and implementation of a national communication campaign to raise environmental awareness to create habits, awareness and behaviour compatible with the natural coastal environment conservation and coastal protection.

Table 20. Specific interventions of strategic intervention A3.2 "Development of instruments for coastal protection through ecological restoration".

Specific interventions
SI44. Elaboration of an issues paper of good practices and methodological guide for decision-making processes related to the selection and implementation of interventions for the conservation of the natural environment on a regional scale based on their proven effects on erosion hazard, vulnerability, and risk on the natural environment.
SI45. Incorporation, into the selection and implementation of interventions for the conservation of the natural environment, of considerations for the exploitation of coastal ecosystem assets and services, principally the protection service against erosion and flooding of beaches and transitional waters, based on their monitoring.
SI46. Establishment of a programme for the systematic review of the extension of environmental protection figures, in collaboration with the appropriate administrations.
SI47. Design and implementation of a national environmental awareness-raising communication campaign to generate habits, awareness and behaviour compatible with the natural coastal environment conservation and the coastal protection.

6.4 Programme for Enhanced Reconstruction (P4)

The "Programme for Enhanced Reconstruction" includes a single strategic intervention consisting of the "development of instruments for an enhanced reconstruction" (A4.1), as described below.

A4.1 Development of instruments for an enhanced reconstruction

The preparation of an issues paper of good practices and a methodological guide for decision making processes related to the selection of interventions for their implementation after erosion events is contemplated, identifying from them the emergency interventions, and aligning this selection with specific plans in unique enclaves and regional strategies for the coastal protection considering adaptation to climate change, as well as the designation of strategic assets and services in the DPMT and of strategic lines of defence or their removal.

Table 21. Actuaciones específicas de la actuación estratégica A4.1 "Desarrollo de instrumentos para la reconstrucción mejorada".

Specific interventions
SI48. Preparation of an issues paper on good practices and a methodological guide for decision making processes in relation to the selection of interventions to be implemented after erosion events.
SI49. Incorporation, into the selection of interventions to be implemented after erosion events, of considerations for the identification of emergency interventions among all of them.

6.5 Programme for strengthening the capacity to understand (P5)

The "Programme for strengthening the capacity to understand" includes the following three strategic interventions:

- "Design and implementation of a coastal monitoring system" (A5.1).
- "Establishment of a maintained capacity building and training project for DGCM staff according to professional profiles" (A5.2).
- "Establishment of a project to improve the state of the art in coastal protection" (A5.3).

These strategic interventions are composed of several specific interventions as described below.

A5.1 Design and implementation of a coastal monitoring system.

This system focuses on the systematic monitoring of coastal erosion and flooding events and their impacts, considering the different time scales of erosion events (including short, but also medium and long term processes), preferably using satellite earth observation techniques.

Coastal erosion monitoring includes the estimation of sediment volume inputs and outputs from the coastal system at the macro-scale, with emphasis on natural inputs from drainage basins. It is based on

the development of methodological guidelines for the characterisation of coastal erosion hazard from the identification and understanding of the relevant hydro-morphodynamical processes at different spatial-temporal scales, and on the revision of the methodologies applied in the Floods Directive framework for the characterisation of coastal flood hazard and the identification of ARPSIS.

Specifically, the system considers the establishment of a programme for the systematic revision and updating of the hazard characterisation derived from coastal erosion and flooding (this last one is based on studies carried out in the Floods Directive framework according to the revised methodologies) and for the vulnerability and risk characterisation on the coastal system and, in particular, on its natural and anthropic environment and on the DPMT occupations, for the diagnosis at regional scale.

On the other hand, this system incorporates a viewer which facilitates access to updated information on protection ecosystem services against erosion and flooding of coastal ecosystems, but also considers other regulatory, provisioning, or cultural services.

In addition, the system includes another viewer and repository to centralize and homogenize the information collected by the various regional climate change adaptation projects. It also contains information on coastal erosion projections (derived from erosion events on short term scale but also in the medium and long term), in combination with coastal flooding, based on the results of its systematic monitoring and the study of its hazard and under climate change scenarios, emphasizing its potential impacts (risk).

Table 22. Specific interventions of strategic intervention A5.1 "Design and implementation of a coastal monitoring system".

Specific interventions
SI50. Design and implementation of a system for systematic monitoring of coastal erosion and flooding, preferably using satellite earth observation techniques.
SI51. Incorporation into the monitoring system of a component for the systematic monitoring of coastal erosion and flooding produced by erosion events (on short-term scales).
SI52. Incorporation into the monitoring system of the inputs and outputs sediment volumes estimation from the coastal system at the macro-scale, with emphasis on natural inputs from drainage basins.
SI53. Elaboration of methodological guidelines for the characterisation of coastal erosion hazards based on the identification and understanding of the relevant hydro-morphodynamical processes at various spatial-temporal scales.
SI54. Revision of the methodologies applied in the *Floods Directive* framework for the characterisation of coastal flood hazard and the identification of ARPSIS, so that the coastal erosion process is considered.
SI55. Incorporation into the monitoring system of the systematic review and update of coastal erosion hazard for the regional scale diagnosis.
SI56. Incorporation into the monitoring system of the systematic review and update of the coastal erosion and flooding hazard for the regional scale diagnosis, based on the studies carried out in the *Floods Directive* framework according to the revised methodologies.
SI57. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the coastal system based on the characterisation of coastal erosion and flooding hazards for the regional scale diagnosis.
SI58. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the coastal natural environment based on the characterisation of coastal erosion hazards for the regional scale diagnosis.
SI59. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the coastal anthropic environment based on the characterisation of coastal erosion and flooding hazards for diagnosis on a regional scale.
SI60. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the DPMT occupations based on the hazard characterisation derived from coastal erosion and flooding for diagnosis on a regional scale.
SI61. Incorporation into the monitoring system of a viewer for the systematic monitoring of protection ecosystem services against erosion and flooding of coastal ecosystems, but also addresses other regulatory, provisioning, or cultural services.
SI62. Incorporation into the monitoring system of a viewer and repository to centralize and homogenize the information collected by the various regional climate change adaptation projects.
SI63. Incorporation into the monitoring system of a viewer with information on projections of erosion events (on short-term scales) based on the results of their systematic monitoring and the study of the hazard, and under climate change scenarios, emphasizing on their potential impacts (risk).
SI64. Incorporation into the monitoring system of a viewer with information on coastal erosion projections (on medium and long-term scales) based on the results of systematic monitoring and the hazard, and under climate change scenarios, emphasizing on its potential impacts (risk).
SI65. Incorporation into the monitoring system of a viewer with information on combined coastal erosion and flooding projections based on the results of its systematic monitoring and the study of its hazard and under climate change scenarios, emphasizing on its potential impacts (risk).

A5.2 Establishment of a maintained capacity building and training project for DGCM staff according to professional profiles

This project ensures that DGCM staff are aware of the multiple alternative approaches to address erosion risk management through social, institutional, physical, and structural prevention, for which it contemplates the design and implementation of internal DGCM communication campaigns to disseminate the new methodological guidelines, thematic documents, and advances in the state of the art proposed on the *National Strategic Plan*.

Furthermore, this project contains specific interventions for the valorisation of the DGCM's own knowledge related to the implementation of measures for the coastal management and coastal protection. such as the elaboration of good practice guides based on the DGCM's experience and their dissemination within the framework of experience exchange programmes between the DGCM's technical staff, including the celebration of conferences, practical workshops and work sessions, in relation with the implementation of coastal management and protection measures for the DPMT release, sediment management, environmental rehabilitation of beaches, their dunes and in cliff stabilization, construction and removal of structures for coastal protection, revision and recovery after erosive events.

It also seeks to complement the internal experience by incorporating into this project a specialization course on environmental rehabilitation of transitional waters for the technical staff of the DGCM, with emphasis on the peripheral services where there are significant transitional waters.

Table 23. Specific interventions of strategic intervention A5.2 "Establishment of a maintained capacity building and training project for DGCM staff according to professional profiles".

Specific interventions
SI66. Design and implementation of internal communication campaigns within the DGCM to disseminate the new methodological guides, thematic documents, and advances in the state of the art proposed on the *National Strategic Plan*.
SI67. Elaboration of good practices guides based on the experience of the DGCM and development of training activities related to the implementation of coastal management and protection measures for the DPMT release.
SI68. Elaboration of good practices guidelines based on DGCM experience and development of training activities related to the implementation of sediment management measures.
SI69. Elaboration of good practices guides based on the experience of the DGCM and development of training activities related to the implementation of environmental rehabilitation measures for beaches, their dunes and cliff stabilization.
SI70. Elaboration of good practices guides based on the experience of the DGCM and development of training activities related to the implementation of measures for structures building for coastal protection.
SI71. Elaboration of good practices guidelines based on the experience of the DGCM and development of training activities related to the implementation of measures for the removal of structures for coastal protection.
SI72. Elaboration of good practices guidelines based on the experience of the DGCM and development of training activities related to the implementation of measures for the review and recovery after erosive events.
SI73. Development of a specialization course on environmental rehabilitation of transitional waters for the DGCM technical staff, with emphasis on the peripheral services in places where there are transitional waters of relevance.

A5.3 Establishment of a project to improve the state of the art in coastal protection

The project focuses on provide institutional support for the development of the following research areas funded by the state, at regional scale and by European Union:

- Coastal ecosystem services (benefits provided and damages they experience due to coastal operations/climate change), in concordance with the ongoing work about development and implementation of a new ecosystems accounts module, in the framework of environmental accounting, in accordance with the recent publication of the modified Regulation (EU) 691/2011 of 6 July 2011 on European environmental economic accounts.
- Nature-based coastal protection measures.
- The effectiveness of conservation interventions for the environment.

This support is specified on the following specific interventions provided by the DGCM:

- Introduction in the *State Research Plan*, in collaboration with the Ministry of Science and Innovation, of specific strategic lines and the creation of new calls for projects focused on knowledge generation oriented to the public sector or public-private collaboration.

- Participation in the design of Complementary Plans, in collaboration with the Ministry of Science and Innovation and the Autonomous Communities, to establish multi-annual research and innovation programmes.
- Establishment of a scientific collaboration programme with different national research agencies and public administrations to facilitate Spain's participation in Horizon Europe and other European and international framework programmes or calls for proposals.

On the other hand, the project also contemplates the development of the following research work carried out with DGCM's own resources:

- Pilot study of cases for the analysis of lessons learned in relation to the following topics:
  - The prevention of silt accumulations on basins and reservoirs, in cooperation with various administrations.
  - The search for alternative sources of sediment inputs.
  - The environmental rehabilitation of transitional waters.

- Theoretical study about the effects (positive and negative) of the removal of disruptive structures compared to their maintenance, for different coastal typologies and under different time horizons.

Table 24. Specific interventions of strategic intervention A5.3 "Establishment of a project to improve the state of the art in coastal protection".

Specific interventions
SI74. Institutional support for research into coastal ecosystem services (benefits provided by them and damage experienced from coastal operations/climate change) with state, regional and EU funding.
SI75. Institutional support for research into nature-based coastal protection measures with state, regional and EU funding.
SI76. Institutional support for research into the effectiveness of conservation interventions for the environment with state, regional and European Union funding.
SI77. Development of pilot study of cases for the analysis of lessons learned in relation to the prevention of silt accumulation on basins and reservoirs, in cooperation with different administrations.
SI78. Development of pilot study of cases for the analysis of lessons learned in relation to the search for alternative sources of sediment inputs.
SI79. Development of pilot study of cases for the analysis of lessons learned in relation to the environmental rehabilitation of transitional waters.
SI80. Development of a theoretical study about the effects (positive and negative) of the removal of disruptive structures compared to their maintenance, for different coastal typologies and under different time horizons.

7. ROADMAP

The *National Strategic Plan* contemplates a total of 80 specific interventions that are organized into 13 strategic interventions and 5 intervention programmes. It is not possible to implement all these interventions simultaneously, so a time sequence for their progressive implementation is necessary.

To this end, six successive goals are established throughout the present management cycle, corresponding to the years 2025, 2029, 2033, 2037, 2041 and 2045. The roadmap proposed below establishes six itineraries corresponding to the aforementioned goals for the implementation of intervention programmes, strategic and specific interventions.

The six implementation itineraries design is based on two prioritization criteria of those of the *National Strategic Plan*:

1. A first criterion relating to the urgency of each of the seven strategic objectives.
2. A second criterion based on the importance assigned to each of the 47 specific objectives.

Thus, each intervention proposed in the *National Strategic Plan* is linked to one of the 6 goals according to the objectives to which it contributes (see Table 25).

Table 25. Criteria for the design of implementation pathways.

Goal (year)		**Strategic objective urgency**		
		Short term	**Medium term**	**Long term**
Importance of specific objective	**High**	**1** (2025)	**3** (2033)	**5** (2041)
	Normal	**2** (2029)	**4** (2037)	**6** (2045)

The objectives to which each intervention of the *National Strategic Plan* contributes, as well as the short, medium, or long term urgency assigned to each of the seven strategic objectives, on the one hand, and the high or normal importance of each of the forty-seven specific objectives, on the other hand, are detailed in Chapter 8 (Compliance and prioritization of objectives).

Finally, the implementation itineraries are refined considering the links between different specific interventions, addressing the necessity to complete the implementation of some interventions in order to approach the implementation of others.

The content of the resulting implementation itineraries is shown in Table 26 in terms of the intervention programmes and strategic interventions to be developed and, in terms of the specific interventions of each itinerary, in the following tables, indicating the interdependencies between specific interventions of the same and other itineraries.

Table 26. Implementación (en %) de programas y actuaciones estratégicas.

	Goal 1 2025	Goal 2 2029	Goal 3 2033	Goal 4 2037	Goal 5 2041	Goal 6 2045
P1. Programme for integrated management promotion and improvement of the governance framework.	3	3	50	30	14	
A1.1 Review of regulations and procedures.			50	50		
A1.2 Adoption of agreements for coordination between administrations.	25	25	25	25		
A1.3 Attracting external resources.			75	25		
A1.4 Development of instruments for strategic planning.			100			
A1.5 Development of instruments for the public participation consolidation in the management of the coast.				43	57	
P2. Programme for the reduction of anthropic pressure on the coast.	67				11	22
A2.1 Design and implementation of a DPMT management system.	100					
A2.2 Development of tools for the defence lines management.					33	67
P3. Programme for the promotion of the natural resilience of the coast.	12	38	38	12		
A3.1 Design and implementation of a coastal sediment management system.			75	25		
A3.2 Development of instruments for coastal protection through ecological restoration.	25	75				
P4. Programme for Enhanced Reconstruction.	100					
A4.1 Development of instruments for an enhanced reconstruction.	100					
P5. Programme for strengthening the capacity to understand.	10	42	3	23	12	10
A5.1 Design and implementation of a coastal monitoring system.	19	81				
A5.2 Establishment of a maintained capacity building and training project for DGCM staff according to professional profiles.			12	88		
A5.3 Establishment of a project to improve the state of the art in coastal protection.					57	43

Table 27. Target 1 - Implementation schedule up to 2025.

Specific intervention	Goal 1 2025	Goal 2 2029	Goal 3 2033	Goal 4 2037	Goal 5 2041	Goal 6 2045
SI3. Review of the Coastal Regulations in relation to the extension of easement and influence zones of the DPMT.						
SI4. Revision of the Coastal Law and its regulations in relation to the use of the DPMT, prohibitions and authorisations in easement and influence zones of the DPMT and infringements and sanctions.						
SI8. Adoption of agreements for the use and/or incorporation into the monitoring system of information collected by other private actors or administrations, with emphasis on regional governments and impacts after erosion events.						
SI31. Design and implementation of a system for the systematic revision and updating of the approved demarcation of the DPMT, based on its graphic definition, which allows the estimation of the discordance degree between the approved demarcation and the proposed demarcation.						
SI32. Redefinition of the content of the DGCM Occupations Database for the identification and characterisation of all DPMT occupations, with emphasis on unlicensed occupations and including data on occupied surface area and other relevant characteristics.						
SI33. Incorporation into the DPMT management system of the DGCM Occupations Database, in accordance with the previous redefinition of its content, for the systematic revision and updating of the DPMT occupations.						
SI34. Elaboration of methodological guides for the identification of DPMT assets, to guarantee the homogeneity of criteria in the interpretation of what is disposal in law in technical terms.						
SI35. Elaboration of methodological guides to confer DPMT occupation licenses based on measurable and objective information considering the current and future situation (under climate change scenarios) and on the basis of clear, concrete and unequivocal criteria, established in collaboration with the appropriate regional administrations.						
SI36. Incorporation of criteria based on the estimation of carrying capacity from beaches and, in general, from the coastal environment, considering their environmental sensitivity and ecological requirements, into the methodology to confer DPMT occupation licenses.						
SI47. Design and implementation of a national environmental awareness-raising communication campaign to generate habits, awareness and behavior compatible with the natural coastal environment conservation and the coastal protection.						
SI48. Preparation of an issues paper on good practices and a methodological guide for decision making processes in relation to the selection of interventions to be implemented after erosion events.						
SI49. Incorporation, into the selection of interventions to be implemented after erosion events, of considerations for the identification of emergency interventions among all of them.						
SI50. Design and implementation of a system for systematic monitoring of coastal erosion and flooding, preferably using satellite earth observation techniques.						
SI51. Incorporation into the monitoring system of a component for the systematic monitoring of coastal erosion and flooding produced by erosion events (on short-term scales).						
SI52. Incorporation into the monitoring system of the inputs and outputs sediment volumes estimation from the coastal system at the macro-scale, with emphasis on natural inputs from drainage basins.						
SI55. Incorporation into the monitoring system of the systematic review and update of coastal erosion hazard for the regional scale diagnosis.						
SI56. Incorporation into the monitoring system of the systematic review and update of the coastal erosion and flooding hazard for the regional scale diagnosis, based on the studies carried out in the Floods Directive framework according to the revised methodologies.						
SI57. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the coastal system based on the characterisation of coastal erosion and flooding hazards for the regional scale diagnosis.						
SI58. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the coastal natural environment based on the characterisation of coastal erosion hazards for the regional scale diagnosis.						
SI59. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the coastal anthropic environment based on the characterisation of coastal erosion and flooding hazards for diagnosis on a regional scale.						
SI60. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the DPMT occupations based on the hazard characterisation derived from coastal erosion and flooding for diagnosis on a regional scale.						
SI62. Incorporation into the monitoring system of a viewer and repository to centralize and homogenize the information collected by the various regional climate change adaptation projects.						
SI63. Incorporation into the monitoring system of a viewer with information on projections of erosion events (on short-term scales) based on the results of their systematic monitoring and the study of the hazard, and under climate change scenarios, emphasizing on their potential impacts (risk).						
SI66. Design and implementation of internal communication campaigns within the DGCM to disseminate the new methodological guides, thematic documents and advances in the state of the art proposed on the National Strategic Plan.						

Table 28. Target 2 - Implementation schedule up to 2029.

Specific intervention	Goal 1 2025	Goal 2 2029	Goal 3 2033	Goal 4 2037	Goal 5 2041	Goal 6 2045
SI8. Adoption of agreements for the use and/or incorporation into the monitoring system of information collected by other private actors or administrations, with emphasis on regional governments and impacts after erosion events.						
SI10. Adoption of agreements for the conservation of the coastal natural environment carried out by other competent administrations, based on their proven effectiveness, and the multiple synergies of nature-based measures (through the constitution of a cross-sectoral working group).						
SI44. Elaboration of an issues paper of good practices and methodological guide for decision-making processes related to the selection and implementation of interventions for the conservation of the natural environment on a regional scale based on their proven effects on erosion hazard, vulnerability and risk on the natural environment.						
SI45. Incorporation, into the selection and implementation of interventions for the conservation of the natural environment, of considerations for the exploitation of coastal ecosystem assets and services, principally the protection service against erosion and flooding of beaches and transitional waters, based on their monitoring.						
SI46. Establishment of a programme for the systematic review of the extension of environmental protection figures, in collaboration with the appropriate administrations.						
SI50. Design and implementation of a system for systematic monitoring of coastal erosion and flooding, preferably using satellite earth observation techniques.						
SI51. Incorporation into the monitoring system of a component for the systematic monitoring of coastal erosion and flooding produced by erosion events (on short-term scales).						
SI53. Elaboration of methodological guidelines for the characterisation of coastal erosion hazards based on the identification and understanding of the relevant hydro-morphodynamic processes at various spatio-temporal scales.						
SI54. Revision of the methodologies applied in the Floods Directive framework for the characterisation of coastal flood hazard and the identification of ARPSIS, so that the coastal erosion process is considered.						
SI55. Incorporation into the monitoring system of the systematic review and update of coastal erosion hazard for the regional scale diagnosis.						
SI56. Incorporation into the monitoring system of the systematic review and update of the coastal erosion and flooding hazard for the regional scale diagnosis, based on the studies carried out in the Floods Directive framework according to the revised methodologies.						
SI57. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the coastal system based on the characterisation of coastal erosion and flooding hazards for the regional scale diagnosis.						
SI58. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the coastal natural environment based on the characterisation of coastal erosion hazards for the regional scale diagnosis.						
SI59. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the coastal anthropic environment based on the characterisation of coastal erosion and flooding hazards for diagnosis on a regional scale.						
SI60. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the DPMT occupations based on the hazard characterisation derived from coastal erosion and flooding for diagnosis on a regional scale.						
SI61. Incorporation into the monitoring system of a viewer for the systematic monitoring of protection ecosystem services against erosion and flooding of coastal ecosystems, but also addresses other regulatory, provisioning or cultural services.						
SI63. Incorporation into the monitoring system of a viewer with information on projections of erosion events (on short-term scales) based on the results of their systematic monitoring and the study of the hazard, and under climate change scenarios, emphasizing on their potential impacts (risk).						
SI64. Incorporation into the monitoring system of a viewer with information on coastal erosion projections (on medium and long-term scales) based on the results of systematic monitoring and the hazard, and under climate change scenarios, emphasizing on its potential impacts (risk).						
SI65. Incorporation into the monitoring system of a viewer with information on combined coastal erosion and flooding projections based on the results of its systematic monitoring and the study of its hazard and under climate change scenarios, emphasizing on its potential impacts (risk).						
SI66. Design and implementation of internal communication campaigns within the DGCM to disseminate the new methodological guides, thematic documents and advances in the state of the art proposed on the National Strategic Plan.						

Table 29. Target 3 - Implementation schedule up to 2033.

Specific intervention	Goal 1 2025	Goal 2 2029	Goal 3 2033	Goal 4 2037	Goal 5 2041	Goal 6 2045
SI3. Review of the Coastal Regulations in relation to the extension of easement and influence zones of the DPMT.						
SI4. Revision of the Coastal Law and its regulations in relation to the use of the DPMT, prohibitions and authorisations in easement and influence zones of the DPMT and infringements and sanctions.						
SI6. Review of sediment extraction procedures, their control and monitoring in the different types of potential borrow areas.						
SI9. Adoption of agreements for exploitation of sediment sources between the DGCM and administrations with jurisdiction over potential borrow areas and for the designation of strategic borrow areas, with emphasis on submarine deposits.						
SI11. Estimation of the resources deficit in the DGCM based on the estimation of required human, material and economic resources.						
SI14. Estimation of human, material and economic resources necessary for the supervision of the penalties assigned by the DGCM.						
SI15. Preparation of a feasibility study and legal conditions about obtaining external financing or assets and services financed by third parties, in general.						
SI16. Preparation of a feasibility study and legal conditions to explore the possibility of obtaining additional contingency funds from private sources in the climate emergency context.						
SI17. Preparation of a feasibility study and legal conditions for the incentives and penalties implementation to third parties with coastal sediment management obligations (including a program to review the technical terms of their obligations and the supervision until fulfillment).						
SI18. Elaboration of a feasibility study and legal conditions for establishing shared responsibilities in terms of financing coastal protection by the direct beneficiaries of coastal ecosystem services.						
SI19. Elaboration of a catalog of measures for prevention (implemented in advance to avoid risks) and recovery (implemented after experiencing an impact), both institutional and social (not involving action on the physical environment), including soft measures (at administrative and management level) and hard measures (at regulations and laws level), as well as structural and physical measures, with an emphasis on nature-based measures.						
SI20. Elaboration of strategies for coastal protection considering the effects of climate change in regions where it is unavailable or obsolete.						
SI21. Elaboration of a thematic document of good practices and methodological guidance for decision-making processes in relation to the selection and implementation of interventions for social, institutional, physical and structural prevention at regional scale, with emphasis on controlled rollback and nature-based measures, based on the proven effects of conservation and restoration of coastal ecosystems and ecosystem services on erosion and flood hazard, vulnerability and risk on the anthropogenic environment.						
SI22. Incorporation into the selection and implementation of interventions for social, institutional, physical and structural prevention of climate change adaptation based on the results of regional climate change adaptation projects.						
SI23. Elaboration of specific plans for coastal protection in singular enclaves that require special attention, based on the identification of these singular enclaves.						
SI26. Incorporation of the opinions of the general public as one of the elements to be considered in decision-making processes, from the level of selection and definition of interventions for coastal protection carried out by the DGCM.						
SI34. Elaboration of methodological guides for the identification of DPMT assets, to guarantee the homogeneity of criteria in the interpretation of what is disposal in law in technical terms.						
SI35. Elaboration of methodological guides to confer DPMT occupation licenses based on measurable and objective information considering the current and future situation (under climate change scenarios) and on the basis of clear, concrete and unequivocal criteria, established in collaboration with the appropriate regional administrations.						
SI40. Elaboration of a complete inventory with a review program, regarding sediment sources (inside and outside the coastal system) with physical, environmental and economic information, with emphasis on the identification of new sources not yet exploited and including information on the specific limitations to the exploitation of each source.						
SI42. Development of exploitation plans for the inventoried sediment inputs sources, based on the designation of strategic sediment sources.						
SI43. Identification and designation of strategic sediment management interventions, based on the estimation of the volume of sediment required in beach maintenance, guaranteeing their ecosystem protection service.						
SI66. Design and implementation of internal communication campaigns within the DGCM to disseminate the new methodological guides, thematic documents and advances in the state of the art proposed on the National Strategic Plan.						
SI73. Development of a specialization course on environmental rehabilitation of transitional waters for the DGCM technical staff, with emphasis on the peripheral services in places where there are transitional waters of relevance.						

Table 30. Target 4 - Implementation schedule up to 2037.

Specific intervention	Goal 1 2025	Goal 2 2029	Goal 3 2033	Goal 4 2037	Goal 5 2041	Goal 6 2045
SI1. Identification of regulations and procedures for simplification.						
SI2. Review of the administrative procedure for the DPMT demarcation in order to simplify it.						
SI5. Review of the Coastal Law and its regulations in relation to limit and relocate coastal uses that add a few or no value at regional or national level outside the coastal strip.						
SI7. Mapping of the governance framework to illustrate roles, relationships between institutions, deficits and overlaps.						
SI12. Estimation of human, material and economic resources required for regulatory development, implementation and monitoring by the DGCM.						
SI13. Estimation of human, material and economic resources necessary for the monitoring of the DPMT administrative demarcation procedure, its systematic review and updating by the DGCM.						
SI19. Elaboration of a catalog of measures for prevention (implemented in advance to avoid risks) and recovery (implemented after experiencing an impact), both institutional and social (not involving action on the physical environment), including soft measures (at administrative and management level) and hard measures (at regulations and laws level), as well as structural and physical measures, with an emphasis on nature-based measures.						
SI21. Elaboration of a thematic document of good practices and methodological guidance for decision-making processes in relation to the selection and implementation of interventions for social, institutional, physical and structural prevention at regional scale, with emphasis on controlled rollback and nature-based measures, based on the proven effects of conservation and restoration of coastal ecosystems and ecosystem services on erosion and flood hazard, vulnerability and risk on the anthropogenic environment.						
SI22. Incorporation into the selection and implementation of interventions for social, institutional, physical and structural prevention of climate change adaptation based on the results of regional climate change adaptation projects.						
SI24. Review of current regulations, in order to contemplate the need to develop communication and participation plans that must accompany all interventions for coastal protection carried out by the DGCM.						
SI25. Elaboration of methodological guides for the development of communication and participation plans for every coastal protection interventions carried out by the DGCM.						
SI26. Incorporation of the opinions of the general public as one of the elements to be considered in decision-making processes, from the level of selection and definition of interventions for coastal protection carried out by the DGCM.						
SI30. Design and launch of a communication campaign related to the implementation of the National Strategic Plan.						
SI34. Elaboration of methodological guides for the identification of DPMT assets, to guarantee the homogeneity of criteria in the interpretation of what is disposal in law in technical terms.						
SI35. Elaboration of methodological guides to confer DPMT occupation licenses based on measurable and objective information considering the current and future situation (under climate change scenarios) and on the basis of clear, concrete and unequivocal criteria, established in collaboration with the appropriate regional administrations.						
SI36. Incorporation of criteria based on the estimation of carrying capacity from beaches and, in general, from the coastal environment, considering their environmental sensitivity and ecological requirements, into the methodology to confer DPMT occupation licenses.						
SI41. Development of a sediment sinks inventory together with a program for their revision, with emphasis on those of anthropogenic origin.						
SI44. Elaboration of an issues paper of good practices and methodological guide for decision-making processes related to the selection and implementation of interventions for the conservation of the natural environment on a regional scale based on their proven effects on erosion hazard, vulnerability and risk on the natural environment.						
SI45. Incorporation, into the selection and implementation of interventions for the conservation of the natural environment, of considerations for the exploitation of coastal ecosystem assets and services, principally the protection service against erosion and flooding of beaches and transitional waters, based on their monitoring.						
SI48. Preparation of an issues paper on good practices and a methodological guide for decision making processes in relation to the selection of interventions to be implemented after erosion events.						
SI49. Incorporation, into the selection of interventions to be implemented after erosion events, of considerations for the identification of emergency interventions among all of them.						
SI53. Elaboration of methodological guidelines for the characterisation of coastal erosion hazards based on the identification and understanding of the relevant hydro-morphodynamic processes at various spatio-temporal scales.						
SI54. Revision of the methodologies applied in the Floods Directive framework for the characterisation of coastal flood hazard and the identification of ARPSIS, so that the coastal erosion process is considered.						
SI66. Design and implementation of internal communication campaigns within the DGCM to disseminate the new methodological guides, thematic documents and advances in the state of the art proposed on the National Strategic Plan.						
SI67. Elaboration of good practices guides based on the experience of the DGCM and development of training activities related to the implementation of coastal management and protection measures for the DPMT release.						
SI68. Elaboration of good practices guidelines based on DGCM experience and development of training activities related to the implementation of sediment management measures.						
SI69. Elaboration of good practices guides based on the experience of the DGCM and development of training activities related to the implementation of environmental rehabilitation measures for beaches, their dunes and cliff stabilization.						
SI70. Elaboration of good practices guides based on the experience of the DGCM and development of training activities related to the implementation of measures for structures building for coastal protection.						
SI71. Elaboration of good practices guidelines based on the experience of the DGCM and development of training activities related to the implementation of measures for the removal of structures for coastal protection.						
SI72. Elaboration of good practices guidelines based on the experience of the DGCM and development of training activities related to the implementation of measures for the review and recovery after erosive events.						

Table 31. Target 5 - Itinerary of implementation until 2041.

Specific intervention	Goal 1 2025	Goal 2 2029	Goal 3 2033	Goal 4 2037	Goal 5 2041	Goal 6 2045
SI24. Review of current regulations, in order to contemplate the need to develop communication and participation plans that must accompany all interventions for coastal protection carried out by the DGCM.						
SI25. Elaboration of methodological guides for the development of communication and participation plans for every coastal protection interventions carried out by the DGCM.						
SI27. Design and implementation of a communication campaign to facilitate access to knowledge by the public on coastal erosion projections.						
SI28. Design and implementation of a communication campaign that facilitates the access by the public to information about the use of the DPMT, the DPMT easement and influence areas and the impacts of human activities pressure on the coastal environment.						
SI29. Design and implementation of a communication campaign that facilitates public access to the range of coastal protection measures contemplated by the DGCM, with an emphasis on nature-based measures.						
SI37. Identification of lines of defence (understood in a broad sense) and their designation as strategic lines of defence to be maintained or retreat in a controlled manner as a result of the increased risk produced.						
SI75. Institutional support for research into nature-based coastal protection measures with state, regional and EU funding.						
SI77. Development of pilot study of cases for the analysis of lessons learned in relation to the prevention of silt accumulation on basins and reservoirs, in cooperation with different administrations.						
SI78. Development of pilot study of cases for the analysis of lessons learned in relation to the search for alternative sources of sediment inputs.						
SI79. Development of pilot study of cases for the analysis of lessons learned in relation to the environmental rehabilitation of transitional waters.						

Table 32. Target 6 - Implementation Schedule to 2045.

Specific intervention	Goal 1 2025	Goal 2 2029	Goal 3 2033	Goal 4 2037	Goal 5 2041	Goal 6 2045
SI38. Elaboration of a feasibility study and legal conditions for the implementation of controlled rollback measures for the release of the DPMT.						
SI39. Identification and designation of strategic assets and services to be defended, relocated or removed from the DPMT.						
SI74. Institutional support for research into coastal ecosystem services (benefits provided by them and damage experienced from coastal operations/climate change) with state, regional and EU funding.						
SI76. Institutional support for research into the effectiveness of conservation interventions for the environment with state, regional and European Union funding.						
SI80. Development of a theoretical study about the effects (positive and negative) of the removal of disruptive structures compared to their maintenance, for different coastal typologies and under different time horizons.						

8. COMPLIANCE AND PRIORITIZATION OF OBJECTIVES

The previous two chapters describe the content of the intervention programmes (see Chapter 5) and the proposed roadmap (see Chapter 6). This chapter shows how the proposed interventions, and their implementation itineraries result in a robust and coherent *National Strategic Plan* with the established objectives and their prioritization.

Firstly, the strategic and specific objectives to which each programme and intervention contributes are indicated (see section 8.1), so that it is clear that the *National Strategic Plan* is robust in relation to the fulfilment of the established objectives.

Secondly, the prioritization of objectives that justifies the design of the roadmap is detailed (see section 8.2), so that it is evident that the implementation itineraries are consistent with this prioritization.

8.1 Strategic and specific objectives of intervention programmes

The intervention programmes develop the seven strategic objectives as detailed below (see Table 33), with the general objective of adaptation to climate change being common to all of them.

Table 33. Programas de actuación y objetivos estratégicos a los que contribuyen.

Intervention programmes	Strategic objectives	
P1. Programme for integrated management promotion and improvement of the governance framework.	2. Improving the governance framework.	2.1. Strengthening planning capacity. 2.2. Improving communication and participation.
P2. Programme for the reduction of anthropic pressure on the coast.	1. Release of the Maritime-Terrestrial Public Domain (PMTD).	
	5. Controlled withdrawal.	
P3. Programme for the promotion of the natural resilience of the coast.	3. Restoration of the sediment balance.	
	4. Recovery of natural elements.	
P4. Programme for Enhanced Reconstruction.	6. Recovery and revision after erosion events.	
P5. Programme for strengthening the capacity to understand.	7. Strengthening the capacity to understand.	7.1.Information gathering and management. 7.2.DGCM staff training. 7.3.Improving the state of art regarding coastal protection.

The strategic objectives to which the strategic interventions of each programme contribute, and the specific objectives to which the corresponding specific interventions contribute are detailed below.

8.1.1. Objectives of the interventions of programme for integrated management promotion and improvement of the governance framework (P1)

The "Programme for integrated management promotion and improvement of the governance framework" contributes mainly, as its name indicates, to **improving the governance framework** (Strategic Objective 2) and includes the following five strategic interventions:

- Four strategic interventions that contribute to the strategic objective of **Strengthening planning capacity** (Strategic Objective 2.1):
  - "Review of regulations and procedures" (A1.1).
  - "Adoption of agreements for coordination between administrations" (A1.2).
  - "Attracting external resources" (A1.3).
  - "Development of instruments for strategic planning" (A1.4.

- A strategic intervention that contributes to the objective of **Improving communication and participation** (Strategic Objective 2.2):
  - "Development of instruments for the public participation consolidation in the management of the coast" (A1.5).

These strategic interventions are composed of several specific interventions that contribute to the specific objectives detailed in the following tables.

Table 34. Specific interventions of strategic intervention A1.1 "Review of regulations and procedures" and specific objectives to which they contribute.

Specific intervention	Specific objective
SI1. Identification of regulations and procedures for simplification.	9. Fix the complexity of regulations development, implementation, and monitoring.
SI2. Review of the administrative procedure for the DPMT demarcation in order to simplify it.	1. Correct the administrative procedure length for delimitation of the DPMT.
SI3. Review of the Coastal Regulations in relation to the extension of easement and influence zones of the DPMT.	26. Reduce the anthropic environment pressure..
SI4. Revision of the Coastal Law and its regulations in relation to the use of the DPMT, prohibitions and authorisations in easement and influence zones of the DPMT and infringements and sanctions.	27. Reduce the human activities pressure.
SI5. Review of the Coastal Law and its regulations in relation to limit and relocate coastal uses that add a few or no value at regional or national level outside the coastal strip.	34. Reduce the consequences of the socioeconomic value of the coast.
SI6. Review of sediment extraction procedures, their control and monitoring in the different types of potential borrow areas.	18. Decrease the limitations on exploitation of sediment sources.

Table 35. Specific interventions of strategic intervention A1.2 "Adoption of agreements for coordination between administrations" and specific objectives to which they contribute.

Specific intervention	Specific objective
SI7. Mapping of the governance framework to illustrate roles, relationships between institutions, deficits, and overlaps.	9. Fix the complexity of regulations development, implementation, and monitoring.
SI8. Adoption of agreements for the use and/or incorporation into the monitoring system of information collected by other private actors or administrations, with emphasis on regional governments and impacts after erosion events.	45. Promote impact monitoring after erosive events.
SI9. Adoption of agreements for exploitation of sediment sources between the DGCM and administrations with jurisdiction over potential borrow areas and for the designation of strategic borrow areas, with emphasis on submarine deposits.	18. Decrease the limitations on exploitation of sediment sources.
SI10. Adoption of agreements for the conservation of the coastal natural environment carried out by other competent administrations, based on their proven effectiveness, and the multiple synergies of nature-based measures (through the constitution of a cross-sectoral working group).	28. Reduce the consequences of interventions for the natural environment conservation without an adequate basis.

Table 36. Specific interventions of strategic intervention A1.3 "Attracting external resources" and specific objectives to which they contribute.

Specific intervention	Specific objective
SI11. Estimation of the resources deficit in the DGCM based on the estimation of required human, material, and economic resources.	10. Reduce limitations on human, material, and economic resources.
SI12. Estimation of human, material and economic resources required for regulatory development, implementation, and monitoring by the DGCM.	9. Fix the complexity of regulations development, implementation, and monitoring.
SI13. Estimation of human, material, and economic resources necessary for the monitoring of the DPMT administrative demarcation procedure, its systematic review and updating by the DGCM.	1. Correct the administrative procedure length for delimitation of the DPMT.
SI14. Estimation of human, material, and economic resources necessary for the supervision of the penalties assigned by the DGCM.	27. Reduce the human activities pressure.
SI15. Preparation of a feasibility study and legal conditions about obtaining external financing or assets and services financed by third parties, in general.	10. Reduce limitations on human, material, and economic resources.
SI16. Preparation of a feasibility study and legal conditions to explore the possibility of obtaining additional contingency funds from private sources in the climate emergency context.	46. Promote the acquisition of additional contingency funds.
SI17. Preparation of a feasibility study and legal conditions for the incentives and penalties implementation to third parties with coastal sediment management obligations (including a program to review the technical terms of their obligations and the supervision until fulfilment).	16. Reduce the consequences of anthropogenic disruption of coastal sediment drift.
SI18. Elaboration of a feasibility study and legal conditions for establishing shared responsibilities in terms of financing coastal protection by the direct beneficiaries of coastal ecosystem services.	10. Reduce limitations on human, material, and economic resources.

Table 37. Specific interventions of strategic intervention A1.4 "Development of instruments for strategic planning" and specific objectives to which they contribute.

Specific intervention	Specific objective
SI19. Elaboration of a catalogue of measures for prevention (implemented in advance to avoid risks) and recovery (implemented after experiencing an impact), both institutional and social (not involving action on the physical environment), including soft measures (at administrative and management level) and hard measures (at regulations and laws level), as well as structural and physical measures, with an emphasis on nature-based measures.	39. Promote social, institutional, physical, and structural prevention.
SI20. Elaboration of strategies for coastal protection considering the effects of climate change in regions where it is unavailable or obsolete.	12. Promote strategic planning for coastal protection based on the best scientific and technical knowledge.
SI21. Elaboration of a thematic document of good practices and methodological guidance for decision-making processes in relation to the selection and implementation of interventions for social, institutional, physical and structural prevention at regional scale, with emphasis on controlled rollback and nature-based measures, based on the proven effects of conservation and restoration of coastal ecosystems and ecosystem services on erosion and flood hazard, vulnerability and risk on the anthropogenic environment.	39. Promote social, institutional, physical, and structural prevention.
SI22. Incorporation into the selection and implementation of interventions for social, institutional, physical, and structural prevention of climate change adaptation based on the results of regional climate change adaptation projects.	8. Promote the use of information from climate change adaptation projects.
SI23. Elaboration of specific plans for coastal protection in singular enclaves that require special attention, based on the identification of these singular enclaves.	12. Promote strategic planning for coastal protection based on the best scientific and technical knowledge.

Table 38. Actuaciones específicas de la actuación estratégica A1.5 "Desarrollo de instrumentos para la consolidación de la participación pública en la gestión de la costa" y objetivos específicos a los que contribuyen.

Specific intervention	Specific objective
SI24. Review of current regulations, to contemplate the need to develop communication and participation plans that must accompany all interventions for coastal protection carried out by the DGCM.	13. Promote an inclusive coastal management culture.
SI25. Elaboration of methodological guides for the development of communication and participation plans for every coastal protection intervention carried out by the DGCM.	13. Promote an inclusive coastal management culture.
SI26. Incorporation of the opinions of the general public as one of the elements to be considered in decision-making processes, from the level of selection and definition of interventions for coastal protection carried out by the DGCM.	13. Promote an inclusive coastal management culture.
SI27. Design and implementation of a communication campaign to facilitate access to knowledge by the public on coastal erosion projections.	33. Correct expectations regarding the coastal protection through structures as the predominant measure.

Specific intervention	Specific objective
SI28. Design and implementation of a communication campaign that facilitates the access by the public to information about the use of the DPMT, the DPMT easement and influence areas and the impacts of human activities pressure on the coastal environment.	27. Reduce the human activities pressure.
SI29. Design and implementation of a communication campaign that facilitates public access to the range of coastal protection measures contemplated by the DGCM, with an emphasis on nature-based measures.	33. Correct expectations regarding the coastal protection through structures as the predominant measure.
SI30. Design and launch of a communication campaign related to the implementation of the *National Strategic Plan*.	13. Promote an inclusive coastal management culture.

8.1.2. Objectives of the interventions of programme for the reduction of anthropic pressure on the coast (P2)

The "Programme for the reduction of anthropogenic pressure on the coast" includes the following two strategic interventions:

- "Design and implementation of a DPMT management system" (A2.1), which primarily contributes to the **Release of the Maritime-Terrestrial Public Domain (DPMT)** (Strategic Objective 1).
- "Development of tools for the management of defence lines" (A2.2), which primarily contributes to the **Controlled withdrawal** (Strategic objective 5).

These strategic interventions are composed of several specific interventions that contribute to the specific objectives detailed in the tables below.

Table 39. Specific intervention of strategic intervention A2.1 "Design and implementation of a DPMT management system" and specific objectives to which they contribute.

Specific intervention	Specific objective
SI31. Design and implementation of a system for the systematic revision and updating of the approved demarcation of the DPMT, based on its graphic definition, which allows the estimation of the discordance degree between the approved demarcation and the proposed demarcation.	2. Correct the discrepancy between the approved demarcation and the legal definition of the DPMT.
SI32. Redefinition of the content of the DGCM Occupations Database for the identification and characterisation of all DPMT occupations, with emphasis on unlicensed occupations and including data on occupied surface area and other relevant characteristics.	3. Correct the lack of information on DPMT occupations.
SI33. Incorporation into the DPMT management system of the DGCM Occupations Database, in accordance with the previous redefinition of its content, for the systematic revision and updating of the DPMT occupations.	3. Correct the lack of information on DPMT occupations.
SI34. Elaboration of methodological guides for the identification of DPMT assets, to guarantee the homogeneity of criteria in the interpretation of what is disposal in law in technical terms.	2. Correct the discrepancy between the approved demarcation and the legal definition of the DPMT.
SA35. Elaboration of methodological guides to confer DPMT occupation licenses based on measurable and objective information considering the current and future situation (under climate change scenarios) and based on clear, concrete, and unequivocal criteria, established in collaboration with the appropriate regional administrations.	6. Reduce DPMT occupation pressure on the coastal system.
AE36. Incorporation of criteria based on the estimation of carrying capacity from beaches and, in general, from the coastal environment, considering their environmental sensitivity and ecological requirements, into the methodology to confer DPMT occupation licenses.	6. Reduce DPMT occupation pressure on the coastal system.

Table 40. Specific interventions of strategic intervention A2.2 "Development of instruments for the management of defence lines" and specific objectives to which they contribute.

Specific intervention	Specific objective
SI37. Identification of lines of defence (understood in a broad sense) and their designation as strategic lines of defence to be maintained or retreat in a controlled manner as a result of the increased risk produced.	33. Correct expectations regarding the coastal protection through structures as the predominant measure.
SI38. Elaboration of a feasibility study and legal conditions for the implementation of controlled rollback measures for the release of the DPMT.	7. Enhance the experience in the implementation of DPMT release measures.
SI39. Identification and designation of strategic assets and services to be defended, relocated, or removed from the DPMT.	34. Reduce the consequences of the socioeconomic value of the coast.

8.1.3. Objectives of the interventions of programme for the promotion of the natural resilience of the coast (P3)

The "Programme for the promotion of the natural resilience of the coast" includes the following two strategic interventions:

- "Design and implementation of a coastal sediment management system" (A3.1), which principally contributes to the **restoration of the sediment balance** (Strategic Objective 3).
- "Development of instruments for coastal protection through ecological restoration" (A3.2), which mainly contributes to the **recovery of natural elements** (Strategic Objective 4).

These strategic interventions are composed of different specific interventions that contribute to the specific objectives detailed in the following tables.

Table 41. Specific interventions of strategic intervention A3.1 "Design and implementation of a coastal sediment management system" and specific objectives to which they contribute.

Specific intervention	Specific objective
SI40. Elaboration of a complete inventory with a review program, regarding sediment sources (inside and outside the coastal system) with physical, environmental, and economic information, with emphasis on the identification of new sources not yet exploited and including information on the specific limitations to the exploitation of each source.	14. Correct the lack of information related to sources for sediment inputs.
SI41. Development of a sediment sinks inventory together with a program for their revision, with emphasis on those of anthropogenic origin.	16. Reduce the consequences of anthropogenic disruption of coastal sediment drift.
SI42. Development of exploitation plans for the inventoried sediment inputs sources, based on the designation of strategic sediment sources.	20. Promote the availability of sediment inputs.
SI43. Identification and designation of strategic sediment management interventions, based on the estimation of the volume of sediment required in beach maintenance, guaranteeing their ecosystem protection service.	40. Fix the deterioration of the coastal maintenance and conservation status before the erosion event.

Table 42. Specific interventions of strategic intervention A3.2 "Development of instruments for coastal protection through ecological restoration" and specific objectives to which they contribute.

Specific intervention	Specific objective
SI44. Elaboration of a thematic document of good practices and methodological guide for decision-making processes related to the selection and implementation of interventions for the conservation of the natural environment on a regional scale based on their proven effects on erosion hazard, vulnerability, and risk on the natural environment.	28. Reduce the consequences of interventions for the natural environment conservation without an adequate basis.
SI45. Incorporation, into the selection and implementation of interventions for the conservation of the natural environment, of considerations for the exploitation of coastal ecosystem assets and services, principally the protection service against erosion and flooding of beaches and transitional waters, based on their monitoring.	31. Promote the ecosystem services of the natural coastal environment.
SI46. Establishment of a programme for the systematic review of the extension of environmental protection figures, in collaboration with the appropriate administrations.	29. Promote environmental protection figures.
SI47. Design and implementation of a national environmental awareness-raising communication campaign to generate habits, awareness and behaviour compatible with the natural coastal environment conservation and the coastal protection.	27. Reduce the human activities pressure.

8.1.4. Objectives of the interventions of programme for enhanced reconstruction (P4)

The "Programme for enhanced reconstruction" includes a single strategic intervention consisting of the "development of instruments for an enhanced reconstruction" (A4.1), as described below, and contributes to the **recovery and revision after erosion events** (Strategic Objective 6).

This strategic intervention is composed of several specific interventions that contribute to the specific objectives detailed in the table below.

Table 43. Specific interventions of strategic intervention A4.1 "Development of instruments for an enhanced reconstruction" and specific objectives to which they contribute.

Specific intervention	Specific objective
SI48. Preparation of a thematic document on good practices and a methodological guide for decision making processes in relation to the selection of interventions to be implemented after erosion events.	47. Promote an enhanced reconstruction after erosive events.
SI49. Incorporation, into the selection of interventions to be implemented after erosion events, of considerations for the identification of emergency interventions among all of them.	43. Enhance emergency processing.

8.1.5. Objectives of the interventions of programme for strengthening the capacity to understand (P5)

The "Programme for strengthening the capacity to understand" contributes primarily to **strengthening the capacity to understand** (Strategic Objective 7). To this end, it includes the following three strategic interventions:

- "Design and implementation of a coastal monitoring system" (A5.1), relating to **information gathering and management** (Strategic objective 7.1).

- "Establishment of a maintained capacity building and training project for DGCM staff according to professional profiles" (A5.2), which contributes to the **DGCM staff training** objective (Strategic objective 7.2).
- "Establishment of a project to improve the state of the art in coastal protection" (A5.3), which contributes to the objective of **improving the state of the art regarding coastal protection** (Strategic objective 7.3).

These strategic interventions are composed of several specific interventions that contribute to the specific objectives detailed in the following tables.

Table 44. Specific interventions of strategic intervention A5.1 "Design and implementation of a coastal monitoring system" and specific objectives to which they contribute.

Specific intervention	Specific objective
SI50. Design and implementation of a system for systematic monitoring of coastal erosion and flooding, preferably using satellite earth observation techniques.	4. Reduce the consequences of the changing physical environment in the current situation and in the long term.
SI51. Incorporation into the monitoring system of a component for the systematic monitoring of coastal erosion and flooding produced by erosion events (on short-term scales).	45. Promote impact monitoring after erosive events.
SI52. Incorporation into the monitoring system of the inputs and outputs sediment volumes estimation from the coastal system at the macro-scale, with emphasis on natural inputs from drainage basins.	17. Reduce the consequences of the complexity of the coastal physical system.
SI53. Elaboration of methodological guidelines for the characterisation of coastal erosion hazards based on the identification and understanding of the relevant hydro-morphodynamical processes at various spatial-temporal scales.	21. Correct the lack of information on erosion hazards.
SI54. Revision of the methodologies applied in the *Floods Directive* framework for the characterisation of coastal flood hazard and the identification of ARPSIS, so that the coastal erosion process is considered.	32. Fix the lack of information on combined erosion and flood hazards.
SI55. Incorporation into the monitoring system of the systematic review and update of coastal erosion hazard for the regional scale diagnosis.	21. Correct the lack of information on erosion hazards.
SI56. Incorporation into the monitoring system of the systematic review and update of the coastal erosion and flooding hazard for the regional scale diagnosis, based on the studies carried out in the *Floods Directive* framework according to the revised methodologies.	32. Fix the lack of information on combined erosion and flood hazards.
SI57. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the coastal system based on the characterisation of coastal erosion and flooding hazards for the regional scale diagnosis.	41. Reduce erosion and flooding impacts on the coastal system in the current situation.
SI58. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the coastal natural environment based on the characterisation of coastal erosion hazards for the regional scale diagnosis.	24. Reduce erosion impacts on the natural coastal environment in the current situation.
SI59. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the coastal anthropic environment based on the characterisation of coastal erosion and flooding hazards for diagnosis on a regional scale.	35. Reduce erosion and flooding impacts on the anthropogenic coastal environment in the current situation.
SI60. Incorporation into the monitoring system of the systematic review and updating of vulnerability and risk on the DPMT occupations based on the hazard characterisation derived from coastal erosion and flooding for diagnosis on a regional scale.	5. Reduce erosion and flooding impacts on the DPMT occupations with license

Specific intervention	Specific objective
SI61. Incorporation into the monitoring system of a viewer for the systematic monitoring of protection ecosystem services against erosion and flooding of coastal ecosystems, but also addresses other regulatory, provisioning, or cultural services.	22. Correct the lack of information and knowledge about the ecosystem services of the coastal natural environment.
SI62. Incorporation into the monitoring system of a viewer and repository to centralize and homogenize the information collected by the various regional climate change adaptation projects.	8. Promote the use of information from climate change adaptation projects.
SI63. Incorporation into the monitoring system of a viewer with information on projections of erosion events (on short-term scales) based on the results of their systematic monitoring and the study of the hazard, and under climate change scenarios, emphasizing on their potential impacts (risk).	42. Reduce the consequences of increased hazard associated with erosive events in the long term.
SI64. Incorporation into the monitoring system of a viewer with information on coastal erosion projections (on medium and long-term scales) based on the results of systematic monitoring and the hazard, and under climate change scenarios, emphasizing on its potential impacts (risk).	25. Reduce consequences of increased erosion hazard in the natural coastal environment in the long term.
SI65. Incorporation into the monitoring system of a viewer with information on combined coastal erosion and flooding projections based on the results of its systematic monitoring and the study of its hazard and under climate change scenarios, emphasizing on its potential impacts (risk).	36. Reduce the consequences of increased erosion and flooding hazards in the anthropogenic coastal environment in the long term.

Table 45. Specific interventions of strategic intervention A5.2 "Establishment of a maintained capacity building and training project for DGCM staff according to professional profiles" and specific objectives to which they contribute.

Actuación específica	Objetivo específico
SI66. Design and implementation of internal communication campaigns within the DGCM to disseminate the new methodological guides, thematic documents, and advances in the state of the art proposed on the *National Strategic Plan*.	11. Enhance the capacity-building on the DGCM staff
SI67. Elaboration of good practices guides based on the experience of the DGCM and development of training activities related to the implementation of coastal management and protection measures for the DPMT release.	7. Enhance the experience in the implementation of DPMT release measures.
SI68. Elaboration of good practices guidelines based on DGCM experience and development of training activities related to the implementation of sediment management measures.	19. Enhance experience in sediment management.
SI69. Elaboration of good practices guides based on the experience of the DGCM and development of training activities related to the implementation of environmental rehabilitation measures for beaches, their dunes and cliff stabilization.	30. Promote experience in environmental rehabilitation of beaches, dunes, and cliff stabilization.
SI70. Elaboration of good practices guides based on the experience of the DGCM and development of training activities related to the implementation of measures for structures building for coastal protection.	37. Enhance the experience in building structures for coastal protection.

Actuación específica	Objetivo específico
SI71. Elaboration of good practices guidelines based on the experience of the DGCM and development of training activities related to the implementation of measures for the removal of structures for coastal protection.	38. Enhance the experience in the removal of structures for coastal protection.
SI72. Elaboration of good practices guidelines based on the experience of the DGCM and development of training activities related to the implementation of measures for the review and recovery after erosive events.	44. Enhance the experience in review and recovery after erosive events.
SI73. Development of a specialization course on environmental rehabilitation of transitional waters for the DGCM technical staff, with emphasis on the peripheral services in places where there are transitional waters of relevance.	23. Correct the limited experience in environmental rehabilitation of transitional waters.

Table 46. Specific interventions of strategic intervention A5.3 "Establishment of a project to improve the state of the art in coastal protection" and the specific objectives to which they contribute.

Actuación específica	Objetivo específico
SI74. Institutional support for research into coastal ecosystem services (benefits provided by them and damage experienced from coastal operations/climate change) with state, regional and EU funding.	22. Correct the lack of information and knowledge about the ecosystem services of the coastal natural environment.
SI75. Institutional support for research into nature-based coastal protection measures with state, regional and EU funding.	39. Promote social, institutional, physical, and structural prevention.
SI76. Institutional support for research into the effectiveness of conservation interventions for the environment with state, regional and European Union funding.	28. Reduce the consequences of interventions for the natural environment conservation without an adequate basis.
SI77. Development of pilot study of cases for the analysis of lessons learned in relation to the prevention of silt accumulation on basins and reservoirs, in cooperation with different administrations.	15. Reduce the consequences of drainage basins regulation.
SI78. Development of pilot study of cases for the analysis of lessons learned in relation to the search for alternative sources of sediment inputs.	14. Correct the lack of information related to sources for sediment inputs.
SI79. Development of pilot study of cases for the analysis of lessons learned in relation to the environmental rehabilitation of transitional waters.	23. Correct the limited experience in environmental rehabilitation of transitional waters.
SI80. Development of a theoretical study about the effects (positive and negative) of the removal of disruptive structures compared to their maintenance, for different coastal typologies and under different time horizons.	16. Reduce the consequences of anthropogenic disruption of coastal sediment drift.

8.2 Prioritization of objectives for the design of implementation itineraries

The strategic and specific objectives to which each roadmap itinerary contributes are outlined below according to their urgency and importance, respectively.

8.2.1. Objectives of goal 1 – implementation itinerary until 2025

The implementation itinerary for goal 1 contains 13 of the 80 specific interventions of the *National Strategic Plan*, 12 of which contribute to one of the strategic objectives with short-term urgency and specific objectives of high importance (see Table 47).

Table 47. Strategic and specific objectives of goal 1 with short-term urgency and high importance.

Strategic objective (short-term urgency)		**Specific objective** (high importance)
1. Release of the Maritime-Terrestrial Public Domain (DPMT).		2. Correct the inconsistencies between the approved demarcation and the legal definition of the DPMT..
		3. Correct the lack of information on DPMT occupations.
		6. Reduce DPMT occupation pressure on the coastal system.
4. Recovery of natural elements.		27. Reduce the human activities pressure.
6. Recovery and revision after erosion events.		43. Enhance emergency processing.
		47. Promote an enhanced reconstruction after erosive events.
7. Strengthening the capacity to understand.	7.1 Information gathering and management.	4. Reduce the consequences of the changing physical environment in the current situation and in the long term.
		8. Promote the use of information from climate change adaptation projects.
		17. Reduce the consequences of t he complexity of the coastal physical system.

In addition, specific intervention SI8 *"Adoption of agreements for the use and/or incorporation into the monitoring system of information collected by other private actors or administrations, with emphasis on regional governments and impacts after erosion events"* is included in this itinerary, due to its interdependence with other specific interventions from this itinerary and even though it contributes to a strategic objective with medium-term urgency (2. Improving governance framework. 2.1 Strengthening planning capacity) and to a specific objective of normal importance (45. Promote impact monitoring after erosive events).

8.2.2. Objectives of goal 2 – implementation itinerary until 2029

The implementation itinerary for goal 2 contains 17 of the 80 specific interventions of the *National Strategic Plan*, 16 of which contribute to one of the strategic objectives with short-term urgency and specific objectives of normal importance (see Table 48).

Table 48. Strategic and specific objectives of goal 2 with short-term urgency and normal importance.

Strategic objective (short-term urgency)		**Specific objective** (normal importance)
4. Recovery of natural elements.		28. Reduce the consequences of interventions for the natural environment conservation without an adequate basis.
		29. Promote environmental protection figures.
		31. Promote the ecosystem services of the natural coastal environment.
7. Strengthening the capacity to understand.	7.1 Information gathering and management.	5. Reduce erosion and flooding impacts on the DPMT occupations with license.
		21. Correct the lack of information on erosion hazards.
		22. Correct the lack of information and knowledge about the ecosystem services of the coastal natural environment.
		24. Reduce erosion impacts on the natural coastal environment in the current situation.
		25. Reduce consequences of increased erosion hazard in the natural coastal environment in the long term.
		32. Fix the lack of information on combined erosion and flood hazards.
		35. Reduce erosion and flooding impacts on the anthropogenic coastal environment in the current situation.
		36. Reduce the consequences of increased erosion and flooding hazards in the anthropogenic coastal environment in the long term.
		41. Reduce erosion and flooding impacts on the coastal system in the current situation.
		42. Reduce the consequences of increased hazard associated with erosive events in the long term.
		45. Promote impact monitoring after erosive events.

Additionally, the specific intervention SI10 *"Adoption of agreements for the conservation of the coastal natural environment carried out by other competent administrations, based on their proven effectiveness, and the multiple synergies of nature-based measures (through the constitution of a cross-sectoral working group)"* is included in this itinerary, due to its interdependence with another specific interventions from this itinerary and despite the fact that it contributes to a strategic objective with medium term urgency (2. Improving governance framework. 2.1 Strengthening planning capacity) and to a specific objective of normal importance (28. Reduce the consequences of interventions for the natural environment conservation without an adequate basis).

8.2.3. Objectives of goal 3 – implementation itinerary until 2033

The implementation itinerary for goal 3 contains 19 of the 80 specific interventions of the *National Strategic Plan*, 18 of which contribute to one of the strategic objectives with medium-term urgency and specific objectives of high importance (see Table 49).

Table 49. Strategic and specific objectives of goal 3 with medium-term urgency and high importance.

Strategic objective (medium-term urgency)		**Specific objective** (high importance)
2. Improving governance framework.	2.1 Strengthening planning capacity.	8. Promote the use of information from climate change adaptation projects.
		10. Reduce limitations on human, material, and economic resources.
		12. Promote strategic planning for coastal protection based on the best scientific and technical knowledge.
		18. Decrease the limitations on exploitation of sediment sources.
		26. Reduce the anthropic environment pressure.
		27. Reduce the human activities pressure.
		39. Promote social, institutional, physical, and structural prevention.
		46. Promote the acquisition of additional contingency funds.
3. Restoration of the sediment balance.		14. Correct the lack of information related to sources for sediment inputs.
		20. Promote the availability of sediment inputs.
		40. Fix the deterioration of the coastal maintenance and conservation status before the erosion event.
7. Strengthening the capacity to understand.	7.2 DGCM staff training.	23. Correct the limited experience in environmental rehabilitation of transitional waters.

In addition, specific intervention SI17 *"Preparation of a feasibility study and legal conditions for the incentives and penalties implementation to third parties with coastal sediment management obligations (with a program to review the technical terms of their obligations and the supervision until fulfilment"*) is included in this itinerary due to its interdependence with other specific interventions from this itinerary and despite the fact that it contributes to a strategic objective with medium-term urgency: (2. Improving governance framework. 2.1 Strengthening planning capacity), and to a specific objective of normal importance (16. Reduce the consequences of anthropogenic disruption of coastal sediment drift).

8.2.4. Objectives of goal 4 – implementation itinerary until 2037

The implementation itinerary for goal 4 contains 17 of the 80 specific interventions of the *National Strategic Plan*, 14 of which contribute to one of the strategic objectives with medium-term urgency and specific objectives of normal importance (see Table 50).

Table 50. Strategic and specific objectives of goal 4 with medium-term urgency and normal importance.

Strategic objective (medium-term urgency)		Specific objective (medium importance)
2. Improving governance framework.	2.1 Strengthening planning capacity.	1. Correct the administrative procedure length for delimitation of the DPMT.
		9. Fix the complexity of regulations development, implementation, and monitoring.
		34. Reduce the consequences of the socioeconomic value of the coast.
3. Restoration of the sediment balance.		16. Reduce the consequences of anthropogenic disruption of coastal sediment drift.
7. Strengthening the capacity to understand.	7.2 DGCM staff training.	7. Enhance the experience in the implementation of DPMT release measures.
		11. Enhance the capacity-building on the DGCM staff.
		19. Enhance experience in sediment management.
		30. Promote experience in environmental rehabilitation of beaches, dunes, and cliff stabilization.
		37. Enhance the experience in building structures for coastal protection.
		38. Enhance the experience in the removal of structures for coastal protection.
		44. Enhance the experience in review and recovery after erosive events.

Additionally, this itinerary includes the three specific interventions SI25 *"Elaboration of methodological guides for the development of communication and participation plans for every coastal protection interventions carried out by the DGCM"*, SI26 *"Incorporation of the opinions of the general public as one of the elements to be considered in decision-making processes, from the level of selection and definition of interventions for coastal protection carried out by the DGCM"*, and SI30 *"Design and launch of a communication campaign related to the implementation of the National Strategic Plan"*, due to their interdependence with another of the specific interventions of this itinerary and despite the fact that they contribute to a strategic objective with a long-term urgency (2. Improving governance framework. 2.1 Strengthening planning capacity) and to a specific objective of high importance (13. Promote an inclusive coastal management culture).

8.2.5. Objectives of goal 5 – implementation itinerary until 2041

The implementation itinerary for goal 5 contains 9 of the 80 specific interventions of the *National Strategic Plan*, all of which contribute to one of the strategic objectives with long-term urgency and specific objectives of high importance (see Table 51).

Table 51. Objetivos estratégicos y específicos de la meta 5 con urgencia de largo plazo e importancia alta.

Strategic objective (long-term urgency)		Specific objective (high importance)
2. Improving governance framework.	2.2 Improving communication and participation.	13. Promote an inclusive coastal management culture.
		27. Reduce the human activities pressure.
5. Controlled withdrawal.		33. Correct expectations regarding the coastal protection through structures as the predominant measure.
7. Strengthening the capacity to understand.	7.3 Improving the state of the art regarding coastal protection.	14. Correct the lack of information related to sources for sediment inputs.
		15. Reduce the consequences of drainage basins regulation.
		23. Correct the limited experience in environmental rehabilitation of transitional waters.
		39. Promote social, institutional, physical, and structural prevention.

8.2.6. Objectives of goal 6 – implementation itinerary until 2045

The implementation itinerary for goal 6 contains 5 of the 80 specific interventions of the *National Strategic Plan*, all of which contribute to one of the strategic objectives with long-term urgency and specific objectives of normal importance (see Table 52).

Table 52. Strategic and specific objectives of goal 6 with long-term urgency and normal importance.

Strategic objective (long-term urgency)		Specific objective (normal importance)
5. Controlled withdrawal.		7. Enhance the experience in the implementation of DPMT release measures.
		34. Reduce the consequences of the socioeconomic value of the coast
7. Strengthening the capacity to understand.	7.3 Improving the state of the art regarding coastal protection.	16. Reduce the consequences of anthropogenic disruption of coastal sediment drift.
		22. Correct the lack of information and knowledge about the ecosystem services of the coastal natural environment.
		28. Reduce the consequences of interventions for the natural environment conservation without an adequate basis.

Notes