

# Proposal for amended marine spatial plans for the Gulf of Bothnia, the Baltic Sea and Skagerrak/Kattegat



Espoo consultation document (Ref. no. 3746-2022)



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Swedish Agency  
for Marine and  
Water Management

# International consultation on proposals for amended marine spatial plans

Marine spatial planning is one of our most important tools for achieving a long-term sustainable development of our seas. From November 2023 to February 2024, proposals on amended marine spatial plans for the Gulf of Bothnia, the Baltic Sea and Skagerrak/Kattegat with the associated impact assessment are being circulated for international consultation.

The Swedish Agency for Marine and Water Management (SwAM) has prepared the consultation proposal within the scope of a Government assignment on new or changed areas for energy extraction in the marine spatial plans. The objective of the assignment is to enable another 90 Terawatt hours of electricity production at sea, in addition to the planned capacity in the current marine spatial plans (M2022/00276). The aggregated strategic objective then amounts to 120 terawatt hours. The use energy extraction refers to offshore wind energy.

In accordance with the assignment, offshore wind energy is the main focus of the proposal. The starting point for the planning for offshore wind energy has mainly been the report from the first step of the assignment presenting potential new or changed areas for energy extraction in the marine spatial plans (Swedish Energy Agency, 2023a).

In addition to proposals for energy extraction areas, we also present a number of alternative areas. Proposed areas and alternative areas are marked differently in the plan maps. During the consultation, the alternative areas shall be seen as possible replacements or complements to proposed areas. To achieve the mission's objectives, we estimate that several of the areas that are now presented as alternatives need to be included in the final proposal. During the consultation, we therefore wish to receive comments both on proposed areas and the alternative areas. The goal is to arrive at the most suitable use of the marine area from a holistic perspective based on the assignment's strategic objective.

Environmental, economic and social consequences are summarised overall in the plan proposal, but are presented in more detail in the document *Impact assessment of proposal for amended marine spatial plans for the Gulf of Bothnia, the Baltic Sea and Skagerrak/Kattegat. Espoo consultation document. Ref. no. 03746-2022*. The impact assessment includes proposals on the impact assessment that is required in the framework of the strategic environmental assessment according to Chapter 6, Sections 1-19 of the Environmental Code.

# Summary

Sweden is preparing three marine spatial plans— one for the Gulf of Bothnia, one for the Baltic Sea and one for Skagerrak and Kattegat. A marine spatial plan provides guidance on the best use of the sea. The marine spatial plans provide guidance to national authorities, municipalities and courts in future decisions, planning and permit reviews. Business operators can also find guidance in the plan.

The marine spatial plans shall contribute to long-term sustainable development. They should combine economic policy, social and environmental objectives.

The marine spatial plans contain guidance on the most suitable use. The use or uses that are presented in an area take priority over other uses. In large parts of the sea, different uses can coexist if they adapt to each other. The marine spatial plans provide guidance on which use or uses take precedence and what adaptation is needed. The marine spatial plans set out 13 uses:

- electricity transmission
- energy extraction
- investigation area for energy extraction
- defence
- general use
- culture
- nature
- recreation
- sand extraction
- investigation area for sand extraction
- shipping
- investigation area for shipping
- commercial fishing.

The marine spatial plans also contain areas that are indicated as alternative energy extraction areas, and alternative investigation areas for energy extraction. The alternative areas can be seen as possible replacements or complements to proposed areas.

The marine spatial plans also set out areas where particular consideration should be given to areas of high natural value, areas of high cultural heritage value or the interests of national defence.

All uses are based on balancing different interests and a suitability assessment based on situation, character and needs. National interests and public interests are important in these considerations.

The consequences of the marine spatial plans are assessed from ecological, economic and social perspectives are generally summarised in the plan proposal, but are presented more specifically in the document *Impact assessment of proposals on amended marine spatial plans for the Gulf of Bothnia, the Baltic Sea and Skagerrak/Kattegat. Consultation version. Ref. no. 2168-23.*

The marine spatial planning takes its point of departure in laws, ordinances, societal objectives, reports of various kinds and the dialogue that is conducted with relevant stakeholders in the various stages of the planning process.

## **Reading instructions**

You can read the plans as a document – with map support online

The document is supplemented with web pages at SwAM that are an aide in exploring the plans. On the web pages, there are maps that are both clickable and searchable, and that can be zoomed in. There is also documentation in various maps to compare.

You can find both the web version and this document at [www.havochvatten.se](http://www.havochvatten.se).

This document is structured as follows

The document is divided into eight parts. Part 1 is a background description. Part 2 is common to all three marine spatial plans and contains comprehensive guidance and considerations. The same applies to Part 6 on implications and consequences, Part 7 on planning conditions and Part 8 with references and lists. Parts 3, 4 and 5 contain guidance and considerations for the respective marine spatial plan, i.e. for the Gulf of Bothnia, the Baltic Sea and Skagerrak/Kattegat.



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# **1. About marine spatial plans and the marine spatial planning process**

## **1.1. Preparing marine spatial plan proposals**

On 10 February 2022, the Government made a decision on Sweden's first marine spatial plans, for the Gulf of Bothnia, the Baltic Sea and Skagerrak/Kattegat. In connection with the decision on the marine spatial plans, the Government decided on a new assignment regarding new areas for energy extraction in the marine spatial plans to enable energy extraction at sea with an additional 90 terawatt hours in addition to the areas in the approved marine spatial plans (M2022/00276).

According to the assignment, SwAM must submit proposals for new marine spatial plans by 31 December 2024. A first part of the assignment that concerns documentation for new or amended areas for energy extraction at sea was delivered on 31 March 2023 by the Swedish Energy Agency (Swedish Energy Agency, 2023a). The preparation of the documentation was coordinated by the Swedish Energy Agency and prepared together with SwAM, Svenska Kraftnät, the Swedish Armed Forces, the Swedish Environmental Protection Agency, the Swedish National Heritage Board, the Swedish Maritime Administration, the Swedish National Board of Agriculture and the Geological Survey of Sweden. The report is available on the Swedish Energy Agency's website.

SwAM and the Swedish Energy Agency have at the same time had a related Government assignment to prepare a knowledge compilation on the possibilities and conditions for coexistence between offshore wind energy, commercial fishing, aquaculture and nature conservation. The assignment was presented on 28 February 2023 (SwAM, 2023c).

## **1.2. The marine spatial plans and their application**

Marine spatial planning is done so that the sea will be used sustainably, now and in the future. Many interests must share the sea, and the marine spatial plans facilitate this by providing guidance on the best use of the sea from a holistic perspective.

In Sweden, there is a national marine spatial planning that is regulated in the Environmental Code and the Marine Spatial Planning Ordinance (2015:400). Through this legislation, Sweden has also transposed the EU Maritime Spatial Planning Directive (2014/89).

### **General information**

The national marine spatial planning comprises three marine spatial plans – one for the Gulf of Bothnia, one for the Baltic Sea and one for Skagerrak and Kattegat. The marine spatial plans cover Sweden's exclusive economic zone and the areas that are not a part of private properties in

Swedish territorial waters from one nautical mile seawards outside the baseline referred to in the Act concerning Territorial Waters and Maritime Zones of Sweden (2017:1272).

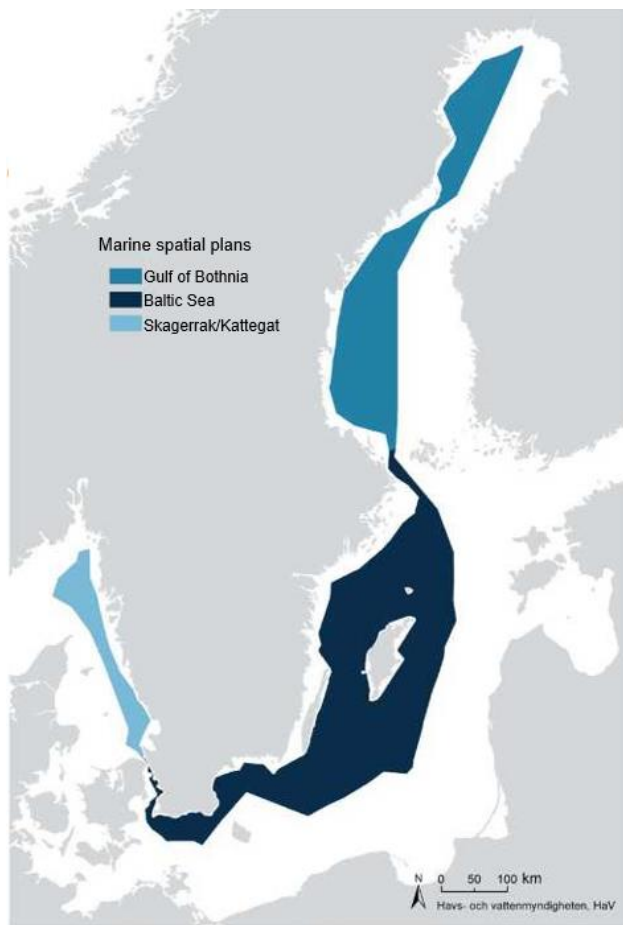


Figure 1.2-1 The three marine spatial planning areas

The marine spatial plans, which are approved by the Government, provide guidance to public authorities, municipalities and regions in the planning and review of claims for the use of the areas in the sea. The Government may pronounce regulations on such prohibitions or limitations of operations and measures in an area subject to marine spatial planning as necessary to achieve the purpose of the plan.

A marine spatial plan provides guidance on use for the areas covered by the plan for the purpose or purposes that they are most suited for considering the areas' characteristics, location and the needs that exist in society. If necessary, the marine spatial plans contain trade-offs between different interests.

The objective of the marine spatial plans is to contribute to long-term sustainable development. The marine spatial plans combine economic policy, social and environmental objectives and shall contribute to

- achieving and maintaining good environmental status
- the resources of the sea being used sustainably so that maritime industries can develop
- promoting coexistence between various activities and areas of use

In the work of preparing marine spatial plans, an ecosystem approach shall be applied.

According to the Marine Spatial Planning Ordinance, SwAM shall keep up-to-date on the development in affected areas and, if necessary or at least every eight years, prepare new proposals for marine spatial plans. During this marine spatial planning round, the update of the plans is being implemented within the scope of a Government assignment. There, the need is identified to find new or expanded locations in the sea suitable for energy extraction to contribute to an increasing need for fossil-free electricity production

## **The marine spatial plans provide guidance on a strategic level**

The considerations in the marine spatial plans are strategic and long-term. This means that the marine spatial plans set out the direction of the use of the sea. In the marine spatial planning process, the suitability is assessed for various uses overall. Based on this assessment, the marine spatial plan provides guidance on the priority for uses. In a possible subsequent permit review, a more detailed project- and site-specific review is conducted of the use in an area. For example, it is reviewed whether an exploitation entails a risk of accidents, a risk to human health and safety, a risk of erosion, a risk of material damage to a national interest or a risk that environmental quality standards cannot be complied with.

In order for the plan's objective for a long-term sustainable development to be achieved, the marine management with associated regulations must be developed in some cases, or the Government must issue regulations on prohibitions or limitations of certain activities or measures. This may, for example, involve regulation or other measures that facilitate coexistence between different interests. In terms of measures in commercial fishing or shipping, agreements or decisions in the EU or the International Maritime Organization (IMO) are required in many cases.

## **The marine spatial plans in permit reviews**

The marine spatial plans shall be a guiding input both in permit reviews and in other matters according to the Environmental Code. Each authority or municipality that applies the Environmental Code must ensure that the marine spatial plans are available in the case or matter of a review of an activity or measure in the marine spatial planning area. In issues that concern new or changed uses of a marine area, the Environmental Code must be applied. In the interpretation of what the most suitable use is according to these provisions, the marine spatial plans will serve as guides.

The marine spatial plans will also be a guiding input in certain permit reviews according to other laws where the Environmental Code's management provisions are applicable, such as the Act on Sweden's Exclusive Economic Zone (1992:1140), the Continental Shelf Act (1966:314) and the Act on the Establishment, Expansion and Closure of Public Shipping Lanes and Public Ports (1983:293). This is because the provisions in Chapters 3 and 4 of the Environmental Code must also be applied in reviews in cases and matters under these laws.

The county administrative board plays an important role since it is responsible for the initiatives needed to take account of Chapters 3 and 4 of the Environmental Code in planning and decision-making processes. When Chapters 3 and 4 of the Environmental Code are to be applied in the review of a case or matter, the county administrative board shall work especially to ensure that

national interests are satisfied. In the areas covered by a marine spatial plan, the county administrative board's work shall be based on the marine spatial plan according to Section 3 of the Ordinance (1998:896) on Land and Water Management, etc.

## The marine spatial plans' role in municipal planning

According to the Planning and Building Act (2010:900), the municipality must prepare a comprehensive plan for the entire municipality, including the territorial sea. The marine spatial plans serve as guides in the municipal planning. In the area in the territorial sea where the state and municipal plans overlap, both of the plans are in effect, while in the outermost marine area, only the marine spatial plan is in effect and in the coastal area, only the municipal comprehensive plan is in effect.

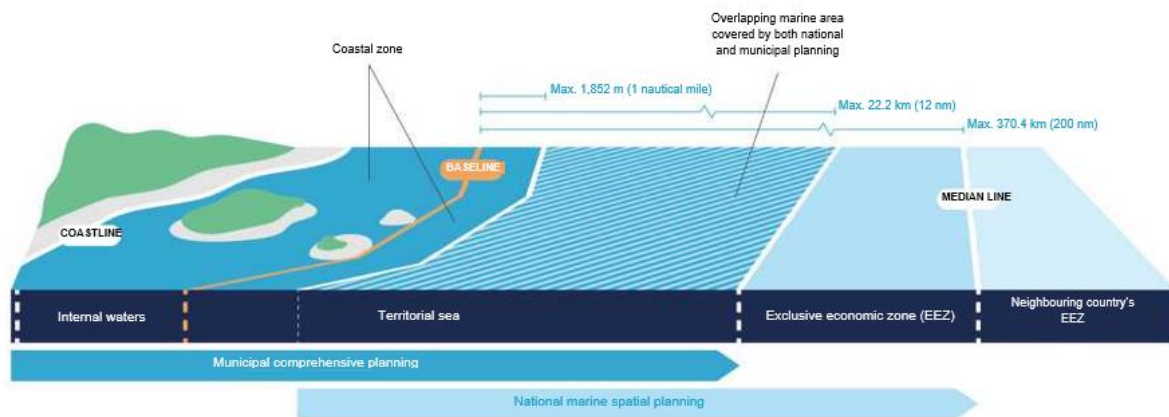


Figure 1.2-2 Terms, boundaries and planning responsibility. In the territorial sea, the state shares planning responsibilities with the municipalities. In the exclusive economic zone, the state has sole planning responsibility.

The interaction between marine spatial plans and comprehensive plans is important for the land-sea-interaction to work well. The comprehensive plans are important to show local and regional considerations and claims that may be of relevance to the marine spatial planning.

In case a municipality has presented clear intentions regarding the future use of the marine areas that will be covered by both a comprehensive plan and a marine spatial plan, they are weighed in on the decision on the marine spatial plan. In municipal reconsiderations and in-depth reviews of comprehensive plans, the marine spatial plans become a collective source of information on the State's view of the future land and water use in the area. The same applies in relation to regional plans. If the stand points in the marine spatial plan are out of date, for example, if new knowledge material has emerged since the plan was approved, there may be reason for the municipality to deviate from the marine spatial plan in the comprehensive plan. There are no obstacles to adopting a comprehensive plan that differs from the marine spatial plan.

The county administrative board has two formal tools where it shall pay special attention to the municipalities in the comprehensive planning work on whether the municipality's view does not correspond with the view presented in the marine spatial plan.

- During the review period of a new or changed comprehensive plan, the county administrative board submits a review opinion in accordance with Chapter 3, Section 16 of the Planning and Building Act. Among other things, it must state if the municipality's proposal does not satisfy a national interest according to Chapter 3 or Chapter 4 of the Environmental Code, if the proposal can contribute to an environmental quality standard according to Chapter 5 of the Environmental Code not being complied with, if inter-municipal issues are not coordinated in an appropriate way, or if a construction structure is unsuitable considering health and safety. The county administrative board's review opinion shall be based on one of the points in Chapter 3, Section 16 of the Planning and Building Act, but in the assessment of whether the plan proposal satisfies a national interest according to Chapter 3 or Chapter 4 of the Environmental Code, the county administrative board receives guidance from the marine spatial plan (see reference above to Section 3 of the Ordinance on Land and Water Management).
- In documentation to the municipality, the county administrative board shall also present such State and inter-municipal interests that may be of significance to the comprehensive plan's topicality according to Chapter 3, Section 26 of the Planning and Building Act. The report shall be produced in the second half of the period between two ordinary elections to the municipal council. The documentation indicates how these interests relate to the comprehensive plan and if the county administrative board's review opinion in any part no longer applies.

The county administrative board safeguards the State interests and shall express an opinion on the municipality's proposed detailed development plan when the municipality prepares one, according to the provisions of the Planning and Building Act. Even when a municipality prepares a detailed development plan, situations could arise when the plan does not correspond with the view of the future use of the marine area that is presented in the marine spatial plan.

## **Possibility for review of new claims in the marine spatial plan areas**

New claims and needs are expected to continuously arise in the marine spatial plan areas. Such claims are addressed in follow-ups and new marine spatial plan proposals. Until new marine spatial plans are approved, guidance shall be taken from existing marine spatial plans to the extent that it is relevant. If there is no direct guidance in the marine spatial plans, planning and decision-making can be done based on the marine spatial plans' intentions or based on the best available knowledge.

## **Possibility of proposing regulations**

The Government may pronounce regulations on prohibitions or limitations of operations or measures in an area subject to marine spatial planning as necessary to achieve the purpose of the plan. Regulations or limitations on the use of the planned area shall be such that are not covered by existing restriction and prohibition possibilities (as per Government bill 2013/14:186 p. 21). Prohibitions and limitations for a certain use can provide possibilities for other uses of the area. To-date, SwAM has not prepared any proposals for such regulations. The agency assesses that existing management generally has the possibility of capturing what the marine spatial plans guide. At the same time, there are areas where additional restrictions or simplification measures may need to be introduced to achieve the plan's objectives, but where it is unclear if today's regulations provide sufficient support for this. An issue that needs to be investigated is whether

special regulations are needed against trawling near environmentally hazardous wrecks. The possibility of issuing regulations on prohibitions or limitations on activities or measures in a marine spatial planning area can in some cases be limited by international regulations, such as the EU's Common Fisheries Policy.

## **Planning in cycles and follow-up of the plan**

Marine spatial planning can be described as a recurring process that is under way in cycles over several years. Through several steps, the marine spatial planning goes from gathering information and analysing the present situation to planning where the marine spatial plans are the result of the planning process. The plans are subsequently implemented and monitored continuously. According to the Marine Spatial Planning Ordinance (2015:400), SwAM must follow up on the agreed plans and prepare new proposals on marine spatial plans if necessary or at least every eight years. Preparedness is required to continuously take in, evaluate and use new knowledge in future marine spatial plans.

SwAM has prepared a proposal for a framework for follow-up of the marine spatial plans in collaboration with county administrative boards and universities. The objective of the framework is to provide guidance in the follow-up of marine spatial plans to facilitate and prepare the next planning round and to provide support to SwAM to meet the statutory requirements for follow-up.

The framework includes continuous follow-up that concerns market intelligence and updating planning conditions, such as changed claims or uses. On one hand, the framework includes in-depth follow-up where the focus is on application, goal attainment, consequences and analysis of the plan's timeliness.

During this planning round, a continuous follow-up will be carried out within the scope of the planning process. The framework is set in connection with proposals on marine spatial plans being submitted to the Government.

The in-depth follow-up focuses on:

- analysing the plan's timeliness based on new or changed claims, conditions and uses
- answering questions about how the marine spatial plan is applied and how the guidance works
- assessing the plan's impact and goal attainment
- developing knowledge of the significant environmental impact that the plan entails.

The results from the follow-up will be used in SwAM's timeliness review of approved marine spatial plans. In accordance with the Marine Spatial Planning Ordinance, new MSP proposals shall be prepared at least every eight years.

Once the Government has approved the marine spatial plans, SwAM is responsible for follow-up by continuously staying informed about developments in the affected areas.

The follow-up of the plan can be divided into two parts,

- partly based on Section 21 of the Marine Spatial Planning Ordinance, which mainly concerns the application and timeliness of the plan, such as the application process of the plan's



guidance, environmental monitoring, such as development in various sectors, national policies, legislation and regulations.

- partly based on requirements according to Chapter 6, Sections 16 and 19 of the Environmental Code on environmental effects of the plan's application.

With regard to follow-up pursuant to the Environmental Code, SwAM must also especially follow up and evaluate the environmental impact that the plans have in practice. The intention is to obtain knowledge early on about significant negative environmental impacts that were not identified previously so that these impacts can be eliminated or reduced. The follow-up is also intended to monitor the environmental impact that is expected and has been described in the plan's environmental impact assessment.

An account of measures for follow-up and monitoring of the significant environmental impact that the implementation of the marine spatial plans entails is in the environmental impact assessment.

In addition to the mandatory follow-up of the plans' environmental impact, the agency also intends to monitor their economic and social impact and effect on the future planning, management and operational level. Part of the follow-up is about how state and municipal planning contributes to linking land and sea.

In the follow-up, an analysis will also be done of how activities in the sea relieve activities that otherwise need to take place on land. This documentation can contribute to a collective assessment of how society's needs can best be met from a sustainability perspective.

### **1.3. Marine spatial planning process**

Marine spatial planning is a broad process that involves many actors in several stages. After the Government has decided on the marine spatial plans, they shall be applied and followed up in a recurring cyclical process.

#### **Marine spatial plans are prepared in collaboration**

Marine spatial planning is an open process that provides the possibility of participation to those affected at the municipal, regional, national and international levels. Industry and interest groups, as well as research institutions, are also given the opportunity to participate and contribute insight and knowledge.

On a national level, cooperation takes place with central authorities, county administrative boards and the Swedish Association of Local Authorities and Regions (SALAR) on strategic planning issues, the planning process and sector issues. Collaboration takes place among other things within a cross-sectoral cooperation group in which relevant authorities, coordinating county administrative boards and SALAR are included.

On a regional and municipal level, the county administrative boards play an important role in the coordination between national and municipal planning. Sweden's 14 coastal county administrative boards participate in the work on municipal participation and in other supporting work towards the municipalities. The county administrative boards in Kalmar, Västernorrland and Västra Götaland

coordinate the work for affected coastal county administrative boards. The coastal county administrative boards also compile complementary regional planning documentation, such as from municipalities and actors responsible for development, or internally from the county administrative board on issues within the county administrative board's areas of responsibility.

The municipalities contribute to the planning with input, comments and improvement proposals during the planning process. This takes place not least through the municipal comprehensive planning in both coastal areas and the part of the territorial sea that overlaps with the national marine spatial planning. It contributes to strengthening the connection between sea and land and improves the coordination between national and municipal planning.

As of 1 January 2019, it is the regions that lead and develop the regional growth work. In Gotland County, it is the Municipality of Gotland that is responsible. The regional development strategies constitute input in the planning work. The marine spatial planning process involves the participation of the regions, county administrative boards and municipal cooperation bodies responsible for development.

[There is an opportunity to read more about who participates in the marine spatial planning process in the process description prepared by the Swedish Agency for Marine and Water Management.](#)

## **Dialogue in several stages**

The process of preparing marine spatial plans has several steps. Two formal dialogue stages, consultation and review, take place before the Government makes a decision on the marine spatial plans according to the Marine Spatial Planning Ordinance. This means that the plan proposals are made available so that those who wish can express their opinions. The comments received are assessed and form the basis of revised plan proposals. The formal dialogue stages contribute to a broad participation and a democratic process.

SwAM also holds consultations with Sweden's neighbouring countries in accordance with the Espoo Convention. The Espoo Convention concerns cross-border environmental effects.

The marine spatial planning process to a large extent also includes continuous dialogue and collaboration. This entails, for example, debriefings and dialogue with central authorities and county administrative boards on thematic and process-related issues.

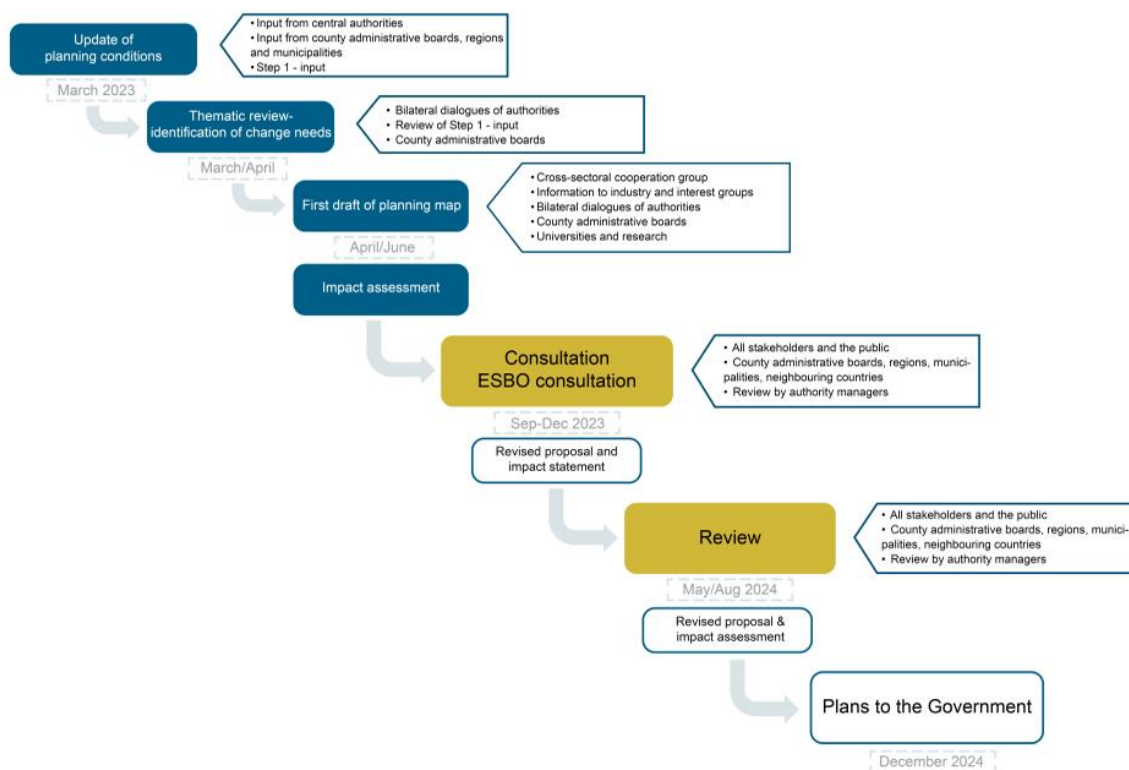


Figure 1.3-1 Illustration of overall process stages and affected actors. Consultation and review are especially important dialogue steps during this marine spatial planning round

## Planning with the ecosystem approach as a basis

According to the Marine Spatial Planning Ordinance, an ecosystem approach shall be applied when the marine spatial plans are prepared. The ecosystem approach is a strategy for the preservation of nature values, sustainable use and fair distribution of natural resources, with the objective of ensuring that the use of the ecosystems takes place within their limits (SwAM, 2012).

The UN Convention on Biodiversity constitutes one of the most important international bases for the ecosystem approach. The ecosystem approach is based on the 12 so-called Malawi principles. The ecosystem approach is applied in the marine spatial planning in several different ways based on the Malawi principles (SwAM, 2012). Some examples:

- The marine spatial planning is based on the societal objectives that are set based on society's overall interests. Collaboration and dialogue in the course of the work makes it possible to capture perspectives from many different actors. Relates mainly to Malawi Principle 1 – Society's interests determine the management's objectives and 10 – The ecosystem approach should integrate the preservation of biological diversity and a sustainable use of it.

- The marine spatial planning provides guidance on an overall and strategic level with space for planning at a local and regional level. Municipalities and regions are given the possibility of participation in the national marine spatial planning, so that consideration can be given to local and regional needs. Relates mainly to the Malawi Principle 2 – Administration should be decentralised to the lowest applicable level and engage everyone to be able to balance local and public interests.
- The marine spatial planning is implemented in an open planning process with collaboration and dialogue based on municipal, regional, national and international perspectives. The process allows for both collaboration in the daily work and formal opportunities to obtain comments. Relates mainly to Malawi Principle 2 – Administration should be decentralised to the lowest applicable level and engage everyone to be able to balance local and public interests, 11 – The ecosystem approach should take into account all kinds of relevant information, including scientific and traditional and local knowledge, innovations and methods, and principle 12 – The ecosystem approach should involve all relevant sectors in society and scientific disciplines.

## **Assessment of consequences**

According to the Environmental Assessment Ordinance, marine spatial plans are assumed to entail such a significant environmental impact as is referred to in Chapter 6, Section 3 of the Environmental Code. There are therefore requirements on the implementation of strategic environmental assessment according to Chapter 6, Sections 1-19 of the Environmental Code. The work on strategic environmental assessment is documented in an impact assessment in the form of a collective document for the three marine spatial planning areas.

The requirements on the environmental assessment of marine spatial plans are also based on the Environmental Code's portal clause according to which the Code shall be applied so that:

- human health and the environment are protected against damage and inconveniences regardless of whether they are caused by pollution or other impact;
- valuable natural and cultural environments are protected and cared for;
- biodiversity is preserved;
- land, water and the physical environment otherwise are used so that management that is good in the long term from an ecological, social, cultural and socio-economic perspective is safeguarded; and
- re-use and recycling, as well as other management of materials, raw materials and energy is promoted so that a cycle is achieved.

The requirements mean that social and economic aspects also need to be included in a broad assessment of effects. The impact assessment therefore includes social and economic effects in addition to the environmental requirements according to Chapter 6 of the Environmental Code.

A national consultation of the strategic environment assessment scoping report was held during the period from 8 July to 10 October 2022. Sweden's neighbouring countries have been notified according to the Espoo Convention (1 December 2022 to 28 February 2023).

The impact assessment is a part of the application of the ecosystem approach. It shall clarify environmental and other effects and guide the planning to contribute to a long-term sustainable development.

According to the Marine Spatial Planning Ordinance, the marine spatial plan proposal shall clearly present the implications and consequences of the use of the marine area according to the plan.

## 2. The marine spatial plans' overall guidance and considerations

### 2.1. Vision and objectives

#### Vision – the sea in 2050

A marine spatial plan is future-oriented and should lead to shaping the future we want to achieve. The target year in the marine spatial plans is 2040. At the same time, 2050 is used as a vision year to stimulate discussion and thoughts about the planning's long-term perspective.

The marine spatial plans look forward to 2050 and are based on a vision of how the sea is used, provided that the planning objectives are met. The vision represents the status that the marine spatial planning should contribute to achieving.

*In 2050, we use the sea through competitive, innovative and sustainable maritime industries. The sea has a good environmental status and rich biological diversity. We preserve and develop natural and cultural environments in the sea and safeguard its ecosystem services. There are plenty of experiential values and possibilities for recreation. The sea provides enjoyment and benefits to all. Industry and management collaborate, and the marine spatial plans contribute a holistic perspective, advanced planning and predictability. In 2050, we live in peace and freedom in the Baltic Sea and North Sea region. Climate change has been slowed down and we have adapted to changed conditions.*

#### Planning objectives

The marine spatial plans shall integrate economic policy objectives, social objectives and environmental objectives. To support the implementation of the marine spatial planning process, there are ten planning objectives. The planning objectives are based on societal objectives, legislation, national strategies and other relevant documents (Figure 2.1-1). Goals and strategies from the global to the national level are included, and among them are the UN Global Sustainable Development Goals and EU strategies linked to marine and maritime issues, the environment, climate and energy. On a national level, for example, strategies and objectives that relate to marine environment issues, various activities related to the sea have been taken into consideration, as well as Sweden's environmental objectives.

The planning objectives were prepared during the first planning round, but have been slightly updated in this second planning round. The planning objectives consist of an overall objective that is supported by the other nine objectives. These nine are divided into two groups with the headings *creating conditions for* and *creating preparedness for*. Claims that are clear and extensive in the immediate future are grouped under *conditions*, while issues that mainly in a longer future perspective are deemed to be able to have extensive claims in the sea are grouped under *preparedness*. The objectives that relate to preparedness signal that the marine spatial planning shall provide margins for future needs and activities.

Overall objective:

- Contribute to a good marine environment and sustainable development.

Creating conditions for:

- Regional development, recreation and preservation of cultural values
- Marine green infrastructure and the promotion of ecosystem services
- Sustainable shipping
- Good accessibility
- Energy transmission and renewable energy production in the sea
- Sustainable commercial fishing
- Defence and security.

Establishing preparedness for:

- Future extraction of minerals and carbon dioxide storage
- Future establishment of sustainable aquaculture.

*Overall objective: Contribute to a good marine environment and sustainable development*

The marine spatial plans shall overall provide spatial conditions to meet development needs and objectives regarding sustainable development, at the same time that they contribute to achieving and maintaining a good marine environment.

A good marine environment is mainly described in the national environmental quality objective *Oceans in balance along with a flourishing archipelago and coastal life* and its specifications. Other environmental quality objectives are also relevant, such as *A rich plant and animal life*, *Zero eutrophication* and a *Toxin-free environment*, which also capture how environmental problems from land and air have an impact on the sea. According to the Marine Environmental Ordinance, good environmental status is one of the specifications.

Sustainable development relates, among other things, to Sweden's maritime strategy and to the European Green Deal, which for example includes the development of a sustainable blue economy.

Development is considered sustainable when we can economically, environmentally and socially satisfy our current needs, while at the same time creating the conditions for future generations to meet their own needs. An important starting point for marine spatial planning is that sustainable development requires well-functioning ecosystems. In accordance with the ecosystem approach's holistic perspective, the ecosystem's functions are therefore taken into account from multiple time perspectives and direct, indirect and collective cumulative effects of claims in the sea.

*Objective: Create conditions for regional development, recreation and preservation of cultural values*

The marine spatial plans should provide the spatial conditions for sustainable development, a good quality of life, equality and attractive environments both regionally and locally. Different locations and areas have different conditions for and perspectives on regional development. The marine spatial planning must therefore strive for good conditions for local and regional development along the entire coastline.

The marine spatial plans shall contribute to preserving important natural and cultural values, taking into account the landscape appearance and creating conditions for the development of marine-related industries and recreation. Recreation, which includes outdoor recreation and angling, is of major significance to people's quality of life and health.

Cultural values are important to the experience of the landscape, to people's identity and to creating attractive environments to live in. Today, the sea contains a rather unexplored part of our cultural heritage values. Increased knowledge of the cultural values in the sea contributes both to local and regional identity and to tourism. The cultural values also have an intrinsic value.

Nature values and cultural values on the coast and in the open sea are often a prerequisite for being able to create opportunities for and further develop commercial fishing and tourism in coastal communities. Other marine-related activities that contribute to development and a sustainable blue economy in the coastal area shall also be given good conditions to contribute to employment and quality of life.

*Objective: Create conditions for marine green infrastructure and the promotion of ecosystem services*

The marine spatial plans shall contribute to healthy ecosystems and the development of ecosystem services. They shall support the establishment of new marine protection areas in accordance with national and international objectives and create conditions to strengthen and preserve representativeness, functionality and ecological relationships. The marine spatial planning should also contribute to favourable conservation status being maintained for those species and habitats covered by the protection. Favourable conservation status is a concept that is used to describe the conditions necessary for a nature type, habitat or specific species to be able to exist long term. The term is used for nature types and species pointed out as especially valuable in the framework of the Natura 2000 network.

The marine spatial plans shall contribute to ensuring marine green infrastructure. By green infrastructure, we mean an ecologically functional network of habitats and structures, natural areas and constructed elements that are designed, used and managed in a way that preserves biodiversity and promotes ecosystem services that are important to society throughout the landscape. The green infrastructure is an important prerequisite for the promotion of ecosystem services. The plans shall also contribute to securing spreading routes and migration routes in and between habitats in the marine environment and migration routes for birds. The marine spatial plans shall provide conditions for scientific studies and long-term monitoring of the marine environment.



*Objective: Create conditions for sustainable shipping*

The marine spatial plans should provide conditions for ecologically, socially and economically sustainable shipping. This applies to both short-sea shipping and long-distance shipping. Shipping is given enough space to grow, while at the same time the marine spatial plans contribute to improving safety at sea, with fewer accidents and a reduction of the risks of spills of oil or other substances, as well as other disturbances. The marine spatial plans should provide conditions for efficient transport routes with low fuel consumption and the least possible environmental impact from shipping, especially in ecologically sensitive areas. Consideration shall be given to the Baltic Sea being pointed out as a particularly sensitive sea area (PSSA) by the International Maritime Organization (IMO).

*Objective: Create conditions for good accessibility*

The marine spatial plans shall create conditions for the development of the marine-related transport sector and other infrastructure and make the sea accessible to a broad public.

Good accessibility in the transport system at sea provides good conditions to keep the transport infrastructure together as a whole, so that, for example, the transfer of goods from road and rail to shipping is facilitated. There should be a level of preparedness for a development physical infrastructure, such as future tunnels or bridges.

There shall continue to be good conditions for fishing vessels to reach and use the sea and ports necessary for the fishing activities.

Spatial conditions shall be provided for use of the sea for electronic communications infrastructure in the form of submarine cables and radio systems. Conditions should also be created to give people access to the sea for outdoor activities and recreation. It can contribute to both public health and development in tourism

*Objective: Create conditions for energy transmission and renewable electricity production in the sea*

The marine spatial plans shall support the work of integration and connection to the European electricity grid and provide conditions for existing, planned and potential sea cables for energy transmission within Sweden and between Sweden and other countries. This also applies to gas pipelines and cables for energy transmission from sea-based energy production.

The marine spatial plans should help to create conditions for Sweden's future extraction needs regarding fossil-free energy. In this, the planning shall support Sweden's energy objectives by creating conditions for the expansion of offshore wind energy production.

A level of preparedness should be established for other offshore energy production from other kinds of renewable sources, and the marine spatial plans should provide a platform for testing new technologies in the area.

*Objective: Create conditions for sustainable commercial fishing*

The marine spatial plans should contribute to an environmentally sustainable, resource-efficient, innovative, competitive and knowledge-based fishing industry within the framework of ecosystem-

based management, which includes giving consideration to important habitats for both fish and other species. Well-managed fish stocks and habitats for fish are a prerequisite for sustainable and competitive commercial fishing.

Integration with the planning of coastal areas is particularly important as important fish habitats are found there, namely spawning and nursery areas.

*Objective: Create conditions for defence and security*

The marine spatial plans shall create conditions for the defence of Sweden and Swedish interests in both the short and long term. Actors in both military and civil defence are given conditions to conduct their activities, including conducting exercises under different conditions and other activities of significance to military defence, such as signals intelligence. The marine spatial plans shall also provide conditions to meet Sweden's strategic supply needs in times of peace, crisis and war.

*Objective: Establish preparations for the possible future extraction of minerals as well as for carbon dioxide storage*

Consideration should be given to the fact that it may become relevant to increase extraction of finite resources, such as sand, gravel and other minerals, and to store carbon dioxide to counteract climate change. Extraction of oil and gas in Sweden's marine territory or exclusive economic zone is, however, not of current interest.

*Objective: Establish preparations for the future establishment of sustainable aquaculture*

The marine spatial plans shall have spatial preparedness for the development of aquaculture and the potential to use the sea for sustainable production in a surface-efficient manner.

In terms of aquaculture development potential and increased research in the area, aquaculture outside the coastal zone might become relevant in a future that is included within the marine spatial planning framework for 2040 and the vision year of 2050. The marine spatial planning must therefore take it into account that aquaculture might become relevant in the marine spatial planning areas in the future.

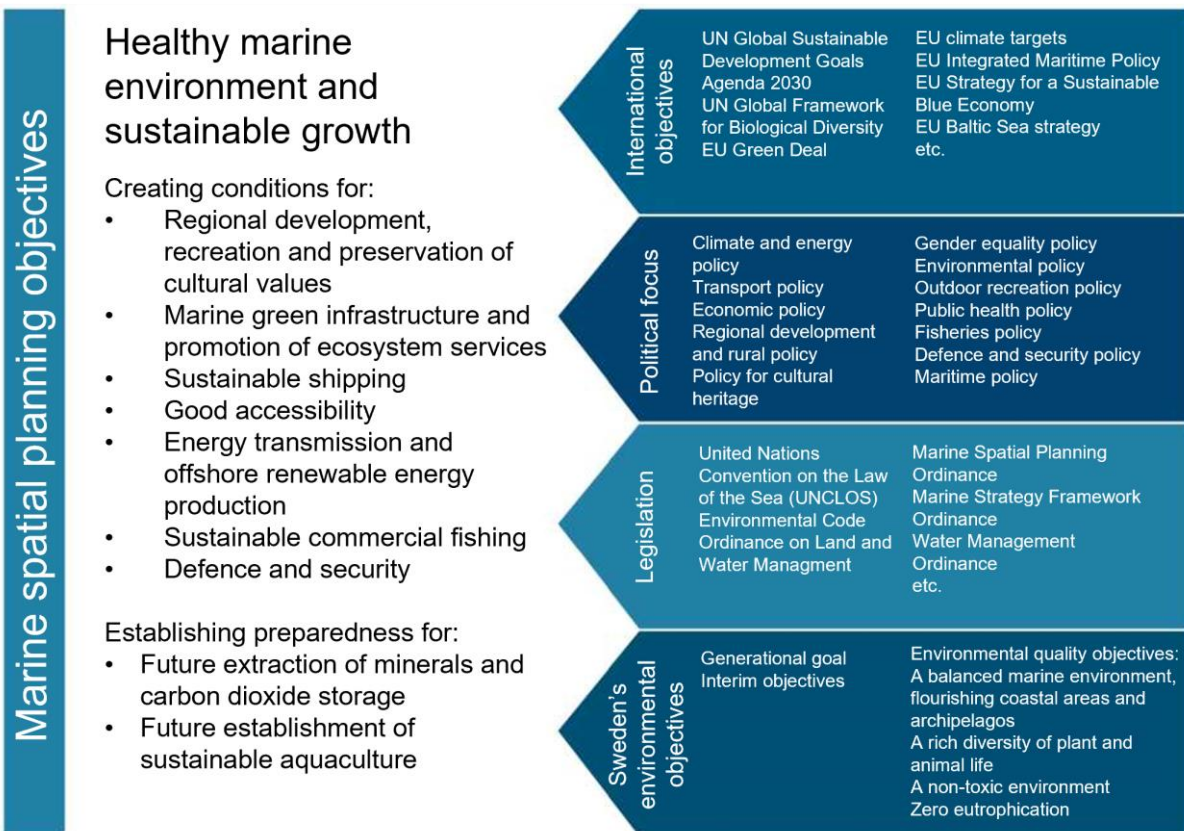


Figure 2.1-1 The planning objectives and some of the overall objectives and conditions that have been points of departure in the formulation of the planning objectives

## **2.2. Guidance on the most suitable use and Particular consideration**

The plan description and associated plan maps provide guidance on the use of the sea. The plan maps present the geographic areas for various uses and Particular consideration. This chapter presents how the plan maps are to be read and the implications of uses and Particular consideration.

### **Plan map presentation**

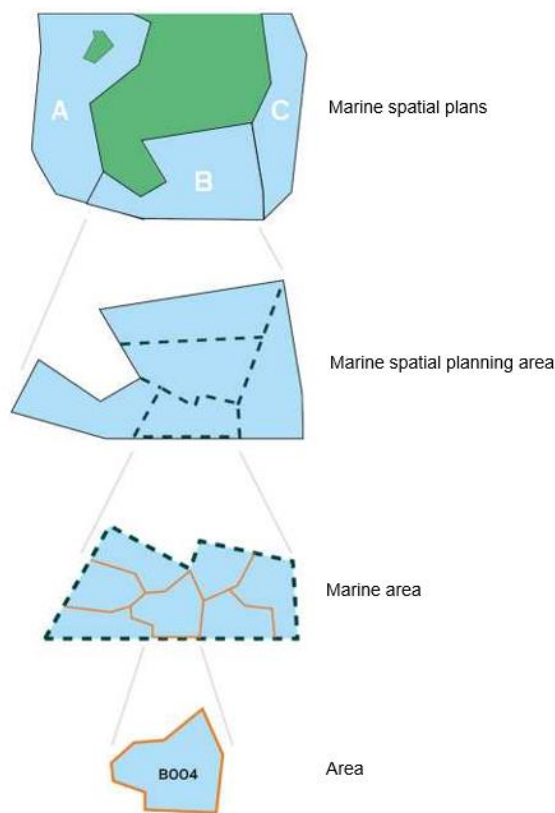
The uses presented by the plan map have been deemed to be the most suitable and take precedence over other uses. Other use in the area shall be adapted to the conditions of the stated uses and needs in management, planning and permit review.

In many cases, several uses are shown as most suitable in the same place, and these have the same degree of priority over other uses. They then have the same degree of priority over other uses. Where more than one use is shown, coexistence is deemed to be possible. Where one of several uses form an investigation area, future reviews or planning rounds must show if coexistence is possible. The uses where coexistence is deemed possible might need to adapt to each other.

The marine spatial plan comprises all areas within the planning area – the sea, the space above the surface of the sea, and the seabed and its underlying soil layers. Please note that the delimitation between private water and public water is not fully investigated. The planning areas' delimitation towards the coast can therefore in reality deviate from the delimitation that is shown in the marine spatial plans' maps. Pursuant to Chapter 4, Section 10 of the Environmental Code, the marine spatial plans are to cover Sweden's exclusive economic zone and the areas that are not a part of private properties in Swedish territorial waters outside the special demarcation lines, one nautical mile from the baseline referred to in the Act concerning Territorial Waters and Maritime Zones of Sweden (2017:1272).

The plan maps should be interpreted in the approximate scale between 1:700,000 and 1:1,000,000. The boundaries and markings for the planning in the map are generally based on the strategic level of the marine spatial plans. The planning area maps (maps 1, 5 and 11) are on a scale of 1:2,300,000 in full A4, while the marine area maps (maps 2-4, 6-10 and 12-13) are on a scale of 1:1,000,000 in full A4.

To more clearly present the planning, the respective marine spatial planning area is divided into the marine areas. The three marine spatial plans consist of ten marine areas. The division into marine areas has no legal significance.



#### FACT BOX: Guidance on priority

The guidance on the most suitable use indicates priority for uses. In addition, a need for particular consideration is indicated in certain areas. The guidance entails neither prohibitions nor any binding restrictions.








For example, the ships' right to make their way regardless of what the marine spatial plans indicate, as long as there are no restrictions in the shipping regulations, the possibility of applying for permits for energy extraction in areas other than those indicated in the marine spatial plans, consideration of natural and cultural values even where they are not indicated in the marine spatial plans and that commercial fishing is conducted in larger areas than the marine spatial plans' use and is regulated through the EU.

Figure 2.2-1 The marine spatial plans are divided into different types of areas.

Uses are presented in different ways in the plan map:

- The uses of energy extraction, investigation areas for energy extraction, defence, general use, cultural environment and nature are presented with a letter and delimited with lines that form the areas. Each area has a number, such as Ö200.
- The uses of electricity transmission, recreation, sand extraction, investigation area for sand extraction, shipping, investigation area for shipping and commercial fishing are bounded by their own geographic markings. These geographic markings usually extend over several of the numbered areas. Below is a description of the uses and the approaches that are important to the uses in management, planning and permit review.

## Most suitable use

	<i>Electricity transmission</i> Conditions for infrastructure to distribute and transmit electricity shall be maintained. There shall be good possibilities to maintain and service the infrastructure.
	<i>Energy extraction</i> Area for energy extraction. Conditions for energy extraction shall be maintained. Infrastructure to distribute and transmit electricity, stability on and below the seabed for possible foundations and good accessibility for ships during construction, operation and maintenance shall be taken into account.
	<i>Investigation area energy extraction</i> Areas with good conditions for energy extraction where further investigation is required to determine if energy extraction is the most suitable use.
	<i>Energy extraction, alternative</i> Alternative area with good conditions for energy extraction. During the consultation, an alternative area is seen as an alternative or potential complement to proposed areas to consider in the continued planning process.
	<i>Investigation area for energy extraction, alternative</i> Alternative area with good conditions for energy extraction where investigation is required in the areas to determine if energy extraction is the most suitable use. During the consultation, an alternative area is seen as an alternative or potential complement to proposed areas to consider in the continued planning process.
	<i>Defence</i> Area for defence activities that comprise marine training areas and impact areas for installations outside the marine spatial planning areas. Conditions for defence activities shall be maintained.
	<i>General use</i> Area where no special use takes precedence. The uses of electricity transmission, recreation, sand extraction, investigation area for sand extraction, shipping, investigation area for shipping and commercial fishing that are delimited by their own geographic markings, however, take precedence where they are indicated.



### *Culture*

Area with cultural heritage or natural history environment. Cultural heritage and natural history values must be preserved.



### *Nature*

Area for nature. The area has nature values that must be preserved and developed to ensure biodiversity and the promotion of ecosystem services.



### *Recreation*

Area for recreation including outdoor recreation. Conditions for recreation and good accessibility to the public must be maintained.



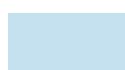
### *Sand extraction*

Area for sand extraction. Conditions for sand extraction and good accessibility to ships during extraction must be maintained.



### *Investigation area for sand extraction*

Areas with good conditions for sand extraction where further investigation is required to determine if sand extraction is the most suitable use.



### *Shipping*

Area of special significance to shipping. Conditions for shipping activities must be maintained and traffic safety with sufficient room for manoeuvre must be taken into account.



### *Investigation areas, shipping*

Areas for further investigation to determine if shipping is the most suitable use.



### *Commercial fishing*

Area for commercial fishing. Conditions for conducting commercial fishing must be maintained. Good accessibility of commercial fishing vessels to ports and fishing areas suitable based on variations over seasons and years shall be taken into account.

### *Special note on cables and pipelines*

The laying, operation and maintenance of data and telecommunication cables, power cables, pipelines and gas lines must be made possible where appropriate. This applies to the entire planning area.

## Particular consideration

**f**

### *Particular consideration of national defence interests*

Within the area, Particular consideration must be given to the interests of national defence in management, planning and permit review. The risk of collective, cumulative impact from energy extraction on defence interests must be taken into account. In an area designated as Gf or Nf, consideration refers to limitations of tall objects due to aviation activities

### *Particular consideration of high cultural heritage values*

Within the area, Particular consideration shall be given to high cultural heritage values in management, planning and permit review.

The consideration designation comprises cultural environments that are mainly outside the marine spatial planning areas. Particular consideration concerns landscape appearance and impact needs to be assessed based on local conditions. Impact areas may be larger than indicated areas in the marine spatial plans.

**n**

### *Particular consideration of high nature values*

Within the area, Particular consideration shall be given to high nature values in management, planning and permit review.

The values that have been identified in the marine spatial planning process are listed per marine area in Parts 3, 4 and 5.

## 2.3. Overall considerations

### Assessment of the most suitable use and Particular consideration

#### Use

The marine spatial plans indicate uses of the sea for various geographic areas. The uses indicated are deemed to be the most suitable considering the areas' characteristics and location and the needs that exist, and based on the overall objective of the plans. The geographic delimitations of uses in the marine spatial plans are based on one of the following three types of public interests:

- National interests according to Chapter 4, Section 8 of the Environmental Code, i.e. Natura 2000 areas.
- National interest claims in accordance with Chapter 3 of the Environmental Code.
- Other public interests of substantial significance.



## Particular consideration

The marine spatial plans set out areas where Particular consideration should be given to the interests of national defence, areas of high cultural heritage value or areas of high natural value. This consideration relates to values that are important to preserve or strengthen in order for the sea to be able to be used sustainably. The need to indicate Particular consideration has been identified in the marine spatial planning process as a complement to indicating uses.

## About national interests

### *Areas covered by national interest claims*

Areas covered by national interest claims are pointed out by authorities and regulated in the operational management provisions in Chapter 3 of the Environmental Code. The areas relate to both different conservation interests and areas that are important for development for a certain purpose. An area covered by national interest claims must be protected against measures that can substantially damage the area's value. In order for the concept of substantial damage to be fulfilled, the measure must either have a lasting negative impact on the interest in question or temporarily have a very large negative impact on it.

### *Special note on national interest claims and public interest of substantial significance in the proposal work*

In the proposal work, the energy areas presented in the Government assignment's first part regarding documentation for new or changed areas for energy extraction in the marine spatial plans (Swedish Energy Agency, 2023a) have been deemed to be a public interest of substantial significance, unless previously pointed out as a national interest claim. In the report, the Swedish Energy Agency states that the agency intends to review and update the national interest areas for wind power at sea and sees the documentation and appointed areas in the planning documentation as a basis for pointing out new national interest areas. This might thereby mean that individual areas that are now public interests of substantial significance for wind power are pointed out as national interest claims before proposals for marine spatial plans are submitted to the Government.

In a proposed area for energy extraction, public interest of substantial significance for offshore wind energy production is given priority over part of a national interest claim for commercial fishing that overlaps. This is because it is deemed to be the most suitable use for the area based on the overall picture and the Government assignment's strategic objective. Also in five alternative areas, it is reported that a public interest of substantial significance for wind power is given priority over commercial fishing.

### *The areas of national interest in accordance with Chapter 4 of the Environmental Code*

Areas that are of national interest are regulated in the geographically linked management provisions in Chapter 4 of the Environmental Code. Areas of particularly great value in terms of nature and cultural heritage conservation, tourism and outdoor recreation are directly defined in Chapter 4. These areas are of national interest in their entirety. Natura 2000 areas are also of national interest in accordance with Chapter 4 of the Environmental Code. Activities or measures that can affect such a natural area in a significant way require special permit reviews.

### *Public interests of substantial significance*

In general, public interests in the planning are land and water interests that contribute to achieving societal objectives for an economically, socially and environmentally sustainable development. What public interests of *substantial significance* are and what must be presented in the marine spatial plans according to the Marine Spatial Planning Ordinance (2015:400) is considered at a national level in the marine spatial planning process. One of the following should be met for the interest in a geographic area to be deemed in the marine spatial planning to be a public interest of substantial significance:

- Is of major national importance.
- Is needed for important societal functions now or in the future.
- Is needed to achieve major societal benefit.
- Is needed to fulfil Sweden's international commitments.
- Is needed to implement or maintain nationally or internationally important structures.

If any of the criteria is met, a local, regional, national or international issue might be a public interest of substantial significance.

### Electricity transmission

#### *Needs*

One condition for achieving national and European goals for energy and climate policy respectively is that there are opportunities to connect the electrical systems in Sweden and different countries in Europe to a greater extent. Through better interconnection of the electricity grids between the countries around the Baltic Sea and the North Sea, better conditions are created for a socially efficient expansion of offshore wind energy production.

#### *Areas with national interest claims*

Facilities for energy distribution can be pointed out as national interests according to Chapter 3, Section 8 of the Environmental Code. It is the Swedish Energy Agency that can point out the national interest claims. No national interest claims for energy distribution are in the marine spatial planning areas.

#### *Areas of public interest of substantial significance*

Transmission and regional networks are deemed to be a public interest of substantial significance.

#### *Marine spatial plan areas with the use of electricity transmission*

The areas given a use of electricity transmission build on Sweden's existing transmission network, which constitutes a public interest of substantial significance in the marine spatial planning areas. When the areas are given the use of electricity transmission, this entails a guidance that the interest has priority planning and permit review in these areas.

## Energy extraction

### *Needs*

According to the Tidö Agreement, the planning for electricity consumption in Sweden should be based on a need of at least 300 terawatt hours annually in 2045, roughly a doubling compared with the current consumption of electricity. This shall be done within an energy target that is 100 per cent fossil free. The agreement sets no specific objective for the expansion of wind power in general or offshore wind energy specifically, but describes it as an important element in the country's energy mix.

The Government assignment that forms the basis for the work of preparing amended marine spatial plan proposals indicates that the objective is for the marine spatial plans to enable an additional 90 terawatt hours in annual production. Together with earlier planning, this means that the objective is 120 terawatt hours.

### *Areas with national interest claims*

The Swedish Energy Agency points out areas of national interest for energy production, in this case wind power, according to Chapter 3, Section 8 of the Environmental Code. For several areas where there is a national interest claim for wind power, the marine spatial plans indicate a different use. This is due to the uses being deemed incompatible and the other use being given priority.

### *Areas of public interest of substantial significance*

In addition to the national interest claims, additional areas for energy extraction have been worked out together with the Swedish Energy Agency and other authorities (Swedish Energy Agency, 2023a). These areas are deemed to be public interests of substantial significance to the national production of renewable electricity. They contribute to the possibility of achieving the energy objectives.

The areas have been identified based on a comprehensive assessment that takes into account if the area has suitable conditions. These conditions refer to wind speed, sea depth and distance to the base line. As technology changes at a rapid pace, areas were also identified that are not of current interest in the near future, but are deemed to possibly be of interest later in the future.

For several areas, another use is indicated. This is due to the uses being deemed incompatible and the other use being given priority.

### *Marine spatial plan areas with the use energy extraction*

The areas with the use energy extraction relate to offshore wind energy only in this planning round. They build on areas with national interest claims and areas of public interest of substantial significance for wind power that have been identified in the marine spatial planning process.

Areas indicated as investigation areas are areas where further investigation in planning or permit review is required to determine if energy extraction is the most suitable use. For example, it may

be a matter of a so-called Natura 2000 permit being required for wind power to be built or detailed analyses being needed to assess if a specific facility is compatible with some other interest.

In addition to proposals for areas with energy extraction, we also present a number of alternative areas. Proposed areas and the alternative areas are marked in different ways in the plan maps. During the consultation, the alternative areas shall be seen as possible replacements, alternatives or potential complements to proposed areas to consider in the continued planning process. To achieve the Government assignment's objectives, we assess that several of the areas that are now presented as alternatives need to be included in the final proposal.

When the areas are indicated for the use energy extraction, this entails a guidance that the interest has priority in planning and permit review in these areas. An application for permission for the establishment of offshore wind energy installations can also be submitted for areas that are not indicated in the marine spatial plans. To build a wind farm at sea, a permit is required that is reviewed by the Land and Environmental Court or the Government.

An area's delimitation in the map is at a general level based on the strategic level of the marine spatial plans. The more detailed delimitation at a offshore wind energy establishment is determined in a permit review and may differ from the plan's delimitation. Among other things, there is a need for safety distances between shipping traffic and wind power facilities. The size of the safety distance is dependent on the type of traffic in the shipping lane, but also the geographic conditions. How large a distance is needed in an individual project is determined in the permit process for the offshore wind energy installation. The safety distance is outside the delimitation for the use shipping. In the planning process, an overall assessment has been made if the respective proposal for an area for energy extraction or an alternative area can encompass a safety distance.

## Defence

### *Needs*

Sweden's national defence consists of military defence and civil defence. The Swedish Armed Forces have a need for training areas in the sea and in the coastal zone, without disruptions from physical or technical obstacles. For signals intelligence, there is a need for protection to counteract disturbances from other activities. Civil defence is in need of a functioning supply of goods and services. Shipping lanes to strategic ports need to be kept free and conditions for sea cables for electricity supply and communication need to be maintained.

### *Areas with national interest claims*

For military defence, national interests are defined in and adjacent to the sea. The Swedish Armed Forces point out military areas of national interest according to Chapter 3, Section 9 of the Environmental Code. Within the marine spatial planning areas, these relate to marine training areas.

Within the marine spatial planning areas, there are also national interest claims for the military component of national defence that are covered by secrecy and for these, a geographical delimitation or function is not presented.

#### *Areas of public interest of substantial significance*

Impact areas in the marine spatial planning areas for defence facilities (national interest claim for national defence) outside the marine spatial planning areas are deemed to constitute public interests of substantial significance as they are needed for the functions of the defence facilities.

#### *Marine spatial plan areas with the use defence*

The areas assigned the use defence are based on national interest claims within the marine spatial planning areas (sea training areas) and on the impact areas for national interest claims that are outside the marine spatial planning areas. When the areas are indicated for the use defence, this entails a guidance that the interest has priority in planning and permit review in those areas.

#### *The marine spatial plans' areas where Particular consideration is given to the interests of national defence*

In the areas where Particular consideration of defence interests is indicated, activities that comprise permanent installations need to consult with the Swedish Armed Forces on how facilities can be designed so that defence interests are not negatively affected.

#### **General use**

##### *Needs*

New types of claims and claims in new geographic areas are expected to arise in the future. There is therefore a need to retain areas where such new claims may be suitable to assess. At the same time, such claims can be assessed everywhere in the marine spatial planning area.

#### *Marine spatial plan areas with general use*

Within areas that are indicated as general use, other uses overlap to varying degrees that are delimited by their own markings, such as electricity transmission, recreation, sand extraction, investigation areas for sand extraction, shipping or commercial fishing. These uses take precedence where they are indicated.

#### **Culture**

##### *Needs*

According to the national cultural heritage objectives, the cultural heritage work shall among other things promote a sustainable society with a diversity of cultural environments that are preserved, used and developed, and promote a holistic view of the management of the landscape that means that the cultural environment is safeguarded in the development of society.

#### *Areas with national interest claims*

The Swedish National Heritage Board points out areas of national interest for cultural heritage conservation according to Chapter 3, Section 6 of the Environmental Code. At present, there are no national interest claims pointed out in the marine spatial planning areas. However, there are

national interest claims for cultural heritage conservation adjacent to or close to the marine spatial planning areas.

#### *Areas of public interest of substantial significance*

World Heritage sites are deemed to be so valuable from cultural or natural environment perspectives that they are a matter for all of mankind. They are listed in accordance with the UNESCO Convention concerning the Protection of World Cultural and Natural Heritage. Within the marine spatial planning area for the Gulf of Bothnia, there is the High Coast world heritage site.

According to Chapter 7, Section 9 of the Environmental Code, a county administrative board or a municipality can decide that an area shall be protected and managed as a cultural heritage reserve. The intention is to enable the care and preservation of valuable cultural landscapes. At present, there are no cultural heritage reserves in the marine spatial planning areas.

Landscape appearance protection is a protection that was introduced with the support of Section 19 of the Nature Conservation Act in its wording before 1 January 1975. The purpose of the protection is to protect large areas from major impact or change. The provisions in the areas with landscape appearance protection apply until they are replaced with other forms of protection. Within the marine spatial planning areas, there is landscape appearance protection for an area at Öregrund and Östhammar.

The Swedish National Heritage Board has identified cultural heritage characteristics based on the marked cultural heritage value cores (P. Nordström, 2003). Areas with cultural heritage value cores are included in the marine spatial plans. In addition to the general consideration distance that is included, an analysis is needed of how cultural values can be affected based on local conditions, such as topography, etc. and in relation to the activities planned.

The areas described above are deemed in the marine spatial planning process to be public interests of substantial significance. Additional documentation that improves the knowledge situation regarding high cultural values within and adjacent to the marine spatial planning areas may form the basis for public interests of substantial significance in future planning.

#### *Marine spatial areas with the use culture*

The areas assigned the use culture are currently based on areas with world heritage sites.

When the areas are assigned the use culture, this entails a guidance that the interest has priority planning and permit review in those areas. High cultural values are also present in other areas.

#### *The marine spatial plans' areas where particular consideration is given to high cultural heritage values*

The areas indicated with Particular consideration of high cultural heritage values build on areas with landscape appearance protection and areas that the Swedish National Heritage Board has indicated as cultural heritage value cores (P. Nordström, 2003).

When the areas are indicated with Particular consideration of high cultural heritage values, this entails a Particular consideration given to the interest in management, planning and permit reviews.

## Nature

### *Needs*

Biodiversity shall be preserved. When the sea and its resources are used, it shall take place in a sustainable way, for present and future generations. Some marine environments in particular need to be safeguarded in relation to other activities. These needs can motivate protection or other measures in management and permit review to ensure reduced environmental impact on marine ecosystem services, such as fish production.

Healthy marine environments strengthen and ensure access to ecosystem services. Coherent, representative and ecologically functional structures are important conditions for this. There is also a need for sustainable management of areas that are extra important to the marine ecosystems when the climate changes, so-called climate refugia.

Climate refugia are areas that might need special protection in order to preserve important plants and animals when the climate changes and their spread decreases. These areas are often the more stable areas that are expected to remain of a species' larger range when salinity and temperature change. Climate refugia are deemed to be important for the species to continue to exist in the marine area. Read more in the report Documentation for climate refugia in marine spatial planning in 2017 (SwAM, 2017d).

### *Areas of national interest and with national interest claims*

Three different national interests concern nature values in the sea:

- National interests according to Chapter 4, Section 8 of the Environmental Code, i.e. Natura 2000 areas, are proposed by the county administrative board. The Swedish Environmental Protection Agency then reviews the selection and proposes areas to the Government. It is then the Government that decides to propose to the European Commission that these areas be included in the Natura 2000 network. Natura 2000 areas are included as a part of the marine area protection.
- National interests for nature conservation according to Chapter 3, Section 6 of the Environmental Code are pointed out by SwAM.
- National interests for commercial fishing regarding spawning and nursery areas according to Chapter 3, Section 5 of the Environmental Code are pointed out by SwAM.

### *Areas of public interest of substantial significance*

In the marine spatial planning process, the national interests and national interest claims are deemed to be insufficient to achieve a good environmental status, preserve biodiversity, strengthen ecosystem services and protect important areas and species when the climate changes. Therefore, additional areas with high nature values have been recognized or identified in the marine spatial planning process and deemed to be public interests of substantial significance. The areas consist partly of already protected areas according to Chapter 7 of the

Environmental Code and partly of areas identified within the scope of the marine spatial planning process.

The areas that are of public interest of substantial significance to high nature values that have been identified in the marine spatial planning are based on a large amount of supporting information gathered or prepared by SwAM (SwAM, 2019). An update of this supporting information was done by the coastal county administrative boards in the autumn of 2022. This supporting information shows nature types and species that are present and representative for the respective marine spatial planning areas. The assessment is based on the following criteria:

- The area constitutes a Marine Protected Area (MPA) according to the regional marine environment conventions Helcom (Convention on the Protection of the Marine Environment of the Baltic Sea Area) and OSPAR (Convention for the Protection of the Marine Environment in the North-East Atlantic), but is not protected through Swedish legislation.
- The area has confirmed nature values or consideration needs on multiple bases. This relates to supporting information that concerns natural value mapping and environmental impact. There is also information on the areas important to species and ecosystems in a future changed climate, so-called climate refugia.
- The area has confirmed nature values or consideration needs on an individual basis. The supporting information that forms the basis for the assessment shows low uncertainty.
- The area has confirmed nature values with high originality. Originality is defined as areas with relatively low environmental impact at the same time that the ecological values are high.
- The area is in a planning process to become a protected marine area, such as a Natura 2000 area, nature reserve or national park. Established protected areas receive the use designation capital N.

Marine nature reserves and national parks are deemed to be public interests of substantial significance. These areas are included in the marine area protection together with Natura 2000 areas. Planned marine area protection of the types Natura 2000 and marine nature reserves also constitute public interests of substantial significance.

Some areas of public interest of substantial significance are not currently covered by existing area protection. The Marine spatial plans contribute to calling attention to and strengthening potential ecological contexts between areas covered by a marine protection and areas of public interest of substantial significance by identifying the latter. The planning thereby reinforces the conditions for a coherent green infrastructure, through areas that are important to preserve ecosystem services.

#### *Marine spatial plan areas with the use nature*

When the areas are assigned the use nature, this entails a guidance that the interest has priority in planning and permit review in these areas. Nature values that need to be protected can also be found in other areas.



Environmental monitoring stations are in specific locations in the sea. Due to the scale of the marine spatial plans, the locations are not presented in the marine spatial plans. The stations should, however, be taken into account in planning, management and permit review.

#### *The marine spatial plans' areas where Particular consideration is given to high values*

The areas indicated with Particular consideration of high Nature values are based on identified public interests of substantial significance. In areas with Particular consideration of high nature values, there may be special needs for future measures in management, planning and permit review to ensure ecosystem services linked to the areas' values, structures and conditions. Nature values to give consideration to can also be found in other areas.

### Recreation

#### *Needs*

The overall objective of outdoor recreation policy is to support people's possibilities of spending time in nature and pursue outdoor recreation with the right of public access as a basis. All people should have the opportunity to have natural experiences, well-being, social community and greater knowledge of nature and the environment. Development of outdoor recreation-related economic activities can make outdoor recreation available to more people.

#### *Areas with national interest claims*

SwAM points out areas of national interest to outdoor recreation in the sea, according to Chapter 3, Section 6 of the Environmental Code. Only a few areas are pointed out in the marine spatial planning areas. These are mainly in connection with the coasts and at some offshore banks, i.e. shallow areas in the open sea.

#### *Areas of national interest*

Along the coast and in the marine area, there are national interests for active outdoor recreation according to Chapter 4, Section 2 of the Environmental Code. In some coastal areas, they are delimited so that they are in or extend into the marine spatial planning area.

#### *Areas of public interest of substantial significance*

In this planning round, no areas with public interests of substantial significance are indicated. In future planning, interests that meet criteria for public interests of a substantial significance may consist, for example, of important passages for recreational craft, areas that are attractive to visit and recreation areas identified in municipal comprehensive plans.

#### *Marine spatial plan areas with the use recreation*

The areas assigned the use recreation are based on national interest claims for outdoor recreation according to Chapter 3, Section 6 of the Environmental Code.

When the areas are assigned the use recreation, this entails a guidance that the interest has priority planning and permit review in those areas.

## Sand extraction

### *Needs*

Extraction of natural gravel on land shall decrease as part of securing Sweden's groundwater and meeting the environmental quality objective of good quality ground water. Natural gravel builds up many natural grounds and drinking water reservoirs and often has high natural and cultural values. Crushed rock is the main replacement substantial for natural gravel in the effort to reduce the withdrawal of natural gravel. There are some areas of use, such as to the fine fraction in concrete, where in today's situation it is costly or requires a lot of energy to produce replacement materials from crushed rock and generate residual products. Within these areas of use, marine sand and gravel can replace natural gravel from land.

Marine sand and gravel can also be used to counteract the coastal erosion that is taking place along some coastal areas in southern Sweden. The sand being extracted close to where it is to be used is advantageous considering the costs and environmental effects of long-distance transports.

### *Areas with national interest claims*

Finds that contain valuable substances or materials can be pointed out as national interests according to Chapter 3, Section 7 of the Environmental Code. It is Sweden's Geological Survey, SGU, that can point out the national interest claims. No national interest claims for sand are in the marine spatial planning areas.

### *Areas of public interest of substantial significance*

Based on a Government assignment, Sweden's Geological Survey has identified areas where there are possibilities for an environmentally sustainable extraction of marine sand and gravel of the right quality. The environmental sustainability is assessed based on several aspects (SGU, 2017):

- The area may not be too close to the coast since this risk's changes in sediment dynamics, which can cause increased coastal erosion.
- Sunlight exposed shallow biologically productive and sensitive areas shall be avoided.
- Biodiversity must be preserved and the ecosystems in and around the source must not be affected to such an extent that the ability to deliver ecosystem services disappears or irrevocably decreases

The identified areas are deemed in the marine spatial planning process to be public interests of substantial significance as sand extraction in the sea is considered important in the work of climate adaptation, to achieve environmental quality objectives and for the material supply.

### *Marine spatial plan areas with the use sand extraction*

The areas assigned the use sand extraction build on areas identified in the marine spatial planning process to be public interests of substantial significance. The areas identified as suitable for sand extraction in the marine spatial plans need to be investigated further in which parts of the

areas that sustainable extraction can be made possible, based on the documentation prepared by SGU and SwAM.

When the areas are assigned the use sand extraction, this entails a guidance that the interest has priority in planning and permit review in these areas. An area must be carefully evaluated in terms of physical, archaeological and biological aspects, among other things, before extraction activities can be established. Continuous evaluation with the help of suitable control programmes is also necessary.

The majority of the area pointed out as areas for sand extraction in the marine spatial plans is in southern Sweden where the consumption of natural gravel is extensive at the same time that access to natural gravel on land is limited. Southern Sweden is expected to continue to have an expansive construction. The marine conditions, relatively low transport costs to consumption areas and high costs for other replacement materials justify sand extraction as a use in parts of the marine areas. Another motive is the need for sand to counteract coastal erosion in southern Sweden.

#### *Marine spatial plan areas with the use investigation area for sand extraction*

In areas where sand extraction is expected to require so-called Natura 2000 permits according to Chapter 7, Section 28a of the Environmental Code, the area is indicated as an investigation area for sand extraction.

## Shipping

### *Needs*

The overall transport policy objective is to ensure a supply of transport for the citizens and industry throughout the country that is socially efficient and long-term sustainable. Efficient, sustainable and capacity-strong freight transport is a priority for the Government. Some of the objectives of the national plan for the transport system from 2022 to 2033 are to promote the shift of freight from road to rail and shipping, to reduce the transport sector's environmental impact and to create conditions to develop tomorrow's transport system. Shipping is of major significance to a functioning supply of goods and services to Sweden, which is also relevant to national defence.

### *Areas with national interest claims*

The Swedish Transport Administration points out areas of national interest for transportation regarding shipping according to Chapter 3, Section 8 of the Environmental Code.

### *Areas of public interest of substantial significance*

Routes that constitute especially important links between Sweden and neighbouring countries are deemed to be public interests of substantial significance.

### *Marine spatial plan areas with the use shipping*

The areas assigned the use shipping build on national interest claims for shipping and areas identified in the marine spatial planning process to be public interests of substantial significance to shipping. Shipping is conducted in all marine areas. Due to various factors, large parts of the

international traffic mainly take place with larger ships in certain delimited routes. These routes only constitute recommendations. Ship traffic of very large importance to Sweden can occur and also does occur outside the routes assigned the use shipping in the marine spatial plans.

Shipping as a whole makes significantly larger surface claims than the plan map's routes in order to function well.

When areas are assigned the use shipping, this entails a guidance that the interest has priority in planning and permit review in these areas. These areas represent the routes that are of the greatest significance for efficient, safe and accessible shipping transports to be able to be maintained and developed, but in no way limit shipping to these routes. The fact that shipping has access to and uses other areas is a prerequisite for the routes pointed out in the marine spatial plans to have such a limited geographic area. Ships are entitled to harmless passage in the territorial sea according to the law of the sea. International shipping is mainly regulated by the International Maritime Organization (IMO).

In the Bothnian Bay, there are special conditions in the winter with thick, extensive sea ice. This affects the conditions for shipping, which needs large areas of open water to ensure navigability. This should be taken into account in the establishment of wind power and other permanent installations at sea. There is a lack of gathered knowledge about how offshore wind energy installations affect ice formation, conditions for ice extraction and winter navigation. Consequently, this requires further investigation.

There shall be a safety distance between a wind farm and a shipping route or a shipping lane. The size of the safety distance is dependent on the type of traffic in the shipping lane, but also the geographic conditions. How large a distance is needed in an individual project is determined in the permit process for the wind power installation. The safety distance is outside the delimitation for the use shipping and is not presented in the plan map. The marine spatial plan does not provide guidance on safety distances at specific locations.

#### *Marine spatial plan areas with the use investigation area for shipping*

Where the areas are assigned the use investigation area for shipping, it needs to be investigated further if shipping is the most suitable use. More than one use is indicated there as having claims in the same area and more investigation of the needs of the relevant uses at the site is required before decisions on the most suitable use can be made. National interest claims for shipping remain even if the national interest claim is matched by an investigation area for shipping. The use investigation area for shipping is also indicated where there is insufficient documentation to delimit the closer extent of the use.

### Commercial fishing

#### *Needs*

Commercial fishing is a maritime industry of significance to the food supply and food production. Commercial fishing also gives rise to land-based employment in port operations and processing industries, which contribute to vibrant archipelago communities that maintain their identity and cultural heritage. Maintaining a sustainable food production with food with a high nutritional value is important to society. Fish from our region is an important contribution to our food supply. The

needs presuppose that good environmental status in the sea is achieved and maintained and that the ecosystem services that the fishing is dependent on are ensured. Commercial fishing requires relatively large areas since different catch methods and target species entail different fishing areas that change between different seasons, from year to year and over a longer period of time.

#### *Areas with national interest claims*

SwAM points out areas of national interest to commercial fishing in terms of catch areas and landing ports according to Chapter 3, Section 5 of the Environmental Code.

#### *Marine spatial plan areas with the use commercial fishing*

The use commercial fishing is mainly based on national interest claims regarding catch areas. A small part of an area in Skagerrak is based on a public interest of substantial significance to commercial fishing.

National interest claims for commercial fishing regarding spawning and nursery areas are included in areas with the use nature in the marine spatial plans. Potentially important areas for fish habitats outside of national interest areas are included in areas with Particular consideration of high nature values.

How commercial fishing is conducted and what fishing gear is used may change in the future, for example due to stock changes or technical development of fishing gear. It may also change due to the introduction of restrictions that concern a specific fishing or fishing method.

When the areas are assigned the use commercial fishing, this entails a guidance that the interest has priority in planning and permit review in these areas. Commercial fishing is also conducted in other areas and in permit reviews, it is therefore important to seek updated information about the fishing in the area in question.

#### *Data and telecommunication cables*

There is a lack of overall sector planning for data and telecommunication cables. Locations for the laying of such cables should be coordinated early in the project engineering of cable laying to reduce the conflicts with other claims.

#### *Geological storage of carbon dioxide*

According to calculations, there is a significant capacity for carbon dioxide storage in Sweden and within the Swedish exclusive economic zone. However, more data and knowledge is needed before any areas for storage can be proposed in the marine spatial plans.

#### *Aquaculture*

At present, there is no coordinated national mapping of possible geographic development areas for aquaculture in the planning area. In the Swedish Board of Agriculture and SwAM's action plan for the development of Swedish aquaculture in 2021-2026, a measure aims to facilitate the identification and planning of suitable areas for various forms of sustainable aquaculture (Swedish Board of Agriculture, 2021). New planning documents together with developed cultivation technology can in the long term contribute to better planning conditions for aquaculture

in the planning area. In this phase, the marine spatial plans establish preparations for aquaculture, but assign no specifically delimited areas intended for aquaculture.

## Guidance on coexistence

The marine spatial plans shall promote coexistence between various activities and areas of use. The marine spatial plans' indication of coexistence creates flexibility and encourages activities to seek mutual adaptation and development. Coexistence can also lead to synergy effects. The considerations below aim to provide guidance on how coexistence can work and explain how the marine spatial plans relate to coexistence between the various uses presented. They are grouped under two headings depending on the degree of adaptation that is usually deemed necessary for coexistence – some adaptation and more adaptation. For the coexistence to work, for example, some activities may need to be regulated further or special conditions need to be set by licensing authorities. This may also concern special regulations that may be needed to achieve the objective of the marine spatial plans that the Government decides on in accordance with Chapter 4, Section 10, Paragraph 2 of the Environmental Code.

Coexistence between uses can be deemed to be possible in one location while in another location it is not deemed to work. Similarly, coexistence can be deemed to be possible from an overall perspective, but not within the planning's time horizon. When uses are not deemed to be able to coexist, one interest is given priority.

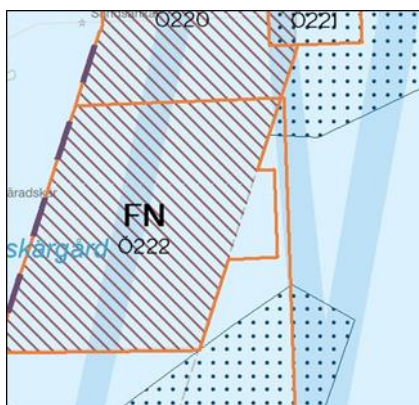


Figure 2.3-1 Example of what coexistence might look like on the plan map. The plan map presents coexistence by overlapping uses. In area Ö222, the uses defence (F), nature (N), recreation (downward slash) and shipping (blue lines) coexist.

### Where coexistence can require some adaptation

#### *Defence and shipping*

The Marine spatial plans indicate coexistence between defence and shipping. Shipping can often be conducted without limitation in a marine training area. When defence exercises are under way, a marine training area may need to be temporarily closed.

#### *Defence and commercial fishing*

The marine spatial plans indicate coexistence between defence and commercial fishing. Commercial fishing can often be conducted without limitation in a defence area. When defence exercises are under way, a marine training area may need to be temporarily closed. Defence

exercises can, however, affect commercial fishing's resources through fish mortality and impact on spawning and nursery areas.

#### *Culture and nature*

The marine spatial plans indicate coexistence between culture and nature. Cultural environments are often well integrated into nature. Nature conservation efforts, such as the handling of marine litter and the removal of lost fishing gear, can damage ancient remains if they are carried out with careless methods. Wrecks can in some cases constitute a cultural value at the same time that they can negatively affect the environment.

#### *Culture and recreation*

The marine spatial plans indicate coexistence between culture and recreation. Cultural environments are often a part of the values that form the basis for recreation or make an area attractive to visitors. This contributes to synergy effects, but a high tourism pressure can also have a negative impact on the cultural environment. There is great value in making underwater cultural heritage accessible, to divers, among others. Diving and other outdoor recreation, such as sports fishing and boating, may, however, entail a risk that the underwater cultural environment is destroyed.

#### *Nature and recreation*

The marine spatial plans indicate coexistence between nature and recreation. Nature is often a part of the values that form the basis for recreation or make an area attractive to visitors. This contributes to synergy effects, but a high tourism pressure can also entail an impact on the nature values. Exploitation of scenic locations for tourism activities, as well as noise from recreational boats, jet skis and other activities, can entail a conflict with nature conservation interests.

#### *Recreation and sand extraction*

Sand extraction can entail negative impact on nature values. At the same time, an increased traffic in the removal of the sand can negatively affect the conditions for recreation. Sand extraction, and thereby the transports, takes place, as a rule, during limited periods.

#### *Recreation and commercial fishing*

The marine spatial plans indicate coexistence between recreation and commercial fishing. Commercial fishing forms the foundation for fishing communities along the coast that are attractive for recreation. Conflicts of interest can exist between angling and commercial fishing if one wants to fish in the same place with fishing gear that does not work together.

#### *Sand extraction and shipping*

The marine spatial plans indicate coexistence between sand extraction and shipping. Sand extraction can generate some traffic and entail obstacles to navigability for shipping. However, sand extraction takes place during very limited periods, which means that the impact is limited.

### *Shipping and commercial fishing*

Commercial fishing with moving fishing gear often works with some adaptation in the areas with shipping, but can sometimes be impeded by intensive shipping traffic or traffic separation.

Where coexistence can require more adaptation

### *Energy extraction and defence*

Energy extraction and defence interests are difficult to combine in many areas since wind farms can have a major impact on the Swedish Armed Forces' facilities and operations. In some areas, it is possible to establish energy facilities if Particular consideration is given to the interests of national defence. For all energy areas (proposals or alternatives), the marine spatial plan sets out Particular consideration of national defence interests.

### *Energy extraction and culture*

Energy facilities can negatively affect cultural environments and landscape appearance. Large-scale wind farms in the vicinity of the coast may dominate a location and thereby affect the values that represent important historical developments and have previously given the site its character. Facilities such as foundations or cables on the seabed can have a negative impact on ancient remains. In the construction phase, the impact area on the seabed may be significantly larger than the actual development area. Archaeological studies and investigations may be required.

Localization and adaptation measures in the design of energy facilities can limit negative impact. Within the areas covered by national interests according to Chapter 4, Section 3 of the Environmental Code, permit-bound wind power is not permitted, except for Öland. In such areas, the marine spatial plans do not indicate energy extraction.

### *Energy extraction and nature*

The use energy extraction is not presented together with the use nature in areas where nature values are so high and of such a nature that there is major uncertainty if energy extraction installations can be established without damaging or impeding conservation of the nature values.

The assessment of the possibility of coexistence is done from a holistic perspective that also takes into account cumulative effects of energy areas or other planned activities in the immediate vicinity from a long-term perspective. The assessment is done in the same way in all areas with the use nature. In the permit review of an activity that may have a significant impact on a Natura 2000 area, an assessment must be made of whether the activity is consistent with the provisions of Chapter 7, Sections 28b-29 of the Environmental Code. The permit review takes place at a more detailed level than the marine spatial planning's overall assessments.

Energy extraction in the form of offshore wind energy facilities at sea can negatively affect birds and bats, and the seabed habitat. During the construction phase, underwater noise usually arises from piling and traffic that can negatively affect animal life. During the operating phase, noise arises that can affect animal life. The facility in itself can be an obstacle to birds or bats. During the decommissioning phase, underwater noise usually arises from work and traffic that can negatively affect animal life. Cables along the seabed can damage valuable natural environments and electrical cables that generate electromagnetic fields can affect marine organisms to varying



extends. At the same time, the wind power stations can constitute artificial reefs that create protected food search areas for fish.

#### *Energy extraction and recreation*

Energy areas can reduce the accessibility to recreation, especially in areas close to the coast. Energy areas can at the same time constitute landmarks and tourist destinations.

#### *Energy extraction and sand extraction*

Energy extraction and offshore wind energy facilities need a stable seabed for their foundations. In sand extraction, sand is sucked up or dug up from the seabed, which changes its stability.

#### *Energy extraction and shipping*

The marine spatial plans usually do not indicate energy extraction and shipping in the same area. The interest given priority depends on which of the uses is deemed to be most suitable to the specific location and if the needs are deemed to be able to be met elsewhere. In several places, the navigability of shipping is deemed to be satisfied in nearby areas.

In several cases, it is possible to adapt the design of the wind farms in such a way that the navigability of shipping is not negatively affected. However, shipping usually cannot pass through an area with permanent facilities like a wind farm if the area is small or the stations are close to one another. Submarine cables can impact the possibilities of emergency anchoring and therefore come into conflict with shipping, especially in heavily trafficked lanes. There is also a special need for improved knowledge in terms of the offshore wind energy's impact on ice formation and conditions for icebreaking and winter navigation in the Gulf of Bothnia.

#### *Energy extraction and commercial fishing*

Offshore wind energy facilities make it difficult for navigation and commercial fishing in the area. Installation of wind power makes it difficult to use both active and passive gear to varying degrees. Adaptation of the wind farm's design or fishing gear can affect the possibilities of coexistence. International examples have shown a reduced fishing even in adapted wind farms (SwAM, 2023c).

#### *Defence and culture*

The marine spatial plans usually indicate coexistence between defence and culture. In the sea, defence activities can entail a risk of negative impact on cultural remains and cultural landscapes on the seabed. Defence facilities can at the same time form a part of the cultural heritage on the coast.

#### *Defence and nature*

The marine spatial plans usually indicate coexistence between defence and nature. In cases where coexistence is deemed to be unsuitable, one interest is given priority. If the area is a Natura 2000 area, the Environmental Code's rules apply regarding activities in Natura 2000 areas. National defence interests are given priority according to Chapter 3 of the Environmental Code if the nature values are made up of public interests of substantial significance or are

covered by national interest claims. Defence activities can entail traffic, noise, explosions and other activities that are at risk of negatively affecting nature values. The military marine activities may need to be adapted so that damage to nature values is minimised. This can be done by, for example, the Swedish Armed Forces planning their training activities in the area so that the impact on nature values is minimised, which the Swedish Armed Forces also already plan for today.

#### *Defence and recreation*

The marine spatial plans indicate coexistence between defence and recreation. Defence activities can entail noise, traffic, explosions and other activities that are at risk of negatively affecting recreation, including outdoor recreation. The activities can in many cases be adapted to each other.

#### *Defence and sand extraction*

The marine spatial plans do not indicate coexistence between defence and sand extraction. The interests of national defence are given priority according to Chapter 3 of the Environmental Code. Defence activities that entail, for example, residual ammunition can mean that the sand is not suitable for extraction.

#### *Culture and sand extraction*

Cultural remains can be negatively impacted by sand extraction, which entails a change to the seabed. Archaeological investigation may be required.

#### *Culture and shipping*

The marine spatial plans indicate coexistence between culture and shipping. Shipping has given rise to several of the cultural environments that we have today and ancient remains in the form of wrecks. Shipping routes and shipping lanes that are intensively trafficked can entail emissions, changed landscape appearance and dredging that negatively affect cultural values. Shipping can lead to erosion that can lay bare, grind against and completely remove exposed parts of remains. Shipping can also cause shallow remains to be damaged by anchors or hulls.

#### *Culture and commercial fishing*

Commercial fishing is in several cases an industry that has contributed to valuable cultural environments, such as fishing communities that are a part of the cultural heritage. Fishing with active gear such as trawling can negatively affect cultural remains on the seabed.

#### *Nature and sand extraction*

The marine spatial plans indicate coexistence between nature and sand extraction in cases where the assessment is that such coexistence may be possible. In the permit review of an activity that may have a significant impact on a Natura 2000 area, an assessment will be made of whether the activity is consistent with the provisions of Chapter 7, Sections 28b-29 of the Environmental Code. The permit review takes place at a more detailed level than the marine spatial planning's overall assessments. Sand extraction can affect the nature values that are in an area, especially if they are concentrated to the benthic environment. The extraction is local, takes

place within short periods of time and is done with relatively gentle technology can limit the impact.

#### *Nature and shipping*

The marine spatial plans usually indicate coexistence between nature and shipping. Shipping can entail loads on nature in the form of underwater noise, dredging, erosion and oil emissions. At the same time, shipping, if optimised, can constitute a climate-efficient means of transport compared with other means of transport.

#### *Nature and commercial fishing*

The marine spatial plans indicate coexistence between nature and commercial fishing. Fishing can have major effects on the marine ecosystems, mainly on the species it intends to catch, but also on other species and habitats that there may be a need to protect. Commercial fishing that is done with active gear such as bottom trawling or that entails by-catch of protected and endangered species can entail a negative impact on nature values. In some cases, commercial fishing does not entail any impact, and often there are possibilities to adapt catch methods so that the impact on nature values is limited. Adaptation of fishing methods is a commonly occurring measure in the fisheries management's regulatory work, but there are also many other ways to adapt commercial fishing to the needs of nature conservation. In some cases, fishing is not permitted.

#### *Recreation and shipping*

The marine spatial plans indicate coexistence between recreation and shipping. Shipping is in several cases an industry that has contributed to settings that are attractive to visit. Shipping can also contribute good accessibility. Shipping lanes that are intensively trafficked can, however, entail disturbances such as noise and emissions or constitute barriers to angling and recreational boat traffic, for example.

#### *Sand extraction and commercial fishing*

The marine spatial plans indicate coexistence between sand extraction and commercial fishing. Sand extraction affects the benthic environment, which in turn can affect the fish's habitats and thereby the fish stocks commercial fishing uses. However, the impact is usually local and limited in time, which in some cases can provide room for adaptation, for example by avoiding periods when the area is important to the fish, such as during spawning.

#### *Coexistence through Particular consideration*

The marine spatial plans do not specify what measures may need to be implemented to meet Particular consideration in a specific area. Appropriate measures can, when necessary, be specified by the Government or by other authorities in permit reviews or in other management activities.

#### *Particular consideration of national defence interests*

Particular consideration of national defence interests might mean that the placement and design of a wind farm needs to be adapted to defence interests. This also applies to other kinds of

permanent installations and other uses. Particular consideration of national defence interests might also mean that adaptation is needed if several energy areas together may have an impact on national defence. The risk of cumulative impacts on defence interests must therefore be taken into account. This means that expansion in an energy area can affect the possibility of using another area that in the plan has been designated E for energy extraction, or E (utr) for energy extraction investigation area.

#### *Particular consideration of high cultural heritage values*

Assessment of the impact on cultural environments needs to take place for individual projects at an early stage and from a holistic perspective based on local conditions. Cultural environments that can be affected by a changed landscape appearance are mainly outside the marine spatial planning areas. The connection between land and sea needs to be taken into account. Facilities and activities in the sea may need to be adapted in design or location so that the cultural heritage values are preserved.

#### *Particular consideration of high nature values*

Particular consideration to high nature values may, among other things, mean that activities are adapted to places and time periods that minimise direct, indirect or cumulative damage to nature values. This can, for example, involve:

- the Swedish Armed Forces, in the planning of its activities, consulting with municipalities and county administrative boards regarding the local conditions and adapting exercises and activities to places and time periods so that high nature values are not damaged
- adaptation in the design and technology of installations for energy extraction or adaptation of construction works and operation to special time periods
- introduction or expansion of marine area protection
- fishing regulation regarding areas, gear or time for catches
- adaptation of speed, maximum draft or the time for shipping traffic.

### **3. Gulf of Bothnia: Guidance and considerations**

#### **General information on the marine spatial planning area**

Here is a summary of the plan's main features for the marine spatial planning area. The focus for the use and considerations for the marine spatial planning area's marine areas is also presented.

The plan map should be interpreted in the approximate scale between 1:700,000 and 1:1,000,000. The boundaries and markings in the map are general based on the strategic level of the marine spatial plans.

The laying, operation and maintenance of data and telecommunication cables, power cables, pipelines and gas lines must be made possible where appropriate. This applies to the entire planning area.

In the Gulf of Bothnia, there are three marine sub-regions:

- Bothnian Bay
- Northern Bothnian Sea and North Kvarken
- Southern Bothnian Sea.

#### **Production of renewable energy**

The marine spatial plans should contribute to achieving the societal objective of 100-per-cent fossil-free energy production by 2040. The conditions for energy extraction in the form of wind power in the Gulf of Bothnia differ to some extent from the other marine spatial planning areas. The conflicts of interest with nature, commercial fishing and defence are generally lower and shipping is also less intensive in these marine areas. The Bothnian Bay has ice winters every year and even in so-called mild ice winters, sea ice basically forms in the entire marine area. There is a lack of gathered knowledge regarding the impact of offshore wind energy on ice formation and the conditions for icebreaking and winter navigation in the Gulf of Bothnia (Swedish Maritime Administration, 2022). The wind conditions are somewhat worse in the Gulf of Bothnia compared with the Baltic Sea and Skagerrak and Kattegat, but still generally good. In some areas in the Gulf of Bothnia, there is, however, such strong competition between wind power and other uses, such as different nature values or defence interests, that coexistence is not deemed to be attainable.

The starting point for the planning has been updated documentation for new or changed areas for energy extraction in the marine spatial plans (Swedish Energy Agency, 2023a). The planning of areas with energy extraction builds on a comprehensive assessment of how the marine spatial plans can best contribute to achieving the energy objectives. The areas with energy extraction are proposed both in the open sea and in more coastal areas. Some proposed areas are covered by the Natura 2000 legislation, which means that wind power establishment can only be permitted in the area if it does not risk damaging or disturbing the habitats or species that are to be

protected. Several (13 out of 23) energy extraction areas and alternative areas in the Gulf of Bothnia are designated as investigation areas, E (utr) in the plan map. In the Gulf of Bothnia, this is largely based on the uncertainties that prevail around the impact of offshore wind development on defence interests. The pointing out of alternative investigation areas for energy extraction is based on uncertainties regarding cumulative effects of large-scale offshore wind development, including on nature values and the possibilities of connecting the electricity production to the main grid.

In the expansion of energy extraction, particular consideration must be given to national defence interests. Proposed energy areas and alternative energy areas that the marine spatial plan indicates in the Gulf of Bothnia entail a risk of combined, cumulative impact on the national defence interests. This risk must be taken into account, and this might entail limitations to the scope of the expansion, either altogether or in individual areas. In all proposed energy areas or alternative energy areas, particular consideration is therefore given to the interests of national defence. In some of the areas, particular consideration of high nature values is also indicated.

## **Good conditions for various activities**

The Gulf of Bothnia is the one of Sweden's three marine spatial planning areas that is least burdened by anthropogenic effects while at the same time that the environmental status still needs to be improved to achieve a good environmental status. Here, there are large areas with high outdoor recreation and nature values and good conditions for various activities. Among other things, there are many large and important industries in northern Sweden, which use the shipping route for their transports. In large parts of the Gulf of Bothnia, there are areas with good conditions for fossil-free energy extraction in the form of offshore wind. There is an area in the northern Bothnian Bay that may be suitable for the extraction of sand. Sweden has national defence interests in the marine spatial planning area, including a marine exercise area in the northern Bothnian Sea and impact areas in the Bothnian Bay for activities on land.

Many activities in the Gulf of Bothnia are deemed to work well together, meaning that they can coexist. At times, however, coexistence must be regulated to work. This might, for example, involve areas being restricted during defence exercises or rules for how ships, such as fishing boats that are fishing, may be navigated in shipping lanes that are a part of a traffic separation system. Such regulations do not take place through the marine spatial plan, but are found in other legislation. There is a lack of gathered knowledge about the possibilities for coexistence between winter navigation and large-scale energy extraction at sea.

## **World heritage, small-scale fishing and valuable nature**

The High Coast world heritage site is well-visited by tourists year-round, but mainly in the summer, when the tour boats and recreational craft come to the harbours in the area. Early autumn sees the beginning of the fermented herring (surströmming) season, which is also well known and much visited.

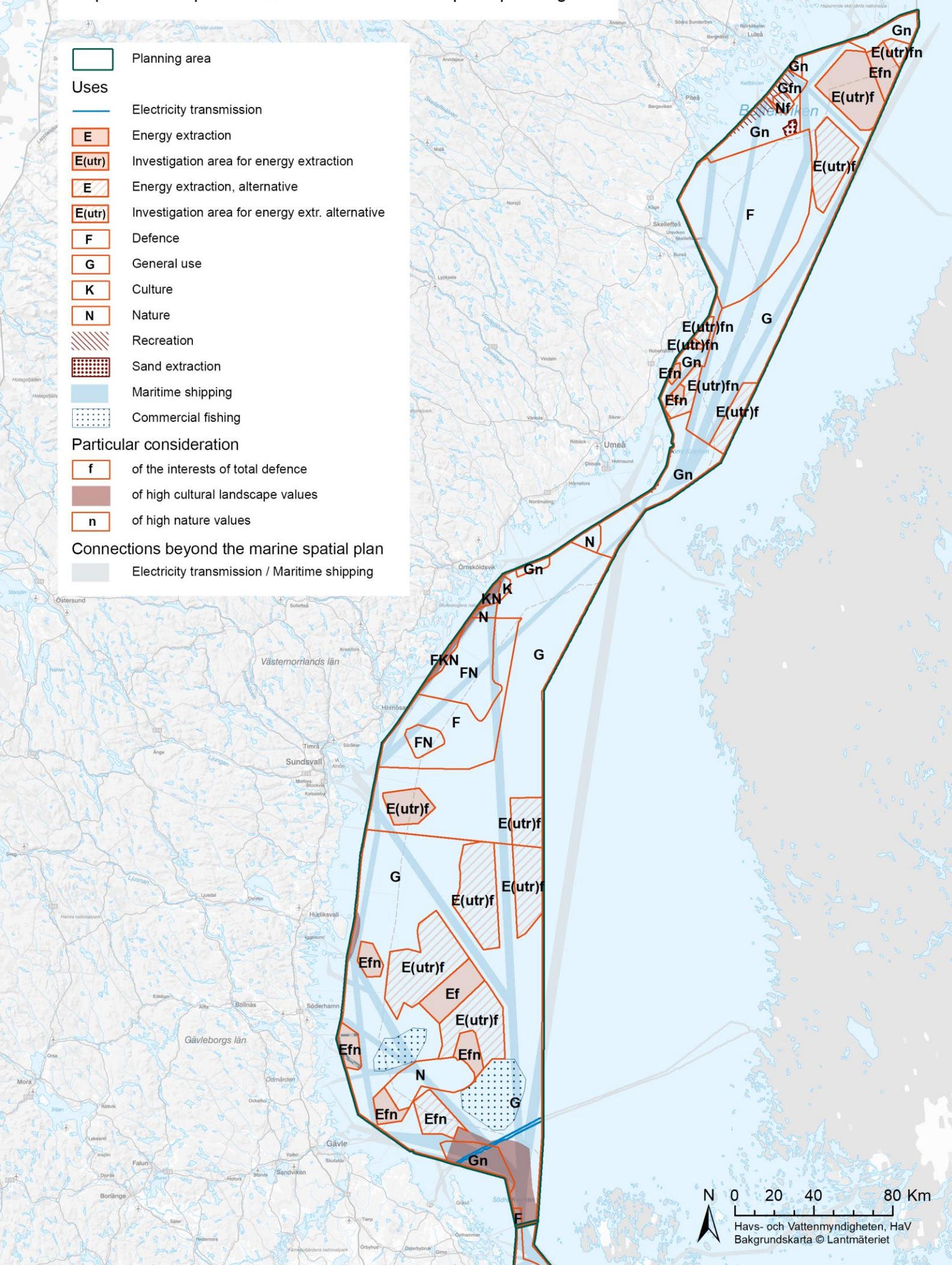
Commercial fishing in the Gulf of Bothnia is mostly small scale. Fishing is sparse in the open sea, but more frequent in the coastal waters. The use commercial fishing is indicated in the Southern Bothnian Sea where the largest concentration of Swedish commercial fishing in the marine spatial planning area is located. Fishing may be affected by proposed energy areas and alternative

areas. The use commercial fishing in the plan is based solely on fishing from Swedish vessels, but Finnish fishing is also conducted. Often, Swedish and Finnish fishing coincide geographically. Within the areas affected by national interest claims for commercial fishing in the Southern Bothnian Sea, no overlapping energy areas or alternative energy areas are proposed.

In the marine spatial planning area, there are large areas with high nature values and several of them are nature reserves, Natura 2000 areas and national interest claims for commercial fishing that pertain to spawning and nursery areas for fish. These have the use nature (N) in the marine spatial plan. In addition to them, there are areas with high nature values with a need for particular consideration to be able to continue contributing to valuable ecosystem services. Other activities need to show particular consideration to these values.



Map 1. Plan map for the Gulf of Bothnia marine spatial planning area





## 3.1. Bothnian Bay

### Energy extraction

In the Bothnian Bay, a total of 10 energy areas are indicated, which includes proposals for areas with energy extraction and alternative areas for energy extraction.

In the northern part of the Bothnian Bay, there are four energy areas (B110, B111, B113, B117). Offshore wind is considered to be a public interest of substantial significance in all four areas. For all areas, particular consideration is given to the interests of national defence. South-eastern Malören (B111), which is partly in the territorial sea within Kalix Municipality and partly in the exclusive economic zone and Öst Farstugrunden (B110), which is partly in the territorial sea within Luleå and Kalix municipalities and partly in the exclusive economic zone are proposed energy areas. This is due to B111 and parts of B110 overlapping with a project area that the Swedish Armed Forces analysed and where they assess that there may be possibilities for offshore wind without it entailing substantial damage to national interests or areas of significance to the military component of national defence (Swedish Energy Agency, 2023a). The impact on the confidential interests of the military component of national defence has not been investigated in parts of area B110. The area is therefore indicated as an investigation area. For area B111, particular consideration to high nature values is indicated, which includes reef environments and fish spawning areas. Within area B111, bottom-fixed foundations are suitable while in B110, it is largely suitable with floating foundations considering the depth.

Two of the areas in the northern part of the Bothnian Bay are indicated as alternative areas (B113, B117). The pointing out of alternative areas signals the importance of taking into account cumulative effects where larger clusters of energy areas exist. Potential cumulative effects in the area can, among other things, include effects on nature values, cultural values, recreational values and the possibilities of connecting electricity production to the main grid. The impact on the confidential interests of the military component of national defence has not been investigated in the areas. Therefore, they are also indicated as investigation areas. The area of South-eastern Malören and Sandskär (B117), which is mainly within Haparanda Municipality, is indicated as an alternative also due to the proximity to Haparanda archipelago national park and potential impact on the national park's values. The area (B117) also indicates particular consideration to high nature values due to fish spawning and mammal areas. In this area, bottom-fixed foundations are suitable considering the depth. In the offshore area of South-eastern Svalan and Falkens grund (B113), there is a larger alternative investigation area for energy extraction. In the area, mainly floating foundations are suitable considering the depth. B113 has conditions similar to B110. There are, however, major uncertainties regarding the impact on national defence interests for area B113, due, among other things, to the proximity to the Tåme Artillery Range (B105). The area is therefore indicated as an alternative.

In the southern part of the Bothnian Bay's marine area, there are six energy areas (B107, B108, B135, B137-B139). Wind power is deemed to be a public interest of substantial significance in all six areas. For all areas, particular consideration is given to the interests of national defence. Three of the areas are indicated as proposals for areas with energy extraction (B107, B108, B139). Two of the proposed areas are in Robertsfors Municipality in the southern part of the Bothnian Bay (B107, B108) and are proposed as energy extraction areas for various reasons.

The areas are indicated as energy areas in the municipal comprehensive planning. The areas are also indicated as energy extraction areas in the approved Swedish marine spatial plans (Government, 2022) and coexistence with the confidential interests of the military component of national defence is therefore deemed to probably be possible (Swedish Energy Agency, 2023a). These areas are considered to be a public interest of substantial significance for wind power. In both of these areas, bottom-fixed foundations are suitable considering the depth. The areas' coastal location means that consideration needs to be given to migratory and breeding birds and bats. For the areas, particular consideration is indicated to high nature values, which also includes reef environments and fish spawning areas. The third proposed area, Syd Kallviksklubben (B139), is also in Robertsfors Municipality and is indicated as an energy area in the municipal comprehensive planning. However, the area is not included in the approved marine spatial plan (Government, 2022) and the impact on the confidential interests of the military component of national defence has not been investigated in the area. The area is therefore indicated as an investigation area.

Three of the areas in the southern part of the Bothnian Bay's marine area are indicated as alternatives (B135, B137, B138). In all areas, bottom-fixed foundations are suitable considering the depth. The pointing out of alternative areas signals the importance of taking into account cumulative effects where larger clusters of energy areas exist. Potential cumulative effects in the area can, among other things, include effects on nature values, cultural values, recreational values and the possibilities of connecting electricity production to the main grid. Two of the areas are in the territorial sea, South-eastern Kallviksklubben (B137) within Skellefteå Municipality and the area around Rata Storgrund (B138) within Robertsfors Municipality. Area B137 is indicated as an alternative also due to a potential negative impact on recreational values and the national interest claims for outdoor recreation that extend along the Lövånger coast. Area B138 is also close to national interest claims for outdoor recreation according to Chapter 3, Section 6 of the Environmental Code, The Holmöarna. In both B137 and B138, particular consideration of high nature values is indicated due to fish spawning, mammal areas and bird and bat areas. The third alternative area in the southern part of the Bothnian Bay's marine area is the offshore area east Rata Storgrund (B135). The impact on the confidential interests of the military component of national defence has not been investigated in the area. The areas are therefore indicated as investigation areas.

There are national interest claims for wind power in the sea outside of Piteå and Luleå and national interest claims for shipping and national defence (B104–B105). In this area, offshore wind is not deemed to be compatible with the other national interest claims. The national interest claims for shipping and national defence are given priority over the national interest claim for wind power. Outside of Luleå and Piteå, there is an area with a public interest of substantial significance for sand extraction (B104) that is given priority over a public interest of substantial significance for wind power.

## **Defence**

The marine spatial plan indicates defence use at the Tåme Artillery Range in Skellefteå Municipality, since it has an impact area that extends out into the marine spatial planning area (B105). Particular consideration to national defence interests is indicated at the air exercise area at Kallax (B102 - B103) where a small area with height restrictions on built objects overlaps with the marine spatial planning area. In the expansion of energy extraction, particular consideration

must be given to national defence interests. Particular consideration of the interests of national defence is therefore indicated for all areas with the use energy extraction (B107-B108, B110, B111, B113, B117, B135, B137-B139).

## **Culture**

The areas with national interest claim for cultural heritage conservation are along the coast towards land outside the marine spatial planning area. There are also core cultural heritage sites identified by the Swedish National Heritage Board outside the marine spatial planning area. The safety distance to the cores sites needs to be assessed from a local perspective, such as possible impact on cultural environment values from energy extraction in the areas furthest from the coast from Rata Storgrund up to Bjuröklubb (B106-B108, B137-B139) and in the northern Bothnian Bay (B110, B111, B117).

## **Nature**

The marine spatial plan indicates nature use for the area Marakallen off of Luleå (B103), which is protected through Natura 2000. Particular consideration of high nature values is indicated at the far north (B111, B112 and B117), within parts of Luleå and Piteå municipalities (B102, B104, B109) and for the areas along the coast from Rata Storgrund up to Bjuröklubb (B106-B108, B137-B139), where consideration consists of both bird and bat areas, as well as reef environments and fish spawning areas. Almost the entire national interest claim for nature conservation at Kinnbäcksfjärden is outside the marine spatial planning area. A small part of the national interest claim enters the marine spatial plan area B105. The national interest claim is met, but depending on the marine spatial plans overall scale, it does not constitute a use in the marine spatial plan. The stable winter ice in the Bothnian Bay characterises the marine environment in the deep sea. The ice forms a substrate for photosynthesising algae and the ringed seal needs the ice in order for the pups to survive. When climate change reduces the extent of the compact pack ice, the northern parts of the Bothnian Bay will become increasingly crucial for these activities. Climate refuges for ringed seals have been identified in close connection to the marine spatial planning area along parts of the northern coast (SwAM, 2017d).

## **Recreation**

In the northern part of the marine area, the entire coast towards land, outside the marine spatial planning area, is covered by national interests for active outdoor recreation and national interest claims for outdoor recreation. The national interest and the national interest claim extend into the marine spatial planning area. In the marine spatial plan, recreation use is indicated (B102-B105, B109). The possibility of coexistence with other uses and consideration distances needs to be assessed from a local perspective. Possible offshore wind establishment in the exclusive economic zone provides a visual impact on the area.

## **Sand extraction**

The marine spatial plan indicates sand extraction use at the far end of Luleå Municipality's offshore area at Svalans and Falkens grund (B104). From a risk perspective, sand extraction is not deemed to be suitable in adjacent areas that enter the impact area for the Tåme Artillery Range (B105).

## **Shipping**

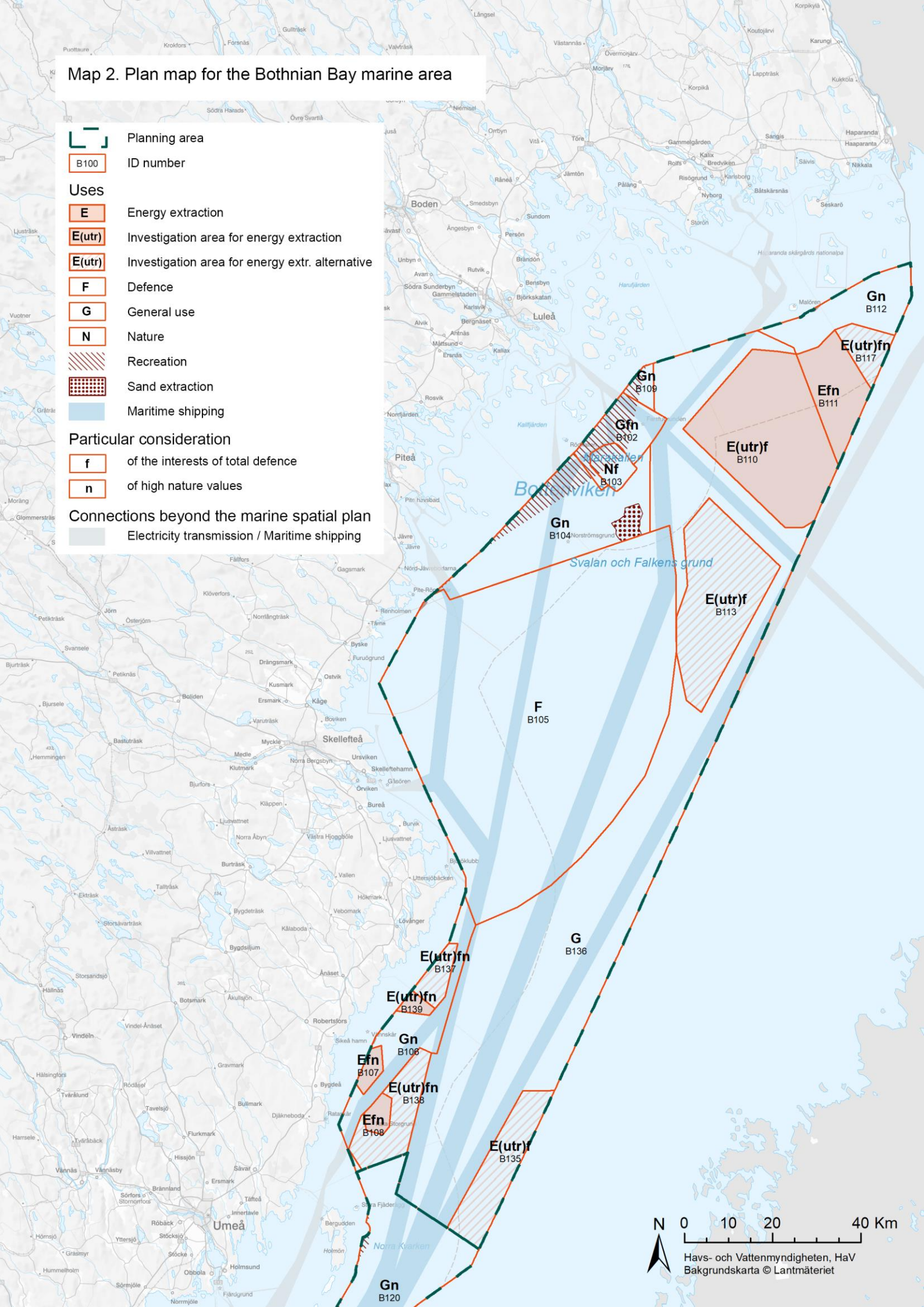
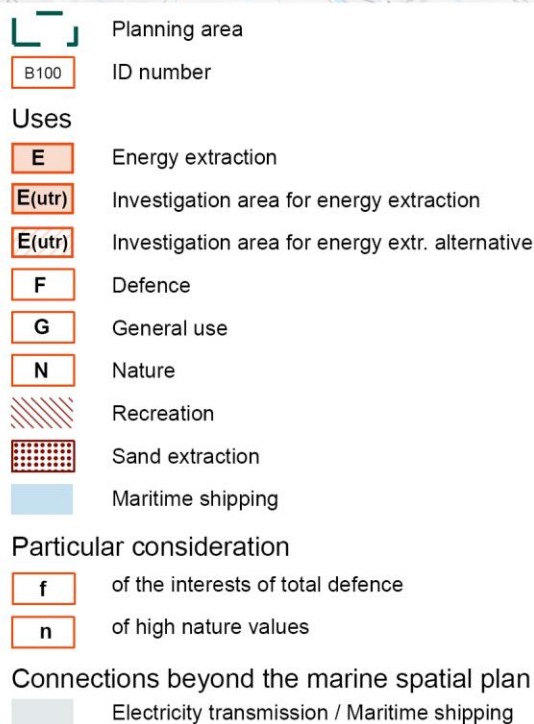
The marine spatial plan indicates maritime shipping use in the offshore area and into ports within the marine area (B102-B106, B136). Several important ports, including Skellefteå and Luleå, are along the coast in the Bothnian Bay. Shipping traffic is important to the industry in northernmost Sweden. The approaches to the ports are often long and pass through the shallow archipelago. Consideration must be given to continuously on-going land uplift.

In the Bothnian Bay, there are special conditions in the winter with thick, extensive sea ice. This affects the conditions for shipping, which needs large areas of open water to ensure navigability. This should be taken into account in the establishment of offshore wind and other permanent installations at sea. There is a lack of gathered knowledge about how offshore wind installations affect ice formation, conditions for ice extraction and winter navigation. Consequently, this requires further investigation. The planning map presents the most important shipping lanes, not shipping's total need for space. In connection with the shipping lanes, there should be a safety distance. The distance is adapted to local conditions according to risk assessment.

## **Commercial fishing**

Commercial fishing is sparse in the offshore areas of the Bothnian Bay. The fishing that is conducted is mostly with passive gear and close to the coast. Autumn fishing for vendace for whitefish roe is economically significant. This fishing takes place close to the coast with active gear and mainly outside the marine spatial planning area.

Map 2. Plan map for the Bothnian Bay marine area





## Area table for the Bothnian Bay

Table 1 Area table for the Bothnian Bay

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
<b>B102</b>	General use Recreation Shipping	High nature values: Mammal area. Fish spawning ground. Bird area. National defence interests		
<b>B103</b>	Nature Shipping Recreation	National defence interests		
<b>B104</b>	General use Recreation Shipping Sand extraction	High nature values: Mammal area. Fish spawning ground. Bird area. Reef environment.	Defence, shipping and sand extraction are given priority over energy extraction.	<p>According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power and public interest of a substantial significance for wind power.</p> <p>The uses are deemed to not be able to coexist.</p> <p>Public interests of substantial significance for sand extraction are given priority over public interests of substantial significance for wind power.</p> <p>The uses are deemed to not be able to coexist.</p>
<b>B105</b>	Defence Shipping Recreation	High cultural heritage values	Defence and shipping are given priority over energy extraction and sand extraction	<p>According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power and public interest of a substantial significance for sand extraction.</p> <p>The uses are deemed to not be able to coexist.</p>
<b>B106</b>	General use Shipping	High nature values: Bird area. Reef environment. Bat area. Fish spawning ground.		
<b>B107</b>	Energy extraction	High nature values: Bird area. Reef environment. Bat area. Fish spawning ground. National defence interests		

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
<b>B108</b>	Energy extraction	High nature values: Fish spawning ground. Reef environment. Bird area. Bat area. National defence interests		
<b>B109</b>	General use Recreation	High nature values: Mammal area. Fish spawning ground. Bird area.		
<b>B110</b>	Investigation area energy extraction	National defence interests		
<b>B111</b>	Energy extraction	High nature values: Fish spawning ground. Mammal area. National defence interests		
<b>B112</b>	General use	High nature values: Fish spawning ground. Mammal area. High cultural heritage values		
<b>B113</b>	Investigation area for energy extraction, alternative	National defence interests		
<b>B117</b>	Investigation area for energy extraction, alternative	High nature values: Fish spawning ground. Mammal area. National defence interests		
<b>B135</b>	Investigation area for energy extraction, alternative	National defence interests		Public interest of substantial significance for wind power adapted to high nature values.
<b>B136</b>	General use Shipping			
<b>B137</b>	Investigation area for energy extraction, alternative	High nature values: Bird area. Reef environment. Bat area. Fish spawning ground. National defence interests		
<b>B138</b>	Investigation area for energy extraction, alternative	High nature values: Bird area. Reef environment. Bat area. Fish spawning ground. National defence interests		

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
<b>B139</b>	Investigation area energy extraction	High nature values: Bird area. Reef environment. Bat area. Fish spawning ground. National defence interests		



## **3.2. Northern Bothnian Sea and North Kvarken**

### **Energy extraction**

In the Northern Bothnian Sea and North Kvarken, there is an investigation area with the use energy extraction, Brämön (B163). Some of the area is within Sundsvall Municipality and a part is in the exclusive economic zone. Offshore wind is considered to be a public interest of substantial significance in this area. In most of the area, floating foundations are suitable considering the depth. In the area's western part, bottom-fixed foundations are possible.

In the Northern Bothnian Sea and North Kvarken, there is an alternative area with the use energy extraction Nordöst Eyrasaltbanken (B161), which is part of a larger area (B160) that extends into the Southern Bothnian Sea marine area. In the western part of the area, floating foundations are suitable considering the depth and in the eastern part, bottom-fixed foundations are possible. The area is indicated as an alternative energy area due to it being part of a larger cluster of areas that extend south to the Southern Bothnian Sea marine area. This indicates the importance of considering cumulative effects where large clusters of energy areas exist.

### **Defence**

The marine spatial plan indicates the use defence for the Härnön marine exercise area, which extends from the coast through the territorial sea out into the Swedish exclusive economic zone, and for the impact area for the Skärsviken Artillery Range (B127 – B129, B132). In the expansion of wind power, particular consideration must be given to national defence interests. Particular consideration of national defence interests is therefore indicated for all areas with the use energy extraction (B163, B161).

### **Culture**

The High Coast world heritage site with unique cultural and nature environments extends out into the sea. Along the coastline of the High Coast, there is a concentration of coastal remains from continuous human activity over 7000 years. The coastlines of different time periods contain both settlements and catch pits from the Stone Age and Bronze Age cairns. Grave mounds from the Iron Age and harbours and building foundations from the last millennium are other types of remains from the shorelines (National Heritage Board, 2017). For these areas, the marine spatial plan indicates the culture use (B130–B132). On the Finnish side, there is the World Heritage site of the Finnish Kvarken Archipelago. The High Coast is also covered by national interests for unbroken coast.

The areas with national interest claim for cultural heritage conservation are along the coast towards land, outside the marine spatial planning area. Core cultural heritage sites identified by the Swedish National Heritage Board are mainly outside the marine spatial planning area. However, such an area extends into the planning area at the High Coast and is covered there by particular consideration of high cultural heritage values (B126, B127, B130–B132, B162). The consideration distance to the core sites needs to be assessed from a local perspective.

## Nature

The marine spatial plan indicates nature use to several areas from Bonden and Sydostbrotten in the north to Vânta litets grund in the south. Sydostbrotten (B122) is covered by both a Natura 2000 area and the nature reserve Örefjärden-Snöanskärgården. At the High Coast, there are national interest claims for nature values (B126–B127, B131–B132). Vânta litets grund (B129) is covered by Natura 2000. This bank has been classified as one of the most valuable offshore banks in the Gulf of Bothnia (Swedish EPA, 2006).

Particular consideration of high nature values is indicated off of Holmön (B120) and Vallinsgrundet (B118), which has reef environments, fish spawning areas and the presence of birds and mammals. The area at Holmön (B120) also serves as a passage for migratory birds of prey (Hansson, 2019). In its entirety, the marine area is characterised by low use, and the environmental impact is therefore relatively low with high originality (Hansson, 2019). The Natura 2000 area Holmöarna and overlapping nature reserves and national interest claims for nature conservation are mainly in the coastal zone, but a small part extends into the marine spatial planning area's delimitation towards Holmöarna and the coast (B120). The national interest claim is met, but depending on the marine spatial plans's overall scale, nature use is not indicated in the planning map.

## Recreation

At the High Coast, there is a national interest for active outdoor recreation that borders on the marine spatial planning area. Within the planning area south and east of Holmöarna (B120), there are national interest claims for outdoor recreation. Possible offshore wind establishment north of Holmöarna has a visual impact on the area. The possibility of coexistence with other uses and consideration distances needs to be assessed from a local perspective

## Shipping

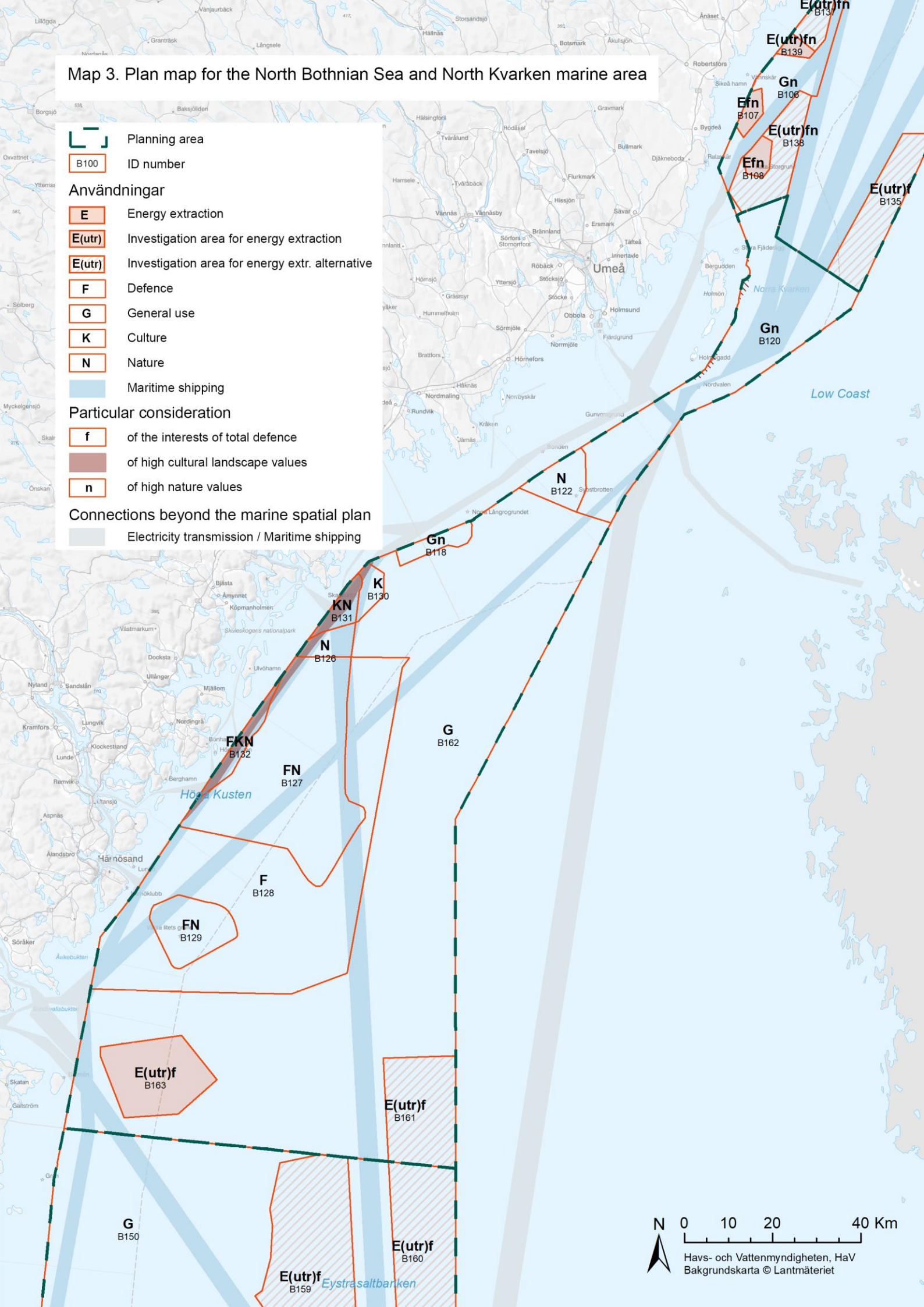
The marine spatial plan indicates shipping use for several shipping lanes to and from North and South Kvarken (B120, B126-B128, B130-B132, B136, B162). There are several important ports along the coast in the Northern Bothnian Sea. Shipping traffic is important both to Sweden's own coast and south via South Kvarken out into the Baltic Sea and north via North Kvarken to both Swedish and Finnish ports in the Bothnian Bay. Since the winter ice moves unpredictably, shipping needs large areas and alternative routes within the Gulf of Bothnia. There is a lack of gathered knowledge about how offshore wind installations affect ice formation, conditions for ice extraction and winter navigation. Consequently, this requires further investigation.

North Kvarken, which links the Bothnian Bay with the Bothnian Sea is very important to industry in the north. Through North Kvarken, shipping is led for safety reasons in a traffic separation system (TSS), since the passage is narrow and shallow, which gives shipping limited room to manoeuvre. Over Kvarken, between Umeå and Vasa in Finland, Europe route 12 passes as a ferry line and has the use shipping in the plan. The planning map presents the most important shipping lanes, not shipping's total need for space. In connection with the shipping lanes, there should be a safety distance. The distance is adapted to local conditions according to risk assessment.

## **Commercial fishing**

The fishing that is conducted is limited, with passive gear and close to the coast. Some pelagic fishing takes place in the south.

Map 3. Plan map for the North Bothnian Sea and North Kvarken marine area



## Area table for the Northern Bothnian Sea and North Kvarken

Table 2 Area table for the Northern Bothnian Sea and North Kvarken.

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
<b>B118</b>	General use	High nature values: Reef environment. Fish spawning ground. Bird area. Mammal area.		
<b>B120</b>	General use Recreation Shipping	High nature values: Reef environment. Fish spawning ground. Bird area. Mammal area.	Energy extraction adapted to nature	Area of public interest of substantial significance for wind power adapted to the area with particular consideration of high nature values.
<b>B122</b>	Nature			
<b>B126</b>	Nature Shipping	High cultural heritage values		
<b>B127</b>	Defence Nature Shipping	High cultural heritage values		
<b>B128</b>	Defence Shipping			
<b>B129</b>	Defence Nature Shipping			
<b>B130</b>	Culture Shipping	High cultural heritage values		
<b>B131</b>	Culture Nature Shipping	High cultural heritage values		

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
<b>B132</b>	Defence Culture Nature Shipping	High cultural heritage values		
<b>B161</b>	Investigation area for energy extraction, alternative	National defence interests		
<b>B162</b>	General use Shipping	High cultural heritage values		
<b>B163</b>	Investigation area energy extraction	National defence interests		

### **3.3. Southern Bothnian Sea**

#### **Electricity transmission**

The use electric transmission consists of two transmission cables (FennoScan) that go from the area at Forsmark in Sweden over to Finland. (B150, B154)

#### **Energy extraction**

In the Southern Bothnian Sea, there are several shallow areas and good wind conditions, which makes the area interesting for energy extraction.

In the Southern Bothnian Sea, there are five areas with proposed areas for energy extraction:

- In the offshore area North Sylen (B164) which is considered to be a public interest of substantial significance for wind power. The area is indicated as an energy extraction area in the approved marine spatial plan (Government, 2022).
- At Storgundet (B146) where there is a permit-granted offshore wind project and national interest claim for wind power. The area is indicated as an energy extraction area in the approved marine spatial plan (Government, 2022).
- At Gretas klackar (B142), Östra Finngrunden (B149) and Utknallen (B152) where there are national interest claims for wind power. The areas are indicated as energy extraction areas in the approved marine spatial plan. Östra Finngrunden (B149) has been adapted to the area of national interest for commercial fishing. In all five areas (B142, B146, B149, B152, B164), bottom-fixed foundations are possible considering the depth.

An alternative area for energy extraction is indicated in the Southern Bothnian Sea, Syd Finngrunden (B156). The area is included in Älvkarleby, Tierp and Östhammar municipalities. Parts of the area are in the exclusive economic zone. Wind power is deemed to be a public interest of substantial significance in this area. Public interest of substantial significance to wind power has been adapted to the national interest area for commercial fishing and the area with particular consideration of high cultural heritage values. The area partly overlaps an offshore wind project area analysed by the Swedish Armed Forces where they assess that wind power can be built with a higher probability without entailing tangible damage to national interests or areas of significance to the military component of national defence (Swedish Energy Agency, 2023a).

The marine spatial plan indicates alternative investigation areas with the use energy extraction in four major areas in the Southern Bothnian Sea that are considered to be of public interest of substantial significance to wind power.

- The offshore area Eystrasaltbanken (B159). The area largely overlaps with a project area that the Swedish Armed Forces has analysed and where they assess that it cannot be ruled out that there can be a possibility for wind power to be built without entailing tangible damage to national interests or areas of significance to the military component of national defence (Swedish Energy Agency, 2023a).

- The offshore area of Öst Eysrasaltbanken (B160), which is part of a larger area that extends into the marine area of the Northern Bothnian Sea and North Kvarken. The impact on the confidential interests of the military component of national defence has not been investigated (Swedish Energy Agency, 2023a).

- Offshore area Hudiksvall to Söderhamn (B148). Public interest of substantial significance to wind power has partly been adapted to recreational values on the coast. The impact on the confidential interests of the military component of national defence has not been investigated (Swedish Energy Agency, 2023a).

- Offshore area Norr Finngrundet (B158). The area partly overlaps with an offshore wind project area analysed by the Swedish Armed Forces where they assess that there may be a possibility for wind power to be built without entailing tangible damage to national interests or areas of significance to the military component of national defence (Swedish Energy Agency, 2023a).

Also, most of the alternative investigation areas with the use energy extraction have the possibility of establishment with bottom fixed foundations with the exception of the offshore area Hudiksvall to Söderhamn (B148) and Öst Eysrasaltbanken (B160) where parts of the areas are suitable for establishment of bottom fixed foundations. The possibility that bottom fixed foundations become suitable in larger parts of the area may, however, exist in the future.

The alternative investigation areas with the use energy extraction show that there are good conditions for energy extraction in the Southern Bothnian Sea, but indicate the importance of considering cumulative effects where larger clusters of areas exist. This is also based on standpoints in the approved marine spatial plan (2022).

Västra banken and Finngrundet (B157) are covered by several national interest claims. Finngrundet's western, northern and eastern parts are covered by national interest claims for wind power. There is an important shipping lane through the area that constitutes a national interest claim for shipping. At Finngrundet, there is also a spawning and nursery area for fish that constitutes a national interest claim for commercial fishing. In addition to this, Natura 2000 areas have been established on the banks to protect nature values. In the area of Västra banken and Finngrundet (B157), priority is given to nature use and shipping use over energy extraction. The investigation area for energy extraction at Västra Finngrundet, which according to the previously approved marine spatial plan for the Gulf of Bothnia in 2022 was deemed to be compatible with the Natura 2000 legislation, is removed. This is because changed conditions mean that several other areas for energy extraction are proposed that are deemed to be more suitable from a holistic perspective.

Four of the areas with the use energy extraction indicate particular consideration of high nature values. Besides Finngrundet (B149, B152), which is of significance to resting and wintering sea birds, particular consideration of high nature values also applies to other offshore banks in the marine area, such as Greta Klackar (B142) and Storgrundet (B146). Also in the alternative energy area, Syd Finngrundet (B156), particular consideration shall be given to high nature values. An activity or measure that can significantly affect an area that is protected according to Chapter 4, Section 8 of the Environmental Code, meaning Natura 2000, always requires a special permit review. This also applies to activities and measures that are outside of the Natura 2000 area, but that can affect the values in the Natura 2000 area.



Through four of the energy areas (B148-B149, B158, B164), there is a shipping lane covered by national interest claims for shipping. Priority is given to energy extraction and shipping is adapted in accordance with the assessment in the previously approved marine spatial plan for the Gulf of Bothnia (2022). The assessment is that accessibility to the ports of the southern Norrland coast remains even if traffic may need to shift more to the east than before.

At Campsgrund in the south, there are national interest claims that are not deemed to be compatible with each other (B150). The part of the national interest claims for wind power in Tierps and Älvkarleby municipalities that is in the marine spatial planning area is not deemed to be consistent with overlapping national interest claims for national defence or national interest claims for shipping. The national interest claims for national defence and shipping are therefore given priority over the national interest claim for wind power.

## **Defence**

Within Östhammar Municipality, the use defence is indicated due to an area of influence with special obstacle clearance needs (B153).

In the expansion of energy extraction, particular consideration must be given to national defence interests. The many energy areas within the Southern Bothnian Sea entail a risk of combined, cumulative impact on national defence interests. This risk must be taken into account, and this might entail limitations to the scope of the expansion, either altogether or in individual areas. Particular consideration to the interests of national defence is therefore indicated for all energy areas in the Southern Bothnian Sea (B142, B146, B148, B149, B152, B156, B158 -B159, B160, B164).

## **Culture**

The coast in the south, at Gräsö towards South Kvarken, is covered by a national interest of a highly developed coast. The areas with national interest claim for cultural heritage conservation are along the coast outside the marine spatial planning area. An area at Öregrund and Östhammar is a landscape protection area and is covered in the marine spatial plan by particular consideration of high cultural heritage values (B150, B153–B154). Core cultural heritage sites identified by the Swedish National Heritage Board are mainly outside the marine spatial planning area. However, such an area extends into the planning area at Hudiksvall and is covered there by particular consideration of high cultural heritage values (B150). The consideration distance to the heritage sites needs to be assessed from a local perspective, such as the possible impact on cultural environmental values of energy extraction in several areas in the Southern Bothnian Sea (e.g. B142, B146, B152, B156). Along the coast, there is also a historical fairway, St Olav, that extends from Åland to Trondheim.

## **Nature**

The marine spatial plan indicates the nature use at Finngrundens three banks (B157) where there are Natura 2000 areas. At Finngrundens, there are wintering areas for sea birds. The bank constitutes the northernmost outpost for wintering of the long-tailed duck, which is an endangered species in Sweden. There is also a national interest claim for commercial fishing that pertains to spawning and nursery areas for fish that extend over Finngrundens.

At Nordanstigskusten, there is a national interest claim for nature conservation. Part of the national interest claim overlaps with the seal protection area Lillgrund. A small part of the national interest claims and the seal protection area extends into the marine spatial planning area (B150). The national interest claim is met, but depending on the marine spatial plan's overall scale, it is not marked as the nature use in the planning map.

The marine spatial plan indicates particular consideration of high nature values on other offshore banks in the marine area, such as Greta klackar (B142) and Storgrundet (B146) where there are reef environments, fish spawning and mammal areas. Östra Finngrund (B149) where high nature values consist of reef environments, fish spawning and bird areas. In the areas Utknallen (B152), Argos grund to Grundkallegrund (B154) and Syd Finngrund (B156), particular consideration of high nature values is indicated due to them being within an important bird range.

## **Recreation**

In the coastal area, there are shallow archipelagos with traditional fishing villages. Within Hudiksvall Municipality, there are national interest claims for outdoor recreation in the vicinity of the marine spatial planning area. The possibility of coexistence with other uses and consideration distances needs to be assessed from a local perspective. Possible offshore wind establishment in the exclusive economic zone will have a visual impact on the area. The alternative energy area of the Offshore area Hudiksvall to Söderhamn (B148) has partly been adapted to the recreational values on the coast.

## **Shipping**

Shipping use is indicated for several shipping lanes to and from South Kvarken (B150, B153, B154, B157). Several important ports are along the coast in the Southern Bothnian Sea. Shipping in the marine area is crucial to many industries with destinations both along the local coast and in the rest of Sweden and Finland. Because the ice is weather-dependent and unpredictable, shipping needs space for several alternative routes. There is a lack of knowledge about how offshore wind installations affect ice formation, conditions for icebreaking and winter navigation. Consequently, this requires further investigation. The plan map presents the most important shipping lanes, not the total need for space for shipping. In connection with the shipping lanes, there should be a safety distance. The distance is adapted to local conditions according to risk assessment.

A shipping lane covered by national interest claims for shipping goes through two of the investigation areas for energy extraction and two of the alternative investigation areas (B148-B149, B158, B164). Priority is given to energy extraction. Shipping is adapted in accordance with the assessment in the previously approved marine spatial plan for the Gulf of Bothnia (2022). The assessment is that accessibility to the ports of the southern Norrland coast remains even if traffic may need to shift more to the east. The plan hereby meets both the wind power and shipping interests.

## **Investigation areas, shipping**

The marine spatial plan indicates the investigation area for shipping at the inlets to Ljusne and Vallvik at Storgrundet. To achieve coexistence with the area for energy extraction (B146),

shipping needs to be investigated. Adaptation may then need to take place of both shipping and energy extraction.

## **Commercial fishing**

There is coastal fishing that characterises many of the smaller coastal communities and is mostly conducted with passive equipment in and off the coastal area. An occasionally intensive pelagic fishing is conducted mainly around the offshore banks and in the south-eastern parts of the marine area. The Southern Bothnian Sea has three areas that constitute national interests for commercial fishing. There is a spawning and nursery area for fish at Finngrundén. This area is covered to some extent by Natura 2000 and the entire area is indicated as nature use in the marine spatial plan. West and east of Finngrundén, there are two catch areas that constitute national interests for commercial fishing. Here, commercial fishing use is indicated in the marine spatial plan (B150). This has been given precedence over public interests of substantial significance for wind power in the eastern area. Besides Swedish fishing, Finnish fishing is also conducted in the area (Backer & Frias, 2013).





## Area table for the Southern Bothnian Sea

Table 3 Area table for the Southern Bothnian Sea

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
<b>B142</b>	Energy extraction	High nature values: Mammal area. Fish spawning ground. Reef environment. National defence interests		
<b>B146</b>	Energy extraction Investigation areas, shipping	High nature values: Mammal area. Fish spawning ground. Reef environment. National defence interests		
<b>B148</b>	Investigation area for energy extraction, alternative	National defence interests	Energy extraction is given priority over shipping	Shipping adapted in accordance with the assessment in the previously approved marine spatial plan for the Gulf of Bothnia (2022)
<b>B149</b>	Energy extraction	High nature values: Reef environment. Fish spawning ground. Bird area. Especially low environmental impact. National defence interests	Energy extraction is given priority over shipping	The area is covered by national interest claims for wind power. Shipping adapted in accordance with the assessment in the previously approved marine spatial plan for the Gulf of Bothnia (2022)
<b>B150</b>	General use Shipping Commercial fishing Electricity transmission Investigation areas, shipping	High cultural heritage values	Defence, commercial fishing and shipping are given priority over energy extraction.	At Camps grund, priority is given to national interest claims for national defence according to Chapter 3, Section 10 of the Environmental Code and national interest claims for shipping over the part of the national interest claim for wind power that is in the planning area.  The uses are deemed to not be able to coexist. Pursuant to Chapter 3, Section 10 of the Environmental Code, a national interest claim for commercial fishing at South-eastern Finngrundet is given priority over a public interest of substantial significance for wind power.  The uses are deemed to not be able to coexist.
<b>B152</b>	Energy extraction	High nature values: Bird area. National defence interests		
<b>B153</b>	Defence Shipping	High cultural heritage values		

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
<b>B154</b>	General use Shipping Electricity transmission	High nature values: Mammal area. Fish spawning ground. Bird area. Reef environment. High cultural heritage values		
<b>B156</b>	Energy extraction, alternative	High nature values: Bird area. National defence interests	Energy extraction is adapted to culture.	The spread of the public interest of substantial significance for wind power is adapted to the area with particular consideration of high cultural heritage values.
<b>B157</b>	Nature Shipping		Nature and shipping are given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for shipping are given priority over national interest claims for wind power.  Natura 2000 areas are given priority over national interest claims for wind power.  The uses are deemed to not be able to coexist.
<b>B158</b>	Investigation area for energy extraction, alternative	National defence interests	Energy extraction is given priority over shipping	Shipping adapted in accordance with the assessment in the previously approved marine spatial plan for the Gulf of Bothnia (2022)
<b>B159</b>	Investigation area for energy extraction, alternative	National defence interests		
<b>B160</b>	Investigation area for energy extraction, alternative	National defence interests		
<b>B164</b>	Energy extraction	National defence interests	Energy extraction is given priority over shipping	Shipping adapted in accordance with the assessment in the previously approved marine spatial plan for the Gulf of Bothnia (2022)

## 4. Baltic Sea: Guidance and considerations

### General information on the marine spatial planning area

Here is a summary of the plan's main features for the marine spatial planning area. The focus for the use and considerations for the marine spatial planning area's marine areas is also presented.

The plan map should be interpreted in the approximate scale between 1:700,000 and 1:1,000,000. The boundaries and markings in the map are general based on the strategic level of the marine spatial plans.

The laying, operation and maintenance of data and telecommunication cables, power cables, pipelines and gas lines must be made possible where appropriate. This applies to the entire planning area.

In the Baltic Sea, there are five marine sub-regions:

- Northern Baltic Sea and South Kvarken
- Central Baltic Sea
- South-eastern Baltic Sea
- Southern Baltic Sea
- South-western Baltic Sea and Öresund

### Production of renewable energy

The marine spatial plans should contribute to achieving the societal objective of 100-per-cent fossil-free energy production by 2040. The conditions for wind power in the Baltic Sea differ between different marine areas. Common to all areas is that the technical possibilities for offshore wind energy are good in terms of wind speed and depth. Shipping is intensive in the whole of the Baltic Sea. The military component of national defence uses large areas, both open and not open. Close to land, there are many valuable cultural environments and areas for active outdoor recreation. The south-western, southern, south-eastern and central Baltic Sea has large nature values, including birds, mammals and valuable benthic environments.

The starting point for the planning has been updated documentation for new or changed areas for energy extraction in the marine spatial plans (Swedish Energy Agency, 2023a). The planning of areas for energy extraction builds on a comprehensive assessment of how the marine spatial plan can best contribute to achieving the energy objectives. The areas for energy extraction are proposed both in the open sea and in more coastal areas. Some proposed areas are covered by the Natura 2000 legislation, which means that wind power establishment can only be permitted in the area if it does not risk damaging or disturbing the habitats or species that are to be protected. All proposals for areas with energy extraction and alternative areas in the Baltic Sea except for two are indicated as investigation areas. In the Baltic Sea, this is based on the uncertainties that prevail around wind power's impact on defence interests and uncertainties regarding cumulative effects of large-scale wind power establishment, including nature values and the possibilities of connecting electricity production to the main grid.

In the expansion of energy extraction, particular consideration must be given to national defence interests. The many energy areas that the marine spatial plan indicates in the Baltic Sea entail a risk for combined, cumulative impact on the national defence interests. This risk must be taken into account, and this might entail limitations to the scope of the expansion, either altogether or in individual areas. In all proposed areas for energy extraction and alternative energy areas, particular consideration of the interests of national defence is indicated. In some of the areas, particular consideration of high nature values is also indicated.

## **Competition between uses**

There are high nature values in the marine spatial planning area, which affects future establishment of wind power and sand extraction. The activities are deemed to be possible, but in several cases, review according to the Natura 2000 legislation is required.

Sweden's national defence has extensive interests in the marine spatial planning area, among other things in the form of marine training areas. The coexistence possibilities for wind power are thereby lower than in other marine areas.

Operational oil emissions from shipping south of Gotland have a negative impact on the population of long-tailed ducks. Shipping can also affect harbour porpoises through noise. One way to reduce this impact might be to redirect the traffic, but there might also be other solutions. Making changes to any part of the traffic system is complex and might impact other parts of the traffic system. Shipping's impact on the natural environment and what measures may be suitable to reduce the negative impact of shipping need to be investigated further, and the marine spatial plan therefore indicates the use investigation area for shipping south and north and east of Gotland. The population of long-tailed ducks can also be negatively impacted by wind power. Consideration has been given to this in the collective assessment for wind power in the marine spatial planning area.

## **Nature and people**

In the Baltic Sea's marine spatial planning area, there are high nature values and attractive living environments for people. The coastal and archipelago landscapes are frequently used for recreation including outdoor life and there are high cultural values in both the coastal areas and the sea.

There are large areas with high nature values in the marine spatial planning area, and several of them are nature reserves or Natura 2000 areas that have the use of nature in the marine spatial plan. In addition to these, there are areas where activities need to give particular consideration to high nature values.

At the same time that there are good conditions for various activities, the environment in the Baltic Sea needs to be improved to achieve a good environmental status. For example, there are large areas with dead sea beds due to a lack of oxygen.

## **Industry and shipping that ties together**

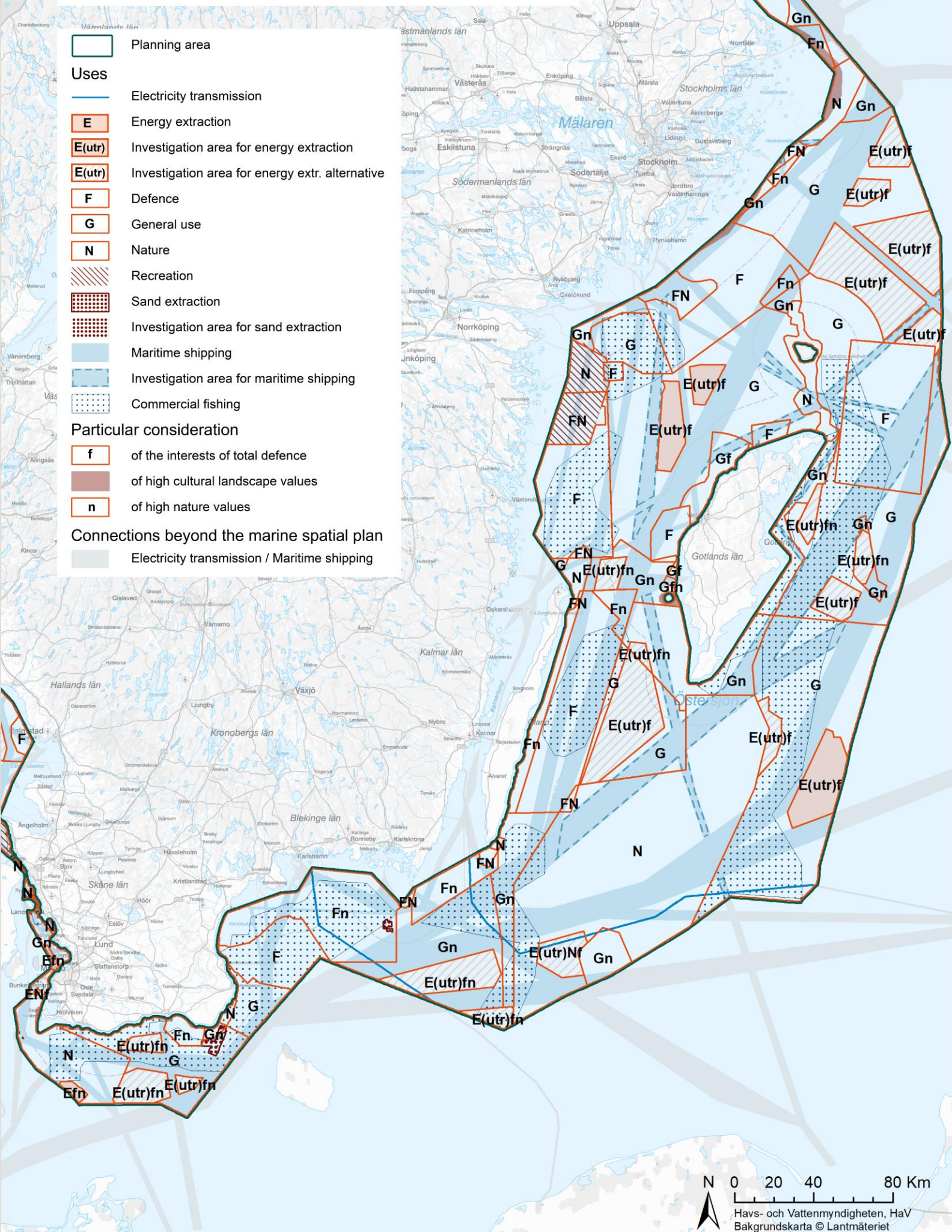
The Baltic Sea is of major significance to international trade and is therefore also one of the most intensively trafficked areas in the world. The many shipping lanes tie the countries together and



contribute to the objective of linking together the Baltic Sea region through the transport of people and goods. With this point of departure, shipping lanes that extend from Sweden's neighbouring countries into the Swedish exclusive economic zone have been identified as public interests of substantial significance and are indicated as the use shipping.

In the marine spatial planning area, there are a few areas that may have a potential for the extraction of sand and there are good technical conditions for sea-based energy extraction. Commercial fishing takes place on very large areas, and fishing areas also change from year to year and over a longer time. The area for the use of commercial fishing is therefore widespread in the marine spatial plan. The development of the stock situation is crucial to the possibilities of fishing. The situation is difficult for, among other things, the cod stock in the Baltic Sea, which negatively affects the possibilities of fishing.

Map 5. Plan map for the Baltic Sea marine spatial planning area





## **4.1. Northern Baltic Sea and South Kvarken**

### **Energy extraction**

In the Northern Baltic Sea, there are good wind conditions and suitable depths for offshore wind installations at the same time that electricity demand is extensive due to the consumption in the Mälardalen region. In several areas along the coast from Norrtälje to Oxelösund, there is a national interest claim for wind power (Ö203, Ö208, Ö210-Ö211, Ö214, Ö504, Ö507). The national interest claims for wind power that are in the marine area are not considered to be compatible with national interest claims for national defence, and the defence interests are therefore given priority. Public interest of substantial significance for wind power in Gustaf Dalén and south-east of Gustaf Dalén (Ö208, Ö211) is not considered to be compatible with the national interest claim for national defence, and public interests of substantial significance for nature conservation. The area is close to the coast and is of major significance to breeding, wintering and resting sea birds.

North-east of Gotland, the marine spatial plan indicates five alternative investigation areas with the use energy extraction (Ö205, Ö216, Ö218, Ö219, Ö279). The areas have few conflicts with other interests and good opportunities for offshore wind energy. The areas are indicated as an alternative as the cumulative impact of all areas is deemed to be large on the defence interest. The possibilities of connecting all of these areas to the electricity grid in the near future are also deemed to be low.

### **Defence**

The marine spatial plan assigns the use defence along large parts of the coastline in the marine area due to national interest claims for national defence and areas of impact. The Vaddö Artillery Range is located in Norrtälje Municipality at South Kvarken, with the associated impact area out over the sea (Ö201). The marine spatial plan indicates the use defence also for impact areas at the Söderarm and Korsö artillery ranges in the municipalities of Norrtälje and Värmdö (Ö202, Ö206-Ö207). In Stockholm's southern archipelago, there is the Utö artillery range and the marine training area of Nåttarö that extends from the coast through the territorial sea out into the Swedish exclusive economic zone off of the municipalities of Värmdö, Haninge, and Nynäshamn (Ö210, Ö504-505). In Ö203, Ö208 Ö210-Ö211, Ö214, Ö220, Ö504, Ö507, national interest claims for the military component of national defence have precedence over national interest claims for wind power.

### **Culture**

The entire coastline in the marine area is covered by national interests of a highly developed coast. In direct connection to the marine spatial planning area, there is a national interest claim for cultural heritage conservation in the municipalities of Norrtälje and Värmdö. Cultural heritage value cores identified by the Swedish National Heritage Board are mainly outside the marine spatial planning area. A couple of such areas extend into the planning area off of Stockholm's archipelago and Norrtälje, where they are covered in the marine spatial plan by particular consideration of high cultural heritage values (Ö200, Ö202-Ö203, Ö217, Ö504, Ö507). The consideration distance to the value cores needs to be assessed from a local perspective.

## Nature

The marine spatial plan indicates the use nature in three areas around Stockholm's archipelago, where there is a national interest claim for nature conservation (Ö203, Ö206, Ö210). The area at Norrtälje Municipality also comprises a planned marine nature reserve (Ö203). Just outside the marine spatial planning area (Ö504), a marine national park is planned in Nämndöskärgården.

The marine spatial plan indicates particular consideration of high nature values in several areas. The Åland Sea (Ö200-Ö201) is a food search area for birds. It is also a passage for migratory birds of prey (Hansson, 2019). In the Åland Sea, there are also unique oxygenated deep areas, migratory salmon and viable cod stocks. North and south-east of Svenska Högarne, there are four areas with potential climate refugia for blue mussels. These are four of the eight identified areas in the Baltic Sea (SwAM, 2017d). The climate refugia is safeguarded through particular consideration given to high nature values (Ö200, Ö202, Ö207, Ö214). In the area of Öst Svenska Högarne (Ö214), there are also high nature values in the form of mammal and bird areas and reef environments. In the far south-west of the marine area, particular consideration of high nature values is indicated since there are reef environments and spawning and mammal areas (Ö211). There are high nature values in the form of reef environments west of Stockholm's southern archipelago (Ö207, Ö507). North of Kopparstenarna, there is a bird area (Ö505).

Some national interest claims for nature conservation that are mainly in the coastal zone extend into the marine spatial planning area. Due to the marine spatial plan's overall scale, they are not marked as the use nature in the marine spatial plan, but the national interest claims are met. This applies, among other things, at Simpräsklubb (Ö200-Ö202) and west of Hävringe in Nyköping Municipality (Ö211).

## Recreation

The marine spatial plans assign the use recreation outside parts of Östergötland's archipelago (Ö208, Ö211). The guidance on the use recreation is based on national interest claims for outdoor recreation.

In the Northern Baltic Sea, there is the outer part of Stockholm's archipelago with high cultural, recreational and nature values. Over South Kvarnen, a unique stretch of shallow archipelagos is formed together with Åland's archipelago and the west coast of Finland. Stockholm's archipelago is one of Sweden's most heavily visited with many natural harbours and marinas. Outdoor recreation and recreational boating are extensive. Recreational boating traffic often moves both to and from the Gulf of Bothnia in the north and Gryts and Sankt Anna's archipelagos in the south to Gotland and across the Sea of Åland.

At the southern parts of the marine area, the coast, outside the marine spatial planning area, is of national interest for active outdoor recreation. The possibility of coexistence with other uses and consideration distances needs to be assessed from a local perspective.

## Shipping

The marine spatial plan indicates the use shipping in routes both in the open sea and towards ports on the coast (Ö200-Ö203, Ö206-Ö208, Ö210-Ö211, Ö214, Ö217, Ö504-Ö505). The shipping lanes are also included in the Baltic Sea's larger traffic system with connections with the

Gulf of Finland, Åland and the Baltic countries. To tie together shipping lanes from Stockholm to Latvia, the use shipping is indicated east of the easternmost (deep) shipping lane in the Swedish exclusive economic zone (Ö217). The narrow area of South Kvarken is the passage between the Northern Baltic Sea and the Bothnian Sea. To make the passage safe, there is a system of traffic separations that is located both in Sweden and in Finland. The passages to Lake Mälaren through Södertälje canal into Stockholm, the way into Oxelösund's port and the port of Stockholm Norvik are other important sections for the use of shipping in the marine area. The plan map presents the most important shipping lanes, not shipping's total need for space. In connection with the shipping lanes, there should be a safety distance. The distance is adapted to local conditions according to risk assessment.

## **Investigation areas, shipping**

Horsstensleden is a possible future shipping lane through Stockholm's archipelago in to Stockholm's harbour. The intended route is not in the marine spatial planning area, but through two national interest claims for shipping connects to the traffic system in the marine spatial planning area (Ö206–Ö207 and Ö203, Ö206). Horsstensleden is not included in the National planning for transport infrastructure in 2022–2033 (Government, 2021b). It is outside the national marine spatial planning's legal mandate to take a position on whether the intended shipping lane outside the marine spatial planning area is suitable. However, the marine spatial plan should allow for margins because in the future, a new shipping lane in towards Stockholm may become relevant. For this reason, the connections are marked as an investigation area for shipping.

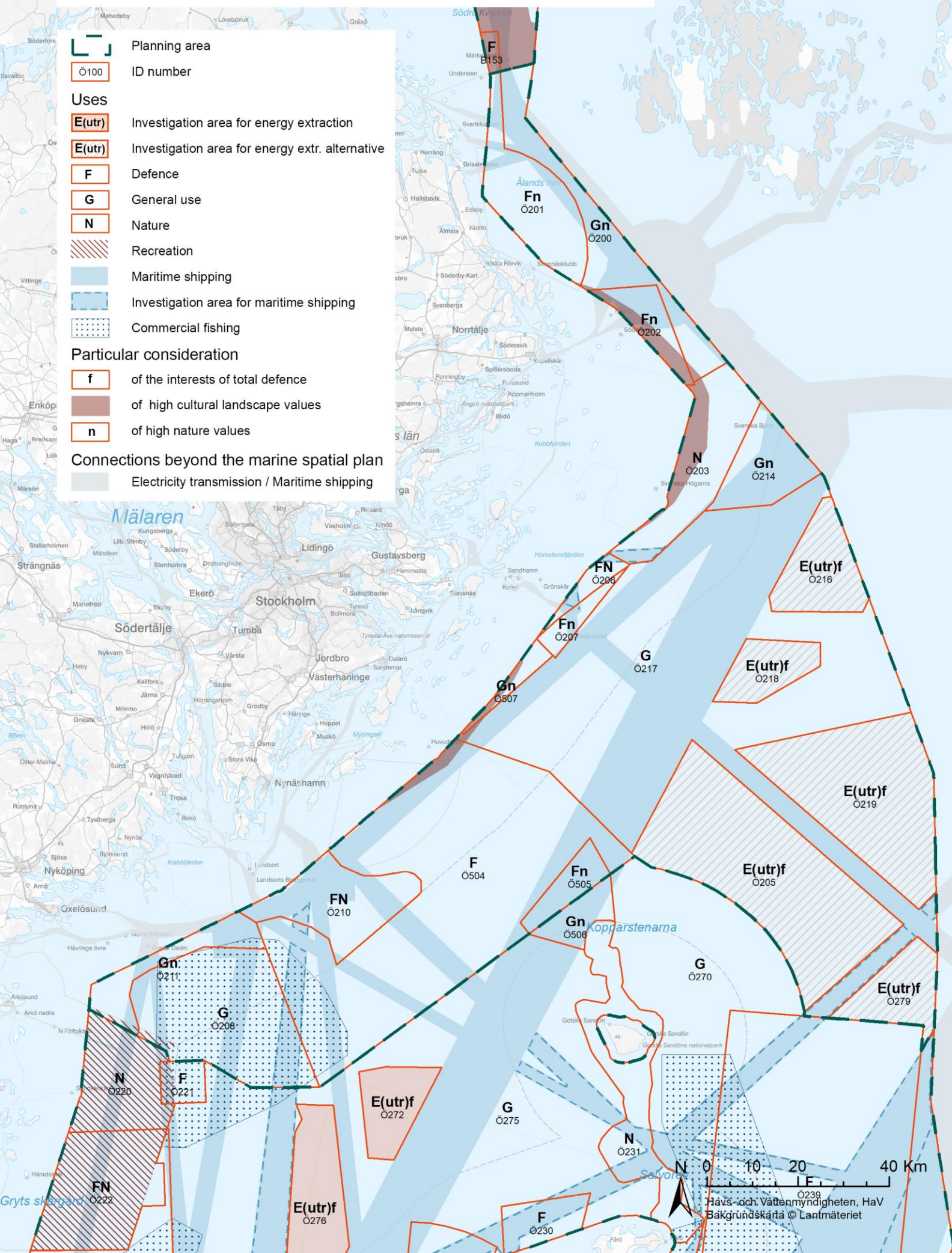
From Nynäshamn, there is a path towards Gdansk in Poland where the marine spatial plan also indicates the investigation area shipping (Ö208, Ö210, Ö504). Also, around Gotland, in the marine sub-regions of the Central Baltic Sea and the South-eastern Baltic Sea, the marine spatial plan indicates the investigation area for shipping, which is described more under the heading Investigation area for shipping in the two marine areas.

## **Commercial fishing**

In the entire Northern Baltic Sea from Värmdö Municipality and south, and in a smaller area in South Kvarken, pelagic fishing is conducted that relates to offshore fishing for herring and sprat. The use commercial fishing is indicated furthest south in the area (Ö208, Ö211, Ö504).



Map 6. Plan map for the North Baltic Sea and South Kvarken marine area



## Area table for the Northern Baltic Sea and South Kvarken

Table 4 Area table for the Northern Baltic Sea and South Kvarken

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
Ö200	General use Shipping	High nature values: Mammal area. Bird area. High originality. Climate refugia for blue mussels. Reef environment. High cultural heritage values		
Ö201	Defence Shipping	High nature values: Bird area.		
Ö202	Defence Shipping	High nature values: Mammal area. Bird area. High originality. Climate refugia for blue mussels. Reef environment. High cultural heritage values		
Ö203	Nature Investigation areas, shipping Shipping	High cultural heritage values	Defence is given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power. The uses are deemed to not be able to coexist.
Ö205	Investigation area for energy extraction, alternative	National defence interests		
Ö206	Defence Nature Shipping Investigation areas, shipping			
Ö207	Defence Investigation areas, shipping Shipping	High nature values: Mammal area. High originality. Climate refugia for blue mussels. Reef environment.		
Ö208	General use Investigation areas, shipping Commercial fishing Shipping Recreation		Defence and nature are given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power.  A public interest of substantial significance for nature conservation is given priority over a public interest of material significance for wind power.  The uses are deemed to not be able to coexist.



Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
Ö210	Defence Nature Shipping Investigation areas, shipping		Defence is given priority over energy extraction.	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power. The uses are deemed to not be able to coexist.
Ö211	General use Commercial fishing Recreation Shipping	High nature values: Mammal area. Bird area. Reef environment.	Defence and nature are given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power. A public interest of material significance for nature conservation is given priority over a public interest of material significance for wind power. The uses are deemed to not be able to coexist.
Ö214	General use Shipping	High nature values: Mammal area. Bird area. Climate refugia for blue mussels. Reef environment.	Defence is given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power. The uses are deemed to not be able to coexist.
Ö216	Investigation area for energy extraction, alternative	National defence interests		
Ö217	General use Shipping Investigation areas, shipping	High cultural heritage values		
Ö218	Investigation area for energy extraction, alternative	National defence interests		
Ö219	Investigation area for energy extraction, alternative	National defence interests		
Ö279	Investigation area for energy extraction, alternative	National defence interests		
Ö504	Defence Commercial fishing Investigation areas, shipping Shipping	High cultural heritage values	Defence is given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power. The uses are deemed to not be able to coexist.



Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
<b>O505</b>	Defence Shipping	High nature values: Bird area.		
<b>O507</b>	General use	High nature values: Reef environment. High cultural heritage values	Defence is given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power. The uses are deemed to not be able to coexist.

## 4.2. Central Baltic Sea

### Energy extraction

In the Central Baltic Sea, there are good conditions for energy extraction. The marine spatial plan indicates two investigation areas with the use energy extraction (Ö272, Ö276). The areas have few conflicts with other interests. The offshore area north-west of Gotland (Ö272) extensively overlaps a larger area that the Swedish Armed Forces have analysed in the permit process. In its opinion regarding the project, the Swedish Armed Forces state that their assessment is that construction of proposed wind farms would entail tangible damage to national interests for the military component of national defence. They therefore oppose wind power in the area (Ö272). Studies need to be done regarding the possibilities of connecting to the electricity grid, the collective impact on shipping and defence interests in the project planning (Swedish Energy Agency, 2023a). The area of Syd Nielsengrin (Ö276) has not been analysed by the Swedish Armed Forces.

In Östergötland's archipelago, there is a part of the national interest claim for wind power (Ö220), which is not deemed to be compatible with the interests of national defence. The national interest claims for national defence are given priority over the national interest claim for wind power.

In the marine area, there are four alternative investigation areas with the use energy extraction (Ö213, Ö271, Ö277, Ö509). East of Gotland (Ö213, Ö271, Ö509), there is a need to investigate the possibilities of connecting to the electricity grid in the near future, the collective impact on the fishing in the area, and the impact on the defence interest. North of Öland (Ö277) is an area that is not included in the planning documentation that was presented by the Swedish Energy Agency in March 2023 and thereby needs to be further investigated. Public interests of substantial significance to wind power are given precedence over commercial fishing in two areas (Ö213, Ö271). In the areas, pelagic fishing is conducted, which is very difficult to combine with a wind power establishment. The uses are therefore deemed to not be able to coexist.

North-east of Gotska Sandön, there is an area of substantial significance to wind power (Ö270). The area is within an area of national interest according to Chapter 4, Section 2 of the Environmental Code and close to an area of national interest for outdoor recreation according to Chapter 3, Section 6 of the Environmental Code. In order to preserve the area's values of being undisturbed and untouched, national interests for active outdoor recreation and national interests for outdoor recreation are given priority over public interests of substantial significance for wind power.

### Defence

There are several areas in the Central Baltic Sea, which are pointed out for the use defence. Along the mainland coast are the marine training areas Sandsäkan (Ö221) and Urban, which extend through the territorial sea out into the Swedish exclusive economic zone off of the municipalities of Valdemarsvik, Västervik and Oskarshamn (Ö222-Ö224). South of Visby out into the territorial sea, defence is indicated since the area is an impact area for the Tofta Artillery Range (Ö228). A little further north is the Fårö marine training area (Ö230). The marine training area of Sankt Olof (Ö239) is east of Gotland and Fårö. The marine spatial plan indicates

particular consideration of national defence interests for parts of Gotland's west coast due to the stop area for tall objects for Visby Airport (Ö229, Ö278, Ö289).

Particular consideration of national defence interests is indicated for all energy areas (Ö213, Ö271, Ö272, Ö276, Ö277, Ö509) in the marine area.

## **Culture**

The areas with national interest claim for cultural heritage conservation are along the coasts outside the marine spatial planning area and on Gotska sandön. Cultural heritage value cores identified by the Swedish National Heritage Board are mainly outside the marine spatial planning area. A couple of such areas extend into the planning area at Stora Karlsö (Ö291) and off of Öland's northern cape (Ö225) and are covered in the marine spatial plan by particular consideration of high cultural heritage values. The consideration distance to the cultural value cores needs to be assessed from a local perspective.

Outside the marine spatial planning area, there is a national interest for an unbroken coast that encompasses both Öland's east and west sides and runs along the coast from Västervik to Arkösund in the north. The coasts around Gotland outside the marine spatial planning area are covered by national interests for highly developed coastal areas.

## **Nature**

The marine spatial plan assigns the nature use for several areas, mainly along the mainland coast and north of Gotland. The areas along the coasts of Östergötland and Kalmar counties are covered by national interest claims for nature conservation (Ö220, Ö222, Ö224–Ö225, Ö234). The area at Gotska sandön and Salvorev is covered by Natura 2000 and several other environmental protections, such as nature reserves and Helcom MPA (Marine Protected Area) (Ö231). There is a national interest claim for nature conservation that is mainly in the adjacent coastal zone, but extends just into the marine spatial planning area, including in Västervik Municipality (Ö223). The national interest claims are met, but due to the marine spatial plan's overall scale, they are not marked as the nature use in the marine spatial plan.

At the Sandsänkan marine training area in Östergötland's archipelago (Ö221), there is a national interest claim for national defence and in the area's western part, there is a small part of a national interest claim for nature conservation. In terms of scale, the area where the national interest claims overlap is small in relation to the geographic scale of the plan map and is therefore not marked in the plan map with the use FN. The defence activities should be conducted so that negative impact is avoided on the nature values that form the basis for national interest claims for nature conservation.

At Kopparstenarna (Ö506), particular consideration of high nature values is indicated due to birds. North-east of Gotland, particular consideration of high nature values is indicated for five areas. The area east of Gotland (Ö296) is characterised by reef environments, bird areas and spawning areas for fish with a low environmental impact. The area of South-eastern Fårösund (Ö506) is a bird area. Klints bank (Ö212–Ö213, Ö215) constitutes a potential climate refugia for blue mussels. Also west of Gotland, around Stora Karlsö (Ö289, Ö291), the marine spatial plan

indicates particular consideration of high nature values as the area is important to birds, such as guillemots and harbour porpoises. Ö277 is also important for birds.

## **Recreation**

The marine spatial plan indicates the use recreation outside parts of Östergötland's archipelago (Ö220-Ö222). The guidance on the use recreation is based on national interest claims for outdoor recreation. Outdoor recreation and recreational boating are extensive, and there are valuable areas along the entire coast at the Gryts and Sankt Annas archipelagos to Northern Öland and around Gotland.

The coast from Västervik Municipality and south as well as the coast around Gotland, off of the marine spatial planning area, is covered by national interests for active outdoor recreation. The possibility of coexistence with other uses and consideration distances needs to be assessed from a local perspective.

North-east of Gotska Sandön, there is an area of substantial significance to wind power. The area is within an area of national interest according to Chapter 4, Section 2 of the Environmental Code and close to an area with a national interest claim for outdoor recreation according to Chapter 3, Section 6 of the Environmental Code. Gotska Sandön is unique in Sweden with its isolated, solitary location that offers outlooks over an unbroken horizon and without noise and light disturbances. In order to preserve the area's values of being undisturbed and untouched, national interests for active outdoor recreation and national interests for outdoor recreation are given priority over public interests of substantial significance for wind power.

## **Shipping**

The marine spatial plan indicates the use shipping in several shipping lanes within the Central Baltic Sea (Ö215, Ö220-Ö225, Ö228-Ö230, Ö234-Ö235, Ö239, Ö270, Ö275, Ö278, Ö289, Ö291, Ö506). Several important ports are located along the coast. Shipping traffic is important with traffic both to the mainland coast, to Gotland and further north or south to both Swedish and foreign ports around the Baltic Sea. A shipping lane that extends from Riga Bay and connects to the deep shipping lane east of Gotland in the Swedish exclusive economic zone is a public interest of substantial significance. The route is marked as the use shipping (Ö270).

The plan map presents the most important shipping lanes, not shipping's total need for space. In connection with the shipping lanes, there should be a safety distance. The distance is adapted to local conditions according to risk assessment.

## **Investigation areas, shipping**

Across Salvorev, between Fårö and Gotska Sandön, there are today two passages for maritime traffic through an area with a great deal of high nature values, including, among other things, the red-listed species long-tailed duck. An investigation from SwAM (2017c) shows that long-tailed duck is negatively impacted by operational oil emissions from ships. The need to investigate shipping's impact in the area around Salvorev and what measures may be suitable to reduce the negative impact of shipping is closely linked to the need for investigation in the more heavily trafficked area around Hoburgs bank south of Gotland. In addition to the long-tailed duck,

shipping's impact on harbour porpoises shall also be investigated there. The harbour porpoise is a red-listed species that is negatively affected by noise from shipping traffic. The combined effect of this needs to be investigated further and for the shipping lanes across Salvoev, the plan therefore indicates investigation area shipping. A shipping lane east of Gotland and the shipping lane in to Slite, as well as two shipping lanes from Nynäshamn towards the Gulf of Riga and Poland are also part of the investigation area for shipping that can affect shipping in the Central Baltic Sea. Read more about it in the section on the direction of the use in the South-eastern Baltic Sea.

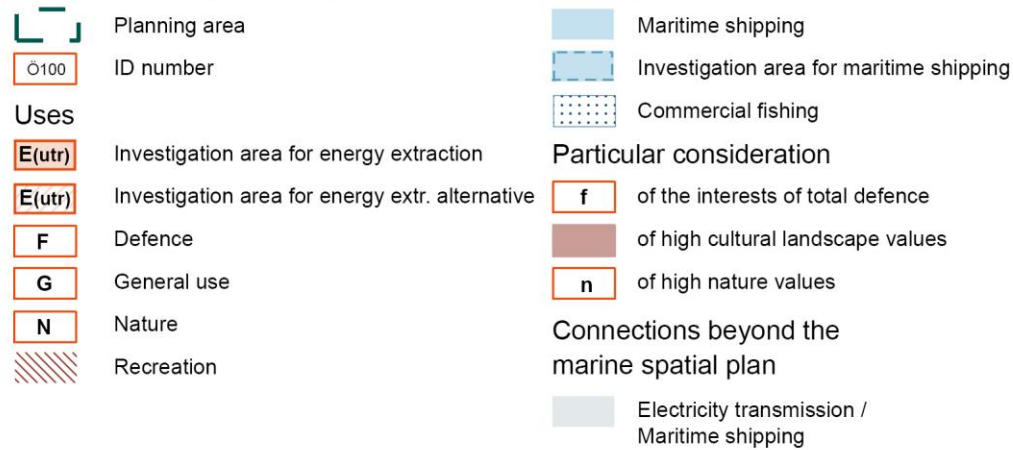
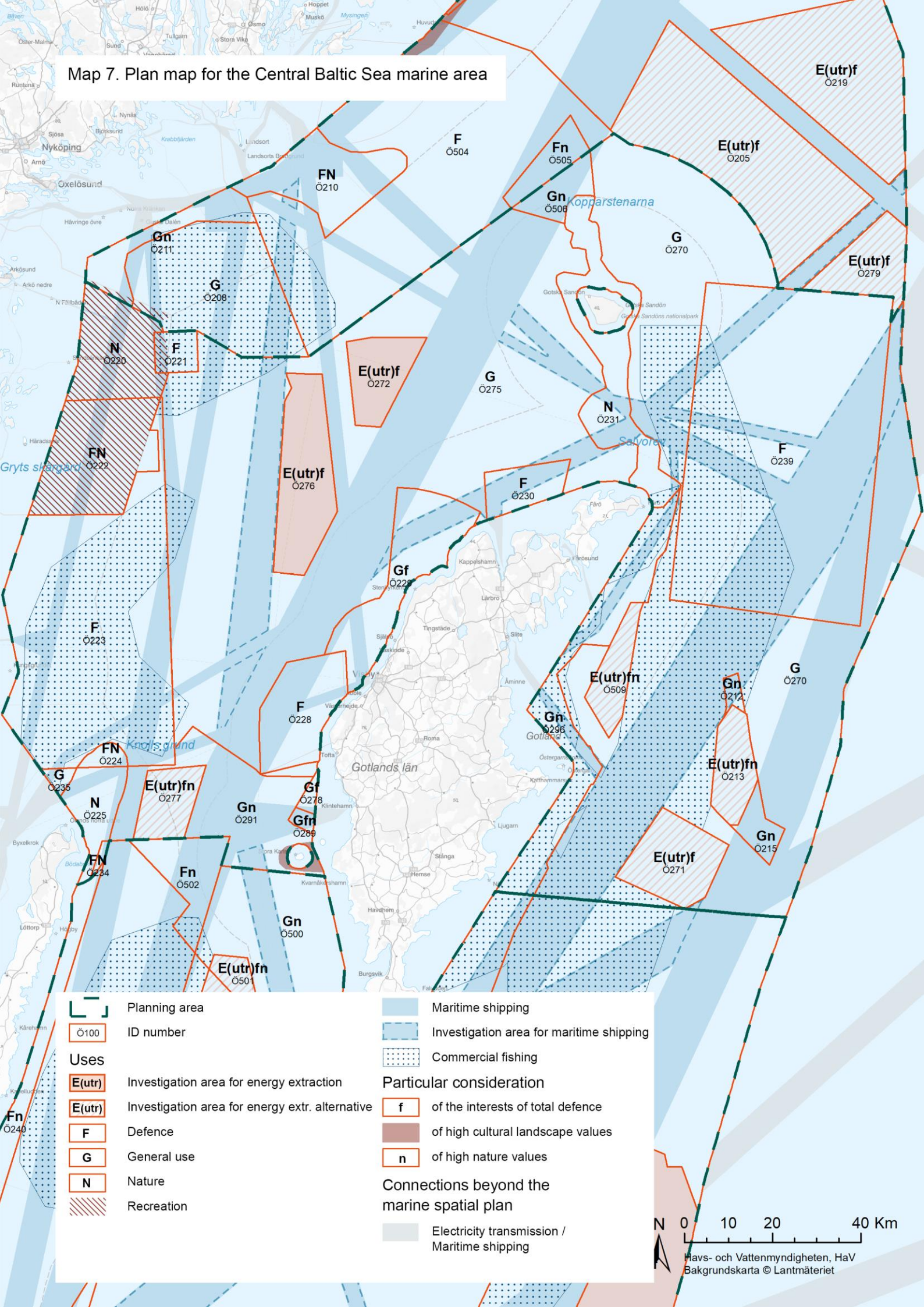
## **Commercial fishing**

The plan indicates the use commercial fishing towards the internal marine spatial planning boundary (Ö221, Ö223, Ö235, Ö275) and east of Gotland (Ö212, Ö231, Ö239, Ö270, Ö275, Ö296). The use corresponds to national interest claims for commercial fishing. Commercial fishing is widespread in the Central Baltic Sea. Most fishing in the Central Baltic Sea is pelagic fishing that relates to fishing for herring and sprat and is conducted throughout the offshore areas. Some fishing with passive gear takes place in towards the coast.

National interest for commercial fishing overlaps a public interest of substantial significance to wind power in two alternative areas for energy (Ö213, Ö271) where the public interest for wind power is given priority. The use of commercial fishing is given priority over a public interest of substantial significance for wind power in Ö270. The uses are deemed to not be able to coexist.



Map 7. Plan map for the Central Baltic Sea marine area



## Area table for the Central Baltic Sea

Table 5 Area table for the Central Baltic Sea

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
Ö212	General use Commercial fishing Investigation areas, shipping	High nature values: Fish spawning ground. Bird area. Climate refugia for blue mussels.		
Ö213	Investigation area for energy extraction, alternative	High nature values: Climate refugia for blue mussels. National defence interests	Energy extraction is given priority over commercial fishing	Public interests of substantial significance to wind power are given precedence over national interest claims for commercial fishing.  The uses are deemed to not be able to coexist.
Ö215	General use Shipping	High nature values: Fish spawning ground. Bird area. Climate refugia for blue mussels.		
Ö220	Nature Recreation Shipping		Defence is given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power.  The uses are deemed to not be able to coexist.
Ö221	Defence Recreation Commercial fishing Shipping			
Ö222	Defence Nature Recreation Shipping			
Ö223	Defence Shipping Commercial fishing			
Ö224	Defence Nature Shipping			
Ö225	Nature Shipping			

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
Ö228	Defence Shipping			
Ö229	General use Shipping Investigation areas, shipping	National defence interests		
Ö230	Defence Investigation areas, shipping			
Ö231	Nature Investigation areas, shipping Shipping Commercial fishing			
Ö234	Defence Nature Shipping			
Ö235	General use Commercial fishing Shipping			
Ö239	Defence Investigation areas, shipping Commercial fishing Shipping		Defence is given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over public interests of substantial significance to wind power.  The uses are deemed to not be able to coexist.



Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
Ö270	General use Investigation areas, shipping Commercial fishing Shipping		Commercial fishing and outdoor recreation are given priority over energy extraction	<p>Pursuant to Chapter 4, Section 2 of the Environmental Code, the national interest for active outdoor recreation at North-east Gotska Sandön is given precedence over public interests of substantial significance for wind power.</p> <p>The uses are deemed to not be able to coexist.</p> <p>According to Chapter 3, Section 10 of the Environmental Code, national interest claims for outdoor recreation are given priority over a public interest of substantial significance for wind power.</p> <p>The uses are deemed to not be able to coexist.</p> <p>According to Chapter 3, Section 10 of the Environmental Code, national interest claims for commercial fishing east of Gotland are given priority over areas of substantial significance to energy extraction.</p> <p>The uses are deemed to not be able to coexist.</p> <p>Pursuant to Chapter 4, Section 2 of the Environmental Code, the national interest for active outdoor recreation east of Gotland is given priority over public interests of substantial significance to wind power.</p> <p>The uses are deemed to not be able to coexist.</p>
Ö271	Investigation area for energy extraction, alternative	National defence interests	Energy extraction is given priority over commercial fishing	<p>Public interests of substantial significance to wind power are given precedence over national interests for commercial fishing.</p> <p>The uses are deemed to not be able to coexist.</p>
Ö272	Investigation area energy extraction	National defence interests		
Ö275	General use Shipping Commercial fishing Investigation areas, shipping		Defence is given priority over energy extraction	<p>According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over a public interest of substantial significance for wind power.</p> <p>The uses are deemed to not be able to coexist.</p>

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
Ö276	Investigation area energy extraction	National defence interests		
Ö277	Investigation area for energy extraction, alternative	High nature values: Bird area. National defence interests		
Ö278	General use Shipping	National defence interests		
Ö289	General use Shipping	High nature values: Bird area.		
Ö291	General use Investigation areas, shipping Shipping	High nature values: Bird area. High cultural heritage values		
Ö296	General use Commercial fishing Investigation areas, shipping	High nature values: Bird area.		
Ö506	General use Shipping	High nature values: Bird area.		
Ö509	Investigation area for energy extraction, alternative	High nature values: Bird area. National defence interests		

## 4.3. South-eastern Baltic Sea

### Electricity transmission

The use electric transmission consists of the NordBalt transmission cable that passes through the marine area (Ö248, Ö254, Ö255, Ö258, Ö263). It connects to Nybro in Sweden and to Klaipeda in Lithuania.

### Energy extraction

In the South-eastern Baltic Sea, there are good conditions for energy extraction, and the need for electricity is great due to the high consumption in southern Sweden. The many offshore banks have both good wind conditions and suitable depths for offshore wind energy installations. At the same time, there are very high nature values. The outermost eastern and western parts of The Northern Midsea bank and a part of The Southern Midsea bank are covered by national interest claims for wind power. There is also public interest of substantial significance to wind power in two areas at The Northern Midsea bank. Both banks, except a part of The Southern Midsea bank, are covered by Natura 2000.

The marine spatial plan does not indicate energy extraction for The Northern Midsea bank (Ö254). It is covered by Natura 2000 and by area protection according to Helcom (MPA). The combined impact on the nature values in the area is deemed to possibly grow too high if wind power is built adjacent to The Southern Midsea bank.

At Kårehamn (Ö240, Ö503), there are national interest claims for both wind power and national defence. In part of the area, there is an existing wind power facility. The facility is limited in scope and due to the marine spatial plan's overall scale, energy extraction is not indicated on the plan map, but the interest is met. Future expansion of the area is deemed in the marine spatial plan to not be compatible with the interests of national defence and therefore the marine spatial plan does not satisfy the national interest claim that is outside the existing facility.

South-east of Gotland, an area with the use energy extraction is pointed out (Ö266), where a public interest of substantial significance to wind power is given priority over a public interest of substantial significance to shipping.

The marine spatial plan indicates the investigation area with the use energy extraction west of The Southern Midsea bank (Ö255). National interest claims for wind power also extend into the area. The area is within the Natura 2000 area Hoburgs bank and The Midsea banks (Ö254). It is assessed that this means that there is a requirement for a special permit review according to Chapter 4, Section 8 of the Environmental Code, a so-called Natura 2000 review. For this reason, the area is indicated as an alternative investigation area.

Coexistence must, however, be examined in a so-called Natura 2000 review. Poland is also planning for wind power in the Polish exclusive economic zone at The Southern Midsea bank, which might give rise to a need for coordination to prevent extensive environmental impact. Good coordination can also promote an efficient use of infrastructure.

Between Öland and Gotland, there is a larger alternative investigation area with the use energy extraction (Ö273, Ö501). South-east of Gotland, there is an alternative investigation area (Ö261). Public interests of substantial significance to wind power are given precedence over national interests for commercial fishing in these areas. The areas of South-western Hoburg (Ö273) and Väst Näsudden (Ö501) extensively overlap areas analysed by the Swedish Armed Forces in the permit process. In their statements regarding the respective projects, the Swedish Armed Forces state that they assess that a construction of the respective proposed wind farm in this area would entail significant damage to the national interest for the military component of national defence. The area of Öst Hoburgs bank (Ö261) has not been analysed by the Swedish Armed Forces. The areas are therefore indicated as alternative. Public interests of substantial significance to wind power overlap national interest claims for commercial fishing (pelagic fishing) in both areas. The uses are deemed to not be able to coexist. The areas Ö262 and Ö273 are presented as alternative areas where wind power has priority over commercial fishing.

Upon expansion, particular consideration must be given to national defence interests.

## **Defence**

The defence is indicated for the marine training area Hanö and Martin, which is off of Öland (Ö234, Ö240, Ö250, Ö252, Ö502-Ö503). The Martin marine training area extends from the coast through the territorial sea out into the Swedish exclusive economic zone off of the municipalities of Bornholm and Mörbylånga. The northernmost part of the Hanö marine training area is within the territorial sea south of Öland. The marine spatial plan indicates particular consideration of national defence interests in all energy areas (Ö255, Ö261, Ö266, Ö273, Ö501)

## **Culture**

The coast along Öland is covered by national interests in an unbroken coast and Gotland's coast is covered by national interests of a highly developed coast. Southern Öland's cultivation landscape is a world heritage site and is also largely covered by landscape appearance protection. There are several areas covered by national interest claims for cultural heritage conservation outside the marine spatial planning area in the coastal areas around Gotland and Öland. Cultural heritage value cores identified by the Swedish National Heritage Board are mainly outside the marine spatial planning area. However, a small part extends into the planning area off of Öland's east coast (Ö240) and is covered in the marine spatial plan by particular consideration of high cultural heritage values. The consideration distance to the value cores needs to be assessed from a local perspective.

## **Nature**

The marine spatial plan indicates the use nature in a large area that extends from Gotland's southern cape at Hoburgen via Hoburgs bank to The Northern Midsea bank and The Southern Midsea bank (Ö254) and two smaller neighbouring areas (Ö250, Ö255). They are covered by Natura 2000 and have a very valuable nature. In large sections, the environmental impact is low and the marine environment can be seen as relatively original (SwAM, 2018e). The nature values consist of valuable seabed environments, reproduction areas for the threatened Baltic Sea harbour porpoise and the most important wintering areas for the long-tailed duck. Both species are red listed according to the Swedish Species Information Centre's assessment. There are also

food gathering areas for long-tailed ducks and other birds, as well as spawning areas for fish in the area. The marine area's banks have been pointed out as possible climate refugia for several species, which indicates that the area's ecological significance may be very high in the future (SwAM, 2017d). The County Administrative Board of Kalmar County has proposed that the Natura 2000 area be expanded and also include Ö248.

The marine spatial plan indicates the use nature at Öland's southern tip (Ö252 - Ö253) where there is a marine nature reserve.

The marine spatial plan prescribes particular consideration of high nature values in several areas along the coasts and adjacent to areas with environmental protection where there are also important nature values (Ö240, Ö248, Ö258, Ö500-Ö502).

## **Recreation**

Recreation and recreational boating is extensive in parts of the South-eastern Baltic Sea. There are several areas covered by national interest claims for outdoor recreation outside the marine spatial planning area in the coastal areas around Gotland and Öland. The coast around Gotland is covered by national interests in active outdoor recreation. The possibility of coexistence with other uses and consideration distances needs to be assessed from a local perspective.

## **Shipping**

The use shipping is indicated for several shipping lanes within the marine area (Ö240, Ö250, Ö254, Ö258, Ö263, Ö266, Ö293, Ö502-Ö503). In the South-eastern Baltic, maritime traffic is important with extensive traffic to both foreign and Swedish ports. West of Gotland, there is mainly traffic with Swedish destinations, while international traffic to and from the Gulf of Finland and the Baltic countries is dominant south and east of Gotland (SwAM, 2017b). Two shipping lanes, which extend from ports in the Baltic (Ventspils and Klaipeda respectively) and connect to the deep shipping lane south-east of Gotland in the Swedish exclusive economic zone, constitute public interests of substantial significance. The routes are assigned the use shipping (Ö254, Ö263). The plan map presents the most important shipping lanes, not shipping's total need for space. In connection with the shipping lanes, there should be a safety distance. The distance is adapted to local conditions according to risk assessment.

## **Investigation areas, shipping**

The plan sets out an investigation area for shipping for a route from Gdansk in Poland to Nynäshamn. The marine spatial plan also indicates an investigation area for shipping between The Northern Midsea bank and Hoburgs bank. Today, shipping runs through a shallow area with very high nature values for the red-listed species harbour porpoises and long-tailed duck, which are also covered by Natura 2000. Studies show that the long-tailed duck population is negatively impacted by operational oil emissions from ships and that harbour porpoises are disturbed by noise from shipping lanes (SwAM, 2016b, 2018a). From a nature conservation perspective, there is reason to investigate shipping's impact on the natural environment and what measures may be suitable to reduce the negative impact of shipping.

Several areas in the South-eastern and Central Baltic Sea are directly or indirectly affected by the problems described above. Possible measures could affect traffic flows through the deep-water route that is south of the route Hoburgs bank–The Northern Midsea bank and north of The Southern Midsea bank, as well as the routes west and east of Gotland and routes in our neighbouring countries.

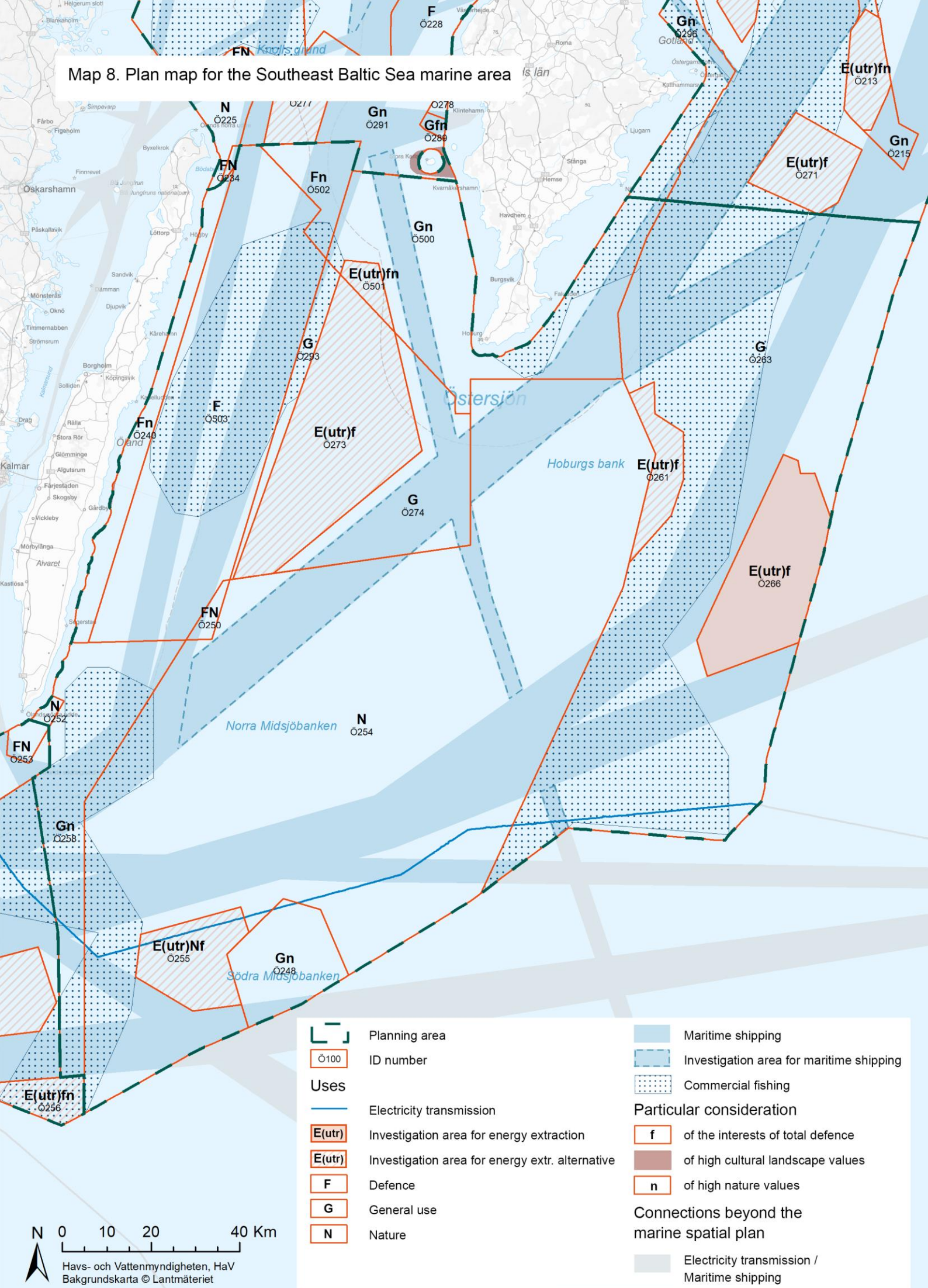
Before a final decision is taken on shipping lanes, the problems need to be investigated. An investigation needs to include, among other things, an analysis of the environmental impact of shipping traffic and various types of measures, as well as socio-economic consequences for transport and the shipping industry nationally and internationally, as well as other consequences as a result of measures. Most changes regarding shipping require decisions that are made internationally, such as route changes, and thereby need international support and be compatible with international law, including the law of the sea.

## **Commercial fishing**

The use commercial fishing is indicated in several large areas (Ö254, Ö258, Ö263, Ö293, Ö500, Ö502-Ö503). Commercial fishing is widespread in the South-eastern Baltic Sea, but is rarely conducted at the offshore banks. Fishing for cod has mostly been conducted in the south-western parts of the marine area with trawler fishing offshore and passive fishing closer to the coast. Pelagic fishing related to fishing for herring and sprat is conducted in large parts of the open sea, but not at the banks. Some fishing with passive gear is done off of Öland's coast. There is also pelagic fishing that is a national interest claim in Ö261 and Ö273. These areas are presented as alternative investigation areas for wind power where wind power is given priority over commercial fishing.



Map 8. Plan map for the Southeast Baltic Sea marine area



## Area table for the South-eastern Baltic Sea

Table 6 Area table for the South-eastern Baltic Sea

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
Ö240	Defence Shipping	High nature values: Mammal area. Bird area. Reef environment. Especially low environmental impact. High cultural heritage values	Defence is given priority over expanded energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power.  The uses are deemed to not be able to coexist.  In part of the area, there is an existing wind power facility. Future expansion of the area is not deemed to be compatible with the national defence interests.
Ö248	General use Shipping	High nature values: Mammal area. Bird area. Climate refugia for blue mussels. Reef environment. Planned area protection.		
Ö250	Defence Nature Shipping			
Ö252	Nature			
Ö254	Nature Shipping Investigation areas, shipping Electricity transmission Commercial fishing		Nature is given priority over energy extraction	Natura 2000 is given priority according to Chapter 3 and Chapter 4 of the Environmental Code over national interest claims for and public interest of substantial significance to wind power.  The uses are deemed to not be able to coexist.
Ö255	Investigation area for energy extraction, alternative Nature	National defence interests	Energy extraction is adapted to nature values	An activity or measure that can significantly affect an area that is protected according to Chapter 7, Section 28 of the Environmental Code, meaning Natura 2000, always requires a special permit review.
Ö258	General use Shipping Commercial fishing	High nature values: Mammal area. Fish spawning ground.		



Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
Ö261	Investigation area for energy extraction, alternative	National defence interests	Energy extraction is given priority over commercial fishing	Public interests of substantial significance to wind power are given precedence over national interests for commercial fishing.  The uses are deemed to not be able to coexist.
Ö263	General use Commercial fishing Shipping Investigation areas, shipping			
Ö266	Investigation area energy extraction	National defence interests		
Ö273	Investigation area for energy extraction, alternative	National defence interests	Energy extraction is given priority over commercial fishing	Public interests of substantial significance to wind power are given precedence over national interests for commercial fishing.  The uses are deemed to not be able to coexist.
Ö274	General use Investigation areas, shipping			
Ö293	General use Commercial fishing Shipping			
Ö500	General use Investigation areas, shipping Commercial fishing Shipping	High nature values: Bird area.		
Ö501	Investigation area for energy extraction, alternative	High nature values: Bird area. National defence interests		
Ö502	Defence Commercial fishing Shipping	High nature values: Bird area.		
Ö503	Defence Shipping Commercial fishing		Defence is given priority over expanded energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power.  The uses are deemed to not be able to coexist.

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
				In part of the area, there is an existing wind power facility. Future expansion of the area is not deemed to be compatible with the national defence interests.

## **4.4. Southern Baltic Sea**

### **Electricity transmission**

The use electric transmission is matched by two transmission cables that connect Sweden with countries abroad. The NordBalt cable runs between Sweden and Lithuania. It connects to Nybro in Sweden and to Klaipeda in Lithuania (Ö247, Ö259). SwePolLink is the second transmission cable in the marine area and it connects Karlshamn with Slupsk in Poland (Ö259, Ö269, Ö508).

### **Energy extraction**

In the southern Baltic Sea, there are good conditions for energy extraction, and there is an extensive need due to the high energy consumption in southern Sweden. The offshore banks and coast have both good wind conditions and suitable depths for sea-based wind turbines. There are two national interest claims for wind power near the coast in the municipalities of Kristianstad and Sölvesborg. In the area of Northern Hanö bay (Ö508), the permit for a previous wind power project has expired. In the area, there are also national interest claims for national defence. The marine spatial plan gives priority to the defence interest.

Part of another national interest claim for wind power extends into the northern part of this marine area. In the area, there are also national interest claims for national defence. The Government has rejected an application for wind power in the area with reference to the national interest claim for national defence having priority over national interest claims for wind power. The marine spatial plan gives priority to the defence interest (Ö508).

In the marine area, there are good prerequisites for wind power with high wind speeds and offshore banks with suitable depths. The marine spatial plan sets out two alternative investigation areas with the use energy extraction (Ö256, Ö269). One of these areas, the offshore area south Öland (Ö256) overlaps with the use commercial fishing. The uses are deemed to be able to coexist. The areas are indicated as alternative areas as the defence interest has large space claims in the area that can impede coexistence. Particular consideration must be given to the interests of national defence in both areas (Ö256, Ö269).

### **Defence**

Defence assigned as the use in large parts of the marine area (Ö247, Ö253, Ö260, Ö264, Ö508). The Karlskrona naval port is one of Sweden's largest and most important marine bases. The Ravlunda and Rinkaby artillery ranges have impact areas in the sea off of the municipalities of Simrishamn, Kristianstad and Sölvesborg. The Hanö marine training area is in the territorial sea and the Swedish exclusive economic zone in Hanö bay and south of Öland.

At Utklippan (Ö260), coexistence is indicated between defence, nature, recreation and shipping. In the northern part of the area, there is a national interest claim for national defence. In the area, there are also national interest claims for nature conservation and a marine nature reserve.

The defence activities should be conducted so that negative impact is avoided on the nature values that form the basis for the marine nature reserve.

Particular consideration of national defence interests is indicated for the areas Ö256 and Ö269.

## **Culture**

The entire coastline is covered by national interests of a highly developed coast. The areas with national interest claim for cultural heritage conservation are along the coast outside the marine spatial planning area. Cultural heritage value cores identified by the Swedish National Heritage Board are mainly outside the marine spatial planning area. However, smaller parts extend into the planning area at Hanö bay (Ö264, Ö267, Ö508) and are covered there by particular consideration of high cultural heritage values. The consideration distance to the value cores needs to be assessed from a local perspective.

In the planning area in Hanö bay and at further locations off the coast in Skåne and Blekinge, there are preserved Stone Age landscapes on the seabed. Out from the mouth of the Verkeån river in Haväng, marine archaeologists have documented and examined an area with stone age remains. In the continued marine spatial planning process, additional documentation may form the basis for future guidance on the use culture in the area.

## **Nature**

The marine spatial plan assigns the use nature to several places in the Southern Baltic Sea. Utklippan (Ö260) is covered by a marine nature reserve, a national interest claim for nature conservation and an existing Helcom MPA area. Kiviksbredan off of Kristianstad (Ö508) has been proposed by the County Administrative Board of Skåne via the Swedish Environmental Protection Agency as an area to be included in the marine Baltic region in the Natura 2000 network. The area is proposed with reference to the species harbour porpoise, grey seal and harbour seal and the nature types sandbanks and reefs. The matter is currently being prepared in the Government Office. South of Simrishamn Municipality (Ö268), there is a coastal stretch of high nature values that are covered by national interest claims for nature conservation.

The marine spatial plan indicates the use nature at Öland's southern tip (Ö252 - Ö253) where there is a marine nature reserve. To promote and ensure ecosystem services, particular consideration of high nature values is indicated for several areas. Off of Karlskrona (Ö247), particular consideration shall be shown to reef environments and mammal areas, and further out into the open sea to fish spawning and mammal areas with especially high environmental impact (Ö256, Ö259, Ö269). In Hanö bay, there is, among other things, the strongly endangered Baltic Sea population of the red-listed harbour porpoise, which are also found in the Swedish Armed Forces' marine training areas (Ö508). In the same area, the plan prescribes particular consideration of high nature values for spawning areas, mammals and birds, and climate refugia for the three species of blue mussel, bladder wrack and herring. In Hanö bay's north-western corner, there are additional areas that can constitute climate refugia for these three species.

## **Recreation**

Recreation use is assigned off of Karlskrona (Ö260) where there is a national interest claim for outdoor recreation. Outdoor recreation, which also includes recreational boating, is important in the Southern Baltic Sea. Along the coast, outside the marine spatial planning area, there are several areas covered by national interest claims for outdoor recreation. The coast in Hanö bay's

western sections is covered by national interests in active outdoor recreation. Along the coast off of Simrishamn, there is a national interest for active outdoor recreation that borders on the planning area. The possibility of coexistence with other uses and consideration distances needs to be assessed from a local perspective.

## **Sand extraction**

The marine spatial plan indicates the use sand extraction off of Utklippan (Ö508). The area is located in a regional setting with expansive built development and municipal interests in coastal restoration and climate adaptation measures. There are also high nature values that must be given particular consideration, which places high demands on coexistence. The area is an important habitat for cod and future extraction needs to show consideration of cod spawning periods to not risk negative impact.

## **Shipping**

The use shipping is assigned to shipping lanes through the area (Ö247, Ö253, Ö259-Ö260, Ö264, Ö267, Ö508). The most trafficked shipping lane in the Baltic Sea runs through the Southern Baltic Sea in traffic separation systems along Sweden's southern coast from Öresund or Gedser between Denmark and Germany, through Bornholmsgattet towards southern Öland. A deep shipping lane also begins here for certain vessels upon passage eastwards through the Baltic Sea. Shipping goes partly in to the coast, but mainly further towards both Swedish and foreign ports.

The plan map presents the most important shipping lanes, not shipping's total need for space. In connection with the shipping lanes, there should be a safety distance. The distance is adapted to local conditions according to risk assessment.

## **Commercial fishing**

The use commercial fishing is assigned to most areas since commercial fishing is widespread in the Southern Baltic Sea (Ö256-Ö257, Ö259, Ö264, Ö267-Ö268, Ö508). The use corresponds to national interest claims for commercial fishing. Commercial fishing for cod has mostly been conducted by trawler in the open sea, but also with passive gear closer to the coast. Pelagic commercial fishing for herring and sprat is conducted in the open sea. Other fishing with passive gear is conducted to varying extents along the coast and in Hanö bay. In the area, fishing is also done by fishermen from other EU countries.

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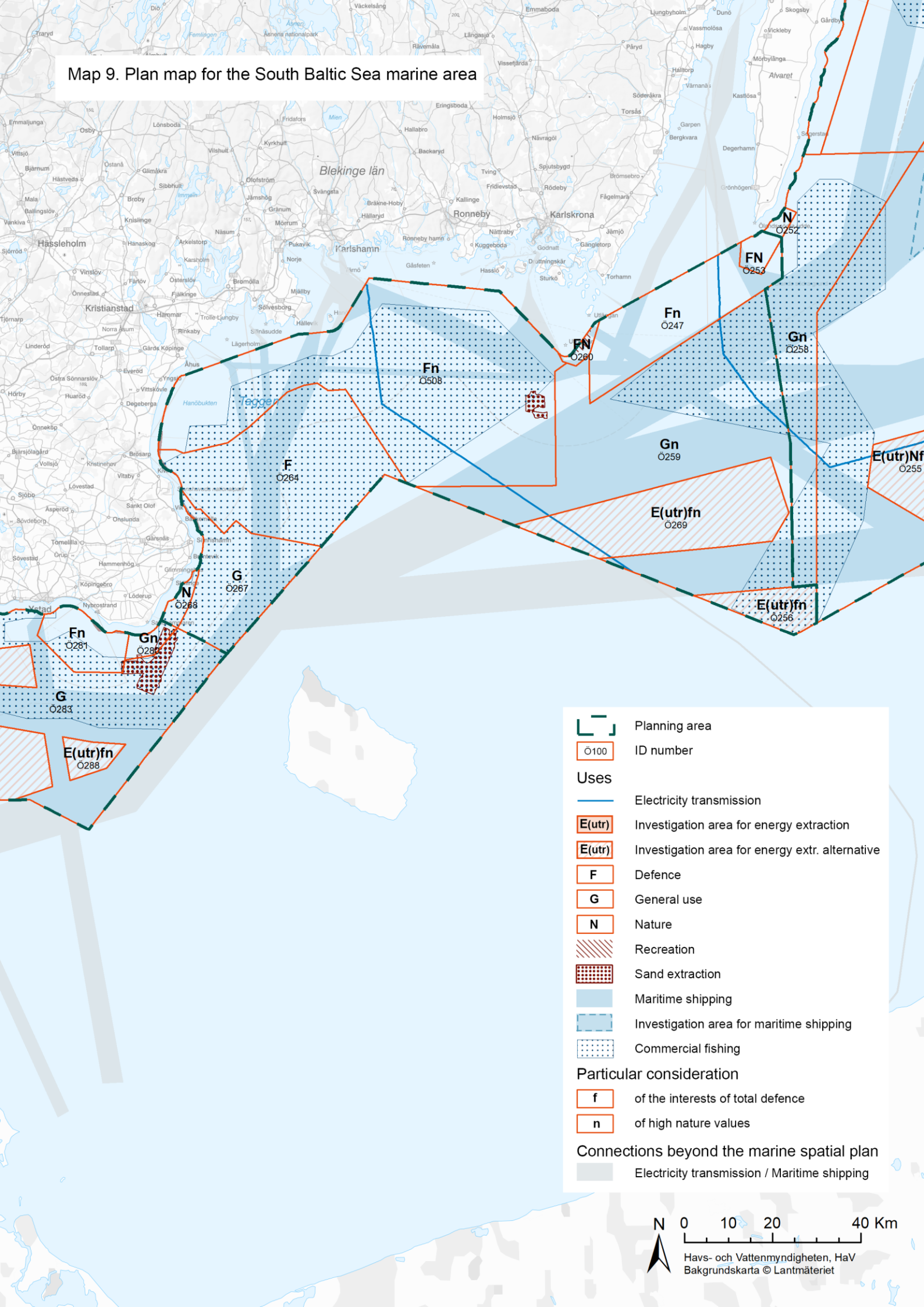
**Map 9. Plan map for the South Baltic Sea marine area**

**Legend:**

- Planning area:** Red outline
- ID number:** Ö100
- Uses:**
  - Electricity transmission: Blue line
  - Investigation area for energy extraction: E(utr)
  - Investigation area for energy extr. alternative: E(utr)
  - Defence: F
  - General use: G
  - Nature: N
  - Recreation: Hatched pattern
  - Sand extraction: Dotted pattern
  - Maritime shipping: Light blue area
  - Investigation area for maritime shipping: Dashed blue area
  - Commercial fishing: Dotted blue area
- Particular consideration:**
  - f: of the interests of total defence
  - n: of high nature values
- Connections beyond the marine spatial plan:**
  - Electricity transmission / Maritime shipping: Grey line

**Scale:** 0 10 20 40 Km

**Source:** Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet



## Area table for the Southern Baltic Sea

Table 7 Area table for the Southern Baltic Sea

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
Ö247	Defence Electricity transmission Shipping	High nature values: Mammal area. Reef environment.		
Ö253	Defence Nature Shipping			
Ö256	Investigation area for energy extraction, alternative Commercial fishing	High nature values: Mammal area. National defence interests		
Ö259	General use Commercial fishing Shipping Electricity transmission	High nature values: Mammal area. Especially high environmental impact.		
Ö260	Defence Nature Shipping Recreation			
Ö264	Defence Shipping Commercial fishing	High cultural heritage values		
Ö267	General use Shipping Commercial fishing	High cultural heritage values		
Ö268	Nature Commercial fishing			
Ö269	Investigation area for energy extraction, alternative	High nature values: Fish spawning ground. Mammal area. Especially high environmental impact. National defence interests		

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
<b>O508</b>	Defence Commercial fishing Shipping Electricity transmission Sand extraction	High nature values: Mammal area. Fish spawning ground. Bird area. Climate refugia for blue mussels. Climate refugia for herring. Climate refugia for bladder wrack. High cultural heritage values	Defence is given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over national interest claims for wind power.  The uses are deemed to not be able to coexist.



## **4.5. South-western Baltic Sea and Öresund**

### **Electricity transmission**

The use electricity transmission is in northern Öresund (Ö294). The use corresponds to the Öresund cables, two cable connections for 400 kV between Kristinelund in Sweden and Skibstrupgård in Denmark.

### **Energy extraction**

There are good conditions for wind power in the marine area, and there is an extensive need due to the high energy consumption in southern Sweden. Coastal and offshore banks have good wind conditions and good depth conditions for bottom-based wind power stations. Lillgrund (Ö287) is Sweden's largest existing sea-based wind farm. In possible changes to the wind power stations at Lillgrund, the approach area to Copenhagen's Kastrup airport needs to be taken into account. At Kriegers Flak (Ö285), there are good conditions for offshore wind energy. In the area, there is a licensed wind power project where most of the project area is covered by a national interest claim for wind power. A small part of the project area overlaps with a Natura 2000 area.

National interest claims for wind power outside of Skurup Municipality (Ö282) are satisfied in the marine spatial plan as an alternative since wind power in the area affects the national interests of national defence and fishing. Two areas have been identified as public interests of substantial significance to energy extraction south of Skåne (Ö286, Ö288). The conditions for wind power are favourable and the cumulative environmental impact is deemed to be low. Due to the interests of national defence, the area is pointed out as an alternative.

Within Malmö and Kävlinge Municipality (Ö298), the possibilities for energy extraction are deemed to be good. The impact on natural interests and shipping needs to be investigated further.

### **Defence**

The marine spatial plan assigns the use defence to the impact area in the sea for the Kabusa artillery range in Ystad Municipality (Ö281). A small part of a national interest claim for national defence at Falsterbonäset, designated as an "other influence area", goes into the area covered by the marine spatial plan (Ö284). Due to the marine spatial plan's overall scale, the defence interest is not shown on the plan map. The national interest claim for national defence is satisfied because the defence interest and the uses the marine spatial plan indicates are deemed to be able to coexist.

Particular consideration of the interests of national defence is prescribed at energy areas (Ö285, Ö282, Ö286, Ö287, Ö288, Ö298).

### **Culture**

The entire coastline is covered by national interests of a highly developed coast. Several areas with national interest claim for cultural heritage conservation are along the entire coast outside the marine spatial planning area. There are national interest claims east of Ystad (Ö280, Ö281).

A small part of a national interest claim for cultural heritage conservation at Falsterbonäset goes into the area covered by the marine spatial plan (Ö284). Due to the marine spatial plan's overall scale, the interest is not shown on the plan map. The national interest claim for cultural environment conservation is satisfied because the interest and the uses the marine spatial plan indicates are deemed to be able to coexist. There are also national interest claims around Ven's eastern and northern coast (Ö292, Ö299) and along the coast north of Helsingborg (Ö294).

Cultural heritage value cores identified by the Swedish National Heritage Board are located outside the marine spatial planning area, which is why the plan map does not indicate areas with particular consideration of high cultural heritage values. The consideration distance to the value cores needs to be assessed from a local perspective.

## Nature

The marine spatial plan indicates the use nature in several areas. For the area that extends from the open sea at eastern parts of Trelleborg Municipality via Falsterbonäset to the southernmost part of Öresund, the use is based on two Natura 2000 areas and national interest claims for nature (Ö284). The eastern part of the area is covered by the Natura 2000 area of South-western Scania's offshore waters, which was established in 2016 for the protection of harbour porpoises. The north-western part of the area is covered by national interest claims for nature and a large part of the Natura 2000 area of the Falsterbo Peninsula/Falsterbo-Foteviken, which is protected according to both the Birds Directive and the Habitats Directive. Also, a marine nature reserve, Måkläppen – Limhamnstårn, is in the area that together is home to large and unique values for birds and has a geology that gives rise to a sand migration area unmatched in Sweden. The existing wind farm Lillgrund (Ö287) is within the national interest claim for nature and the marine spatial plan prescribes coexistence between the use's energy extraction and nature.

The area north of Ven in Öresund (Ö292) comprises a Natura 2000 area for harbour porpoises and important eelgrass beds, the municipal nature reserve Knähaken and national interest claims for commercial fishing spawning areas. Lundåkrabukten (Ö290) comprises national interest claims for commercial fishing that pertain to spawning areas for fish, and the nature reserve of Lundåkrabukten. Outside of Helsingborg, there is the marine nature reserve Grollegrund (Ö294). Here, there is also an important passage for migratory birds of prey (Hansson, 2019).

The marine spatial plan prescribes particular consideration of high nature values in Öresund (Ö298, Ö299) where there are coherent high values of significance to conservation and developed ecosystem services. These are strengthened by the presence of mammals, birds, valuable seabed environments and spawning areas for fish. At the same time that the nature values are high, the impact from human activities is large. The new marine nature reserve Flädierev is in the coastal area off of Bjärred and overlaps with the marine spatial planning area (Ö299). The overlapping part of the nature reserve is too small to be illustrated in the plan map, but concerns a smaller area at the inner planning boundary.

A coastal stretch of high nature values extends east of Ystad where particular consideration to high nature values is prescribed (Ö280 - Ö281). There are valuable reefs for fish spawning and an important bird and mammal area.

## Recreation

The marine spatial plan assigns the use recreation to the area around Ven (Ö292, Ö299) where there is a national interest claim for outdoor recreation. Valuable coastal landscapes extend along western and southern Skåne. In Öresund, there are extensive angling and fishing tours. Outdoor recreation and recreational boating are important in the entire marine area. Several areas with national interest claim for outdoor recreation are outside the marine spatial planning area, mainly along Skåne's southern and western coasts. The possibility of coexistence with other uses and consideration distances needs to be assessed from a local perspective.

## Sand extraction

South of Ystad (Ö280, Ö281, Ö283), there were permits for sand extraction that ran until 2021. The sand is used for coastal replenishment and extraction took place in the years 2011, 2014, 2017 and 2020 (Ystads Municipality, 2023). Performed supervision shows that over sedimentation of earlier traces from the extraction takes place through the geological processes in the area (SGU, 2018b).

## Investigation area for sand extraction

Off of Falsterbo (Ö284), there is an investigation area for sand extraction. The suitability for sand extraction has been assessed for parts of an investigation area and is presented in the report Conditions for extraction of marine sand and gravel in Sweden (SGU, 2017). The proposed sand extraction area at Falsterbo coincides with the westernmost parts of the Natura 2000 area of South-western Skåne's offshore waters. The Natura 2000 area has been established to strengthen the protection of the Danish Straits population and the Baltic Sea population of harbour porpoises. The harbour porpoise's high geographic mobility has resulted in a relatively large Natura 2000 area. The comprehensive assessment in the marine spatial plan is that coexistence with sand extraction may be possible based on extraction being proposed on the outskirts of the Natura 2000 area. The harbour porpoise's seasonal variations, together with the environmental effect of sand extraction being deemed to arise on a limited area for a limited time, strengthen the possibility of coexistence between the use's nature and sand extraction. Sand extraction needs to be adapted to the Natura 2000 protection. An activity or measure that can significantly affect an area that is protected according to Chapter 4, Section 8 of the Environmental Code, meaning Natura 2000, always requires a special permit review.

The investigation area for sand extraction is in the exclusive economic zone. To the east of this area, there is the Natura 2000 area of the Falsterbo Peninsula-Foteviken, which is also a marine nature reserve and a part of the national interest claim for nature conservation. In this area, which is in the territorial sea and outside the investigation area for sand extraction, sand extraction is identified as an activity that constitutes a risk of damage (County Administrative Board of Skåne, 2005). In the report Conditions for the extraction of marine sand and gravel in Sweden (SGU, 2017), it is assessed that sand extraction may be possible in the exclusive economic zone off of the Natura 2000 area of the Falsterbo Peninsula-Foteviken. In the exclusive economic zone, there are ecologically valuable places where bottom vegetation and mussel banks occur and where there is postglacial sand and gravel. The assessment is that sand extraction can be possible west and south-west of these places.

The sand extraction area at Falsterbo is within an area with designated traffic separation for shipping. The interests are deemed to be able to coexist. The traffic that sand extraction is estimated to entail is deemed to be minor (SGU, 2017, 2018b). Existing shipping volumes mean that sand extraction accounts for a negligible addition of noise impact.

For the two sand extraction areas, there is a potential impact on commercial fishing, which at Falsterbo is also strengthened by cumulative environmental effects from Danish extraction in Öresund. The impact is deemed to be able to be limited if gentle extraction methods are used and if the extraction is done at times when the fish are not spawning (SGU, 2017).

## **Shipping**

The use shipping is assigned to shipping lanes through the marine area (Ö281, Ö283-Ö284, Ö292, Ö294, Ö298-Ö299). The most trafficked shipping lane in the Baltic Sea goes through the South-western Baltic Sea in a traffic separation system along Sweden's southern coast from Öresund via Falsterbo in Vellinge Municipality or from Gedser, between Denmark and Germany, to Bornholmsgattet. Shipping continues towards both Swedish and foreign ports. Öresund is one of a few ways into the Baltic Sea for large ships. The plan map presents the most important shipping lanes, not shipping's total need for space. In connection with the shipping lanes, there should be a safety distance. The distance is adapted to local conditions according to risk assessment.

## **Commercial fishing**

Commercial fishing is widespread and the marine spatial plan therefore assigns the use commercial fishing to a large part of the marine area (Ö280-Ö281, Ö283-Ö284, Ö290, Ö294, Ö298-Ö299). The use corresponds to national interest claims for commercial fishing. Commercial fishing for cod is mostly conducted by trawler in the open sea, but also with passive gear closer to the coast. Pelagic commercial fishing for herring and sprat is conducted throughout the open sea. Other fishing with passive gear is conducted to varying extents along the coast. In Öresund, bottom trawling is not permitted, but rather commercial fishing takes place with passive gear, including for cod.



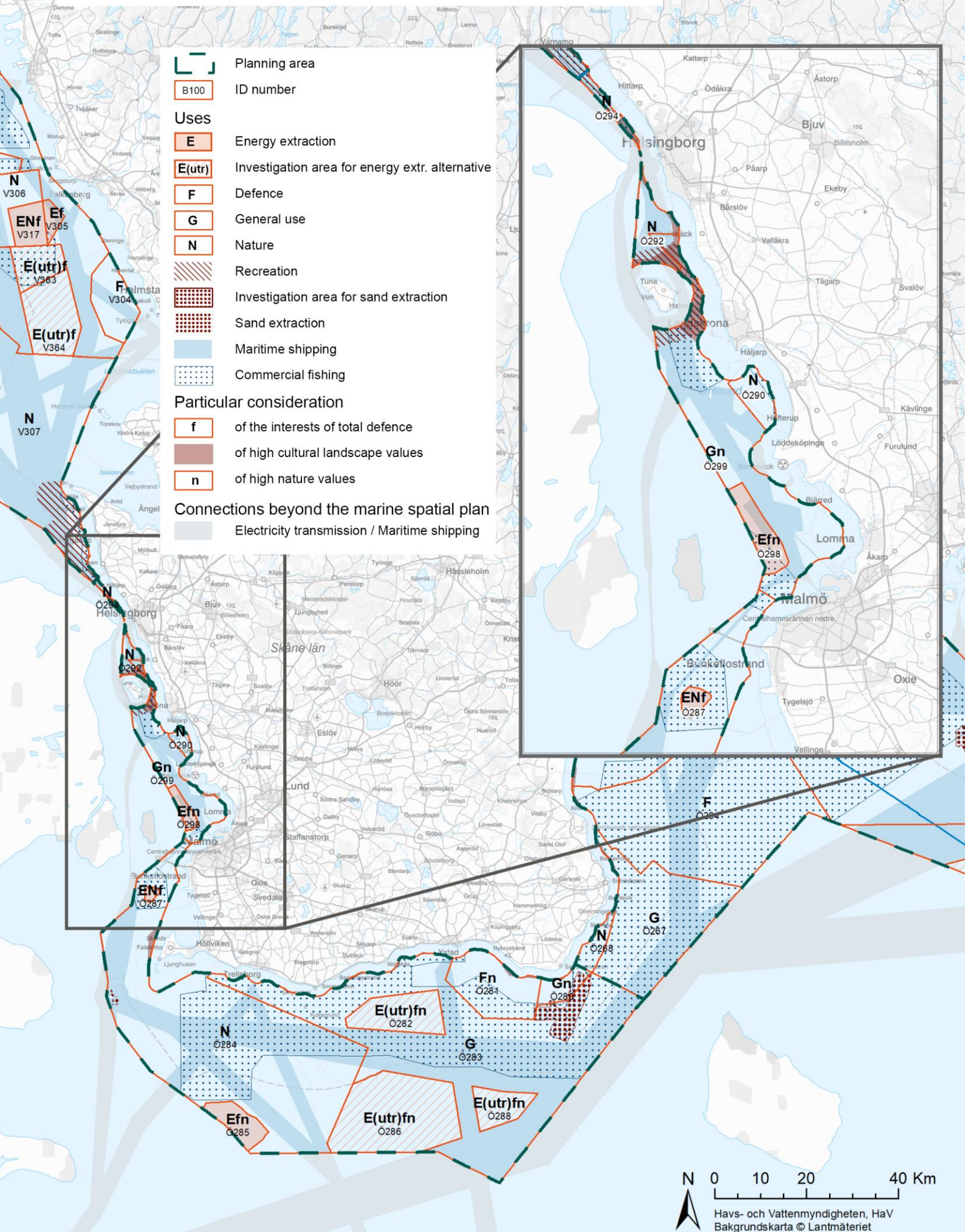
**Map 10. Plan map for the Southwest Baltic Sea and Öresund marine area**

**Legend:**

- Planning area** (Green outline)
- B100** ID number (Orange outline)
- Uses**
  - E** Energy extraction
  - E(utr)** Investigation area for energy extr. alternative
  - F** Defence
  - G** General use
  - N** Nature
  - Recreation** (Diagonal lines)
  - Investigation area for sand extraction** (Red dots)
  - Sand extraction** (Red dots)
  - Maritime shipping** (Blue wavy lines)
  - Commercial fishing** (Blue dots)
- Particular consideration**
  - f** of the interests of total defence
  - n** of high cultural landscape values
  - n** of high nature values
- Connections beyond the marine spatial plan**
  - Electricity transmission / Maritime shipping** (Grey lines)

**Map Details:**

- The map shows the Southwest Baltic Sea and Öresund marine area, including the cities of Helsingborg, Lomma, and Malmö.
- Planning areas are outlined in green, and B100 ID numbers are shown in orange.
- Uses are indicated by letters (E, E(utr), F, G, N) and patterns (diagonal lines, red dots, blue wavy lines, blue dots).
- Particular considerations are indicated by letters (f, n) and patterns (diagonal lines, red dots, blue dots).
- Connections beyond the marine spatial plan are shown as grey lines.
- A scale bar (0-40 Km) and a north arrow are located in the bottom right corner.



## Area table for the South-western Baltic Sea and Öresund

Table 8 Area table for the South-western Baltic Sea and Öresund

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
Ö280	General use Sand extraction Commercial fishing	High nature values: Bird area. Reef environment.		
Ö281	Defence Sand extraction Commercial fishing Shipping	High nature values: Bird area. Reef environment. High cultural heritage values		
Ö282	Investigation area for energy extraction, alternative	High nature values National defence interests	Energy extraction is given priority over commercial fishing	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for wind power are given priority over national interest claims for commercial fishing.  The uses are deemed to not be able to coexist.
Ö283	General use Commercial fishing Shipping Sand extraction		Commercial fishing and shipping are given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for commercial fishing are given priority over national interest claims and public interests of substantial significance to wind power.  The uses are deemed to not be able to coexist.  According to Chapter 3, Section 10 of the Environmental Code, national interest claims for shipping are given priority over public interests of substantial significance to wind power.  The uses are deemed to not be able to coexist.
Ö284	Nature Commercial fishing Investigation area for sand extraction Shipping	High cultural heritage values	Sand extraction is adapted to nature, such as in terms of the time period and location of withdrawals	An activity or measure that can significantly affect an area that is protected according to Chapter 7, Section 28 of the Environmental Code, meaning Natura 2000, always requires a special permit review.
Ö285	Energy extraction	High nature values: Mammal area. Bird area. Reef environment. National defence interests	Energy extraction is adapted to nature and defence	An activity or measure that can significantly affect an area that is protected according to Chapter 7, Section 28 of the Environmental Code, meaning Natura 2000, always requires a special permit review.



Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
Ö286	Investigation area for energy extraction, alternative	High nature values: Bird area. National defence interests	Energy extraction adapted to defence	The use energy extraction needs to be adapted to the defence interest.
Ö287	Energy extraction Nature	National defence interests	Energy extraction is given priority over commercial fishing	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for wind power are given priority over national interest claims for commercial fishing.  The uses are deemed to not be able to coexist.  There is a wind farm in the area. Commercial fishing's needs are met in nearby areas.
Ö288	Investigation area for energy extraction, alternative	High nature values: Bird area. National defence interests	Energy extraction adapted to defence	The use energy extraction needs to be adapted to the defence interest.
Ö290	Nature Commercial fishing			
Ö292	Nature Recreation Shipping	High cultural heritage values		
Ö294	Nature Recreation Shipping Commercial fishing Electricity transmission	High cultural heritage values		
Ö298	Energy extraction Commercial fishing Shipping	High nature values: Bird area. National defence interests	Public interest of substantial significance to energy extraction with adaptation to shipping and commercial fishing	Public interest of substantial significance to wind power is deemed to be able to be adapted to coexist with shipping and commercial fishing.
Ö299	General use Commercial fishing Recreation Shipping	High nature values: Bird area. High cultural heritage values		



## **5. Skagerrak and Kattegat: Guidance and considerations**

### **General information on the marine spatial planning area**

Here is a summary of the plan's main features for the marine spatial planning area. The focus for the use and considerations for the marine spatial planning area's marine areas is also presented.

The plan map should be interpreted in the approximate scale between 1:700,000 and 1:1,000,000. The boundaries and markings in the map are general based on the strategic level of the marine spatial plans.

The laying, operation and maintenance of data and telecommunication cables, power cables, pipelines and gas lines must be made possible where appropriate. This applies to the entire planning area.

In Skagerrak and Kattegat, there are two marine sub-regions:

- Skagerrak
- Kattegat

### **High nature values and national park below the surface**

There are large areas with high nature values in the marine spatial planning area, and several of them are nature reserves or Natura 2000 areas. In Skagerrak, there is also the Kosterhavet National Park, where the environmental protection mainly concerns underwater environments. In addition to protected areas, the marine spatial plan also indicates areas for particular consideration of high nature values.

In Skagerrak and Kattegat, there are marine mammals, such as harbour porpoises and seals and spawning and nursery areas for several fish species. The marine spatial planning area is crossed by two very important routes for e.g. birds of prey that migrate in the spring. This also encompasses shallow areas of international importance to wintering sea birds. The area also constitutes an important connection link and passage for birds that move in a north-south direction between the marine areas.

### **Industry and people**

In many places in the Skagerrak and Kattegat marine spatial planning area, there are attractive living environments for people. Along the entire coast, recreation and tourism are important. Extensive commercial fishing is conducted for both fish and shellfish that are caught with various kinds of fishing gear. Shipping is extensive in the entire planning area, even close to the coast. A significant part of the traffic to and from the Baltic Sea goes through Skagerrak/Kattegat and Öresund, and there are several ports on the west coast of Sweden that are of major significance to Swedish exports. Sweden's national defence has interests in the marine spatial planning area, among other things in the form of marine training areas. There are good conditions for offshore wind energy production with high wind speeds.

At the same time that there are good conditions for various activities, the environmental status in Skagerrak and Kattegat needs to be improved to be able to achieve a good environmental status.

Many activities work well together in the planning area. Coexistence is often regulated. This might, for example, involve areas being restricted during defence exercises or rules for how ships may be sailed in shipping lanes that are a part of a traffic separation system, such as fishing boats that are fishing.

## **Commercial fishing, shipping and wind power**

The marine spatial plans should contribute to achieving the societal objective of 100 per cent fossil-free energy production by 2040. The conditions for offshore wind energy are good in Skagerrak and Kattegat. However, there is extensive competition for the space in Skagerrak and Kattegat with, among other things, commercial fishing and shipping. The starting point for the planning has been updated documentation for new or changed areas for energy extraction in the marine spatial plans (Swedish Energy Agency, 2023a). The planning of areas for energy extraction builds on a comprehensive assessment of how the marine spatial plan can best contribute to achieving the energy objectives in terms of the needs of wind power and other interests. Areas for energy extraction are proposed both in the territorial sea and in the exclusive economic zone. Some proposed areas are covered by the Natura 2000 legislation, which means that wind power establishment can only be permitted in the area if it does not risk damaging or disturbing the habitats or species that are to be protected. Several energy areas and alternative energy areas in Skagerrak and Kattegat are designated as investigation areas. The reasons are that the impact on the military activities and facilities needs to be investigated more, or that establishment of wind power requires so-called Natura 2000 permits.

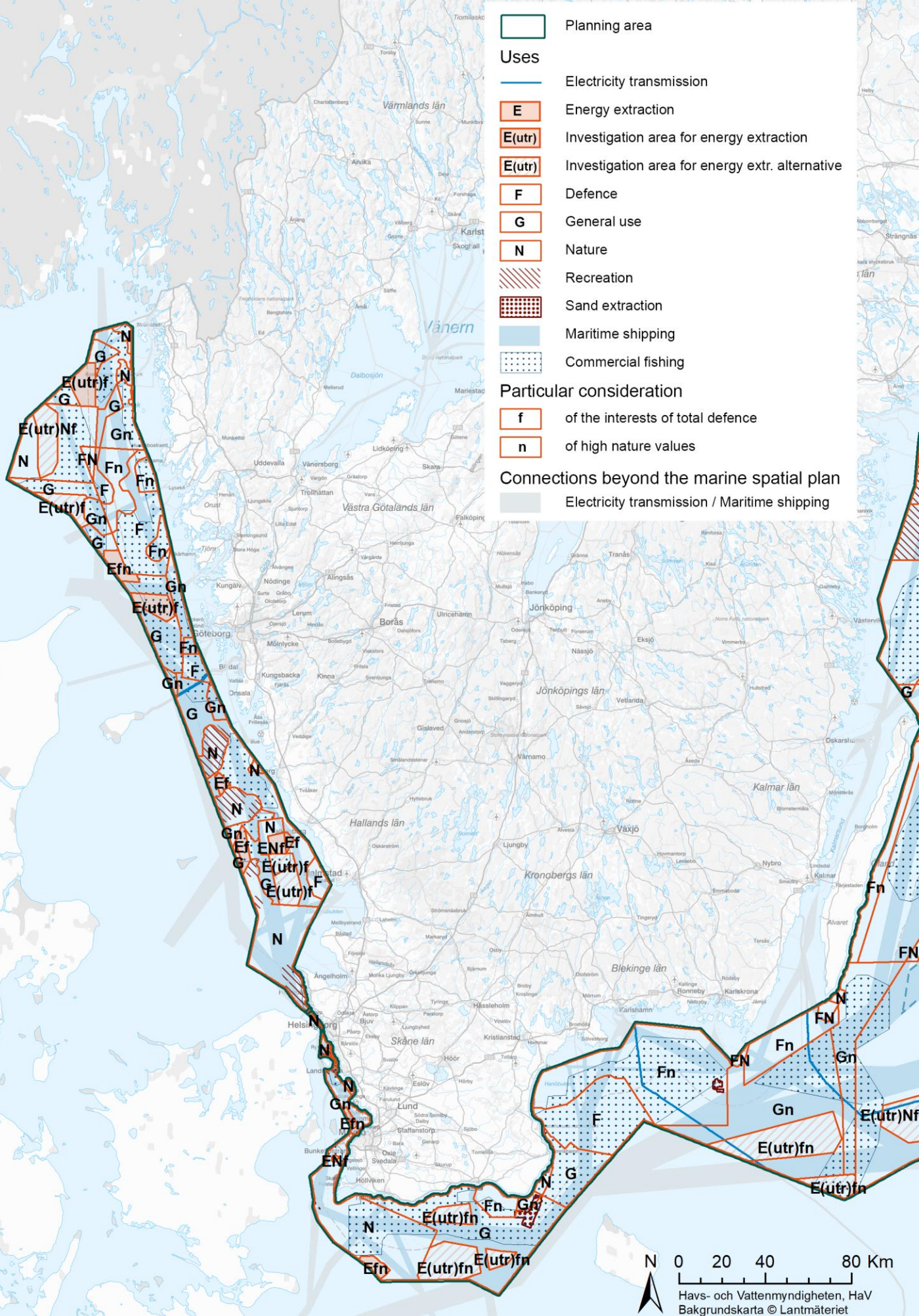
In the expansion of energy extraction, particular consideration must be given to national defence interests. The energy areas that the marine spatial plan indicates in Skagerrak and Kattegat entail a risk of combined, cumulative impact on national defence interests. This risk must be taken into account, and this might entail limitations to the scope of the expansion, either altogether or in individual areas. In all energy areas, particular consideration is therefore given to the interests of national defence. In one area, the marine spatial plan also indicates particular consideration of high nature values.

Commercial fishing is geographically extensive in Skagerrak and Kattegat and to some extent changes from year to year and over a longer time. The area for the use commercial fishing is therefore large in the marine spatial plan. In the planning of the areas for energy extraction, consideration has been given to the combined cumulative impact on commercial fishing. However, in some cases, wind power is given priority over commercial fishing.

There is extensive regulation with traffic separation for shipping in Skagerrak and Kattegat. The marine spatial plan follows national interest claims. The claims are supplemented by a shipping lane that constitutes a public interest of substantial significance in northern Skagerrak.



Map 11. Plan map for the Skagerrak/  
Kattegat marine spatial planning area



## 5.1. Skagerrak

### Energy extraction

In Skagerrak, there are good prerequisites for offshore wind production with high wind speeds. It is deep, which requires floating foundations. From north of Gothenburg to the south, it is shallower and possible to have fixed bottom foundations.

In Skagerrak and Kattegat, there is an area with the use energy extraction (V357), two investigation areas with the use energy extraction (V352, V359) and two alternative investigation areas with the use energy extraction (V355, V360). Possible offshore wind establishment in all five areas is assessed to have a large negative cumulative impact on commercial fishing and its accessibility. For these reasons, two of the areas are presented as alternative areas.

The area Norr Bratten and Väst Kosterhavet (V352) in the exclusive economic zone west of Kosterhavet National Park is indicated as an investigation area with the use energy extraction. Offshore wind energy is considered to be a public interest of substantial significance in this area. The area partly overlaps with a project area analysed by the Swedish Armed Forces and where they assess that offshore wind energy installations can be built with a higher probability without entailing tangible damage to national interests or areas of significance to the military component of national defence. However, the entire area has not been analysed based on the impact on the military interests of national defence (Swedish Energy Agency, 2023a). For this reason, the area is indicated as an investigation area.

The area of the South-western marine training area Skagen (V357) furthest west from Tjörn in the exclusive economic zone is indicated as an area with the use energy extraction. Public interests of substantial significance to wind power take precedence over national interest claims for commercial fishing in the area. Since only floating foundations may be relevant, current commercial fishing for Northern prawn is not deemed to be able to coexist with wind power. The area is within a larger project area analysed by the Swedish Armed Forces where they assess that there may be a possibility for wind power to be built without entailing tangible damage to national interests or areas of significance to the military component of national defence (Swedish Energy Agency, 2023a).

The area of North-western Öckerö (V359) is indicated as an investigation area with the use energy extraction. In the area, there is public interest of substantial significance to offshore wind energy and national interest claims for commercial fishing in the entire part that is in the territorial sea and a small part in the exclusive economic zone. The area overlaps to a small extent with a project area analysed by the Swedish Armed Forces where they assess that there may be a possibility for wind power to be built without entailing tangible damage to national interests or areas of significance to the military component of national defence, but the Swedish Armed Forces also assess that further analyses of the specific area are probably required to further investigate the conditions (Swedish Energy Agency, 2023a). For this reason, the area is indicated as an investigation area.

The area of the North-western Bratten (V360) constitutes an alternative investigation area with the use energy extraction. Offshore wind energy and shipping are considered to be a public



interest of substantial significance in this area. Ship traffic is deemed to be able to go in a north-south route east of the area. Public interest in offshore wind energy is therefore given priority over shipping. In terms of national defence interests, possible impact needs to be investigated. The area is in its entirety within the Natura 2000 area of Bratten. It is assessed that this means that there is a requirement for a special permit review according to Chapter 4, Section 8 of the Environmental Code, a so-called Natura 2000 review. For these reasons, the area is indicated as an investigation area.

The offshore area north of Skagen (V355) west of Öckerö in the exclusive economic zone constitutes an alternative investigation area with the use energy extraction. In the area, there is a public interest of substantial significance to offshore wind energy that overlaps with national interest claims for commercial fishing. Public interests of substantial significance to offshore wind energy take precedence over national interest claims for commercial fishing in the area. Since only floating foundations may be relevant, current commercial fishing for Northern prawn is assessed not to be able to coexist with wind power. An application for a project that also covers a larger area to the north is being assessed and reviewed by the county administrative board on behalf of the Government (information 6 July 2023). In the expanded area, commercial fishing is indicated as the most suitable use and thereby has priority over energy extraction. The Swedish Armed Forces have not analysed the specific area V355, but have analysed the offshore wind energy project with a larger project area that entirely overlaps with the area. The impact on the military interests of national defence for this smaller area's specific delimitation is not fully investigated. For this reason, the area is indicated as an investigation area.

## **Defence**

The marine spatial plan indicates the use defence for the Skagen Marine Exercise Area, which extends from Sotenäs in the north to Tjörn in the south, out across the entire territorial sea and in the exclusive economic zone (V320-V322, V336, V339, V347). Further south, almost entirely within the municipality of Gothenburg, is the Käsö marine training area where the marine spatial plan also indicates the use defence (V318-V319).

National interest claims for defence are given priority over a public interest of substantial significance for offshore wind energy in the marine exercise area (V320).

An alternative investigation area, but the use energy extraction V355 is located within a larger project area for wind power that has been analysed by the Swedish Armed Forces in the permit process. The Swedish Armed Forces' assessment is that an offshore wind energy establishment according to the current project would entail substantial damage to national interests for the military component of national defence. The impact on the secret interests of the military component of national defence for this smaller area's specific delimitation is not fully investigated (Swedish Energy Agency, 2023a).

In all energy areas, particular consideration is given to the interests of national defence.

## **Culture**

The coast along the southern part of Skagerrak and Kattegat is covered by national interests of a highly developed coast. The northern stretch of the coast is covered by national interests of an

unbroken coast. The areas with national interest claim for cultural heritage conservation are along the coast outside the marine spatial planning area, including a larger area around the southern archipelago of Gothenburg. The coastal and marine landscape or free horizon are significant physical expressions for the claims. Cultural heritage value cores identified by the Swedish National Heritage Board are located outside the marine spatial planning area. The consideration distance to the value cores needs to be assessed from a local perspective. Off of Gothenburg's southern archipelago, there is a small area assigned with particular consideration of cultural heritage values (V318).

## **Nature**

The marine spatial plan assigns the use nature to many parts of the marine area. In the west, there is the Natura 2000 area Bratten (V336, V360, V366).

Around the Kosteröarna, the use nature is assigned at Strömstad (V344) and Tanum (V349) in areas with national parks, nature reserves and Natura 2000.

In several areas, particular consideration shall be given to high nature values (V318, V321, V324, V339, V347, V348, V350, V357). In some cases, this relates to areas where there is no area protection today, but which is planned in all or part of the areas. Around Väderöarna and Svabergsgrunden, preliminary studies for the establishment of marine nature reserves have begun due to high values of rare seabed environments.

## **Recreation**

Recreation and recreational boating are extensive in the entire marine area, and recreational boat traffic often moves to and from Norway and Denmark. The Bohuskusten archipelago is well-visited with extensive tourism and there are many natural harbours and marinas. The coast outside the marine spatial planning area in Skagerrak, to the north of Lysekil, is covered by national interests in active outdoor recreation. The entire coastline outside the marine spatial planning area is covered by national interest claims for outdoor recreation. Possible wind power establishment would cause a visual impact on the area. The possibility of coexistence with other uses and consideration distances needs to be assessed from a local perspective.

## **Shipping**

The marine spatial plan assigns the use shipping to large parts of the marine area (V318-V324, V339, V344, V347-V351, V353-V354, V356, V358, V366), with several shipping lanes from Oslo to Kattegat and in towards the coast and out past Skagen towards the North Sea. Offshore wind energy and shipping are considered to be a public interest of substantial significance in areas V355 and V360. The uses are deemed to not be able to coexist. The north-south shipping traffic is deemed to be able to shift eastward. Therefore, the use shipping is presented in a north-south stretch through the areas V348, V351, V356 and V366.

Routes from the Baltic Sea extend through Skagerrak out into the North Sea and on into the world's oceans. Sweden also has routes to Denmark and Norway. Sweden's two largest ports are located in Gothenburg and Lysekil.

In North Bohuslän, a joint comprehensive plan indicates an area for activities between two shipping lanes (V350) in the municipalities of Tanum and Sotenäs. In the establishment of operations, consideration of maritime safety issues is important. The marine spatial plan assigns the area general use with particular consideration of high nature values. The plan map presents the most important shipping lanes, not shipping's total need for space. In connection with the shipping lanes, there should be a consideration distance. The distance is adapted to local conditions according to risk assessment.

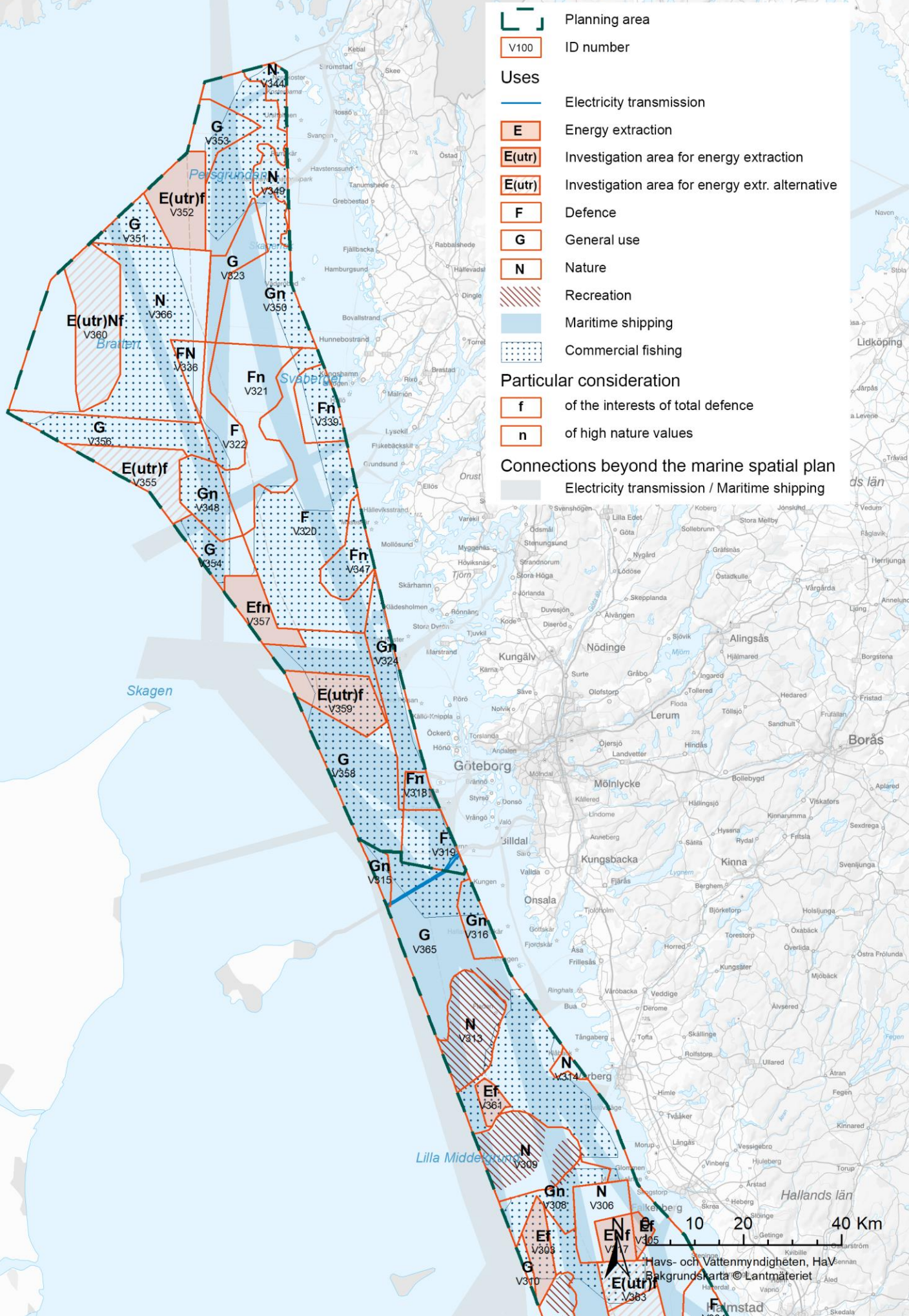
## **Commercial fishing**

Commercial fishing is extensive in Skagerrak and is indicated as a use in a large part of the marine area (V318-V321, V323-V324, V336, V339, V344, V347-V349, V350-V351, V353-V354, V356, V358, V366). Shrimp fishing is conducted to a large extent in the northern part of the area. Fishing for Norway lobster is conducted throughout the marine area except for farthest west. Shellfish have a relatively low geographic mobility, which means that the fishing areas are more stable than in other fishing. There is cage fishing for Norway lobster closer to the coast. Fishing with passive gear takes place to varying extents throughout the area and is somewhat more intensive in the south. Pelagic fishing is conducted from Sotenäs and to the south. Public interests of substantial significance to wind power are given precedence over national interest claims for commercial fishing in area V357 and V355 (alternative). The areas are suitable for floating wind power stations. It is therefore deemed to not be possible to conduct fishing with active gear in the area.

West (23-38 nautical miles) of the island of Måseskär, there is a dumping area with 28 ships that contain chemical weapons to an unknown extent. The marine spatial plan's guidance is that commercial fishing is not a suitable use in this dumping area. Environmentally hazardous substances have leaked out into the marine environment and at the same time, active trawler fishing is conducted in the vicinity of the wrecks. Trawls and trawl boards that are in contact with the seabed tear up sediment and spread the substances over a larger geographic area. Data from studies show that decomposition products from chemical weapons are found in edible fish and crustaceans in the area. Altogether, this means that commercial fishing should not be conducted in the local area. The area is geographically small in relation to the spatial scale of the plan map and is therefore not marked in the plan map.



Map 12. Plan map for the Kattegat marine area



## Area table for Skagerrak

Table 9 Area table for Skagerrak

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
V318	Defence Shipping Commercial fishing	High nature values: Reef environment. Soft seabed with sea pens. High cultural heritage values		
V319	Defence Commercial fishing Shipping Electricity transmission			
V320	Defence Commercial fishing Shipping		Defence is given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for national defence are given priority over public interests of substantial significance to wind power.  The uses are deemed to not be able to coexist.
V321	Defence Shipping Commercial fishing	High nature values: Reef environment. Soft seabed with sea pens. Planned area protection.		
V322	Defence Commercial fishing Shipping			
V323	General use Commercial fishing Shipping			
V324	General use Shipping Commercial fishing	High nature values: Reef environment. Fish spawning ground. Mammal area.		
V336	Defence Nature Commercial fishing			
V339	Defence Commercial fishing Shipping	High nature values: Reef environment. Soft seabed with sea pens. Planned area protection.		

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
V344	Nature Shipping Commercial fishing			
V347	Defence Shipping Commercial fishing	High nature values: Mammal area. Fish spawning ground. High originality. Reef environment.		
V348	General use Shipping Commercial fishing	High nature values: Mammal area. Fish spawning ground. Especially high environmental impact.	Commercial fishing is given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interests for commercial fishing are given priority over public interests of substantial significance to wind power.  The uses are deemed to not be able to coexist.
V349	Nature Commercial fishing Shipping			
V350	General use Shipping Commercial fishing	High nature values: Reef environment. Soft seabed with sea pens. Planned area protection.		
V351	General use Shipping Commercial fishing		Commercial fishing is given priority over energy extraction	A public interest of substantial significance to commercial fishing is given priority over a public interest of substantial significance to wind power.  The uses are deemed to not be able to coexist.
V352	Investigation area energy extraction	National defence interests		
V353	General use Commercial fishing Shipping			
V354	General use Shipping Commercial fishing			
V355	Investigation area for energy extraction, alternative	National defence interests	Energy extraction is given priority over commercial fishing	Public interests of substantial significance to wind power are given precedence over national interest claims for commercial fishing.

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
				The uses are deemed to not be able to coexist.
V356	General use Commercial fishing Shipping			
V357	Energy extraction	High nature values: Bird area. National defence interests	Energy extraction is given priority over commercial fishing	Public interests of substantial significance to wind power are given precedence over national interest claims for commercial fishing.  The uses are deemed to not be able to coexist.
V358	General use Commercial fishing Shipping		Commercial fishing is given priority over energy extraction	According to Chapter 3, Section 10 of the Environmental Code, national interest claims for commercial fishing are given priority over public interests of substantial significance to wind power.  The uses are deemed to not be able to coexist.
V359	Investigation area energy extraction Commercial fishing	National defence interests		
V360	Investigation area for energy extraction, alternative Nature	National defence interests	Energy extraction adapted to nature	An activity or measure that can significantly affect an area that is protected according to Chapter 7, Section 28 of the Environmental Code, meaning Natura 2000, always requires a special permit review.
V366	Nature Shipping Commercial fishing		Commercial fishing is given priority over energy extraction	A public interest of substantial significance to commercial fishing is given priority over a public interest of substantial significance to wind power.  The uses are deemed to not be able to coexist.



## 5.2. Kattegat

### Electricity transmission

The use electricity transmission corresponds to the two parallel transmission grid cables Konti-Skan 1 and Konti-Skan 2, which run between Lindome in Sweden and Vester Hassing on Jutland in Denmark. Two cable connections for 400 kV between Kristinelund in Sweden and Skibstrupgård in Denmark, the so-called Öresund cables are at the boundary between the Skagerrak and Kattegat marine spatial plan and the Baltic Sea. They are presented in area Ö294 in the Öresund marine area in the Baltic Sea marine spatial plan.

### Energy extraction

In the marine area, there are good prerequisites for offshore wind energy production with high wind speeds. The depth allows for bottom-fixed foundations. The transmission grid on land is well developed because the Ringhals nuclear power plant is on the Halland coast.

In Kattegat, there are four areas with the use energy extraction (V303, V305, V317, V361) and two investigation areas with the use energy extraction (V362-V364).

There are three licensed projects in Kattegat. In the exclusive economic zone, there are two areas with licensed projects according to the Continental Shelf Act: one area west of Varberg (V361) and one area west of Falkenberg (V303). Currently (information as of 5 July 2023), appeals are being reviewed for the Natura 2000 permits for the areas. The areas constitute public interests of substantial significance to wind power that largely overlap with national interest claims for commercial fishing.

In the territorial sea, there is a licensed coastal project off of Falkenberg (V305) where an application for an extended start-up time and working time has been submitted (information as of 5 July 2023). In this section, there is a national interest claim for wind power. In the part of area V305, which is not covered by the licensed project, there is instead a public interest of substantial significance to wind power and a small part of a larger national interest claim for commercial fishing. A future establishment of offshore wind energy is deemed to be able to coexist with the national interest claim for commercial fishing if the activities are adapted to each other. West of the area for the licensed project, there is an area (V317) where energy extraction is considered to be a public interest of substantial significance.

In area V317 off of Falkenberg, there is also a national interest claim for commercial fishing that pertains to spawning areas. In the area, the use nature is indicated. Provided that establishment of wind power does not substantially damage the national interest claim regarding spawning area for fish, coexistence is deemed to be possible in area V317.

On the offshore bank Stora Middelgrund, which is located in the north-western part of area V307, there is a national interest claim for wind power. On the southern part of the bank, there is a national interest claim for outdoor recreation. The area is in a Natura 2000 area, which sets special requirements on energy extraction if coexistence is to be possible. The Government has rejected an application for establishment of a wind farm on the bank. The county administrative

board has rejected the application for a Natura 2000 permit according to Chapter 4, Section 8 of the Environmental Code. There is some overlap with the shipping lane in the eastern part of the area. For these reasons, nature, shipping and outdoor recreation are given priority over the national interest in wind power.

In the area of South-western Falkenberg (V363) in Falkenberg Municipality and the adjacent area of Väst Halmstad (V364) in Halmstad Municipality, there are public interests of substantial significance to offshore wind energy. National interest in commercial fishing overlaps almost entirely in V363 and to a small extent in V364. Commercial crayfish fishing is conducted in both areas in their entirety. The impact on the military part of the defence is not investigated. For this reason, the areas are indicated as investigation areas. The areas are indicated as alternative investigation areas with the use energy extraction based on a comprehensive assessment of the collective impact on commercial fishing from already licensed parks in Kattegat (V303, V305, V361), and area V317 which is north of V363-V364.

There is a public interest of substantial significance to offshore wind around 4-6 km from Skrea strand (V365). On the coast close to the offshore wind energy area is an area with a national interest claim for outdoor recreation according to Chapter 3, Section 6 of the Environmental Code and an area of national interest in active outdoor recreation according to Chapter 4, Section 2 of the Environmental Code. National interests in active outdoor recreation and national interest claims for outdoor recreation are therefore given priority over a public interest in wind power.

In energy expansion in Kattegat, particular consideration must be given to national defence interests in all energy areas. Several wind energy parks entail a risk of combined, cumulative impact on national defence interests. This risk must be taken into account, and this might entail limitations to the scope of the expansion, either altogether or in individual areas. For coexistence to be possible between different uses, construction of wind power stations needs to be done with consideration of Kattegat's high nature values and local commercial fishing.

## **Defence**

Off of Halmstad, the marine spatial plan indicates the use defence due to the impact area for the Ringenäs artillery range (V304). In all energy areas, particular consideration is given to the interests of national defence.

## **Culture**

The entire coastline is covered by national interests of a highly developed coast. The areas with national interest claim for cultural heritage conservation are along the coast outside the marine spatial planning area. Cultural heritage value cores identified by the Swedish National Heritage Board are located outside the marine spatial planning area, which is why the plan map does not indicate areas with particular consideration of high cultural heritage values. The consideration distance to the value cores needs to be assessed from a local perspective, such as the possible impact on cultural environmental values of energy extraction west of Falkenberg (V305, V317, V363, V364).

## Nature

The marine spatial plan indicates the use nature for a large area in South Kattegat (V307) that is covered by Natura 2000. The nature reserve Skånska Kattegat and national interest claim for nature conservation at the offshore bank Röde bank in the north and at Hallands Väderö to the east. The use nature is also indicated for Morups bank (V306), Lilla Middelgrund (V309) and Fladen (V313), which have high nature values and constitute Natura 2000 areas in parts of the areas. Lilla Middelgrund (V309) and Fladen (V313) are also covered by national interest claims for nature conservation and the area around Morups bank constitutes a national interest claim for spawning areas for fish (V306, V317). Balgö off of Varberg (V314) is a Natura 2000 area.

On the offshore banks, there are high values mainly for birds and harbour porpoises, important spawning areas for fish and valuable seabed environments. The offshore banks Fladen and Lilla Middelgrund have been identified as especially valuable by the Swedish Environmental Protection Agency (Swedish EPA, 2006).

The marine spatial plan prescribes particular consideration of high nature values in three areas in Kattegat (V308, V315–V316). There are also high nature values outside Swedish territorial waters and the Swedish exclusive economic zone.

## Recreation

The marine spatial plan indicates the use recreation for some of the valuable offshore banks (V307–309, V365) and an area from Kullen south towards Öresund (V307) that is covered by national interest claims for outdoor recreation. The offshore banks are also covered by Natura 2000, and angling has been limited through regulation. On parts of the offshore banks Fladen (V313), Lilla Middelgrund (V309) and Stora Middelgrund (V307) and in southern Kattegat (V307), it is prohibited, for example, to fish for conservation reasons. Recreation and angling are otherwise extensive, both along the coast and on the offshore banks. Important passages for recreational boat traffic run between Sweden and Denmark, and over Läsö. Large parts of the coast, outside the marine spatial planning area, are also covered by national interests in active outdoor recreation. The possibility of coexistence with other uses and consideration distances needs to be assessed from a local perspective.

There is a public interest of substantial significance to offshore wind energy around 4-6 km from Skrea strand (V365). On the coast, there is an area with national interest claims for outdoor recreation according to Chapter 3, Section 6 of the Environmental Code, Skrea strand-Tylösand, which has the support criteria of serenity and being untouched. On the coast, there is also an area of national interest in active outdoor recreation according to Chapter 4, Section 2 of the Environmental Code. Establishment of wind power entails an extensive visual impact on the experiential values in an area that is used by many people. National interests in active outdoor recreation and national interest claims for outdoor recreation are therefore given priority over public interest in offshore wind energy.

## Shipping

The marine spatial plan assigns the use shipping to large parts of Kattegat (V304, V305-V309, V311, V313, V315-V316, V365) in routes from north to south and into the ports along the coasts,



both on the Swedish and Danish sides. The use shipping comprises areas with national interest claims for shipping, which include areas with traffic separation systems that are required for safe shipping.

Shipping is important and extensive because the way through Kattegat is one of only a few ways into the Baltic Sea for large vessels. In the south, off of Stora and Lilla Middelgrund, there is the choice of routes of Öresund or Stora Bält, both of which limit the height and depth the vessels can have. The Stora Bält bridge limits the height.

The other way into the Baltic Sea is the Kiel canal, which entails limits in width, length and depth of the vessels. To ensure safe shipping through the shallow waters in Kattegat, there is a traffic separation system for the traffic north of Skagen and a shipping route closer to the Swedish coast for the traffic between Skagen and Öresund.

The plan map presents the most important shipping lanes, not shipping's total need for space. In connection with the shipping lanes, there should be a safety distance. The distance is adapted to local conditions according to risk assessment.

## **Commercial fishing**

The marine spatial plan assigns the use commercial fishing to large parts of Kattegat (V303, V308, V310-V311, V313, V363-V365). Important spawning areas for cod in the central and southern parts of Kattegat are covered by areas where the marine spatial plan indicates the use nature.

Commercial fishing is widespread in Kattegat, but also strongly regulated, including partly closed to both commercial and angling on parts of the offshore banks Fladen (V313), Lilla Middelgrund (V309) and Stora Middelgrund (V307) and in southern Kattegat (V307), it is prohibited to fish for conservation reasons, for example. In the marine area, fishing is conducted mainly for Norway lobster and pelagic fish. Cages are used to a minor extent for fishing for Norway lobster and lobster closer to the coast. Fishing with passive gear takes place to varying extents throughout the area. There are catch areas that constitute national interest claims for commercial fishing in V303, 305, V307-V308, V310, V313, V309, V315-V316, V361, V363, V365, but fishing also takes place outside the national interest claims.



## Area table for Kattegat

Table 10 Area table for Kattegat

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
V303	Energy extraction Commercial fishing	National defence interests		
V304	Defence Shipping			
V305	Energy extraction Shipping Commercial fishing	National defence interests		
V306	Nature Shipping			
V307	Nature Commercial fishing Recreation Shipping	High cultural heritage values	Nature and shipping are given priority over energy extraction	<p>Natura 2000 is given priority according to Chapter 4 of the Environmental Code over national interest claims for wind power.</p> <p>The uses are deemed to not be able to coexist.</p> <p>According to Chapter 3, Section 10 of the Environmental Code, national interest claims for outdoor recreation are given priority over public interests of substantial significance to wind power.</p> <p>The uses are deemed to not be able to coexist.</p> <p>According to Chapter 3, Section 10 of the Environmental Code, national interest claims for shipping are given priority over national interest claims for wind power.</p> <p>The uses are deemed to not be able to coexist.</p>
V308	General use Shipping Recreation Commercial fishing	High nature values: Bird area. Reef environment. Planned area protection.		

Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
V309	Nature Shipping Recreation			
V310	General use Commercial fishing			
V311	General use Shipping Recreation Commercial fishing			
V313	Nature Shipping Commercial fishing Recreation			
V314	Nature			
V315	General use Shipping Commercial fishing	High nature values: Mammal area. Fish spawning ground. Reef environment. Especially high environmental impact.		
V316	General use Shipping Commercial fishing	High nature values: Mammal area. Fish spawning ground.		
V317	Energy extraction Nature	National defence interests	Energy extraction is adapted to nature (spawning areas for fish)	See text under Kattegat above for more information.
V361	Energy extraction Commercial fishing	National defence interests		
V363	Investigation area for energy extraction, alternative Commercial fishing	National defence interests		



Area	Uses	Particular consideration	Priority or special adaptation for coexistence	Justification of priority
V364	Investigation area for energy extraction, alternative Commercial fishing	National defence interests		
V365	General use Electricity transmission Shipping Commercial fishing Recreation		Outdoor recreation is given priority over energy extraction	<p>Priority is given to national interest claims for outdoor recreation according to Chapter 3, Section 6 of the Environmental Code and active outdoor recreation according to Chapter 4, Section 2 of the Environmental Code over public interests of substantial significance to wind power.</p> <p>The uses are deemed to not be able to coexist.</p>

## 6. Implications and consequences

### 6.1. Implications

#### National comprehensive planning

Spatial planning means that society's various objectives shall be integrated into a sustainable whole, where the spatial context is made visible and decided in a planning document. A plan shall provide stability in the form of predictability of future use, at the same time that it shall allow flexibility for the management of changed environmental factors and the development of new technology. The national marine spatial planning is a relatively new form of spatial planning in Sweden, where the holistic perspective must relate to on-going sector planning and management. In the marine spatial plan, we must also integrate economic policy objectives, social objectives and environmental objectives. Conflicting objectives that concern the use of the sea are clarified when various societal objectives are given a spatial expression.

Marine spatial planning differs to some extent from land planning, in terms of flow and dynamics in its use and in relation to claims and different planning levels, from the local perspective to the international perspective. In the national marine spatial planning, the planning and presentation have been prepared so that the marine spatial plan's guidance is provided at the appropriate level. The description of designations for use and consideration in the marine spatial plans is an expression of this. The marine spatial plans provide guidance on what functions and values need to be preserved and developed, so that the guidance to authorities and operators provides flexibility in relation to changed conditions in the future. While the marine spatial plans indicate what use and functions should take precedence in a certain area, management and measures can be adapted in the future.

#### Different planning levels

The national marine spatial planning is comprehensive and on an overall level; in the municipal physical planning, a more detailed planning is done near land and along the coast. A lot of activities take place in the coastal zone, which is included in the municipal and regional planning, but not in the national marine spatial planning. Municipalities and regions have extensive possibilities in regards to spatial planning of local and regional development. There is also potential for joint further development of the planning between municipal, regional and national levels to strengthen the land-sea perspective.

In the national marine spatial planning, Sweden also collaborates with its neighbouring countries. The international cooperation is, among other things, about method development, joint planning documentation and follow-up of the marine spatial plans. Sweden also strive for functional consistency with the marine spatial plans of our neighbouring countries. By functional, we mean that the planning does not counteract the neighbouring countries' planning.

#### Coexistence

In many respects, the marine spatial plans give priority to use that is already under way in the sea. Coexistence for various activities in the same location can be regulated and already

established, but a developed management is needed for more operations to have space and for the values that should be preserved to be maintained and developed. In terms of commercial fishing and offshore wind energy, the activities need to collaborate to find practical and technical solutions for coexistence where possible.

## **Use of the sea**

### **Development of on-going activities**

The marine spatial plans provide good conditions for future development and an increase in international trade and increasing transports of goods and people at sea both between countries around the Baltic Sea and to and from ports beyond the Baltic Sea. The marine spatial plans thereby contribute to the Baltic Sea Strategy's objective of increasing prosperity and linking together the Baltic Sea region, but also to transport policy objectives that transports should be moved from road to shipping and rail. With some exceptions, shipping use has also been adapted to the planning of shipping in Sweden's neighbouring countries. The marine spatial plan for the Baltic Sea means that shipping traffic and shipping lanes around Gotland are investigated on the premise that shipping's environmental impact needs to decrease, especially regarding negative impact on birds and porpoises, at the same time we need an efficient, climate-smart and safe traffic system. In terms of safety distances, this is handled in the permit review for e.g. offshore wind energy, i.e. the marine spatial plan contains no site-specific guidance on safety distances. Within the marine spatial plan for the Gulf of Bothnia, there are special conditions as the sea ice is thick and extensive in winter, especially in the northern part. The offshore wind development's impact on ice formation, conditions for icebreaking and winter shipping require further investigation and improved knowledge.

The marine spatial plans express societal objectives regarding continued and developed commercial fishing by indicating priority for commercial fishing in important catch areas. Through areas with nature use and Particular consideration of high nature values, the marine spatial plans contribute conditions for sustainable fish stocks that provide future development of commercial fishing. Commercial fishing generally coexists well with other activities, such as shipping and the Swedish Armed Forces' training activities. If offshore wind is established in an area, commercial fishing is affected at that specific location. Adaptation of both the fishing activities and the offshore wind establishment may need to take place. Based on current knowledge, fishing with active equipment is deemed to be very difficult or impossible to conduct in areas with floating wind power stations, depending on how the wind farm is designed among other things.

The ambition has been to reduce future negative impact on commercial fishing from establishment of offshore wind energy. In comparison with the Swedish Energy Agency's proposal on areas for energy extraction during the Government assignment's first step (Swedish Energy Agency, 2023a), several areas have been removed or reduced in area due to commercial fishing's need for catch areas. In an area in Skagerrak and Kattegat, it is proposed, however, that wind power be given priority over commercial fishing. There are also four alternative energy areas in the Baltic Sea, and one in Skagerrak and Kattegat where wind power is given priority over commercial fishing. Preference for wind power is given where conditions only allow floating foundations for the wind power turbines or where the national interest claim refers to pelagic fishing with active equipment. Some areas are indicated as alternative areas with energy extraction, partly due to an impact on commercial fishing. There are also areas with commercial



fishing use that overlap with energy extraction. This involves areas where bottom-fixed foundations may be established in the future. The assessment is that coexistence may be possible, but the coexistence is handled in the permit process and in subsequent project planning.

Both shipping and fishing are mobile activities that use large areas. For shipping, the plan maps present the routes that are especially important for the transport function to be able to be maintained. In reality, shipping can use all areas that do not have direct restrictions, which is also a prerequisite for the appointed routes to have such a limited geographic area. Ship traffic of very large importance to Sweden can occur and accordingly does occur outside the routes marked for shipping in the planning maps.

For fishing, the plan maps present important catch areas. However, fishing can continue to take place in other areas, in accordance with the applicable fishing regulation. In future claims from other operations, precise location and site use need to be analysed in more detailed planning. Considerations need to be made based on the aspect that the functions of fishing and shipping shall be maintained.

Good conditions for defence and security are expressed in the marine spatial plans partly through defence and security weighing heavily in trade-offs between interests, and partly through defence use that comprises both marine exercise areas and the impact areas that are needed for installations on land. Security is a prerequisite for society's development, for both the environment and industry, as well as social welfare. In several cases, time has not permitted a complete analysis of the impact on the defence interest. Such areas, as well as areas with defence interests that are not open are indicated as investigation areas for energy extraction since they need to be investigated further within the scope of the planning or in possible permit processes.

## Renewable energy

Energy extraction is a relatively new use of the sea that sets demands on marine spatial planning. There are good technical conditions for offshore wind energy in Sweden's marine areas and in the southern part of the country, there is a deficit in electricity production. Interest in investing in permit applications and studies is also extensive. In the Government assignment, the objective is for the marine spatial plans to enable an additional 90 TWh (terawatt hours) of annual electricity production. The existing marine spatial plan is deemed to enable 20-30 TWh. The collective objective is for the marine spatial plans to enable 120 TWh.

The Swedish Agency for Marine and Water Management has chosen to conduct consultations on a large number of areas for energy extraction. In addition to proposals on areas or investigation areas with energy extraction, we present a number of alternative areas. During the consultation, the alternative areas shall be seen as alternatives or potential complements to proposed areas to consider in the continued planning process.

For the areas (proposals on areas or alternative areas) that are investigation areas, the impact on other interests, such as defence and Natura 2000, needs to be investigated in the continued planning process or in a possible permit process. Since the marine spatial plans provide guidance and are based on general considerations, it does not mean that all areas for energy extraction in the marine spatial plans can be developed or are developed in their entirety. The

marine spatial plans indication of priority provides possibilities for future decisions. In later permit processes, energy projects are tested against the functions and values to be preserved, including values in Natura 2000 areas. Requirements on adaptation are then set in relation to local conditions and planned activities among other things. In all proposed energy areas including alternative areas, Particular consideration shall be given to the interests of national defence and in several areas Particular consideration shall be given to high natural values.

Areas for offshore wind energy are proposed both in Sweden's exclusive economic zone and territorial sea. The proposal presents 23 proposals for energy areas (101 TWh) and 33 alternative energy areas (279 TWh). The calculated production refers to the production that can theoretically take place if the areas' space is fully used, which is not likely for all areas.

The proposed areas are not enough to achieve the assignment's objective of providing conditions for 120 TWh in annual electricity production from offshore wind (to compare with today's electricity use in Sweden at 140 TWh). To achieve the Government assignment's objectives, several of the areas that are now presented as alternatives must therefore be included in the final proposal.

The consultation proposal contains slightly fewer or smaller areas in terms of area than is presented in the Swedish Energy Agency's presentation of the first part of the Government assignment. This is due to trade-offs with other interests that are presented in the plan-specific parts of the plan proposal.

There are several connections for electricity transmission between Sweden and neighbouring countries. The transmission network constitutes the use electricity transmission in the MSP. To increase the integration between Swedish and European networks, more connections are planned.

### Materials supply

The marine spatial plan provides guidance on sand extraction use in four areas, of which three previously had no sand extraction. Extraction of marine sand contributes to meeting society's need for sand for construction and coastal replenishment as a part of climate adaptation. Material supply from Swedish marine areas is an alternative to imports from other countries. The areas that have been identified are those that are deemed to be most suitable in terms of nature values, biological and geological factors, technical characteristics and sediment dynamics. The more detailed extent in the areas marked presented in the plan map should be determined only in a permit review. The planning documentation presents the precautionary measures necessary for extraction operations to be able to take place with a minimised negative impact.

### Cultural heritage and recreational values

Cultural heritage that is taken into account in the marine spatial planning consists of cultural heritage remains in the sea and cultural heritage environments along the coast. The marine spatial plans draw attention to the risk of both direct and indirect impact on cultural heritage values. The marine spatial plans prescribe that particular consideration shall be given to high cultural heritage values in the coastal zone, but precise areas cannot be indicated at the overall scale of the national marine spatial plan. During this planning round, the Coastal County Administrative Boards are working on a Government assignment to prepare new and improved

planning documents for the marine cultural environment. This documentation shall be delivered to SwAM in January 2024 and may affect the marine spatial plans before the next formal dialogue phase. There is also a need for collective planning documentation for recreation, which describes how the use of the sea interacts with local values and what significance they have in the national marine spatial planning. In addition to this, there is a need to highlight the social values that culture and recreation in the coastal area and the marine area provide in the form of health and well-being.

## **Strengthening ecosystem services**

A marine spatial plan is one of several parts in the marine and water environment management that shall contribute to us achieving the environmental quality objectives and a good environmental status in the sea. Overall, it is a matter of balancing interests to ensure that conditions are provided for the ecosystem services from the sea that we humans need. To a large extent, employment and development in various industries are dependent on the sea's ecosystem services, such as food and oxygen.

The marine spatial plans provide guidance on areas with nature use that gather existing and planned area protection, national interest claims for nature conservation and national interest claims for commercial fishing that pertain to spawning and nursery areas.

The marine spatial plans' guidance also includes a new way of guiding towards the development of valuable ecosystem services, as a complement to established forms of environmental protection, to the benefit of many interests. Through guidance on particular consideration of high nature values, the nature values that all marine management and activities need to take into account are highlighted, not least considering the need for resilience in the on-going climate change. In this way, good environmental status in the sea is also achieved and maintained.

The guidance on particular consideration concerns planning and permit processes, but is also directed at the work on the development of the marine management. The indicated areas are input in the management with the aim that the relevant authorities together with the affected sectors work further with the identified areas to see if specific measures need to be implemented to ensure particular consideration to the high nature values. The intention is also to guide actors to plan operations and activities, in time and space and with the possibility of adaptation to changed conditions, so that they will contribute to the sea's ecosystem services within their own sphere of influence.

## **6.2. Consequences**

This section presents a compilation of effects that the amended marine spatial plans for the Gulf of Bothnia, the Baltic Sea and Skagerrak and Kattegat may give rise to. The point of departure is the guidance in the marine spatial plans on various uses and particular consideration. Relatively large focus is placed on the effects of offshore wind establishment according to the plans' guidance on energy extraction. The reason is that it is this guidance that is primarily considered to lead to significant changes in how the marine spatial planning areas are used. Other uses are not considered to be affected in their operations to the same extent, which is why the respective environmental effects remain largely unchanged compared with the zero alternative in which the

marine spatial plans are not implemented. Sand extraction and shipping are addressed briefly even if no changes are included regarding their use compared with the approved marine spatial plan.

Similarly, the marine spatial plan also does not have control over most human activities on land, several out of which account for the majority of the pressure on Sweden's marine environments. Guiding plans can, however, affect activities and operations on land, which to some extent is included in the assessments of the effects of the plan.

## **Sand extraction**

Sand extraction at Svalans and Falkens grund in the Bothnian Bay and Utklippan, Sandhammaren and Sandflyttan in the Baltic Sea are considered to possibly entail locally large effects on benthic habitats and partly also water quality. However, the effects are limited geographically and in time, and thereby marginal in terms of the marine spatial planning areas in their entirety. It is important that the extraction activities are adapted to spawning and nursery periods for fish species in order not to affect the fish resources negatively. Extraction operations and transportation to and from the coast can lead to higher airborne emissions, and are considered to result in a small deterioration of air quality mainly locally. The effect on human health or the climate is considered to be insignificant considering other emission sources.

## **Shipping**

In the South Bothnian Sea, the marine spatial plans's guidance entails an extension of the travel distance for shipping. This will contribute to an increase in air emissions, including greenhouse gases with some effect on climate. A marginal deterioration of air quality is considered to take place locally, but without an effect on human health. The effects can be limited with the development of fuels and the transition to fossil-free fuels in shipping. The marine spatial plan for the Baltic Sea contains investigation areas for shipping, including Hoburgs bank, the Midsea banks and Salvorev. The investigation alternative is described in the approved marine spatial plan of 2022 with an environmental impact assessment and sustainability assessment, and includes rerouting of shipping away from sensitive nature areas to protect birds and marine mammals. Also in this case, an increased travel distance for shipping is considered to give rise to some negative effect on climate. The rerouting is at the same time considered to be able to benefit the marine environment through reduced noise disturbance and reduced emissions of pollutants at sea. This potential positive effect is especially important for birds and marine mammals that are present in the offshore bank area, such as the long-tailed duck and the Baltic Sea harbour porpoise.

## **Energy**

### **Birds**

The marine spatial plan's guidance on energy extraction is considered to entail a risk of negative effects on migratory birds and breeding, resting and wintering birds in several places. The risk of significant negative effects is largest where energy areas are located in the middle of narrow passages across the ocean, so-called bottlenecks, which is the case in all three marine spatial planning areas. Energy areas along the broad bird migration route across the Baltic Sea also

entail a risk of negative effects. Offshore wind establishment on or next to offshore banks, and close to the coast in turn entails varying risks of impact on breeding, resting and wintering birds, and on species that migrate along the coast. Possible barrier effects need to be investigated, especially upon expansion in several areas at the same time and with consideration to planned offshore wind projects in the neighbouring countries.

### Benthic habitats

The impact on the seabed occurs in the expansion of offshore wind energy installations, with permanent changes in the form of an artificial substrate in the areas that are relevant for bottom-fixed foundations. In some environments, the introduction of a new artificial substrate can have positive effects for the marine environment. However, the effects, positive and negative, need to be investigated specifically for each location, among other things to avoid damage to protected benthic environments. In areas at a greater depth where floating offshore wind establishments are relevant, the impact on the seabed is generally less.

### Marine mammals

Disturbance of marine mammals is considered to be able to occur mainly in connection with the construction of offshore wind energy installations. The risk is especially large in the Baltic Sea harbour porpoise's range in the South-eastern and Central Baltic Sea, given the population's status as critically endangered. The small population of harbour seals in Kalmar Sund is classified as endangered. Other populations of marine mammals in Swedish waters are given the status "least concern" in the Swedish Red List. In most cases, negative impact on marine mammals should be possible to minimise to acceptable levels using noise-reducing measures and by avoiding disturbance during sensitive reproduction periods. Closer to the coast, similar consideration needs to be given to potential effects on seals. The long-term effects during the operating phase are insufficiently studied, which can motivate caution in the pace of establishment and avoidance of a large number of offshore wind projects in areas that are important to the species.

### Fish and fish spawning

According to current knowledge, establishment of offshore wind energy is not considered to constitute a threat to fish species or fish populations, provided that adequate consideration measures are introduced that are adapted to local conditions. In particular, the impact on fish spawning and nursery needs to be considered. Construction and decommissioning of wind power stations causes some sediment dispersion that can affect fish larvae, and thereby fish spawning, negatively. The risk is present in several of the energy areas that are located in or next to known fish spawning areas. However, the risk is generally considered to be possible to minimise to acceptable levels through adaptation of the construction and decommissioning periods to the spawning periods for the species that spawn in the areas in question.

If fishing is limited in wind farms, the fishing pressure will decrease in energy extraction areas, which can benefit the fish resource, benthic environments and marine mammals. Several such areas are located in Skagerrak and Kattegat where energy establishment has the potential of contributing to green infrastructure as links between protected areas. Today however, it is not possible to determine the scope of this positive effect for the environment.

## Air and climate

Emissions of airborne pollutants and greenhouse gases can increase as a result of shipping traffic for construction, maintenance and decommissioning of offshore wind establishments. Based on current knowledge, the magnitude of the effect is, however, not possible to estimate. At the same time, positive effects for the climate are considered to be able to arise through expanded production of fossil-free electricity. In the marine spatial plan proposals, the production potential in proposed energy areas is estimated to correspond to around two-fifths of the potential in alternative energy areas.

Offshore wind establishment according to the plan proposal's guidance on energy extraction is considered to entail a risk of impact on other interests. A brief review of effects on shipping, commercial fishing, cultural environments, landscapes and recreation is found below.

## Electricity production potential

Proposed energy areas have the potential to contribute 101 TWh and the alternative energy areas 279 TWh of fossil-free electricity in accordance with Sweden's climate and energy policy objectives. The introduction of safety distances to shipping will entail a decrease in actual production potential in the energy areas.

## Shipping

The marine spatial plans do not provide guidance on specific safety distances to shipping. Distances will be required for all energy areas. The need for location-specific adaptations to promote coexistence with shipping needs to be assessed for the respective energy area and decided in the permit process. Should safety distances not be applied, it would present a safety risk to shipping with potential consequences for the environment and human health. The energy areas are presented differently in relation to shipping use in the plan maps. The presentation should be more consistent in the continued planning.

In the Gulf of Bothnia, the impact on winter navigation constitutes another potential risk that needs to be worked out for accessibility and maritime safety to be able to be met.

## Commercial fishing

For commercial fishing, the estimated loss in landing value in all three marine spatial planning areas amounts to around SEK 23 million annually, corresponding to around 3% of the annual landing value of Swedish fishing. The loss in the proposed energy areas is estimated to be around one third of this amount. The commercial fishing in Skagerrak and Kattegat account for around 60% of the loss. In the Gulf of Bothnia and the Baltic Sea, it is mainly the pelagic trawl fishery that is affected, while in Skagerrak and Kattegat, it is mainly the bottom trawl fishery targeting shrimp, crayfish and fish where the biggest losses are considered to occur. In all three marine spatial planning areas, the consequences for the local food supply from the sea, fish ports and coastal communities can be significant and should be taken into consideration in the review of offshore wind projects.

## Cultural environment, landscapes and recreation

Negative effects on cultural heritage areas, landscapes and recreation are considered to be able to arise as a result of, among other things, visual impact from offshore wind. The effect is considered to be greatest upon establishment in energy extraction areas closest to the coast, and affects several areas from Haparanda archipelago in the Bothnian Bay, North Kvarken and the South Bothnian Sea coast in the Gulf of Bothnia; areas on Gotland and Öland, and south of Skåne in the Baltic Sea marine spatial planning area; to larger parts of the Skagerrak and Kattegat coast, with a focus on the areas north of Halmstad and up to Kungälv. The distance to land and the size of the energy areas, especially in parallel with the coast, are crucial to the magnitude of the effect.

Recreation areas at sea exist in some places and accessibility upon the establishment of offshore wind energy needs to be ensured. Factual knowledge of the effects of wind power on cultural environment and recreation and its social and economic effects on the tourism industry from a local and regional perspective, for example, is today inadequate and needs to be supplemented.

## Particular consideration of high nature values

In the marine spatial plans, the area with particular consideration of high nature values has been expanded. Focus is especially on the need for strengthened protection of birds, especially migratory birds, but also sea birds in foraging and wintering areas. The proposed expanded areas with particular consideration of high nature values with a focus on sea birds can provide some protection in the form of requirements on precautionary measures in the review of licensed activities in these areas, including offshore wind energy.

In the Baltic Sea and Skagerrak and Kattegat, some new consideration areas refer to stronger protection of the Baltic Sea harbour porpoise and nature types worthy of protection. Together with other consideration areas and areas with the use nature in the marine spatial plans, the new consideration areas point to the need for special protection in the planning and regulation of human activities and are considered to be able to contribute to a sustainable use and preserved biodiversity in the marine spatial planning areas.

## Cross-border effects

### Bird, fish and marine mammals

The majority of identified environmental effects are considered to be cross-border and affect all of Sweden's neighbouring countries to a varying extent. The bird, fish and mammal species that are considered to be able to be affected by uses that the marine spatial plan has influence over are in many cases part of cross-border populations. The bird migration routes across Swedish waters and offshore banks in all three marine spatial planning areas are used by populations that migrate far beyond Scandinavia, and are thereby of global significance.

### Shipping and commercial fishing

The effects on shipping and fishing also impact foreign vessels and fishermen and accessibility to shipping lanes and ports in neighbouring countries. Most of the shipping traffic to and from the Baltic Sea passes through Skagerrak and Kattegat, and this marine spatial planning area is of



global significance to all trade with the Baltic Sea region. In terms of fishing, the potential effects on foreign fleets are considered to be at least as large as those on Swedish fishing. The effects on cultural environment and recreation in the North Bothnian Bay, Hanö Bay, Öresund region and most of Skagerrak and Kattegat are also considered to be able to affect the corresponding values in Finland, Denmark and Norway.

## Energy

Wind power's potential positive effects in the form of expanded production of fossil-free electricity can in turn benefit not only the countries that Sweden has electricity trading with, but also other countries considering potential benefits to the climate.

## Cumulative effects

In Sweden's and its neighbouring countries' territorial waters and exclusive economic zones, human use is continuously increasing. Planned offshore wind energy installations accounts for a strong increase in the short and medium term, not only in Sweden, but also in its neighbouring countries. Consideration must therefore be given to the risk of cumulative effects in the continued planning and permit processes of mainly offshore wind energy, but also other activities. The risk can be especially large in areas with a large concentration of energy areas and where there are high nature values of international significance. Cross-border collaboration on the assessment of these kinds of cumulative effects is desirable.

## **7. Planning conditions**

### **7.1. Marine spatial planning in a context**

The marine spatial planning relates to Sweden's obligations under the UN Convention on the Law of the Sea (SÖ 2000:1) and international law otherwise, as well as legislation and policy at the EU level. Cooperation plays an important role in the planning. Sweden cooperates with its neighbouring countries in EU projects and in the work on regional marine environment conventions. Within Sweden, the planning responsibility in the territorial sea overlaps between the municipality and the State in 65 municipalities. The marine spatial planning is one of several processes in collective marine and water management.

#### **Maritime borders and Sweden's rights**

The UN Convention on the Law of the Sea offers a virtually comprehensive framework for the peaceful use of the seas and includes all marine areas. The Convention establishes a careful balance between, on the one hand, the interests of the coastal state to control activities in coastal areas, and, on the other, the right of all states to use the high seas without unnecessary limitations. The Convention contains a comprehensive regulatory framework with binding provisions for the protection of the marine environment.

Sweden's marine territory comprises internal waters and the territorial sea. Inner waters consist of water areas on land and in the sea within the national border and the baselines that result from the Convention and other international agreements. The territorial sea extends 12 nautical miles from the baselines with the limitations that result from agreements on, among other things, the national border.

Sweden has full sovereignty over its marine territory. In accordance with international law, however, foreign ships have the right to harmless passage in the territorial sea. Sweden's contiguous zone extends a maximum of 24 nautical miles from the baselines. Within the contiguous zone, measures may be implemented to exercise the necessary control to prevent or punish violations in Swedish territory, including territorial waters, of laws and regulations that concern customs, taxes, entry or health issues, and to protect ancient remains, ancient finds and other objects of archaeological or historical interest. A coastal state's sovereign rights in terms of fishing and other living resources may be exercised within the scope of an exclusive economic zone up to 200 nautical miles from the coast. The coastal state also has jurisdiction to build and use artificial islands, installations and constructions, to conduct marine science research and to protect and preserve the marine environment. At the same time, most of the free sea rights (except e.g. fishing) in the exclusive economic zone apply. Sweden's exclusive economic zone comprises the areas outside of the marine territory that are indicated in an appendix to the Act concerning the Territorial Waters and Maritime Zones of Sweden (2017:1272). Sweden has some jurisdiction and some sovereign rights within the exclusive economic zone. Swedish authorities can implement measures within the zone within the scope of the powers it has according to Swedish legislation and in accordance with the rules of international law. The regulation of fishing takes place within the framework of the EU Common Fisheries Policy. The EU has delegated the right to issue certain regulations to the Member States.

The marine spatial plans cover most of the territorial sea and the Swedish exclusive economic zone in its entirety. In the territorial sea, the state shares planning responsibilities with the municipalities. In the exclusive economic zone, the state has planning responsibility.

There are also legislation and policies at the EU level that concern the sea and activities linked to the sea. This applies, among other things, to the EU Marine Strategy Framework Directive (2008/56/EC), other environmental protection directives and the Union's transport, shipping and energy policies, as well as the previously mentioned fisheries policy.

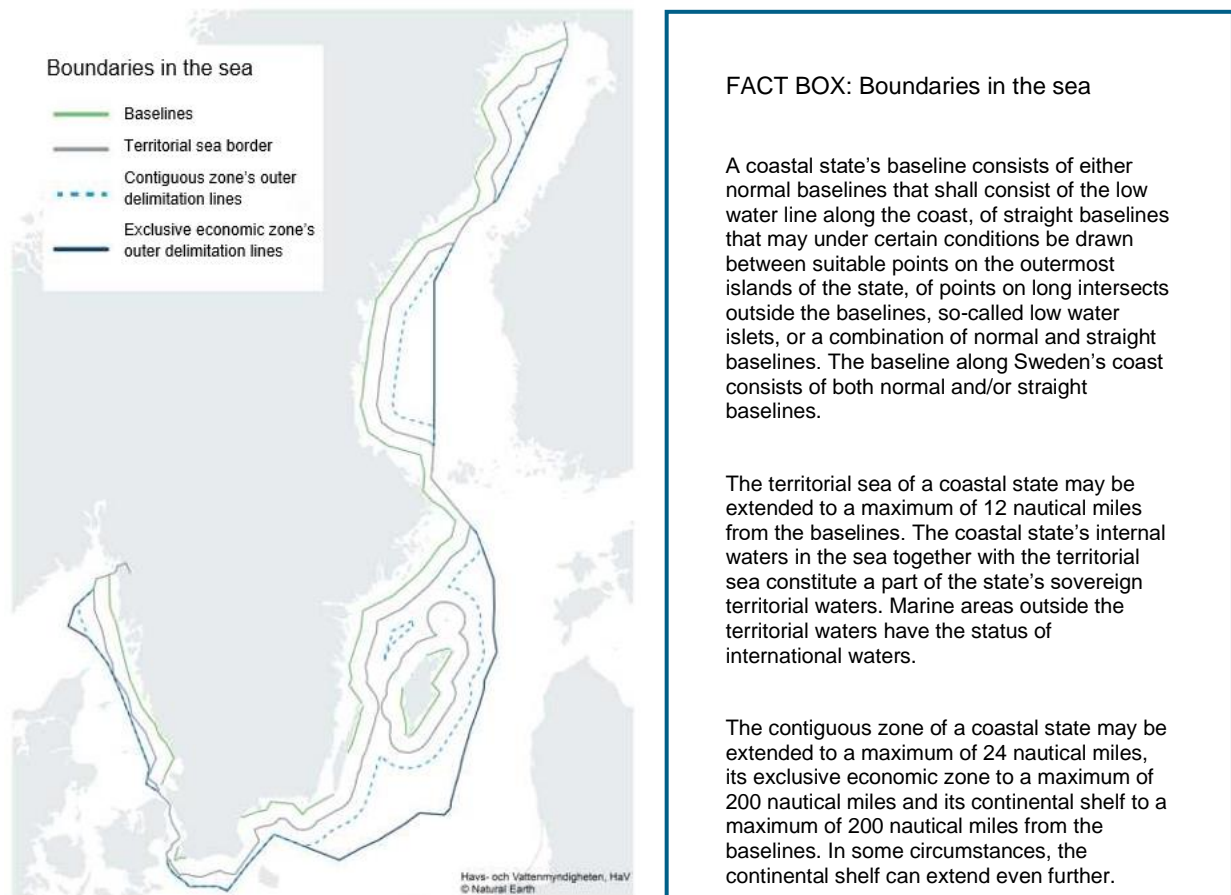


Figure 7.1-1 Sweden's boundaries in the sea.

## Many neighbouring countries to collaborate with

The Swedish marine spatial plans border on nine neighbouring countries' territorial waters or exclusive economic zones. All neighbouring countries except Russia have adopted marine spatial plans. The seven neighbouring countries that are members of the EU are obliged to draft marine spatial plans in accordance with the EU Framework Directive on Maritime Spatial Planning (2014/89/EU). Article 11 of the Directive sets forth the obligation to cooperate with neighbouring EU countries. The objective is to create uniform and coordinated plans and establish collaborative efforts that mainly address cross-border issues. The Member States shall also strive for cooperation with neighbouring countries outside the EU.

Sweden has previously participated in and participates in EU-funded projects to build cooperation with neighbouring countries. This contributes to better coordination in the marine spatial planning work, improved knowledge and management of cross-border issues, as well as better coordination of data and other planning documentation.

Formalised cooperation with neighbouring countries takes place within the scope of the Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM), which includes the Gulf of Bothnia and Kattegat. There is a special forum for cooperation between the ministries that have responsibility for spatial planning in the Baltic Sea region, Vision and Strategies Around the Baltic Sea (Vasab). Vasab and Helcom have formed a working group for spatial planning of the sea that, among other things, has developed guidelines for cross-border consultations and how the ecosystem approach can be applied to marine spatial planning. Since 2018, there is also a forum for marine planners in the Baltic Sea region, the Planners' forum. Within the forum, practical marine spatial planning issues are addressed.

Dialogue between countries and the marine spatial plan proposals and environmental impact assessments that are prepared also take the form of so-called Espoo consultation. This means that neighbouring countries, including Sweden, first inform that marine spatial planning is under way and then allow the interested neighbouring countries to submit their comments.

## **Municipal planning of the territorial sea**

According to the Planning and Building Act (2010:900), the municipalities have planning responsibility for Sweden's territory, which also includes internal waters and territorial sea. The national marine spatial planning means that the planning responsibility in the territorial sea now overlaps between the municipality and the State in 65 municipalities. Some 20 additional municipalities border the sea, but not waters that are included in the national marine spatial plan areas.

In the comprehensive plans, the municipalities present how they intend to promote long-term positive development in terms of land and water use. The comprehensive plans are the basis for the municipalities' right to decide on detailed planning and to interpret the substance of public interests. 60 municipalities have included the coastal and marine area in their comprehensive planning according to the latest follow-up of the indicators in Sweden's maritime strategy (SwAM, 2023d). This corresponds to 72 per cent of the municipalities covered by the indicator and is an increase of 17 percentage points since the last follow-up in 2019. Some municipalities have prepared a change to the comprehensive plan that specifically focuses on the marine area. In the municipal comprehensive plan, others have gathered the marine and marine spatial planning in their own sections with clearly presented interests and well-supported standpoints. However, areas near land and in the coastal zone are addressed in the plans more often and in greater detail than the areas farther out in territorial waters (Boverket, 2018).

According to Chapter 7 of the Planning and Building Act, Stockholm, Skåne and Halland counties shall conduct regional spatial planning. The regional planning in Stockholm, Skåne and Halland is done by the respective region. In Stockholm County, they have worked with regional planning since the 1950s and here the planning includes standpoints that concern the archipelago environments. Since 2019, Region Skåne has been tasked with conducting regional spatial

planning and adopted its first regional plan on 14 June 2022. As of 14 June 2022, Region Halland also has the same assignment. In order to achieve greater consistency in the country, according to Government bill 2017/18:266 (2018), regional spatial planning should be introduced in additional counties, when the need for and conditions for such planning exist.

## **Marine spatial planning – a part of marine and water management**

Marine and water management concerns many of society's sectors. Ecosystems know no administrative boundaries and a basic principle for the management is therefore that it should be coordinated and integrated in all its parts. Water management has a strong connection to marine management and together they should be seen as a whole from source to sea. Maritime policy is based on the idea that the seas are an indispensable resource for mankind and society. Marine and water management contains several tools and instruments, ranging from physical planning to legal and economic instruments.

The Government has pointed out the maritime sector as important to growth and development and adopted a national maritime strategy in 2015 (Ministry of Enterprise and Innovation, 2015). The strategy is a focus document for the continued work of developing the maritime industries. In addition to development of traditional industries, such as fishing and shipping, there is potential for energy extraction at sea, new forms for aquaculture, environmental technology, blue biotechnology and marine and coastal tourism. The national strategy links to the European Commission's Guidelines for an Integrated Approach to Maritime Policy (COM/2008/0395) and to the European Commission's strategy Blue growth - opportunities for marine and maritime sustainable growth (COM/2012/494). In May 2021, the Commission published a new strategy for a sustainable blue economy in the EU: Transforming the EU's Blue Economy for a Sustainable Future (COM/2021/240). The new strategy is part of the EU's Green Deal. At the same time that growth and development are to take place, Sweden has the challenge of achieving good environmental status in our seas. The effects of eutrophication remain clear and extensive. Further measures are required to reduce the supply of nutrients from land to sea. The local action work needs to be developed as well as the work of reducing the load mainly of phosphorous in lakes, coastal areas and the sea. The negative environmental effects of commercial fishing must continue to decrease. Among other things, the fishing of species of fish and shellfish needs to be long-term sustainable. The increased occurrence of marine litter is a growing threat. The objective is to be able to develop the use of the sea's resources in a sustainable way, so that we ensure a good marine environment. Much of the negative environmental impact in the sea originates on land and needs to be addressed at its source. See more in Section 7.3 on the status of the sea.

To reverse the negative environmental development and achieve a sustainable use of the seas' resources, the European Community (now the EU) adopted, among other things, the Marine Strategy Framework Directive (2008/56/EC), which was introduced in Sweden through the Marine Strategy Framework Ordinance (2010:1341). The Marine Strategy Framework Directive aims to achieve or maintain a good environmental status in Europe's seas by 2020. There is also a Water Framework Directive (2000/60/EC) that sets out what the EU countries should be able to achieve in terms of water quality and access to water. The directive was introduced in Sweden through the Water Management Ordinance (2004:660). The tools in the Marine Strategy Framework Ordinance are the definition and assessment of good environmental status, environmental quality standards with indicators, action programmes including exceptions and monitoring programmes.

Assessment of the status in Swedish marine areas is summarised in SwAM's report *Marine strategy for the North Sea and Baltic Sea 2018 – 2023, Assessment of environmental status and socio-economic analysis* (2018c). An updated assessment will be submitted in the autumn of 2023 and is up for approval in 2024.

According to the Marine Strategy Framework Ordinance, Sweden implements two of the articles in the Marine Strategy Framework Directive with the environmental quality standard tool. This is partly what characterises good environmental status (Article 9), and partly environmental objectives (Article 10), which lead to two types of environmental quality standards. The maintenance or attainment of a good environmental status for Sweden's part of the North Sea and the Baltic Sea is an overall standard according to Section 17 of the Marine Strategy Framework Ordinance and what this entails is specified in SwAM's regulations HVMFS 2012:18, Appendix 2. The environmental objectives are implemented as environmental quality standards with indicators that are set according to Section 19 and are also included in HVMFS 2012:18, Appendix 3.

Environmental quality standards are a legal instrument that is regulated in Chapter 5 of the Environmental Code. The Marine Strategy Framework Ordinance states that SwAM shall develop environmental quality standards with indicators in consideration of load and impact. This is a new form of environmental quality standard compared with what previously existed in Sweden. Environmental quality standards with indicators shall show the way to good environmental status and make it possible to achieve good environmental status. For the respective environmental quality norm, there are associated indicators whose target values must be achieved if the norm is to be complied with. If the assessment of the environmental status shows that a good environmental status is not achieved or maintained and if the environmental quality standards with indicators are not complied with, SwAM shall prepare an action programme according to the Marine Strategy Framework Ordinance. The latest action programme was approved in 2021 (SwAM, 2018c) and implementation of it is under way.

In terms of the Water Framework Directive, the objective is to achieve good ecological and good chemical status. To achieve the objective, environmental quality standards and the measures that need to be implemented to achieve good water quality are set. Management plans for the work are also prepared.

Marine spatial planning is a process that shall contribute to enabling the development of marine-related industries at the same time that good environmental status is achieved and maintained. Marine spatial planning creates good opportunities for consensus on how we should use the seas sustainably. Marine spatial planning is one of several processes in the collective marine and water management that together with other management and society building efforts strives to achieve set objectives.

## 7.2. Coastal areas' attractiveness and sustainable societal development

Sweden has one of Europe's longest coasts, a concentration of population along the coasts and a strong tradition of maritime activities. Concentration of population and business activities contributes to favourable conditions in terms of housing, employment, business development, synergies regarding infrastructure, land and resource-efficient use, but also risks an increased pressure on land, water and other natural resources. The marine spatial plans, which aim to contribute to long-term sustainable development (Chapter 4 of the Environmental Code), shall be designed to integrate economic policy objectives, social objectives and environmental objectives, and are a part of an integrated marine management and shall work to balance different needs of and claims to our marine areas. Marine spatial planning and other spatial planning are highlighted as important tools in international, national and regional strategies to promote sustainable development.

### Sustainable regional development

National objectives for the regional development policy are to promote local and regional development capacity for sustainable development throughout the country (Government, 2020c). The regional development policy also forms part of the implementation of Agenda 2030. Here, development capacity is about *“economically, socially and environmentally sustainable development where the three dimensions are integrated and mutually dependent on each other”*, in line with Agenda 2030. The national strategy for regional development serves as the framework for the implementation of the policy. One of the priorities in the strategy is *Equal opportunities for housing, work and welfare in the entire country*. This includes aspects such as *“High quality of life and attractive living environments”*, where natural and cultural values are safeguarded and a *“Good societal planning”* that *“creates conditions for both the development and competitiveness of the economy and for people's quality of life”*, and promotes a *societal structure that contributes to sustainable habitats with reduced climate impact and preservation of biodiversity and ecosystem services in a changed climate*. The strategy's priorities also include creating conditions for entrepreneurship throughout the country, as well as prioritising accessibility and sustainable transport systems and the significance of climate and environmentally sustainable economy and promoting innovations, such as developing solutions for storing electrical energy related to variable power, such as solar and wind. With regard to accessibility, the transport sector's climate transition and the importance of sustainable fuels and electrification of the transport system are highlighted, and the need for better coordination in the spatial planning at the local, regional and national levels regarding operations and transport infrastructure planning.

Marine spatial planning's overall planning objectives, Good marine environment and sustainable development, with associated thematic and sector-specific planning objectives, such as creating conditions for *regional development; energy transmission and renewable energy production in the sea; sustainable shipping, Good accessibility, and marine green infrastructure and promoting ecosystem services*, are in line with the regional development policy and work for coordination and guidance on the use of marine areas with the aim of promoting sustainable development, both regionally and nationally.



In 2015, the Government adopted a Swedish maritime strategy – for people, jobs and the environment (Ministry of Enterprise and Innovation, 2015). The strategy includes a vision of *Competitive, innovative and sustainable maritime industries that can contribute to increased employment, reduced environmental pressure and an attractive living environment*. The strategy comprises three perspectives *Balanced seas, Attractive coastal areas and Competitive industries*. Within the strategy, coastal and marine spatial planning was highlighted as an important tool, as were other areas of action, to achieve the vision. For the strategy, a number of indicators have been prepared for follow-up of the strategy based on its perspectives and areas of action. The indicators comprise economic, environmental and social indicators and the latest follow-up was presented by SwAM in 2023 (SwAM, 2023d).

The follow-up of the indicators points to a positive development in the coastal areas in terms of the share of municipalities that plan their coastal areas, and a relatively favourable relationship in terms of the share of residents, the gainfully employed, life expectancy, economic vulnerability and visitor attraction compared with development in the rest of the country (urban areas with more than 10,000 inhabitants are excluded). The follow-up also shows relatively favourable trend in certain maritime industries, such as tourism, marine technology and aquaculture, while for some activities, an unchanged or downward trend, such as sea-based energy and total volume of caught fish. Some positive development is seen with regard to the marine environment, such as reduced levels of environmental toxins, an increased share of sustainable fish stocks and a relatively reduced climate impact from maritime industries. In follow-up, it is also noted that eutrophication and load levels in the Baltic Proper are still high, and there continue to be large amounts of marine litter on our beaches.

## Population

The historic significance of the sea as a transport route or as a source of food is still reflected in the geographic concentration of the population along the coasts. In 2017, there were 5.3 million inhabitants within 10 kilometres of the coastline in Sweden. This corresponds to just over half the population, or 52 per cent (Statistics Sweden, 2019a). Sweden's three largest municipalities – Stockholm, Gothenburg and Malmö – all have contact with the sea.

In recent years, cities within commuting distance of the three metropolitan regions of Stockholm, Gothenburg and Malmö have grown considerably. Some of the growth has also taken place by earlier recreational settlements acquiring a permanent living population. Many attractive coastal areas also attract tourists in the summer, which provides a basis for permanent residency with provision in the tourism industry. The latest follow-up of the maritime strategy in 2023 (SwAM, 2023d) shows that the coastal area continued to have favourable conditions in terms of, among other things, the share of population and education level. The follow-up also shows that the share of the population in the coastal area (excluding urban areas larger than 10,000) has been relatively constant during the period, yet the share of the working population corresponds to around 30 per cent of all working people in Sweden.

## Maritime industries

With their diversity of maritime activities, Swedish marine and coastal areas are an important asset for the Swedish economy. The national maritime strategy is intended to work for a sustainable blue economy and sustainable maritime industries. Maritime industries are defined in

the strategy as activities that take place on or in the sea, or are dependent on resources from the sea and activities that contribute goods or services directly targeted at the maritime activities. The maritime industries also include activities in the coastal area that are otherwise dependent on the sea, such as tourism. The corresponding activities in and next to the larger lakes are also counted among the maritime industries in the strategy.

The definition of maritime companies is based on a combination of industry and geographic boundaries. In the strategy, the following division of the relevant industries is used: a) Transportation: shipping companies, port and logistics companies, b) Maritime technology and production: technology suppliers, systems suppliers and sub-contractors, shipyards and the recreational boating industry, c) The sea as a natural resource for food, energy from waves, water and wind, substrates for biofuels, minerals, etc. d) Leisure and tourism: ferry traffic, cruise activities, archipelago tourism, angling, trade in and service of recreational craft, and marinas, e) Service: such as shipping brokers, insurance companies, commercial surveying and survey activities.

The latest follow-up of the maritime strategy shows that around 44,500 people were working in the maritime industries in 2020 (excluding urban areas with more than 10,000 inhabitants), of which the number of employees in the areas of maritime tourism and transport corresponded to around 15,500 and 11,500. For maritime industries, excluding archipelago tourism, follow-up showed a value added of around SEK 31 billion. With regard to maritime tourism in its entirety, including archipelago tourism, the follow-up showed that maritime tourism had a net turnover of around SEK 25 billion.

## **Visitor attractiveness**

Coastal and archipelago landscapes with their natural and cultural environments are important to Sweden's attractiveness both to residents and as a tourism country and for a long-term competitive tourism industry. In total, around 35 million guest nights were spent within 10 kilometres of the coast in 2017, which corresponds to 61 per cent of the total number of guest nights in Sweden (Statistics Sweden, 2019b). In the follow-up of the maritime strategy, which is delimited and excludes the larger cities, the number of maritime guest nights was around 15 million in 2017 and the latest follow-up indicates an increase in the number of guest nights until 2019, with some decline in 2020 as a result of the pandemic. The follow-up also shows that net turnover and people employed in maritime tourism increased during the period 2014 to 2019, but there was also a clear decrease in the initial pandemic year 2020 (SwAM, 2023d).

## **Accessibility and connection of the coastal areas**

Accessibility is an important aspect regarding regional development, and an important prerequisite for residents, entrepreneurs and attractiveness. Transport and infrastructure are an important part of accessibility. Access to digital infrastructure, such as broadband, is also one of several conditions for the coastal areas to be attractive to companies as well as residents, work and visits. This concerns, for example, accessibility to new services and in order to bridge the geographic distances that may exist to certain services and other assistance.

## 7.3. Status of the sea

### Prerequisites for the ecosystems

An ecosystem is characterised by plants, animals and micro-organisms in a shared environment that interact with each other. It is difficult to spatially delimit ecosystems, however, habitats can be defined that provide a possible delimitation of spatial units in the marine environment. Habitats may vary in size and can encompass parts of the seabed, the entire seabed, the water column and also adjacent land areas.

Natural conditions that affect the ranges of species in the sea are salinity, temperature, ice cover, currents, winds, waves, the water's turnover time, depth conditions and the type of seabed. There are clear gradients in Swedish marine areas, which result in there being a number of different types of habitats and a large variation of plant and animal species. The organisms that live on the seabed are adapted to specific environmental conditions, such as a certain range in salinity or available sunlight, and do not survive when the environmental conditions change due to natural or human causes. The salinity of the bottom water in Sweden's marine areas varies from nearly fresh water in the northern Bothnian Bay to oceanic conditions in the outer parts of Skagerrak. These differences are reflected in the marine areas' biodiversity and composition. Many species in the Gulf of Bothnia are so-called freshwater species and unique species adapted to the brackish water. The significantly saltier Skagerrak and Kattegat has higher biodiversity that includes several nationally rare species in relatively small habitats.

The conditions for marine ecosystems are affected to varying degrees by human activities. The impact can derive from activities conducted today or from historical use, both on land and in the sea. Shipping, fishing and emissions from land-based sources, such as industry, transportation, agriculture and sewage systems, are examples of human activities that affect the seas' ecosystems.

In the Baltic Sea planning area, many of the deeper sea beds are completely or nearly devoid of oxygen. In Skagerrak and Kattegat, there are periodically low oxygen concentrations in the southern part of Kattegat and in the eastern part of Skagerrak, mainly in the inner fjord systems. The problem of oxygen deficit has not yet been encountered in the Gulf of Bothnia. This oxygen deficit leads to reduced biodiversity and altered species composition, and has a negative impact on the ecosystems and habitats. Oxygen deficit is partly a result of natural conditions, but has worsened and spread to new areas as a consequence of eutrophication.

The needs of the ecosystems and consequences of environmental impact are assessed in the national work on the EU Marine Strategy Framework Directive that is incorporated into Swedish legislation through the Marine Strategy Framework Ordinance (2010:1341). The latest assessment is presented in the report Marine Strategy for the North Sea and Baltic Sea 2018–2023 (2018c), but will be updated in 2024. The report provides a collective picture of the status of the marine environment and the use of it. The next section gives a summary of the report's overall assessment of the status of marine species and habitats. In the referenced report, the Gulf of Bothnia is included in the term Baltic Sea.

## SwAM's assessment of the environmental status in the sea

### Plant and animal life

In most cases, a good environmental status is not deemed to be achieved, either in the Baltic Sea or in Skagerrak and Kattegat. However, there are signs of recovery mainly in Skagerrak and Kattegat and for some species and species groups in the Baltic Sea over the long term, e.g. if one compares with the situation 20 to 30 years ago. In the short term, no clear improvement for most ecosystem components can be seen (SwAM, 2018c).

For harbour porpoises, the population size is relatively stable in Skagerrak and Kattegat, but critically low in the Baltic Sea. For seals, the status is stable. The harbour seal in Skagerrak and Kattegat and the grey seal in the Baltic Sea has increased in number, but with lower growth compared to earlier years. In the past three years, the harbour seal and grey seal populations decrease in Skagerrak, Kattegat and the Baltic Sea. The range of the grey seal and the harbour seal is stable. The situation for ringed seal is still critical with lower growth than necessary for the population to be able to achieve the management objectives in the near future. The harbour seal population in Kalmarsund is naturally small.

The development for most bird species is generally positive. The assessment is done for breeding birds and wintering birds. The species groups of surface foragers, pelagic foragers and plant grazers all achieved a good environmental status, which the groups with wading and benthic foragers did not. For wintering bird species in Skagerrak and Kattegat, the groups with benthic, wading and grazing foraging achieve a good environmental status, while the two groups with surface foraging and pelagic foraging species do not. In the Baltic Sea, the groups with pelagic, wading and grazing foraging achieve a good environmental status, which the groups with surface foragers and benthic foraging species do not

The situation for fish is strained and serious, which is mainly shown by the size distribution of most species having shifted to small individuals. For many stocks in the Baltic Sea, above all bottom-dwelling species, the situation is critical. Good environmental status is not achieved for commercially used fish and shellfish in Skagerrak, Kattegat or the Baltic Sea. Examples of stocks that achieve good environmental status are plaice and common sole in the Baltic Sea and herring (autumn spawning), plaice and hake in Skagerrak and Kattegat.

### Biodiversity

The situation description from 2018 for Skagerrak and Kattegat and the Baltic Sea in the national work on the Marine Strategy Framework Directive shows a picture similar to that of the latest in-depth evaluation in 2023 of the two marine-related environmental objectives *A rich plant and animal life* and *Seas in balance and vibrant coastal areas and archipelagos*. The assessment was that these two environmental quality objectives will not be achieved by 2030 even if there are areas with positive development.

### Anthropogenic pressures

It is difficult to point out individual activities or loads as a cause of the status of species and habitats in Swedish seas. Eutrophication, elevated levels of hazardous substances, noise, habitat

loss, dredging and dumping, and fishing and introduction of certain invasive species contribute negatively to the status of many of the species and habitats assessed.

Good environmental status is not achieved for eutrophication. It is positive that the Swedish leakage of nutrients to the seas generally decreases. However, a long historical period with high emissions means that nutrients have been stored up and continue to negatively affect the marine environment, mainly in the Baltic Sea. This means that improvements cannot yet be clearly discerned in the environment. On the west coast, only Skagerrak's offshore waters are deemed to have a good environmental status, and in the Baltic Sea, only the coastal waters in the northern parts of the Bothnian Sea and in the Bothnian Bay (SwAM, 2018c).

Good environmental status is also not achieved for emissions and existing levels of hazardous substances in the seas. This is due to excessively high levels of several long-lived environmental toxins in the marine environment. The impact is seen, among other things, on molluscs, sea snails and sea eagles. Among positive signs, unchanged or downward trends appear for the levels of many assessed hazardous substances in Swedish seas.

More direct development of marine environments also constitutes a significant impact. The fishing of several species of fish and shellfish is deemed to be too large for the stocks to be long-term sustainable (SwAM, 2018c). In addition to this, there are indirect effects on the ecosystems by fishing, such as accidental by-catch and damage to the seabed. The fish stocks are also affected by other environmental problems, mainly eutrophication due to low oxygen levels or oxygen deficit.

According to preliminary assessments, good environmental status is achieved for impulsive underwater noise in Skagerrak, Kattegat, the Bornholm Sea and Hanö bay, the Western Gotland Sea, the Bothnian Sea, North Kvarken and the Bothnian Bay.

According to preliminary assessments, good environmental status is achieved for continuous underwater noise in the Bothnian Sea, North Kvarken and the Bothnian Bay. In the Swedish management area, it is almost exclusively shipping that affects the indicator, which the results confirm; good environmental status is achieved only in the three basins in the Gulf of Bothnia, with less intensive shipping.

SwAM is holding a consultation on a new initial assessment of the status in the marine environment according to the Marine Strategy Framework Ordinance in autumn 2023 with a decision scheduled for 2024.

Physical impact, such as construction of docks and ports, is deemed to be a problem for the entire food webs. This is especially true in coastal areas where such infrastructure can cause physical loss or damage to plants and animals, especially if they coincide with important spawning and foraging areas. Similar to the assessment in the Marine Strategy Framework Directive, analyses in marine spatial planning show a similar picture regarding the anthropogenic background load on the marine environment. The marine spatial planning analyses have been done with the cumulative planning tool Symphony.

## Monitoring and investigations at sea

The marine areas are currently being monitored and surveyed in terms of oceanographic conditions such as marine geology, depth, the water's physical and chemical characteristics, and biodiversity, including fish stocks. There are special areas and locations in the marine spatial planning area where monitoring is done of sediment with regard to metals and organic toxins. The monitoring consists of several representative points that are spread out in the marine basin either as individual points or as clusters.





Map 14. Cumulative environmental impact, present situation

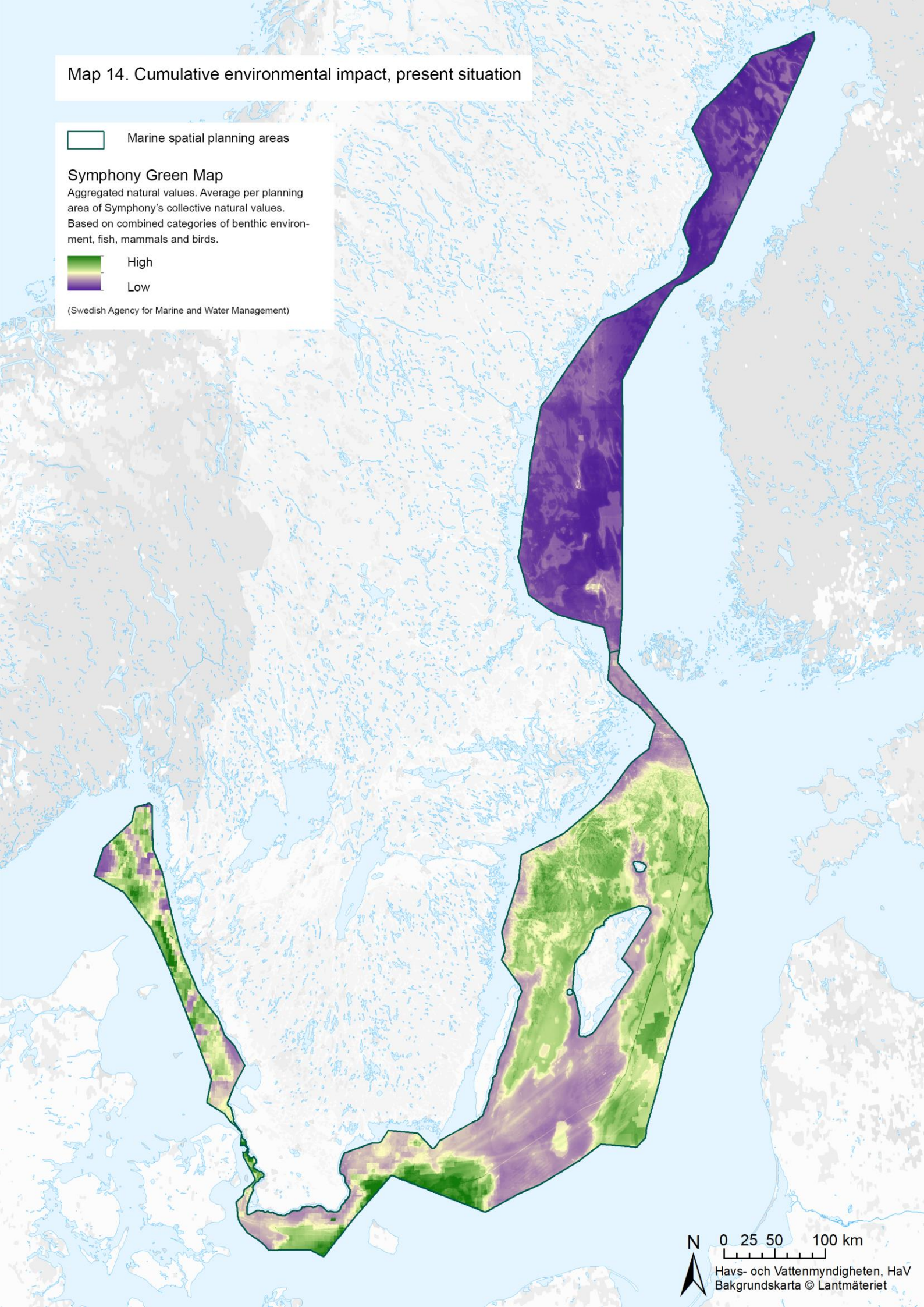
 Marine spatial planning areas

### Symphony Green Map

Aggregated natural values. Average per planning area of Symphony's collective natural values.  
Based on combined categories of benthic environment, fish, mammals and birds.

 High  
 Low

(Swedish Agency for Marine and Water Management)



N 0 25 50 100 km



Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet



## **7.4. Climate and societal adaptation**

On-going climate change will impact the sea and the possibilities for humankind to use the sea and its ecosystem services in many different ways. The issue of climate impact on the sea and humans, and nature's possibility of adapting to new conditions is complex. The interaction between the sea and the plants and animals that live there is regulated by aspects, such as water temperature, salinity, other chemical processes, access to food and nursery and spawning areas, healthy habitats and functioning ecosystems. There is a high likelihood that a changed climate will also entail significant changes in the seas' ecosystems as ice cover patterns, water temperatures, salinity, acidification, currents, oxygenation and wind and wave patterns are affected (IPCC, 2023). The climate issue will also affect society's demands on how the sea should be used. For example, an urgent need to relatively quickly reduce the emissions of greenhouse gases has entailed an increased use of the sea for extraction of various forms of fossil-free energy, such as sea-based wind or wave power. This is now reflected in both national and international policy objectives, and in a strong increase in claims to marine areas regarding the design of wind power establishment at sea (Swedish Energy Agency, 2023a).

### **The consequences of climate change on the marine environment**

Continued emissions and changed carbon dioxide in the atmosphere affect the marine environment and lead to changes to the conditions for life in the sea. Elevated levels of carbon dioxide in the atmosphere result in the sea being acidified as the air's carbon dioxide dissolves in the sea water and lowers the pH value. A dropping pH has been established both in the oceans and in Swedish marine areas. The acidification of the seas contributes to there being less loose lime left in the seas, which has consequences for plant and animal species and ecosystems that use lime in their shells and bones. Temperature increase, shrinking ice and salinity changes are other factors that climate change is expected to entail, which can affect marine life both locally and on a larger scale (SwAM, 2017a; Helcom, 2021), warmer sea water makes it easier for invasive species to establish themselves in Swedish waters and species that do not thrive in higher temperatures either migrate to colder waters or die out.

### **Climate adaptation**

Climate adaptation means working for greater preparedness to handle the effects of climate impact. Nationally, this takes place based on, among other things, the Ordinance on Climate Adaptation Efforts by Public Authorities (2018:1428) and the National Climate Adaptation Strategy (Government bill 2017/18:163), which among other things include the development of risk and vulnerability analyses, and prepare action plans based on prioritisation of biological and ecological effects, but also generally work linked to management areas and practical consideration within the scope of marine spatial planning.

Effects of climate change both in the sea and on land can entail an increased interest in, but also changes to, activities at sea. In preparing marine spatial plans, we need to take into consideration how the use of the sea may need to change. Higher water levels and stronger weather phenomena can, for example, lead to an increased coastal erosion and thereby increase the need for sand extraction at sea (SwAM, 2018d).

Within marine environment management, there is a growing need to take climate into account to protect high nature values and their distribution and to safeguard important ecosystem services. This applies, for example, to the work on marine area protection and protected nature values that need to be evaluated from a climate perspective where the distribution of these values can change in the long term. The need for good follow-up of the marine area protection's representativeness and functionality is expected to increase in a changed climate. This follow-up is important for the network of protected areas to contribute to a green infrastructure in the sea that promotes the production of ecosystem services and a sustainable economic development.

## **Climate refugia in marine spatial planning**

In the marine spatial planning process, reports have been prepared to increase the understanding of the challenges that the seas' ecosystems will be exposed to in a changed climate and to create possibilities for management to handle them. The first report (SwAM, 2017a) indicates the need to promote areas with high biological diversity in the sea, as diversity in itself provides good conditions for resilience to the effects of climate change. The continued production of ecosystem services can be ensured through sustainable future management of these areas. The report proposes that the planning should point out so-called climate refugia. Climate refugia are areas where the effect of climate change is small in relation to the surrounding habitat, which enables higher survival of species. A climate refugia may need special protection in order to preserve important plants and animals when the climate changes and their ranges decrease. These areas are often the more stable areas that are expected to remain of a species' larger range when salinity and temperature change.

In a follow-up report from 2017 (SwAM, 2017d), modelling of hydrographic and ecological factors was done based on two relatively different climate scenarios prepared by the UN Climate Change Panel. The objective is to get an image of probable changes in the distribution patterns of important marine species. The ringed seal, cod, herring, saduria entomon, eel grass, blue mussel and a number of seaweed species have been selected to jointly represent larger groups of species in the Baltic Sea and the Gulf of Bothnia's marine ecosystems. Analyses were done on all three marine spatial planning areas, but for Skagerrak and Kattegat, climate refugia could not be identified as a result of limited data access.

The modelled change will take place gradually, but will probably lead to large parts of the Baltic Sea's marine vegetation being lost and possibly replaced by fresh water species that are more adapted to these new conditions (SwAM, 2017d). Climate refugia have been identified both in the marine spatial planning areas and in the coastal areas outside the marine spatial planning areas. Climate refugia are shown in map 15.

SwAM has led the work of producing new and improved data and knowledge about the cumulative effects of climate change through the ClimeMarine project. In the project, which was completed in 2022, SwAM, SGU, SMHI and the University of Gothenburg prepared new maps for temperature changes, salinity changes and ice spread for various scenarios until the end of the century, and documentation for them in the Symphony tool. Analyses showed that the impact from climate change was in an order of magnitude as large as all cumulative environmental impact that we have from other loads now (SMHI, 2018).

Map 15. Climate refuges

 Marine spatial planning areas

### Climate refuges

Examples of climate refuges for some species based on analysis and data available in 2017. Skagerrak and Kattegat were not covered by the analysis.

-  Blue mussel
-  Bladder wrack
-  Herring
-  Cod
-  Ringed seal
-  Eel grass

(Swedish Agency for Marine and Water Management)



N 0 25 50 100 km



Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet



## 7.5. Ecosystem services

The sea is an indispensable resource for mankind and society. Vigorous ecosystems are the foundation of sustainable use of the sea's resources. The marine ecosystems offer a rich range of goods and services that mankind is dependent on, so-called ecosystem services. The term ecosystem services describe the direct and indirect effects that ecosystems have on human well-being. This represents a way to describe ecosystems from a human perspective and clarifies our dependence on nature.

Regulation of climate through uptake and binding of carbon in biomass, and regulation of water flows and erosion protection based on plant and root systems are examples of important ecosystem services linked, for example, to climate and climate adaptation. Biodiversity is a necessary prerequisite for the ecosystems to have the capacity to deliver ecosystem services. Many different ecosystems and nature types, various species and large genetic variation within the species are needed for the ecosystems to be viable and have the ability to adapt and recover despite disturbances, such as emissions of pollutants and heat waves. Such recovery capacity or power of resistance is also called resilience.

Certain ecosystem services are more direct and visible than others, such as the raw materials we use for materials and food. Others are indirect and supportive, such as important habitats and nursery environments for fish, but constitute conditions for the direct, so-called supplying ecosystem services, see the fact box below. Other ecosystem services link to people's experiences and well-being, such as recreation in coastal and marine environments. By analysing what ecosystem services we receive from the sea, it becomes clearer how important they are to people and society.

### FACT BOX: Ecosystem services

Ecosystem services are products and services from nature that contribute to human welfare and well-being, such as the production of food and purification of water. Ecosystem services are often divided into four categories: supporting, regulating, provisioning and cultural:

Supporting ecosystem services are fundamental functions in the ecosystems on which all other ecosystem services depend, such as photosynthesis and biochemical processes, as well as habitats for species such as fish.

Regulating ecosystem services is the benefit people receive from ecosystem functions that affect environmental factors. This concerns, for example, climate regulation, such as the capture of greenhouse gases and the breakdown of nutrients to counteract eutrophication in our waters and seas.

Provisioning ecosystem services are the vital resources that nature provides, such as food, clean water and raw materials.

Cultural ecosystem services comprise spiritual and experiential values that contribute to our well-being, such as environments for inspiration and recreation, like diving, angling and other natural experiences.

## Ecosystem services and interests in the sea

Biodiversity, food webs and habitats, such as spawning and nursery areas for fish, constitute basic structural and functional ecosystem services in the sea. These supportive services create conditions for direct services, such as fish and shellfish for commercial fishing and angling and natural environments for outdoor life and recreation, that are significant to health and well-being. Natural and cultural environments can in turn contribute to regional development and be important conditions for, for example, outdoor recreation and tourism.

Functions, such as regulation of environmental toxins, pollutants and nutrient salts, also contribute to improved water quality. Ensuring these ecosystem services promotes both the rebuilding of commercial fishing stocks and biodiversity. This can in turn contribute to a greater recovery capacity upon climate change and potential disruptions, such as pollutants.

The ecosystem services are a prerequisite for a long-term sustainable management of the sea and to ensure a long-term sustainable use of the sea's resources (SwAM, 2015a).

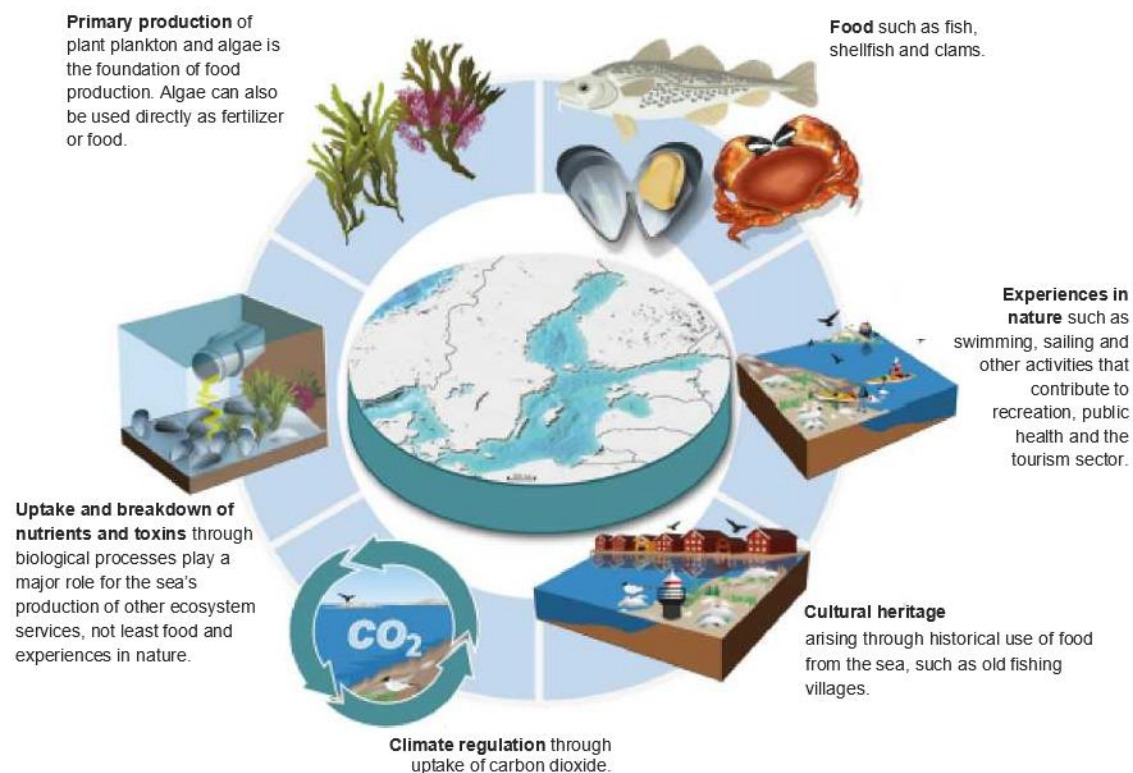


Figure 7.5-1 The sea's ecosystems contribute several functions critical to society, such as the production of food. The more visible ecosystem services affect and are dependent on other indirect services that are not so visible. For example, fish are dependent on vital habitats and spawning areas to survive and provide viable fish stocks. Another example is ecosystems that break down nutrients and toxins

- Outdoor recreation, natural and cultural environments:
  - Ecosystem services in the form of cultural and natural landscapes contribute to experiences and activities, which contribute to people's well-being, quality of life and health, such as angling, paddling or swimming.
  - Natural and cultural environments also contribute to people's identity and social environment. In this case, it concerns ecosystem services, such as landscapes to reside in and cultural heritage that has arisen through the use of the sea, such as fishing villages.
  - The ecosystem services can also contribute to value-creating recreation and tourism.
  - Activities associated with recreation and tourism, as well as other uses of marine areas, can affect different ecosystem services through noise, emissions of hazardous substances from recreational craft, litter and anchoring that disrupt the seabed environment and cultural environments.

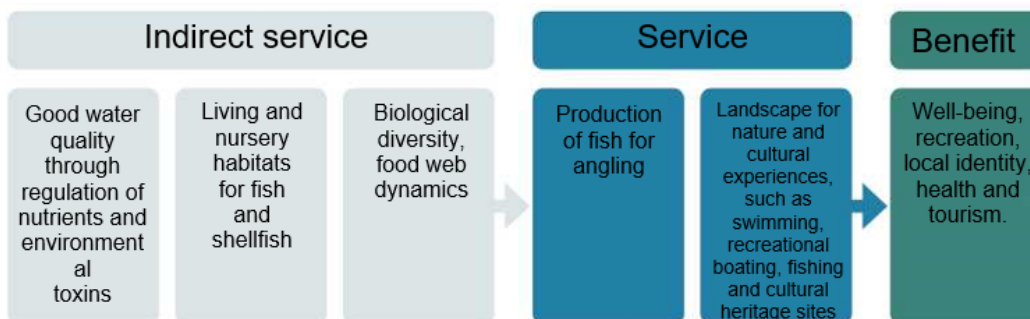


Figure 7.5-2 Important ecosystem services for outdoor recreation, nature and cultural environments.

- Commercial fishing
  - Fish and shellfish are an important ecosystem service for commercial fishing. Fishing is also dependent on indirect ecosystem services, such as well-functioning food web dynamics and good habitats and nursery environments for fish and shellfish.
  - Like most uses of the sea, fishing can also affect habitats and biodiversity through unsustainable extractions of fish, seabed damage, wear and tear and marine litter in the form of lost fishing gear. The uptake of fish and shellfish can result in changes in food webs. Fishing can also damage cultural environments on the seabed, such as wrecks.

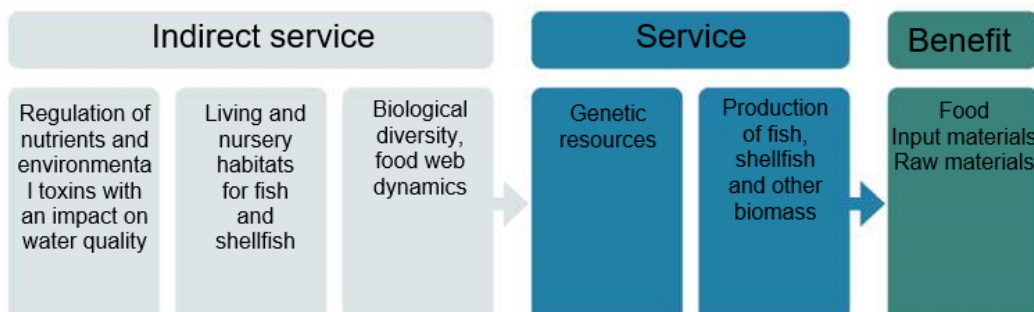


Figure 7.5-3 Important ecosystem services for fishing

## 7.6. Interests and claims

### Energy

The energy sector's need for space in the sea is linked partly to production and partly to the transmission of energy. Energy production at sea takes place in Sweden on a small scale, mainly as wind power. In our territorial sea and exclusive economic zone, the transmission of energy takes place through power lines and gas pipelines.

The energy transformation and the electrification of parts of society and industry are increasing demand for electricity in Sweden. To meet this electricity demand, new electricity production is needed and offshore wind energy has extensive potential.

From an energy extraction perspective, there are several advantages of offshore wind energy. Winds are often stronger and more consistent at sea than over land, which allows the building of larger and more efficient wind farms. Offshore wind energy allows a wider geographic distribution of electricity production in Sweden, which is positive. The difficulty of achieving economic profitability in the projects has previously limited the expansion at sea. The rapid technology development that has taken place in offshore wind energy production has led to pressured prices and increased profitability. As a result, areas with good conditions in the near future should be able to produce electricity at competitive costs (Swedish Energy Agency, 2023a).

The trend of a rapidly declining cost situation was broken in 2022 due to rising costs of capital, raw materials, components and construction.

Ocean energy is an umbrella concept that at present primarily consists of energy conversion from sea waves, tides (streaming and dammed-up), differences in temperature and differences in salinity. Research, development and demonstrations within wave power, as well as research and development within tidal stream energy, are being conducted in Sweden. Tidal stream energy is mainly based on tidal currents and sea currents. Within sea-wave power, Sweden lies well ahead in international development; despite this the technology is still new and under development.

### Existing use

#### *Wind power*

The Swedish wind power produced 33 TWh in 2022, of which the offshore wind power produced 0.6 TWh (Swedish Energy Agency, 2023b). Sweden's total electricity production amounted to 170 TWh in 2022 (Swedish Energy Agency, 2023c). Today, there are three offshore wind farms in Sweden: Lillgrund (Öresund), Bockstigen (Gotland) and Kårehamn (Öland). All are located within Sweden's territorial waters.

A lack of profitability and good conditions for the expansion of other electricity production meant that there was previously little interest in building offshore wind energy in Sweden. But in recent years, interest has increased sharply and there are great expectations for it today. There are several reasons for this extensive interest.



- Investments in technology and market development in other countries have contributed to rapid technical development and cost reductions.
- The electricity production costs for offshore wind energy are still deemed to be higher than for land-based wind power, but the differences are shrinking and for places with good conditions, competitive costs are deemed to be within reach.
- There are strongly increased expectations of the role of electrification in the climate transition with a sharply increased need for expansion of new electricity production as a result.
- The need for new electricity production is currently the largest in southern Sweden where offshore wind energy constitutes a solution with large potential and potentially reduced conflicts with local residents (in relation to land-based wind power).
- Government initiatives have signalled a desire for more offshore wind energy.

### *Ocean energy*

Uppsala University currently runs two different research facilities: Söderfors, where a tidal energy facility has been installed, and Lysekil, which includes several wave power units. Also, off Sotenäs, wave power stations have been installed. Several private and public actors are preparing new experiments with ocean energy in Swedish waters (International Energy Agency, 2023).

### *Transmission of electricity at sea – international connections*

Today, Sweden has several international connections for the transmission of electricity. In Skagerrak and Kattegat, there are two direct current connections (Konti-Skan 1 and 2). In Öresund, the Swedish transmission network is linked together with the power grid on Zealand through two 400-kV alternating current connections. Zealand and Skåne are also connected through several regional lines.

Sweden and Germany are connected through a direct current connection, Baltic Cable, which originates at Trelleborg. Svenska Kraftnät plans to build another direct current connection to Germany, the Hansa Power Bridge. The landing for the new connection is planned east of Ystad. In the southern Baltic Sea, there are also electrical connections to Poland (Swepol Link) and Lithuania (NordBalt).

In the Gulf of Bothnia next to the Forsmark nuclear power plant, there are two electrical connections to Finland (Fenno-Skan 1 and 2)

In addition to offshore cables for electricity, there are also regional and local network lines at sea, including the two direct current connections between Västervik and Gotland. Svenska Kraftnät will also build two new electrical connections to Gotland. These are scheduled to be commissioned in 2031. Lastly, the Swedish Maritime Administration also has a network of cables in the archipelago that are not concession-bound, which provide both lighthouses and private customers with electricity.



Figure 7.6-1 Svenska Kraftnät's marine capacity zones – grid capacity division of the Marine spatial plans. Skagerrak and Kattegat are divided into two zones (1 and 2), the Baltic Sea into five zones (3-7) and the Gulf of Bothnia into two zones (8 and 9). (SvK, 2022)

### *Electricity transmission at sea – connection lines for offshore wind energy*

On 1 January 2022, Svenska Kraftnät was commissioned by the Government at the time to prepare for the expansion of the transmission network in Sweden's marine territory to enable connection of sea-based electricity production. A strategic expansion of the transmission network in six different marine areas was proposed as part of this new assignment (Svenska kraftnät, 2022).

On 21 June 2023, the current Government sent out the memorandum "Amendment to Ordinance (2007:1119) with Instructions for the Public Enterprise Svenska Kraftnät", in which it is proposed that the assignment regarding the transmission network expansion at sea be removed as of 1 October 2023.

In addition to preparations for an expansion of the transmission network at sea – which is now not being done – Svenska Kraftnät is also working to develop the process for actors who are interested in connecting offshore wind energy installations to the transmission network on land. To systematise the work with the large amount of connection requests, work is being done with geographic "marine capacity zones". For these zones, Svenska Kraftnät will prepare one or more connection points in the transmission network on land. The positions for these points and information about the capacity conditions linked to the connection points are subsequently communicated to all stakeholders, which are organised in special stakeholder pools. A connection offer is given to the operator or operators that first obtain the necessary permits regarding the construction and operation of a wind farm in the zone (Svenska kraftnät, 2023).

## *Gas*

Between Malmö and Denmark there is a natural gas pipeline to feed the natural gas system in the west of Sweden. Another natural gas pipeline extends between Denmark and Sweden in Öresund and a new pipeline, Baltic Pipe, is planned between Poland and Denmark, possibly through Sweden's exclusive economic zone. Between Russia and Germany, there are gas pipelines through the Gulf of Finland and the Baltic Sea. The gas pipelines run as parallel pipes on the seabed. The lines are no longer in use as a result of Russia's invasion of Ukraine. The lines are also damaged following sabotage.

## *Claims*

As a basis for the new marine spatial plans, nine authorities, coordinated by the Swedish Energy Agency, have prepared a planning document for offshore wind energy. The objective was to point out the areas to enable 120 TWh of annual production of offshore wind energy. To allow margins for uncertainties, larger areas were identified than would be needed if 100 per cent of all areas were used. 53 areas, which at full utilisation would correspond to 412 TWh, have been identified in the Swedish marine spatial planning area, in a first step to enable 120 TWh of offshore wind energy. This marine spatial plan is the second step in this Government assignment.

Technical development for offshore wind energy production has accelerated in the past ten years and continues at a rapid pace. Among other things, turbines have become larger and thereby more cost-effective, which leads to them being able to produce electricity at a lower cost than before. Around 2010, turbines with an output of around 3 MW were common; among the projects being built today, 7-9 MW is a common size. For the future, turbine sizes corresponding to 15-20 MW are being projected today.

## *Hydrogen production*

Several offshore wind energy projects see it as an opportunity to produce hydrogen with the electricity generated by wind power. This can take place either in the actual facility or on land. In on-site production, this entails additional infrastructure at sea, either to be able to receive ships and load hydrogen, or gas pipelines to land. At present, there is no hydrogen production at sea in the Swedish marine spatial planning area.

## *Infrastructure*

Sweden is divided into four bidding areas, from 1 in the north to 4 in the south. In northern Sweden, there is a production surplus, and in southern Sweden, there is a deficit. Through different pricing, the bidding areas provide guidance on where more production and electricity transmission is needed. As a result of Russia's invasion of Ukraine, electricity prices in all areas have been unusually high for some time, but especially in bidding areas 3 and 4. However, there are indications of increased electrical needs in the north as well due to industry electrification.

## *Electricity market*

Sweden and Europe have deregulated electricity markets and electricity is traded under free competition. The electricity networks are interconnected and electricity can flow across national borders. The purpose of the electricity market is for the collective production and transmission resources to be used as efficiently as possible when meeting the needs of electricity consumers.

The division into bidding areas is a way to handle physical limitations, so-called bottlenecks, in the transmission grid. Today, Sweden is divided into four bidding areas; see Figure 7.6-2. In northern Sweden, there is today a production surplus, and in southern Sweden a deficit (although there are indications that this might change in the future due to electrification). Through different pricing, the bidding areas provide guidance on where more production and electricity transmission is needed. The electricity prices have been unusually high in all of the bidding areas, but mainly in areas 3 and 4, as a result of the geopolitical situation for some time.

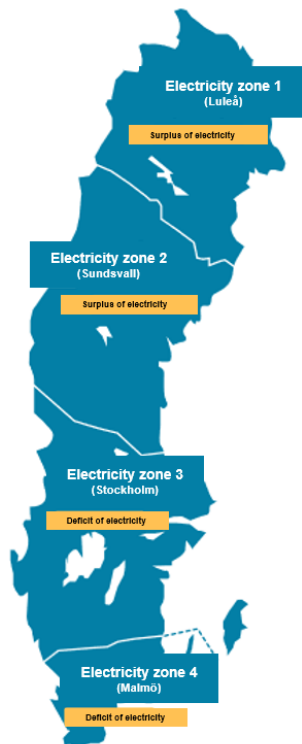


Figure 7.6-2 Bidding areas in Sweden. Today, a lot of electricity is produced in the north, but a lot is consumed in the south (Swedish Energy Market Inspectorate, n.d.).

### National energy policy

According to the Tidö Agreement, the planning for electricity consumption should be based on a need of at least 300 terawatt hours in 2045, roughly a doubling compared with the current situation. This is to be implemented in light of an energy policy objective that the electricity production mix shall become 100 per cent fossil-free. The agreement also means that earlier political initiatives to subsidise the grid connection of offshore wind energy installations through an expansion of the transmission network in Swedish territorial waters were removed. The agreement sets no specific objective for the expansion of wind power, but describes it as an important element in the country's energy mix (Sweden Democrats, the Moderates, Christian Democrats, the Liberals, 2022).

## Development zones and areas for test beds

There is a need for places in the sea to review and test new marine technology or production. In the municipalities of Lysekil, Sotenäs and Tanum, special development zones have been pointed out jointly in the respective municipality's comprehensive plans. The zones are intended for production and test facilities for marine food and marine energy. One of the zones is located in Skagerrak and Kattegat's planning area.

## National interest claims in accordance with Chapter 3 of the Environmental Code

The Swedish Energy Agency decides on national interests in installations for energy production and energy distribution according to Chapter 3, Section 8 of the Environmental Code.

The claims for energy production in the marine spatial planning area include wind power and are based on criteria for average annual wind, depth and area size. National interest energy production was developed in 2013, and the development of technology in wind power has been rapid since then. Technical development since 2013 means that there are today more areas that have suitable characteristics for wind power compared with when the national interest areas were decided on.

No national interests in energy distribution have been pointed out in the marine spatial planning areas yet.

## Public interests

### *Projects*

In addition to the national interest claims, various energy companies have shown interest in establishing offshore wind energy in delimited areas in all three marine spatial planning areas. These claims are at different stages in individual permit or planning processes.

There are also planned wind farms where permits exist, but which are not yet constructed since the technical development has made the permits out of date. Two of these projects have been closed down (Taggen, Utgrunden II), and one has submitted a new application that is being processed by the Land and Environmental Court (Storgrundet). In May 2022, the Government also decided to grant permits for the construction of the Swedish section in the Kriegers Flak area (wind farms have already been built on the Danish and German sides). In February 2023, a permit was also granted to lay cable on the seabed from the area. In May 2023, the Government granted permits for two offshore wind farms off of the Halland coast (Kattegat Syd and Galene). In July 2023, the Government denied a change permit to an offshore wind farm (Stora Middelgrund).

### *Wind power in municipal comprehensive plans*

Municipalities point out areas for wind power in their comprehensive planning according to the Planning and Building Act (2010:900). Several municipalities plan for coastal offshore energy extraction by indicating suitable areas in their comprehensive plans.

### *Other areas*

In the planning documentation prepared jointly by nine authorities, new areas with suitable conditions for offshore wind energy production have been identified. In the work, there has been a difference between what is relevant in the immediate future and what might become relevant in a longer time perspective. In the analyses, wind speed, water depth and distance to the base line served as technical parameters. The parameters have been weighted in the analysis where wind speed has the greatest weight followed by water depth, and distance to the base line has been given the least significance.

### *International interaction*

Different countries' areas for energy extraction can have large coordination advantages, especially if they are somewhat close to each other. This applies in the project phases of planning, construction and operation and to the infrastructure. Several of Sweden's neighbouring countries have on-going planning for areas with energy extraction. Energy extraction in other countries can also entail consequences in Sweden, such as in the form of environmental impact.

The Southern Midsea bank is located in both Sweden's and Poland's exclusive economic zone. In the Swedish zone, there are plans to build a wind farm adjacent to the bank. In the Polish exclusive economic zone at the bank, Poland has issued location permits for energy extraction, which is done at an early stage for continued investigation. The planning and engineering in the respective country can affect different national interests, which is why there is a need to collaborate in cross-border issues.

Since 2015, there has been a wind farm in the German exclusive economic zone and since 2021 in the Danish exclusive economic zone at Kriegers Flak. The wind farms share a grid solution and the grids in Zealand and Mecklenburg-Vorpommern have been connected through an interconnector adjacent to the parks. The electricity can change direction if need be. In the Swedish exclusive economic zone at Kriegers Flak, all permits are in place to begin the installation of wind power. Coordination may also need to take place with Denmark around wind power in the Öresund region. Germany and Denmark have several areas in their marine spatial plans in the vicinity of Swedish waters or the exclusive economic zone where indicated use is wind power. These can affect the possibilities of building wind power in Swedish waters.

In the northern Baltic Sea and the Bothnian Bay, there are several intended projects in the Finnish and Åland exclusive economic zone that can affect the possibilities for expansion in the Swedish exclusive economic zone in the marine areas. In Estonia's, Latvia's and Lithuania's exclusive economic zone, there are also planned wind power projects that can affect the possibilities in the Swedish exclusive economic zone.

Svenska Kraftnät and a German system operator are planning a Swedish-German electrical connection, Hansa Power Bridge. The electrical connection shall extend around 300 kilometres from Güstrow in north-eastern Germany to Hurva in Skåne and have a capacity of 700 MW. The procurement is currently on hold and is expected to resume in 2024. According to the Tidö Agreement, the work on this connection should be paused until the price differences between the electricity zones have decreased significantly.

The EU has agreed on new additions to the Renewable Energy Directive (EU/2018/2001), which entails changes to the planning conditions for renewable energy. Earlier planning will be able to form the basis for a mapping of possible locations for renewable energy, and some places will also be able to be pointed out as acceleration zones where the requirements on environmental impact assessment are lowered. According to the directive, the marine spatial plan should serve as a basis for the national mapping.



Map 16. Energy: National interest claims and other claims

Marine spatial planning areas

National interest claim for energy production,  
Ch 3, Section 8 Environmental Code

Wind power stations

Other claims for wind power

Wind power stations in municipal comprehensive plans (2023)

Planning input

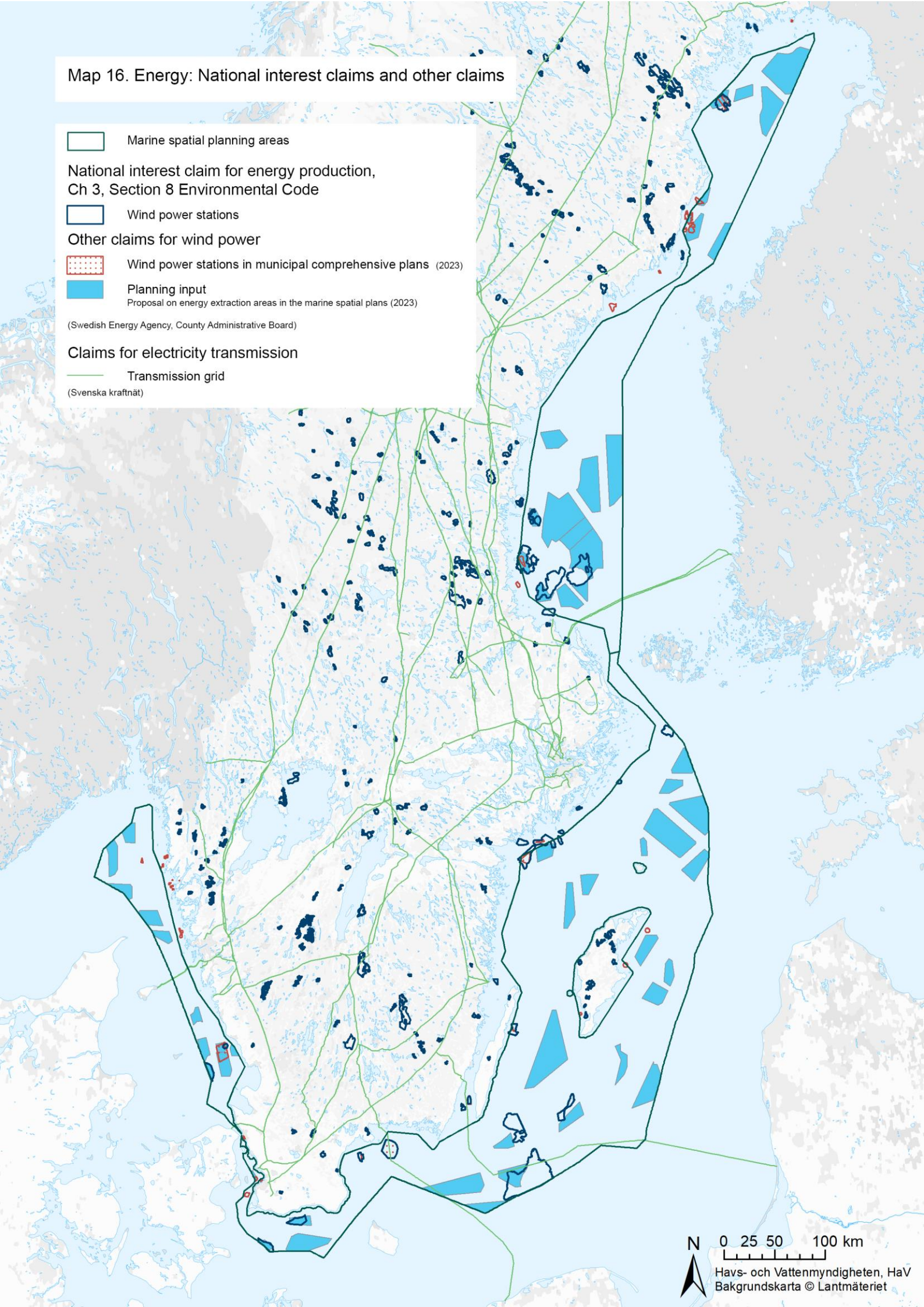
Proposal on energy extraction areas in the marine spatial plans (2023)

(Swedish Energy Agency, County Administrative Board)

Claims for electricity transmission

Transmission grid

(Svenska kraftnät)



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Bakgrundskarta © Lantmäteriet

## Legal prerequisites

To build an offshore wind farm at sea, a number of permits are needed from several different permit authorities. Within the territorial sea, permits are required according to Chapters 9 and 11 of the Environmental Code (1998:808). Within the territorial sea, municipal authority approval is also required according to Chapter 16, Section 4 of the Environmental Code (1998:808), as well as notification according to the Planning and Building Act. The application is reviewed by the Land and Environmental Court. In the exclusive economic zone, a permit is required under the Exclusive Economic Zone Act (1992:1140), and the application is reviewed by the Government. In addition, a permit is required according to the Continental Shelf Act (1966:314) for surveys of the seabed and the laying of lines during wind power establishment in the exclusive economic zone (EZ) or marine territory. If certain conditions are met, the investigation of the seabed inside the territorial boundary is not subject to permit, but is subject to registration. Any activity or measure that might significantly impact the environment in a Natura 2000 area also requires a special Natura 2000 permit according to Chapter 7, Section 28(a) of the Environmental Code. The requirement of such a permit applies both in the territorial sea and in the exclusive economic zone. The review is done by the Land and Environmental Court if the permit application otherwise is to be decided by the court and by the county administrative board when the permit application pertains to a facility in the exclusive economic zone.

If the construction of a wind power installation entails an impact on ancient remains, a permit is also required pursuant to Chapter 2, Section 12 of the Heritage Conservation Act (1988:950). When constructing a facility, one should therefore find out if the effort concerns any ancient remains and consult with the county administrative board.

## Environment and climate

### *Wind power*

Offshore wind energy affects the local marine environment in various ways in connection with construction, operation and phase-out. The local circumstances play a significant role as to which consequences arise. The impact can be divided up into what takes place during the planning and construction phase as well as the decommissioning phase and what takes place during the operating phase. The impact during the construction and decommissioning phase is transient and temporary, such as noise during piling and increased turbidity. There are technical solutions that reduce the disturbance. During the operating phase, some noise arises, but no subtle effects of sound emitted through the foundation have been established yet. With regard to birds and bats, the risk is estimated to be small that they collide due to wind power compared with other anthropogenic pressures, provided that these risks are taken into account in the placement and design of wind farms. Some bird species show avoidance behaviour at wind farms, which means that they must seek food elsewhere. There can then arise habitat loss, which in this case means that a species no longer has access to a habitat it previously had access to. It is unclear if the avoidance behaviour is permanent or if some species become accustomed to new conditions. A positive effect of wind power is that the foundations of the wind power stations can act as artificial reefs and attract certain invertebrates, fish and marine mammals (Bergström et al., 2022).

Offshore wind energy installations currently have two main categories regarding foundations, either bottom-fixed or floating. The most common types of foundations attached to the seabed are

gravity foundations, monopiles or lattice work. Monopiles and lattice work can be anchored in place with suction cup anchors, or through piling or drilling in the seabed. A common factor of the foundations attached to the seabed is that they have a very small footprint in the water column. Including all cable drawing in the park, the impact on the seabed is around 1-2 per cent of the park's area (Isæus et al., 2022). The implication of this is that even if the offshore wind energy installations claims a large surface area, the actual footprint is limited. What kind of seabed-attached foundation is used is determined by the area's characteristics. At present, the seabed-attached foundations are used down to around 70 metres deep, but trials are under way in deeper water.

Floating foundations are a new technology that is currently in place in Scottish and Norwegian waters, to name a few. The depth should be at least around 50 metres for floating foundations to be relevant to use over bottom-fixed foundations. A common factor to all floating techniques is that they are anchored to the seabed with lines. The most common anchorage type involves catenary mooring, which to be effective needs to have slack lines several times longer than the distance between the turbine and the seabed. The electrical cable then needs to be even longer to protect it from stress. This means that floating wind energy generally has a much larger footprint in the water column than bottom-fixed wind energy, but roughly as much seabed impact. Floating wind power will also need a larger safety distance due to the anchorages. At present investigations are also under way of floating foundations with taut lines, which have a smaller footprint in the water mass (SSPA, 2023). However, no such anchorages are in operation yet.

### *Cables*

Laying submarine cables physically interferes with the seabed habitat. The construction work can cause temporary turbidity of the water, changed seabed material structure and local impact on water plants. Turbidity can affect fish and benthic fauna and flora. Benthic plants and animals can, however, re-establish themselves above the buried cable. Environmental impact during the operational period is considered to be limited, until an occasion when, if necessary, the cable is to be repaired. All electric cables generate electromagnetic fields that can affect marine organisms to varying degrees. The state of knowledge regarding fish does not indicate that electromagnetic fields should pose a threat to fish or fish populations (Öhman, 2023). Power fields vary depending on the type of cable used and the amount of electricity being transmitted. The effect of the power field on marine organisms can be minimised through various protective measures, such as burying the cable in the seabed. This could be important where high-voltage cables cross the migration routes for eels (Bergström et al., 2022).

### *Climate*

Wind and ocean energy are renewable energy sources that do not contribute to greenhouse gas emissions or other pollutants during their operation; they also benefit from low life-cycle emissions of carbon dioxide. This is positive for the marine environment since climate change and above all the on-going sea acidification pose significant threats to marine ecosystems in the near future. A transition to society's energy use being free from fossil fuels can only take place on condition that new electricity production is put in place.



## Defence

National defence refers to the collective activities needed to prepare Sweden for war and to defend the country in the event of war. Sweden's national defence consists of military activities (military defence) and civil activities (civil defence). The military and civilian components are mutually reinforcing. Military defence refers to the activities conducted by the Swedish Armed Forces with support from defence authorities, parts of the voluntary defence organisations and parts of the defence industry and other relevant sections of industry. Civil defence refers to civil activities that authorities, municipalities, regions, individuals, companies, independent defence organisations, civil society and others take to prepare Sweden for war.

The main task of the Swedish Armed Forces is to defend Sweden against an armed attack. The Swedish Armed Forces shall promote Swedish security and assert Sweden's territorial integrity. The agency shall have the ability to protect Sweden's sovereign rights and Swedish interests and to prevent and handle conflicts and wars nationally and internationally. The Swedish Armed Forces are currently implementing the largest military expansion since the 1950s, based on the Government's defence decision (Government, 2020b).

Civil defence shall safeguard the civil population, ensure the most important societal functions, and contribute to the Swedish Armed Forces' ability in the event of an armed attack or war in the surrounding world. Several national authorities and other participants are responsible for civil defence. In recent years, the planning of civil defence has resumed.

### Existing use

The military component of national defence uses the sea for several different kinds of activities. The sea is mainly used for various types of military exercises and training activities, monitoring of Swedish territory, signals intelligence and testing activities. The activities are conducted around the clock every day of the year and aim to ensure a functioning military defence of Sweden. The Swedish Armed Forces' activities and information gathering at sea are also of major significance to civil authorities and other actors, such as the Swedish Maritime Administration, the Swedish Coast Guard and SMHI.

### *Exercises*

The mission of the Swedish Armed Forces means that the agency has a continuous need to exercise and train armed forces in the ability to conduct armed combat. For this purpose, the Swedish Armed Forces have a need to be able to use various training and artillery ranges, marine training areas and flight training areas. Around Sweden's coasts and archipelago areas, there are several training and artillery ranges. In the sea, there are marine training areas in both coastal areas and further out from land. These areas are continuously used by the Navy and Air Force units for various types of training activities. Military exercises and training in armed combat capacity need to be conducted in a safe manner for the units involved but also in respect of the general public and civil shipping and aviation, so that accidental shootings, incidents or accidents do not occur. The Swedish Armed Forces conduct exercises on the west, south, east and Norrland coasts with their varying coastal, sea, hydrological and meteorological conditions. Exercises are conducted under different light/darkness conditions, at all times of the day or night, and throughout the year. The military units need to conduct exercises with live ammunition,

among other things, in the vicinity of their regular naval ports, airports and base areas, but also from temporary bases along Sweden's coast.

Some military training areas can also be used for testing operations with various military weapons systems and equipment, which is an essential part of the continuous development of the military defence capability. There are also artillery ranges and marine training areas that are especially suitable for this type of activity.

#### *Monitoring of Swedish territory*

The mission of the Swedish Armed Forces includes being able to discover and repel infringements of Swedish territory and safeguard Sweden's sovereign rights and national interests. This mission requires the Swedish Armed Forces to have the ability to monitor Sweden's marine area and demonstrate resolve against infringements on and below the surface of the sea and in the airspace above the sea. Monitoring takes place, among other things, with the help of fixed and mobile sensors that contribute to generating an air and sea situation report.

The situation report that the Swedish Armed Forces maintain is in turn communicated to several recipients, including the Swedish Coast Guard, which uses the information as support in its work to prevent and increase the detection of violations of the law at sea in shipping traffic, orderly conduct, the environment and fishing and nature conservation. The Swedish Maritime Administration's Joint Rescue Co-Ordination Centre (JRCC) and the Vessel Traffic Service are additional examples of recipients of the maritime situation report.

#### *Signals intelligence*

The National Defence Radio Establishment (FRA) conducts signals intelligence with the aim of mapping, among other things, external military threats to the country, threats to Swedish personnel involved in international operations, international terrorism and cross-border crime, foreign intelligence activities against Swedish interests and other international phenomena that are of significance to Swedish foreign, security and defence policy. All signals intelligence is directed at foreign interactions and takes place on behalf of the Government, the Government Office, the Swedish Armed Forces, the Swedish Security Service and the National Operations Department within the Police Authority. These clients are continuously in need of intelligence reporting and signals intelligence activities continuously contribute to protecting Sweden and Swedish interests.

Signals intelligence can be impeded or made impossible in the presence of passive and active, intentional or unintentional electromagnetic disturbances, since the signals intelligence aims to perceive very weak electromagnetic signals. The nature of these activities therefore requires extensive protection against electromagnetic disturbances.

Telecommunications systems, solar power stations, railways, transmission systems for electric power and facilities for charging cars are examples of land-based activities that can have a strong negative impact on the activities. Wind power installations, especially offshore can also have a strong negative impact on signals intelligence, even from a large distance.

## Civil defence

Military defence has a strong interest in maintaining the functioning of society. The society's collective ability to support the Swedish Armed Forces when there is a high level of preparedness is a part of national defence. The military and civil parts of national defence strengthen and create conditions for each other. Civil defence is dependent on private interests, such as transportation, being able to be conducted and functioning at elevated preparedness since the flow of goods and services is important for secure supply lines. Shipping lanes to strategic ports as well as sea-based cables for communication and for electricity supply, i.e. the transmission network, are parts of civil defence that are included in marine spatial planning. Strategic ports must be able to be secured by the Swedish Armed Forces.

## Claims

The Armed Forces depend on their training areas, artillery ranges and marine training areas in order to be able to carry out exercises in different coastal and sea conditions, without disruptions from physical or technical obstacles that restrict the operations of the military units. For the signals intelligence and monitoring of Swedish territory, there is a need to protect this activity from disturbances from other activities that affect e.g. coordination and radar systems, which can also entail limitations in aviation and maritime safety.

### *Impact of permanent installations on military activities*

Within a part of the areas, establishment of wind power stations and other tall objects is at risk of having a significant negative impact on military interests and appointed national interests for the military component of national defence. The details of such impacts might in some cases not be described openly considering that the information is covered by military secrecy. Facilities for energy extraction may be compatible with the military interests, but the exact spread of wind farms and placement of individual wind power stations needs to be assessed in each individual case either in the planning process that takes place in inter-agency collaboration or in the consultation or permit process with the operator concerned. This is to investigate the exact effect on the military interests.

In general, wind power stations can entail harm to military interests among other things in the form of:

- impact on technical systems and the possibility of using them to monitor Sweden's territory including impact on the ability to provide early warning upon a remote attack on civil and military targets
- limitations in the possibility of exercising and training the abilities that are a prerequisite for the Swedish Armed Forces to achieve operational effect
- limitations to the possibility of protecting the country's territory in a possible future conflict in strategically important areas

### *The Future*

The Swedish Armed Forces' growth is being implemented according to the Government's direction decision for the Swedish Armed Forces in terms of planning conditions, objectives for the Swedish Armed Forces' operational capacity, the development of the war organisation and the development of the foundation organisation (Government, 2020b). The decision is based on the Parliament's enactment of the Government bill *National Defence 2021–2025* (Swedish

Parliament, 2020). In the bill, the Government states, in light of the continued deterioration of the national security situation, that military defence must continue to be strengthened and operational capacity increased. The parliamentary decision states that military defence shall be designed and dimensioned to be able to meet an armed attack on Sweden. This objective means that national defence shall have the ability to defend Sweden against armed attacks and to safeguard our security, freedom, independence and freedom of action.

The Swedish Government also made a decision on 16 May 2022 to apply for membership in NATO. On 5 July 2022, all of the NATO countries signed the accession protocol for Sweden. Until all NATO countries have ratified Sweden's application for NATO membership, Sweden has the status of an invited country (invitee).

The expansion of the Swedish Armed Forces is the largest since the 1950s and entails an extensive increase in the agency's organisation and operations. In order for the Swedish Armed Forces to be able to implement tasks assigned by the Parliament and Government, the Swedish Armed Forces need to secure access to areas and facilities that enable their implementation. Such areas and facilities consist, among other things, of training and artillery ranges, marine training areas, flight wing airports and various types of technical systems. The Swedish Armed Forces state that the need for such areas will increase sharply during the period 2021-2030. The expansion also means that the Swedish Armed Forces need to use existing operating locations, such as training and artillery ranges on land and at sea, to a greater extent than at present.

The Swedish Armed Forces' artillery ranges and training fields constitute a limited resource in total. It is therefore important to ensure that it is possible to use the air wing airports, artillery ranges and training fields that remain without significant limitations. The possibilities for the Swedish Armed Forces to move activities that have become impossible to implement in a marine training area are today minimal. There are simply not enough artillery ranges and training fields. In addition, development is moving towards mobile technical installations, which means that it is becoming more difficult to predict where the defence activities might be disrupted. The technology is becoming more sensitive to disruption, and disruption from permanent installations in the sea is predicted to increase.

#### National interest claims in accordance with Chapter 3 of the Environmental Code

Land and marine areas of significance to national defence must be protected to the furthest possible extent from measures that can substantially counteract national defence interests according to Chapter 3, Section 9, Paragraph 1 of the Environmental Code.

Areas that are of national interest because they are needed for national defence facilities must be protected from measures that can substantially impede the creation or use of the facilities pursuant to Chapter 3, Section 9, Paragraph 2 of the Environmental Code.

In a trade-off between conflicting national interests, the interests of national defence shall be given priority according to Chapter 3, Section 10 of the Environmental Code.








#### *Military component of national defence*

The Swedish Armed Forces decide on national interest claims, their impact areas and other areas of significance to the military component of national defence. As a sector authority for the military



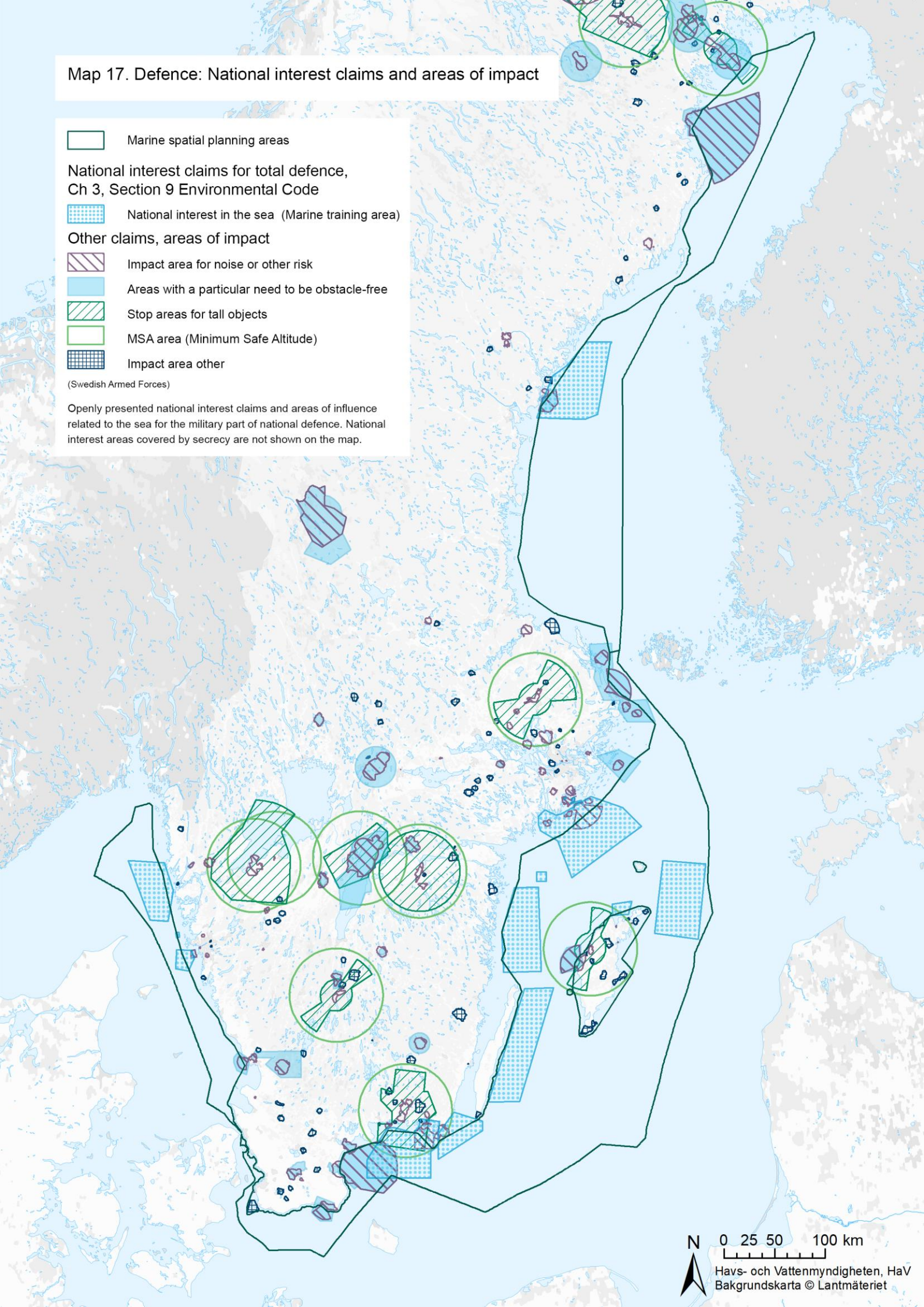
component of national defence, the Swedish Armed Forces also represent other authorities, such as the Swedish Defence Materiel Administration (FMV), the Swedish Defence Research Institute (FOI), the Swedish National Defence Radio Establishment (FRA) and the Swedish National Board for Fortifications (FORTV). Within the areas that have been pointed out as a national interest by the Swedish Armed Forces, there are artillery ranges and marine training areas, military airports, technical infrastructure and facilities. Value descriptions for the claims are on the Swedish Armed Forces' website.

Map 17. Defence: National interest claims and areas of impact

-  Marine spatial planning areas  
 National interest claims for total defence,  
 Ch 3, Section 9 Environmental Code  
 National interest in the sea (Marine training area)  
 Other claims, areas of impact  
 Impact area for noise or other risk  
 Areas with a particular need to be obstacle-free  
 Stop areas for tall objects  
 MSA area (Minimum Safe Altitude)  
 Impact area other

(Swedish Armed Forces)

Openly presented national interest claims and areas of influence related to the sea for the military part of national defence. National interest areas covered by secrecy are not shown on the map.



The Swedish Armed Forces' national interest claims and areas of significance consist partly of claims that are presented openly and partly of national interests that cannot be presented openly for reasons of secrecy. Even the areas that cannot be presented openly considering military secrecy are taken into account in the marine spatial planning.

**FACT BOX:** Examples of various national interest categories and areas of impact in the military component of national defence. A complete list national interests and areas of significance of the military component of national defence with impact areas is available on the Swedish Armed Forces' website.

#### National interests on land

Openly presented national interests on land can, for example, be artillery ranges, airports, training ranges or shooting ranges. National interests for the military component of national defence have been pointed out to protect inalienable areas of activity or functions that are required to ensure that the Swedish Armed Forces can maintain and develop a military defence of Sweden.

#### National interests in the sea (marine training areas)

Marine training areas are required to enable naval units in collaboration with aviation and helicopter units to be able to practice the Swedish Armed Forces' main task, the ability to conduct armed combat. Marked marine training areas of national interest aim to preserve the possibility of conducting activities in areas with, among other things, various coastal and marine conditions and different meteorological and hydrological conditions. It is of vital significance to the Swedish Armed Forces that the training activities in the marine training areas are also ensured in the long term. The areas are used for various types of military training activities and can take place both with marine units and with aircraft. Temporary closures of areas occur. Permanent facilities are at risk of damaging the national interest.

#### Impact area

In most cases, the activities conducted within a national interest or area of significance entail an environmental impact that extends beyond the national interest area. This may involve e.g. firing activities, explosives, port activities, aviation, radar, sensors and communication facilities.

When possible, the environmental impact is presented in the form of various types of impact areas. This is to clarify the planning conditions for municipalities, county administrative boards, other authorities and other actors.

Examples of areas of impact are those that indicate areas that are exposed to noise from the Swedish Armed Forces' activities or where area closure takes place to ensure the safe distances for various types of artillery activities. Further examples are areas adjacent to military airports or training areas where aircraft are used and within which flight obstacles can therefore limit or make the military activities impossible.

### *Civil component of national defence*

The Swedish Civil Contingencies Agency (MSB) has the responsibility to identify national interests for the civil components of national defence. Work to develop documentation is under way. Whether national interest areas within the marine spatial plan's geographic boundary will be identified cannot be predicted at present.

The transmission network in the sea, sea cables for communication and shipping lanes that constitute public interests in civil defence can also constitute national interest claims for communications (Chapter 3, Section 8 of the Environmental Code) that the Swedish Energy Agency, the Swedish Post and Telecom Authority and the Swedish Transport Administration are responsible for presenting.



## International interaction

Outside a country's territorial waters, other countries can conduct military exercises, which NATO and neighbouring countries do in the Swedish exclusive economic zone. The possibility of conducting defence exercises in the Swedish exclusive economic zone is therefore an international interest in the marine spatial planning. When Sweden collaborates internationally in its training activities, ordinary Swedish marine training areas are used. Permanent facilities, such as cables in the sea, can be a part of other countries' national defence, which can affect the Swedish marine spatial planning regarding use and decisions on installations in Sweden's marine spatial planning areas.

## Legal prerequisites

According to the Environmental Code, land and marine areas of significance to national defence must be protected to the furthest possible extent from measures that can substantially counteract national defence interests. According to Chapter 3 Section 10 of the Environmental Code, in a decision between two incompatible national interests, priority shall be given to the defence interest if an area or part of an area is needed for a national defence facility.

Defence activities must comply with the general rules of consideration in Chapter 2 of the Environmental Code. In general, the activities also need to be reviewed for permits under the Environmental Code. This might be an issue of artillery ranges that are environmentally hazardous activities subject to permits or registration. Blasting in water areas can also be viewed as water operations subject to permits or registration.

According to the Swedish Public Access to Information and Secrecy Act (2009:400), secrecy applies to information related to national defence, if it can be assumed to damage the country's defence or cause a risk to national security if the information were disclosed. This applies, for example, to map or aerial photograph materials regarding military geographic conditions, permanent defence facilities used in war time and locations where signals intelligence is conducted.

The Protection Act (2010:305) regulates reinforced protection for buildings, areas and other objects against sabotage, espionage and the disclosure of confidential information concerning Sweden's national defence. Unauthorised personnel may not enter aquatic areas of special significance to defence that have been classed as protected objects. This prohibition can be combined with a prohibition on depictions, descriptions or measurements. Investigations according to the Minerals Act (1991:45) may not take place within 200 metres of the protection objects or at such a distance as determined by the Government without permission from the county administrative board.

According to the Geographical Information Protection Act (2016:319), which regulates positioning information on conditions on and below the surface and on and below the ocean and seabed, permits are required for, among other things, hydrographic measurements, photography from aircraft in certain areas, and for the spread of aerial images and all compilations of information on conditions in a certain water area or a section of a water area that pertains to Sweden's territorial waters, except for lakes, streams and canals.

## Environment and climate

The use of ammunition in artillery exercises causes the introduction of metals to the water habitats, which contributes to the pollution situation in the sea even if relatively little metal is dissolved in the water mass. On a local basis, this can mean a great deal of extra metal. Noise is often created in artillery and blasting exercises and sometimes in aerial and ship exercises, which can cause disturbances to animal life both below and above the sea surface. Noise is often more serious at certain times of the year, when biological activity is high, than at other times of the year. Such times include fish spawning periods, the periods when seals have their offspring and bird breeding and incubation periods. The Swedish Armed Forces, however, have a need to practice and train their operational capability and their units even at these times. In order to take into account when the risk of impact is great, the Swedish Defence Forces have developed a marine biology calendar. It contains information on which areas are sensitive to impact from underwater noise during various times of the year.

Since 2016, the Swedish Armed Forces have objectives in the areas of energy efficiency enhancement, reduced the share of unsorted waste and environmental consideration in exercises and missions (Swedish Armed Forces, 2023).

Marine nature reserves and other formal area protection with distribution over the sea may in turn also entail limitations for the Swedish Armed Forces' activities or tangible damage to national interests for the military component of national defence. This might involve area protection that through regulations and prohibitions prevents the activities of the authorities in the military component of national defence in the area, e.g. through limitations on the possibility of passing through with vessels or conducting artillery or explosives activities in military training areas.

Extreme weather can change the living conditions in different locations and reinforce pre-existing factors that fuel conflicts. Climate changes also mean changes in the Arctic, something that increases interest in and the strategic significance of Sweden's immediate surroundings and the Baltic Sea.

## Geological storage of carbon dioxide

### Existing use

Geological carbon dioxide storage means that carbon dioxide from the air is captured and stored in geological formations deep below the seabed. Today, there is no geological storage of carbon dioxide in Sweden and there are no proposed installations.

It is geology that provides the conditions for geological carbon dioxide storage. The majority of Swedish bedrock is not suitable for carbon dioxide storage due to entirely too low porosity and storage capacity, but in certain parts of Sweden there is bedrock that could be suitable.

The technology for carbon dioxide storage is called CCS, Carbon Capture and Storage. The process comprises the steps capture and separation of carbon dioxide mainly in industrial or combustion processes for further transport to the storage site where it is stored in the form of a liquid that is almost as heavy as water. The transport takes place either in pipelines to a well facility on the seabed or by ship to an injection platform that pumps the liquid down. Together with pipelines, the wells on the seabed make use of a maximum of around one hundred square metres of the seabed. The platform is similar to a small oil platform, which either stands on legs anchored in the seabed or floating on pontoons.

In Sweden, storage of carbon dioxide is most suitable in deep geological formations, so-called aquifers, with high porosity and permeability. The technology is well-known and tested and is used, among other places, in Norway where carbon dioxide has been stored since 1996 deep below the seabed in the Norwegian North Sea and later also in the Norwegian and Barents Sea. The Geological Survey of Sweden (SGU) assesses that better knowledge of aquifers is necessary to investigate the storage capacity. According to a recently completed Government assignment, (SGU, 2021a) recommends conducting new surveys at sea in identified storage areas.

Carbon dioxide storage is regulated in Sweden by rules in the Continental Shelf Act and the Ordinance on Geological Storage of Carbon Dioxide (2014:21), which constitutes the implementation of the CCS Directive, i.e. the EU Directive on geological storage of carbon dioxide (2009/31/EC). For example, permits are required to explore the seabed prior to initial studies.

### Claims

Carbon dioxide storage can be a complement to other methods to reduce the large-scale emissions of carbon dioxide to the atmosphere by separating and storing it in the bedrock. Through international agreements, Sweden has committed to reducing the emissions of greenhouse gases and has also adopted its own climate objectives, including that Sweden shall not have any net emissions of greenhouse gases to the atmosphere by 2045. An environmentally safe geological storage of carbon dioxide is therefore considered to be able to contribute to achieving set climate objectives.

Initial geological assessments indicate that two marine areas in Sweden have good potential for geological storage of carbon dioxide: the Faludden storage unit within parts of the Borgholm formation in the south-eastern Baltic Sea and the Arnager storage unit within parts of the Arnager greensands off of south-western Skåne. There is a need to examine the most suitable storage units more carefully before more detailed planning can be done. More detailed documentation needs to include environmental

conditions, the bedrock of the seabed and geotechnical characteristics. Future claims might concern locations for wells, routes for pipelines or navigability for ships. The Government has assigned SGU the task of investigating and studying suitable locations for permanent storage of carbon dioxide in Sweden and analysing the conditions for the operation of the storage sites. The final report on this assignment shall be issued no later than 15 March 2026.

### Developments and trends

Political decisions and technical development will be crucial to the role geological storage of carbon dioxide will play in the future.

### International interaction

Altogether, the Nordic countries have a high theoretical storage capacity for carbon dioxide, corresponding to storage of more than 500 years of emissions at current levels (SGU, 2016b). The majority extend over the countries' exclusive economic zones. Research and data collection on the large-scale storage of carbon dioxide through international cooperation. Most of the carbon dioxide storage locations are in Norway, but Sweden and Denmark also have potential in and around Skagerrak and Kattegat.

### Legal prerequisites

According to the Ordinance on geological storage of carbon dioxide (2014:21), geological storage of more than 100,000 tonnes of carbon dioxide may only take place in the Swedish exclusive economic zone and in public waters of the Swedish territorial sea from one nautical mile seawards outside the baseline. This is the same geographic delimitation as for the national marine spatial plans. To obtain a permit, a permit review is required under the Environmental Code by the Land and Environmental Court and a permit is required from the Government under the Continental Shelf Act. The legislation is based on the EU Directive on geological storage of carbon dioxide (2009/31/EC) and ultimately on the Convention on the Law of the Sea. Any activity or measure that might significantly impact the environment in a Natura 2000 area also requires a special Natura 2000 permit according to Chapter 7, Section 28(a) of the Environmental Code. The requirement of such a permit applies both in the territorial sea and in the exclusive economic zone. The review is done by the Land and Environmental Court if the permit application otherwise is to be decided by the court and by the county administrative board when the permit application pertains to a facility in the exclusive economic zone.

For the capture and transport of carbon dioxide, a number of permits are also required.

At present, storing carbon dioxide in the Baltic Sea is not consistent with the Helsinki Convention's ban on dumping waste. Within Helcom, it has been recommended to investigate and legally interpret the ban and whether it also includes storage under the seabed. The global London Protocol against dumping considers carbon dioxide storage to be waste and as a premise thereby also bans cross-border transport of carbon dioxide. Since 2009, there is, however, an amendment that allows cross-border transport for the purpose of storage. This has not entered into force, which is why the parties to the convention, including Sweden, passed a resolution that allows cross-border transport for the purpose of storing carbon dioxide, pending the amendment's entry into force. The ban in the EU Directive on geological storage of carbon dioxide (2009/31/EC) against storage in complexes that extend beyond the areas of the Member States



is also something that could affect the possibilities of storage in the Baltic Sea. For example, the Faludden formation previously pointed out is very close to the border of the EU.

#### Environment and climate


Carbon dioxide storage can have a positive effect on the climate since a reduced concentration of carbon dioxide in the atmosphere can counteract the global warming under way.

Safe handling and assessment of environmental and health risks is a key issue in the introduction of large-scale carbon dioxide storage. The atmosphere can counteract the on-going global warming. According to the EU Directive on the geological storage of carbon dioxide, a geological formation may only be used as a storage location if there is no significant risk of leakage, and if in any case no significant environmental or health impacts are likely to occur. The placement of facilities, such as injection wells, may be at risk of burdening the environment. Some sediments or rock types can be more sensitive than others, since some flora and fauna are tied to certain seabed and sediments. Sediment can also contain environmental toxins or cause sediment slides. In the construction phase, but also to some extent during the operating phase, there is a risk of environmental toxins entering circulation. Contaminated sediment occurs mainly close to the coast and in fine-grained soil types. Carbon dioxide storage under the seabed can entail environmental loads in the form of increased shipping traffic during the investigation and construction phase, and for service, maintenance and transport during operation. Environmental impact from established facilities is considered to be limited to the physical location of the facility, from shipping traffic. During the investigation phase and construction phase, underwater noise can increase from marine surveying and shipping traffic.

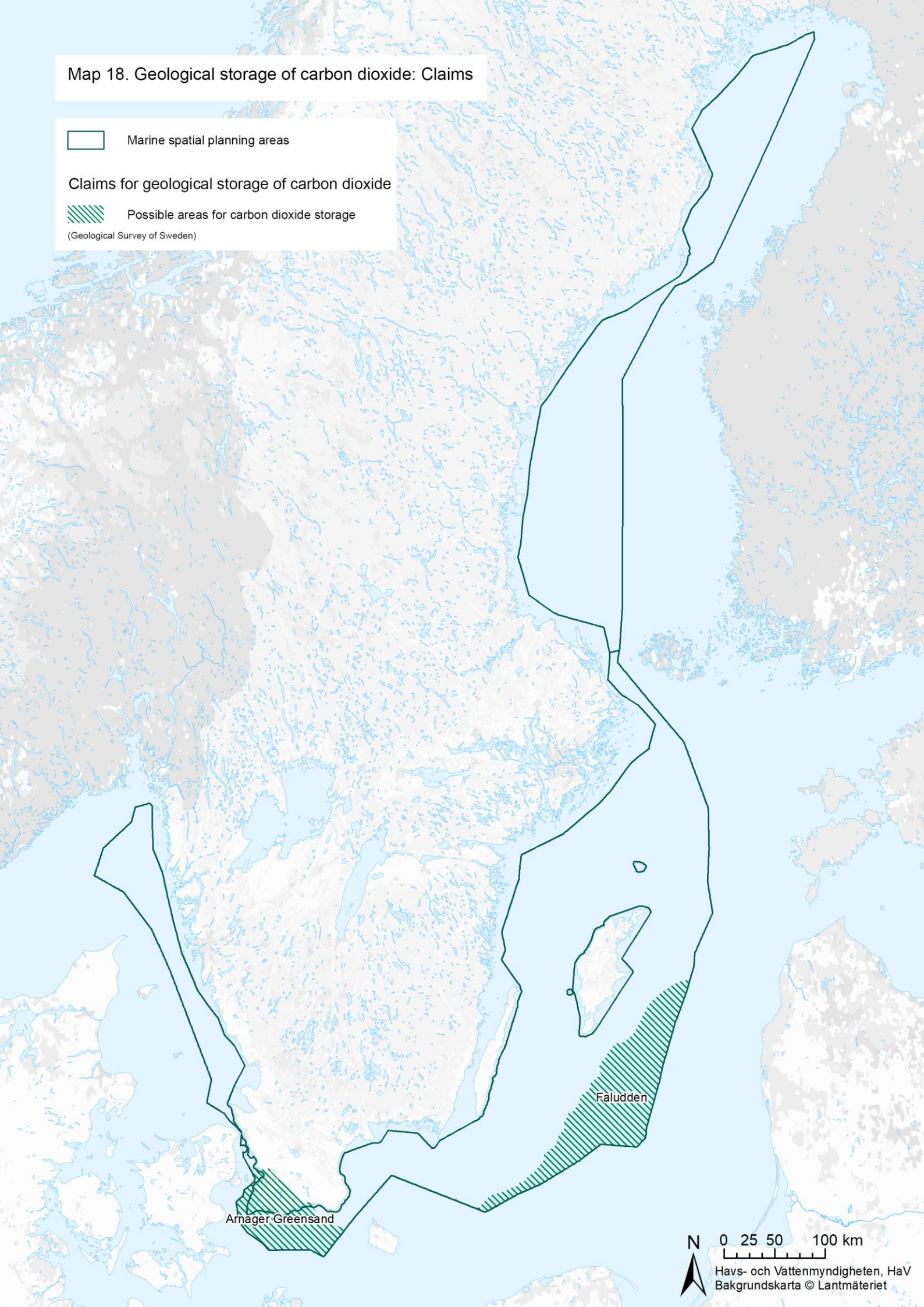
Map 18. Geological storage of carbon dioxide: Claims

 Marine spatial planning areas

Claims for geological storage of carbon dioxide

 Possible areas for carbon dioxide storage

(Geological Survey of Sweden)



Arnager Greensand

Faludden

N 0 25 50 100 km

Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet

## Infrastructure

Infrastructure comprises facilities for the transportation of goods, passengers and services, as well as for the transmission of energy and information. This chapter addresses the transport infrastructure for roads, rail and aviation. Infrastructure for energy and shipping is addressed under the respective section Energy and Shipping. There are also communication cables in the sea. The transport infrastructure enables connection and communication within and between regions and countries. There are currently two longer permanent connections from the Swedish mainland over the sea, the Öland Bridge and the Öresund Link. The latter serves both road and rail traffic. There are ten civil aviation airports with air services that are located near the sea. Air traffic has claims to the airspace over certain parts of the sea, and no buildings taller than 300 metres may be built in approach areas (Minimum Sector Altitude, MSA areas, civil definition).

### Existing use

#### *Road and rail*

The Öland Bridge over Kalmarsund connects Kalmar on the Swedish mainland with Färjestaden on Öland. The bridge is 6.1 kilometres long with a vertical clearance of 36 metres and a free bridge width of 13 metres. The Öresund Link is a 15.9-km long connection over and under the Öresund, between Malmö (at Limhamn) and Copenhagen (at Amager). The upper level of the bridge has a vertical clearance of 57 metres over Flintrännan. The link consists of a motorway and a double track railway. In 2022, around 6.7 million vehicles passed the Öresund Link, which corresponded to nearly 18,000 vehicles per day (Øresundsinstituttet, 2023).

#### *Airports*

The largest civil airports in Sweden, which are located close to the sea, are Luleå (Kallax), Umeå, Skellefteå, Visby, Örnsköldsvik, Sundsvall-Timrå, Ronneby (Kallinge), Ängelholm, Halmstad and Kalmar (Traffic Analysis, 2023a). Several of these airports are also military facilities, for example, Luleå, Visby and Ronneby. For air traffic to function safely, there are areas around all airports that must be kept free of obstacles. The military airports have specific requirements for remaining free of obstacles as there may also be a need for low-level flying exercises.

#### *Cables for data and telecommunications*

Society's dependence on the Internet is constantly growing, as is the need for communication between Sweden and other countries. The majority of this communication with other countries takes place over cables in the sea. An example of such communication is the radio links between Sweden and Denmark across Öresund and between the mainland and Gotland.

Even if the transmission capacity in the cables is constantly growing, there is a need for more cables to create space and security in the networks.

## Claims

### *Transport policy objectives*

The Swedish Parliament has decided on the overall transport policy objective: to ensure a socially efficient and long-term sustainable transport supply for the citizens and industry throughout the country. The Swedish Parliament has also decided on a functional objective regarding accessibility and a consideration objective regarding security (Government, 2021a). The functional objective of accessibility means that the design, function and use of the transport system is to help provide everyone with basic access to a user-friendly system of good quality, and that this will contribute to positive developments throughout the country. Two specifications of the functional objective are especially important in terms of the need for roads or tunnels, which link Sweden with other countries. One specification means that industry shall be given access to transport of a better quality and strengthen international competitiveness. The second implies that accessibility is to be improved within and between regions, and between Sweden and other countries. The health, environment and safety objectives imply that the design, function and use of the transport system are to contribute to the overall generation objective for the environment, and that the environmental quality objectives are achieved.

There are also objectives in the climate policy. An interim objective for Sweden's climate targets is that the emissions of greenhouse gases from domestic transport (besides domestic aviation) shall have decreased by at least 70 per cent by 2030 compared with 2010.

In 2018, the Government drafted a national freight transport strategy. Through the strategy, the Government wants to create conditions for efficient, capacity-strong and sustainable freight transport. At the same time, the strategy shall contribute to achieving the transport policy objectives, strengthen the competitiveness of industry and promote the shift of freight from road to rail and shipping.

### Developments and trends

A permanent connection between Helsingborg and Helsingør has been investigated, in order to deepen integration within the Öresund region, create opportunities for larger labour and housing markets, and to relieve the burden on the Öresund Bridge and the E6 motorway. Freight traffic between Sweden and the continent as well as passenger transports are expected to increase.

The cities of Malmö and Copenhagen are working together on a pilot study regarding how a metro connection between the cities could create additional capacity through the Öresund and, in so doing, strengthen integration and growth in the region. The reason behind the connection is that daily commuting between Malmö and Copenhagen is increasing faster than the rest of the traffic over the Öresund. When the planned tunnel under the Fehmarn Belt is completed in 2028, the capacity of the Öresund Bridge will be stretched further.

The City of Landskrona has investigated the possibilities of what is called "Europaspåret" or the European track, which is a proposed railway connection between Landskrona and Copenhagen. The Öresund Bridge, which is expected to be faced with an increased future load, can be effectively offloaded with the European track. The Landskrona-Copenhagen link is intended to handle all kinds of rail transports: freight trains, high-speed trains and regional trains. The issue has been investigated within a project run by the City of Landskrona (City of Landskrona, 2022).



In Umeå Municipality's comprehensive plan, a reserve is made for a long-term connection between Umeå and Vaasa (Umeå Municipality, 2018). In addition, Umeå and Vaasa have worked out a joint development strategy that aims to improve the quality of life for the region's inhabitants and strengthen the conditions for companies and organisations. In the strategy, a permanent connection between the cities is pointed out as a parameter to achieve the objective of an integrated region and an expanded exchange between the countries. This also includes the possibility of increasing transmission connections for electricity and hydrogen between the countries. In its Government programme from June 2023, the Finnish Government has stated that a permanent connection between Umeå and Vaasa shall be investigated (State Council, 2023).

#### National interest claims in accordance with Chapter 3 of the Environmental Code

The Swedish Transport Administration decides on national interests for facilities for communications for shipping, road, rail and aviation according to Chapter 3, Section 8 of the Environmental Code. The claims refer to existing, planned and future facilities.

The Swedish Post and Telecom Authority decides on national interests for facilities for electronic communications in accordance with Chapter 3, Section 8 of the Environmental Code. No national interests have been pointed out for sea-based electronic communications in the marine spatial planning areas. At present, there is a lack of overall national planning for telecommunication and communication cables.

Both the Öresund Link and the Öland Bridge have been highlighted as national interests. The Öland Bridge, Route 137, is of particular importance for regional and interregional traffic between Öland and the mainland. All ten airports by the sea have been highlighted by the Swedish Traffic Administration as national interests for aviation.


#### Legal prerequisites


Planning must be carried out and a building permit obtained before the construction of buildings and facilities can commence, in accordance with the Planning and Building Act (2010:900). The municipalities are responsible for comprehensive plans, detailed development plans and building permits, which are primarily of importance for land areas and coastal water but extend out to the marine territorial border. As regards infrastructure such as road or rail bridges and tunnels in the sea that connect to land areas, planning is normally preceded by a road or rail plan, in accordance with the Roads Act (1971:948) or the Railway Construction Act (1995:1649), respectively. If the construction or laying of cables entails an impact on ancient remains, a permit is also required pursuant to Chapter 2, Section 12 of the Heritage Conservation Act (1988:950). When constructing a facility or laying cables, one should therefore find out if the effort concerns any ancient remains and consult with the county administrative board.

Map 19. Infrastructure: National interest claims and other claims


 Marine spatial planning areas

National interest claims for infrastructure,  
Ch 3, Section 8 Environmental Code

 Airport, flight obstacles influence area

 Airport, Minimum Sector Altitude (MSA) area

 Railway, existing

 Railway, existing (Öresund Bridge connection)

 Railway, future

 Roads, existing

Other claims for infrastructure

 Airport in neighbouring country, MSA area

(Swedish Transport Administration,  
Swedish Agency for Marine and Water Management)

N 0 25 50 100 km



Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet

## Environment and climate

The construction of bridges and tunnels in the sea often happens in shallow areas, and largely near the coast or on offshore banks. Facilities such as tunnels, foundations and piers result in currents changing, which in turn impacts the seabed sediment around it over the long term. During the construction phase, sediment is stirred up from the seabed and dredging may be needed with consequences to the natural environment. During the operational phase, new construction may constitute an obstacle to migrating species, both beneath and above the surface of the water. New construction can, either on its own or in combination with other connecting facilities, lead to fragmentation of the landscape. Special protective measures may need to be implemented in order to reduce the occurrence of disturbing noise and light barriers. Once the facilities are put into operation, there is a change in earlier transport patterns.

The combined effects on the amount of emissions of greenhouse gases and on the climate need to be investigated for every infrastructure project that is implemented.



## Cultural environment

The cultural environment as a whole provides an image of Sweden's history and people's lives. Cultural environments have arisen through various historical events, processes and activities, and reflect people's use of the landscape from ancient times to the present. Together, they will enable current and future generations to partake of the landscape's historical dimension and thereby understand Sweden's development over time.

Cultural environments can also be of significance to people in various ways. This may involve identity and context in life or well-being. Cultural environments are also of significance to economic development on a local and regional level, as well as recreation, tourism and research. How cultural environments are used varies from generation to generation. One fundamental prerequisite, however, is that there shall be sufficient diversity and numbers of preserved cultural environments to be able to understand how the country was formed and developed over time.

### Cultural heritage in and at the sea

The coastal and archipelago landscapes have largely been characterised by the traditional industries of fishing, shipping, agriculture, industry and tourism. Valuable environments, landscapes and buildings are linked to archipelago agriculture, fishing villages and seaside resorts, ports, fortifications, lighthouse and pilot sites and coastal industries that in turn arose precisely there due to the connection to the sea.

The activities in the coastal and archipelago landscapes have been intensive over the centuries, which has also resulted in an extensive cultural landscape on the seabed. This consists partly of individual remains, such as shipwrecks, and partly areas with remains, such as settlements from the Older Stone Age, ship barriers from the Viking Age and the Middle Ages (so-called piling barriers), port facilities, anchorages, etc.

Land-bound cultural environments along the coast interact to varying degrees with the sea. They can be divided into different types based on their need for interaction with the sea to reflect ages, events or activities. The different needs in turn mean they are sensitive to the impact to varying degrees. For many of these cultural environments, a nearby coastal and archipelago landscape and a free horizon are important to be able to understand how they worked historically.

### National objectives

The national objectives for cultural heritage activities are a complement to the national cultural policy objectives (Government, n.d.) and to the specifications on the cultural environment that exist for several of the environmental quality objectives, and to the generational objective for the environmental (Government, 2020a). These objectives shall govern the national efforts in the cultural heritage area, inspire and guide the policy in municipalities and county councils to promote a sustainable society with a diversity of cultural environments that are preserved, used and developed (Government, 2012). There are a number of different laws and rules for the work to achieve the objectives and to protect the cultural environment, to call for consideration and to use the cultural environment in the planning of changes.

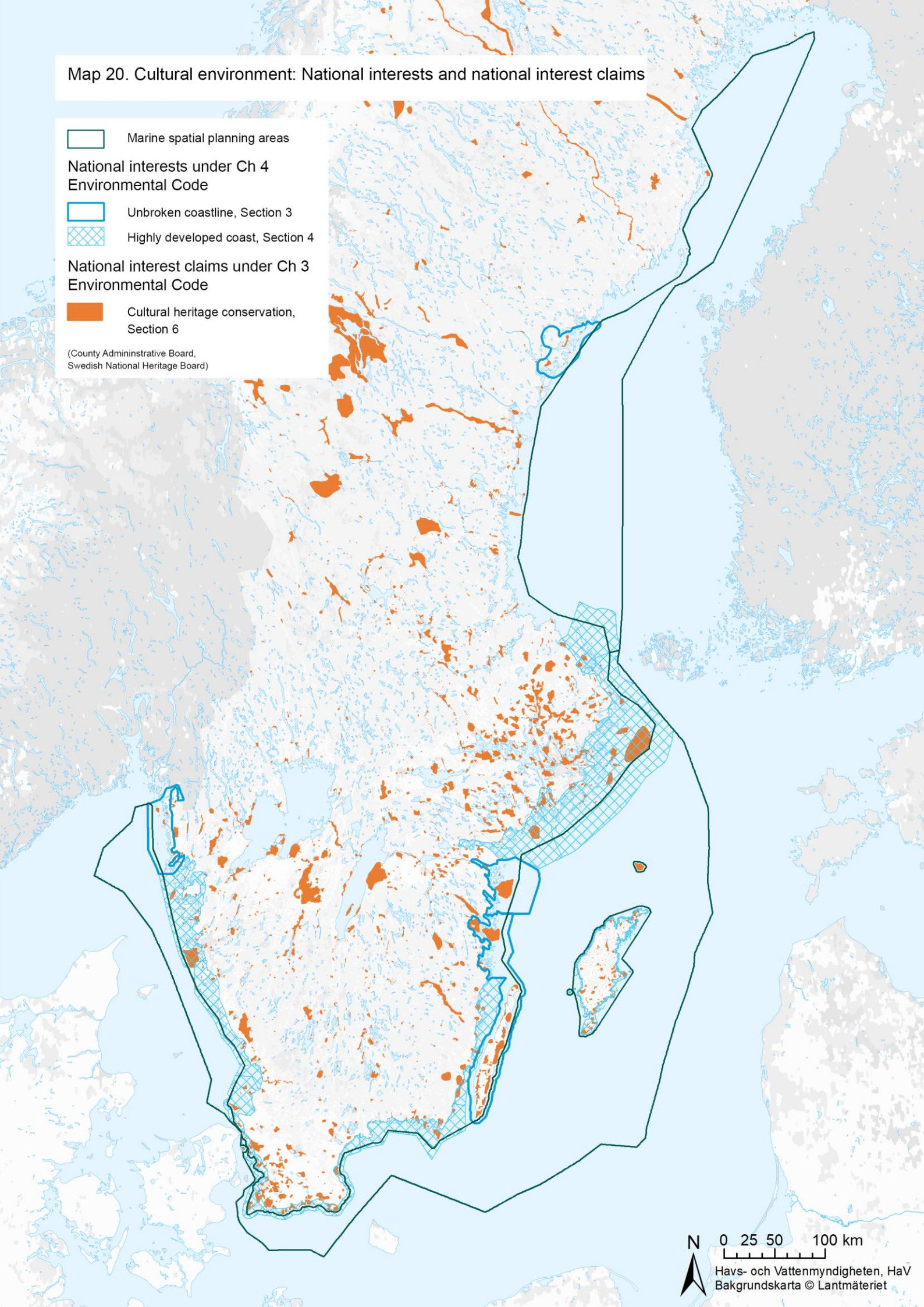
The cultural heritage work also largely takes place within the environmental objective system, in collaboration between authorities that are affected by the cultural heritage objectives.

Generational objective's indent *Biodiversity and the natural and cultural environment are to be preserved, promoted and used sustainably* and the environmental objectives' specifications on the cultural environment are strategic objectives for the work (Swedish EPA, n.d.).

Map 20. Cultural environment: National interests and national interest claims

- Marine spatial planning areas
- National interests under Ch 4  
Environmental Code
- Unbroken coastline, Section 3
  - Highly developed coast, Section 4
- National interest claims under Ch 3  
Environmental Code
- Cultural heritage conservation, Section 6

(County Administrative Board,  
Swedish National Heritage Board)



N 0 25 50 100 km

Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet





Map 21. Cultural environment: Other valuable areas


 Marine spatial planning areas

Other valuable areas for cultural heritage

 World Heritage as per World Heritage Convention UNESCO

 Cultural heritage reserve, Ch. 7, Sect. 9 EC

 Landscape appearance protection,  
formed with support of Sect. 19 of the former Nature Conservation Act

 Cultural heritage value cores from Sweden's coastal and  
archipelago landscape

 Marine remains

(UNESCO, EC, Helcom, Swedish Environmental  
Protection Agency, Swedish National Heritage Board)

N 0 25 50 100 km



Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet

## National interest claims in accordance with Chapter 3 of the Environmental Code

The Swedish National Heritage Board is responsible for pointing out national interests for cultural heritage conservation according to Chapter 3, Section 6 of the Environmental Code. The national interests of cultural heritage conservation should together provide an image of society's various developmental phases from a national perspective. The national interests represent various historical ages and the claims vary both in terms of cultural heritage content and size. At present, there are around 300 identified national interests for cultural heritage conservation along the coast, but none are in the marine spatial planning area yet. The coastal national interests can be affected by activities in or in connection with their delimitation and an assessment needs to be done of whether/how the national interest's value is negatively affected. To know how the national interests are generally to be handled in the planning context, there is a descriptive text that indicates what the national interest consists of. Descriptive texts for all of Sweden's national interests for cultural heritage conservation are on the Swedish National Heritage Board's website.

## National interests in accordance with Chapter 4 of the Environmental Code

In addition to the cultural heritage conservation claims according to Chapter 3 of the Environmental Code, there are also national interests according to Chapter 4 of the Environmental Code. These are geographically delimited national interest areas indicated in the Environmental Code and approved by the Swedish Parliament. These are national interests for an unbroken coastline according to Chapter 4, Section 3 of the Environmental Code and national interests for highly developed coast according to Chapter 4, Section 4 of the Environmental Code. With regard to their natural and cultural values in their entirety, the areas are of national interest and use must not substantially damage the areas' nature and cultural values.

## Other public interests

### *International conventions*

Various international conventions focus on the consideration of the landscape and cultural environments in focus, such as the Council of Europe's Landscape Convention and the UNESCO World Heritage Convention. The requirements of these conventions are applied through the laws and regulations that apply in Sweden.

The Landscape Convention is a convention that emphasizes the landscape as a shared asset and a shared responsibility. The main objective of this Convention is to develop a holistic view of the values of the landscape and means that Sweden shall apply a landscape perspective in its policy for regional development, urban planning, cultural and nature conservation, agriculture, forestry and all other areas that can have an impact on the landscape.

World Heritage sites are identified based on UNESCO's World Heritage Convention and are deemed to be so valuable from cultural or natural environment perspectives that they are a matter for all of mankind. A World Heritage site can be affected by activities in or adjacent to the boundaries of the World Heritage site and an assessment needs to be done of whether the World Heritage site's universal value is negatively affected. There are also buffer zones for the World Heritage sites that belong to the protection area of the world heritage sites. In connection with the marine spatial planning area, there are several World Heritage sites that can be affected by

activities that take place at sea: the High Coast, the Hanseatic City of Visby, the Naval City of Karlskrona, Southern Öland's cultivation landscape and Struve's meridian arch.

#### *Other public interests*

The Government decides on new state-owned historic buildings according to the Ordinance (2013:558) on state-owned historic buildings. They are owned by the state and tell important parts of the history of Sweden and state administration. State-owned historic buildings that concern marine spatial planning are, for example, lighthouses, pilot stations or maritime defence facilities. The state-owned historic buildings can indirectly be affected by planned establishments in the marine spatial planning area. In the current marine spatial plans, no state-owned historic buildings are presented separately.

In 2003, the Swedish National Heritage Board identified cultural heritage characteristics along the Swedish coast and identified core cultural heritage sites based on them (P. Nordström, 2003). The core sites coincide to a significant extent with the areas that are covered by the Environmental Code's geographic management provisions. Also see the section On-going development work.

To enable the care and preservation of valuable cultural landscapes, a county administrative board or a municipality can decide that an area shall be protected and managed as a cultural reserve according to Chapter 7, Section 9 of the Environmental Code (1998:808). At present, there are no cultural reserves in the marine spatial planning area, but some cultural reserves are adjacent to the sea.

Landscape protection is a protection that was introduced with support from the earlier Nature Conservation Act. The purpose of the protection is to protect large areas from major impact or change. The provisions in the areas with landscape protection apply until they are replaced with other forms of protection.

There are also other cultural environments that are of major regional and/or local interest that need to be handled in a planning of an activity or establishment. These can, for example, be delimited and described in the municipalities' comprehensive plans or be protected areas in detailed development plans or area regulations.

#### *Other planning conditions*

Various activities and establishments at sea can affect cultural environments in two ways – a direct more physical impact and an indirect more visual impact. Direct impact can take place through, for example, the interventions that an establishment requires or activities cause on the seabed that can thereby affect ancient remains and cultural heritage remains. The impact area might be larger than the actual development area because, for example, various connection points may be needed with associated cable laying both in the sea and on land.

Indirect impact can take place on the cultural environments that are on land adjacent to the marine area, for example. New establishments can entail a visual impact on a cultural environment and the historical function it is an expression of. The impact relates to how the establishment is perceived and interpreted together with the cultural environment and its values.



The Swedish National Heritage Board summarises the planning conditions for a cultural environment with assessments having to be done based on what sensitivity a cultural environment has to an establishment's location, height and scale, and based on an establishment's distance to the cultural environment as dominance or competition can arise with the cultural environment (National Heritage Board, 2014, 2015, 2019). An important aspect for the planning is that the impact on cultural environments can only to some extent be assessed in the marine spatial planning phase based on the proposed area for establishment. The conditions for an establishment can be fully assessed only when it is clear how an intended establishment will come to expression (height, placement, structure, design). In the early planning phase that a national marine spatial plan constitutes, it is therefore not possible to fully specify conditions for an establishment in the vicinity of a cultural environment, but this is something that is clarified in subsequent processes at a regional and local level.

### Development of planning documentation

At present, there is not a nationally adapted planning documentation for cultural heritage issues in the marine spatial planning. Existing documents are out of date, incomplete, lack adapted analyses or handle a scale that makes them difficult to use in the national marine spatial planning. For example, this may involve the information about marine remains being incomplete and that unknown ancient remains can be encountered in areas that have not been investigated. It can also involve the difficulties of handling the cultural heritage interest on a national level based on detailed documentation. The lack of planning documentation makes it difficult to prepare collective analyses of the cultural heritage conservation claims in relation to marine spatial planning.

All coastal county administrative boards have the task of preparing suitable planning documents on cultural environments for the national marine spatial planning (Government, 2021c). The assignment shall be presented in January 2024. The county administrative boards intend to develop value areas based on e.g. national interests, municipally appointed cultural environments, ancient and cultural heritage remains on land and below the sea surface, context in the landscape and lines of sight, national interests according to Chapter 4 of the Environmental Code, cultural and nature reserves, Natura 2000 areas, biosphere areas and landscape appearance protection. Some county administrative boards have also chosen to update and quality-assure the information on marine remains in the cultural heritage register. The coastal county administrative boards work based on jointly prepared instructions, but at the same time have the possibility to choose their own direction and level of ambition.

The knowledge of the indirect impact on cultural environments in the coastal and archipelago landscape needs to be developed. The development work, both on a national and regional level, is deemed to be able to provide better conditions in the long term for the collective analyses of cultural heritage conservation in the marine spatial planning.

### International interaction

The countries around the Baltic Sea cooperated in the EU project BalticRIM (2017-2020) with the aim of developing methods to integrate the sea's cultural heritage into the marine spatial planning. Within the project, guidance was prepared to treat cultural heritage in the marine spatial planning.



## Legal prerequisites

### *Environmental Code regulations*

The Environmental Code shall be applied so that valuable cultural environments are protected and cared for. This is indicated, for example, by the so-called management provisions in Chapter 3, Section 6, by the provisions on environmental assessments in Chapter 6 and by the provisions on area protection in Chapter 7, Section 9.

### *Planning and Building Act provisions*

Both the Environmental Code and the Planning and Building Act (2010:900) state that cultural values and the cultural environment are a public interest. The municipal and regional cultural heritage claims are protected through the general care requirements and the management provisions in the Environmental Code. The Planning and Building Act aims to promote good social living conditions and a good long-term sustainable living environment for both the people in today's society and for future generations. One way to ensure a long-term sustainable living environment is to safeguard cultural values. Information about these cultural values and environments is included in municipal cultural heritage programmes and comprehensive plans.

### *Provisions on the protection of ancient monuments, valuable buildings and church historical monuments*

The Heritage Conservation Act (1988:950, Ch.1, Sec.1) has rules to protect ancient monuments, such as ancient remains, prehistoric finds and valuable buildings and church historical monuments. The objective is to ensure current and future generations access to a diversity of cultural environments. The Heritage Conservation Act regulates permit processes for activities that can affect cultural environments in and at the sea. The county administrative board examines applications for permits for activities that may lead, for example, to ancient remains being changed or damaged.

It is prohibited to damage or destroy ancient remains and they are protected regardless of whether they are known or not. Of Sweden's almost 700,000 registered ancient remains and cultural heritage remains, around 12,000 are made up of maritime remains, of which nearly 3,000 are ancient remains (National Heritage Board and SwAM, 2020). The act prescribes that a shipwreck shall be considered ancient remains if it sank before 1850. However, the county administrative board can decide that a younger shipwreck is to be considered ancient remains if it has sufficient cultural heritage value. Also, in the contiguous zone outside the territorial waters, Sweden has the right to protect archaeological and historical objects on the sea floor.

## Environment and climate

Climate change effects, such as a sea level rise and change in water temperature, with accompanying processes, such as coastal displacement and seabed movements, can lead to cultural environments being damaged both on land and in the sea. A rise in sea level will mean that several cultural environments will be flooded. The sea's movement also means, for example, that ancient remains might be disturbed. Increased erosion of the beaches can lead to the destruction of cultural environments in the coastal area.

The Baltic Sea and the Gulf of Bothnia have unique conditions with low salinities and temperatures that mean that cultural heritage remains on the seabed are often well preserved. A changed climate and an increase in sea temperature can lead to invasive species that damage wooden structures (such as piling barriers and shipwrecks) being able to become established and affect these unique conditions.

In turn, shipwrecks, older harbour facilities and industrial cultural heritage environments can constitute potential environmental threats in the sea since they can contain various kinds of heavy metals and other hazardous substances.

## Environmental protection

Protection of marine environments is one of the tools to achieve a good environmental status in the sea. Efficient and coherent forms of environmental protection create conditions to achieve several interim objectives within the environmental objectives of *A rich plant and animal life* and *Balanced seas and vibrant coastal areas and archipelagos*. It is important that the protection is ecologically representative, coherent and functional. This forms the basis for a more extensive blue-green infrastructure in the sea that aims to maintain and strengthen the ecosystems and the services they provide.

The concept of environmental protection in the marine spatial plans refers to all forms of protection with claims in the sea. Land and water areas that are especially sensitive from an ecological perspective shall be protected to the greatest extent possible from measures that can harm the natural environment according to Chapter 3, Section 3 of the Environmental Code. Various forms of protection are stated in Chapter 7 of the Environmental Code and include nature reserves, national parks and animal and plant protection areas. The forms of protection in Chapter 7 of the Environmental Code's also cover other types of protection that are not in the marine spatial planning areas, such as coastal protection areas. Different types of fishing regulations also mean that nature is protected from certain measures that can damage the natural environment. Fishing regulation can be introduced with national fishing legislation and with the support of the EU Common Fisheries Policy.

The concept of protected marine areas specifically refers to marine national parks, marine nature reserves and Natura 2000 areas where it has been reported that there are nature values that correspond to marine Natura 2000 nature types. Marine area protection thereby does not cover all of the Environmental Code's forms of protection. Marine protected areas are established and managed in the national work on area protection.

### Different kinds of area protection

#### *Natura 2000 areas*

Natura 2000 is a network of valuable nature areas containing species or nature types that are in particular need of protection from a European perspective. In a Natura 2000 area, nature types should develop well and species should grow into vigorous stocks. It is prohibited to conduct activities without permission or to implement measures that can substantially affect the environment in a Natura 2000 area.

Pointing out of Natura 2000 areas is done based on two EU directives, the Habitats Directive and the Birds Directive.

Natura 2000 areas can be established both in Swedish territory and in the Swedish exclusive economic zone.

#### *National parks*

So far, the Kosterhavet National Park in Skagerrak is the only example of a pure marine national park in Sweden. The aim is to keep a distinctive, species-rich marine and archipelago area and adjacent land areas in an essentially unaltered condition. There are another six national parks by

the sea with marine areas of varying different sizes: Haparanda Archipelago, Skuleskogen near the High Coast, Ängsö in the Stockholm Archipelago, Gotska Sandön, Blå Jungfrun in Kalmarsund and Stenshuvud on the east coast of Skåne. Work is under way to establish the Baltic Sea's first marine national park, Nämdöskärgården. Inauguration of the national park is planned for 2025.

#### *Nature reserves*

The most common form of protection according to Chapter 7 of the Environmental Code consists of nature reserves that are established by county administrative boards or municipalities. Marine nature reserves have a marine purpose with a description of how the purpose is to be achieved and what marine values are covered by the protection. The reserves are accompanied by special order regulations. Most of the marine nature reserves are close to the coast and comprise the sea, beaches and islands, which means that only parts of them are in the national marine spatial planning area. Nature reserves can only be established in Swedish territory, i.e. not in the Swedish exclusive economic zone.

#### *OSPAR and Helcom MPA*

Through international conventions, Sweden has committed to protecting valuable coastal and marine environments. For the North-East Atlantic, OSPAR applies and the protected areas are called Marine Protected Areas, MPA. In the Baltic Sea, there is Helcom and the areas are instead called Helcom MPA.

OSPAR and Helcom MPAs are decided by the Government and can be established both in Swedish territory and in the Swedish exclusive economic zone.

#### *Animal and plant protection areas*

A county administrative board or municipality can establish animal and plant protection areas if there is a need for special protection in addition to the provisions in the Species Conservation Ordinance or the fishing legislation, which protects species through declared protection. Animal and plant protection areas in the sea are primarily bird and seal protection areas where entry is prohibited at certain times of the year.

#### *Existing use*

Together with the Swedish Environmental Protection Agency, the Swedish Agency for Marine and Water Management has national responsibility for area protection. These authorities prepare general advice, manuals, guidelines and other guidance material within their areas of responsibility. They also have the right to appeal certain decisions under Chapter 7 of the Environmental Code.

The county administrative boards together with the coastal municipalities have the right to establish marine area protection in the territorial sea. After the Swedish Parliament's approval, the Government can declare an area a national park. The Government also decides on Natura 2000 areas, OSPAR and Helcom MPAs in both territorial waters and in the exclusive economic zone, after preparation by county administrative boards, the Swedish Environmental Protection Agency and SwAM.

Management of decided marine area protection takes place at the county administrative boards regardless of the form of protection and location in territorial waters or the exclusive economic zone. The exception is municipal marine area protection where the municipalities themselves are responsible for these areas' long-term management. Conservation or management plans are usually prepared depending on the form of protection. With regard to national parks, nature reserves and animal and plant protection areas, various activities are regulated through regulations in the actual decision documents. For nature reserves and national parks, there are also management plans. However, these constitute only guidance for management and contain no regulation directed at the public or activity operators. Natura 2000 areas are regulated differently, partly through a permit requirement for activities that can significantly affect the environment in the area (Chapter 7, Section 28a of the Environmental Code), and partly through public authorities prioritising Natura 2000 areas in the protection work (Chapter 7, Section 27 of the Environmental Code). The Ordinance on Area Protection states that "Within the scope of their powers and areas of responsibility, the authorities shall implement the measures that are necessary or appropriate with regard to the protection interest that led to an area being listed."

Section 17 of the Ordinance on Area Protection also states that the county administrative boards shall prepare conservation plans, which shall describe the purpose of each area and thereby facilitate Natura reviews. Conservation plans are, however, not decision documents.

Fishing in protected marine areas can be regulated by managing parties, i.e. municipalities or county administrative boards, notifying SwAM of any need for fishing regulation to achieve the purpose of the area protection, usually in the form of an official request. Depending on the area's location, the request for a need for fishing regulation can lead to an international process around regulation within the scope of the EU Common Fisheries Policy.

Activities that are subject to permit requirements, such as energy or sand extraction, that are deemed to affect a Natura 2000 area need to apply for a special Natura 2000 permit in addition to the other permits for the activities. Natura 2000 permits can either be reviewed by the Land and Environmental Court if the permit application otherwise is to be decided by the court or by the county administrative board when the permit application pertains to a facility in the exclusive economic zone.

## Claims

### *National and international objectives regarding area protection*

In 2022, a new international framework was adopted to preserve biodiversity up to 2030 within the scope of the UN Convention on Biological Diversity (CBD). The EU represents Sweden in the Convention on Biological Diversity and has prepared a strategy for biodiversity stating that the EU's objective is to protect at least 30 per cent of the marine environment as marine area protection and other effective area-based conservation measures through ecologically representative, coherent and functional networks. Of these area protections, at least 10 per cent must be strictly protected.

Currently, a so-called infringement case is under way against Sweden, where the European Commission considers that Sweden has not fulfilled its commitments under Article 4(1) and (2) of the Birds Directive. This applies specifically in the marine environment and the Commission has

ordered Sweden to investigate how large a share of the 20 *Important Bird Areas* (IBA areas) appointed by BirdLife can correspond to the criteria according to the Birds Directive, and should therefore be proposed as new Natura 2000 areas (SPA). As a result, all coastal county administrative boards except Västerbotten and Norrbotten have had a Government assignment to propose new Natura 2000 areas (SPA) based on these IBA areas. After an assessment of the county administrative boards' proposals, the Swedish Environmental Protection Agency submitted a request for proposals on areas to the Government

The European Commission sets requirements on Member States to contribute to protecting 30 per cent, of which 10 per cent are strictly protected, of the EU's land and sea area, respectively, by 2030. There is also a desire that the Member States implement enough measures to ensure that at least 30 per cent of nature types and species pointed out in the nature conservation directives achieve clearly improved status. Both of these commitments could result in requirements for the protection of larger areas. In terms of the longer term, there is also the commitment within the Habitats Directive that appointed species and nature types shall achieve a favourable conservation status.

The geographic distribution of the marine protected areas is greatest near the coast. Only a few protected areas, mainly Natura 2000 areas, are outside the trawling boundary, which is 3-4 nautical miles from the base line. Sweden's marine area protection covered around 14 per cent of Sweden's internal waters, territorial waters and exclusive economic zone in 2022. This area is based on national parks, nature reserves and Natura 2000 areas. The percentage varies between the marine spatial planning areas, where the largest percentage, 32 per cent, is in Skagerrak and Kattegat and for the Baltic Proper is 17 per cent, and in the Gulf of Bothnia, 5 per cent is protected. In the continued work in marine area protection, the focus is on ensuring the area protection's characteristics as an ecologically representative, coherent and functional network for the protection of core areas in the green infrastructure through the framework and regional plans for marine area protection developed jointly by the coastal county administrative boards and SwAM.

In addition to the geographic distribution, the size of the protected areas is also significant. In order to be able to maintain vital populations of species, a certain size is required.

#### National interest claims in accordance with Chapter 3 of the Environmental Code

SwAM decides on national interests for nature conservation in accordance with Chapter 3, Section 6 of the Environmental Code, in cases where the claims concern marine environments. National interest claims for nature conservation at sea have been prepared based on such criteria as being undisturbed and the number of unique, threatened or vulnerable types of nature or species.

The areas appointed as national interests for nature conservation have few equivalents in the region, either in Sweden or internationally, in terms of especially high nature values. The appointed areas should together represent well the main features of Swedish nature, and the areas should be protected from measures that can substantially harm their value. The areas should be protected from measures that can substantially harm their value.



National interests in accordance with Chapter 4 of the Environmental Code

The areas listed in Chapter 4, Sections 2 to 8 of the Environmental Code are in their entirety of national interest considering the natural and cultural values that are in the areas. This means that all Natura 2000 areas are classified as national interests.

International interaction

#### *Area protection through regional marine environmental conventions*

Sweden is committed to protecting the marine areas that have been pointed out in the scope of the Helsinki Convention (Helcom), which are called Helcom MPA, for the Baltic Sea, including Kattegat. In parts of Kattegat, Helcom's area overlaps with the Oslo-Paris Convention (OSPAR) and its administrative area of the North-East Atlantic. Within OSPAR, there is area protection called OSPAR MPA.

The areas in themselves do not have any legal protection, but Sweden has in most cases chosen areas that are also protected as Natura 2000 areas. By being incorporated into Helcom or OSPAR, they also receive a recognised protection status outside the EU. Area protection in Helcom and OSPAR is based on the respective convention's agreed compilations of marine habitats and species that are deemed threatened.

Sweden's largest Helcom MPA area is on the High Coast, only a very small part of which is a Natura 2000 area.

In the presentation of a Government assignment in autumn 2018, SwAM prepared proposals for additions and adjustments in the network of protected areas according to Helcom and OSPAR. The assignment indicated that the work would focus on areas that are currently entirely or partly protected by other area protection (SwAM, 2018b). In another Government assignment in 2018, the agency presented possible protected marine areas without local anthropogenic impact. The approach was partly to supplement protection according to Natura 2000 with protection according to Helcom and OSPAR (SwAM, 2018g).

#### *Ecologically and biologically significant areas*

The UN Convention on Biological Diversity (CBD) has pointed out areas that, based on scientific criteria, are deemed to be ecologically or biologically significant areas. These areas (EBSA, Ecologically and Biologically Significant Areas) do not have any legal protection in themselves, but the designation indicates areas that are of ecological and biological significance, which shall be able to be taken into account in various contexts.

Within the scope of the Convention, nine EBSA areas were adopted in 2018. Five of the areas are within the marine spatial planning areas:

- Northern Gulf of Bothnia
- Kvarken archipelago
- The Åland Sea, Åland and the Archipelago Sea

- The Southern Gotland harbour porpoise area
- Fladen and Stora, as well as Lilla Middelgrund.

Three of these are cross-border areas that are shared with Finland.

#### *Coordinated marine spatial planning*

In accordance with the EU Marine Spatial Planning Directive, the Member States shall cooperate with other Member States to coordinate their national planning processes. Planning that concerns the marine ecosystem is a central part of a coordinated marine spatial planning and an ecosystem approach shall be applied in the planning.

This cooperation is supported by several projects co-funded by the EU. Sweden has led and participated in several international coordination projects, including the projects Baltic SCOPE 2015-2017 and Pan Baltic Scope 2018-2019. Several on-going projects focus on the marine spatial planning's connection to marine environment management, especially area protection. SwAM participates the eMSP-NBSR project, which covers both the Baltic Sea and the North Sea. SwAM is leading the project's work on ecosystem-based marine spatial planning together with Helcom. Other projects that highlight this perspective are MSP4BIO and MSP-Green.

Through the regional marine conventions Helcom and OSPAR, Sweden also broadly collaborates around the marine environment with, among other things, the United Kingdom and Norway, which are not covered by the joint EU collaborative forum. Within Helcom, there is a special working group for marine spatial planning that has been established in collaboration with the organisation Vision and Strategies around the Baltic Sea, Vasab.

#### *Development work*

Despite earlier and on-going efforts within marine mapping, there is today substantial uncertainty about the distribution of various kinds of nature values in the sea. Some areas can easily be pointed out as valuable or sensitive, but a transparent and uniform process is required in order for the identification of such areas to be comprehensive and accurate. The following mapping projects have bearing on the current and future work of the marine spatial planning.

### *Inventory of offshore banks*


In 2004, the Swedish Environmental Protection Agency was commissioned by the Government to inventory marine nature types on offshore banks, i.e. shallow areas in the open sea. The assignment included highlighting the offshore banks' value from a marine nature conservation perspective, but also assessing the possibilities of coordinating nature conservation's interests with the interest in the establishment of wind power. In two reports (Swedish EPA, 2006, 2010), multi-year mappings were presented of Sweden's offshore banks, which also included a status assessment of marine values presented per species group and habitat, and a total weighted value.

In 2016, SGU was commissioned by SwAM to carry out further studies of Hoburgs bank in order to obtain a more detailed understanding and reliable spatial information on the range of various species and habitats on the seabed. The results are presented in a report (SGU, 2020) that describes how comprehensive mapping with modern methods is used to produce high resolution maps of benthic biotopes and habitats and provides a better picture of how large areas are covered by different habitat types and the spread of more rare smaller habitats.


Map 22. Nature conservation: National interests and national interest claims and national environmental protection

 Marine spatial planning areas


National interests under Ch 4  
Environmental Code

 Natura 2000, Section 8


National interest claims under  
Ch 3 Environmental Code

 Nature conservation, Section 6

Other environmental protection  
under Ch 7 Environmental Code

 National parks, Section 2

 Nature reserves, Sections, 4–6

 Animal and plant protection areas,  
Section 12

(Swedish Environmental Protection Agency)

N 0 25 50 100 km



Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet



Map 23. Natural environment: International environmental protection

Marine spatial planning areas

### Protected areas

Natura 2000

MPA regional marine environment convention HELCOM

MPA regional marine environment convention OSPAR

(Helcom, OSPAR, Swedish Environmental Protection Agency, EEA)

### Other nature values

Ecologically and Biologically Significant Areas, EBSA

(Helcom)

N 0 25 50 100 km

Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet

### *Symphony – a planning aid*

Symphony is an assessment tool to quantitatively weigh together the cumulative impact that a number of different environmental loads, such as trawling, turbidity, noise and emissions from shipping and land-based activities, have on various ecosystem components in the seas. SwAM has developed the method to be used in marine spatial planning and other marine environment management. The method is based on Halpern et al. (2008). With Symphony, the combined, cumulative environmental impact from various loads can be shown based on the present situation, future outlook or changes through the planning. The cumulative environmental impact refers to the combined load from various human activities on plant and animal life in the sea.

The cumulative load is based on a mapping of 32 nature values, such as reef environments, various fish and bird species and mussel colonies. Materials have been collected from, for example, the Geological Survey of Sweden (SGU), the Swedish Meteorological and Hydrological Institute (SMHI) and the Swedish University of Agricultural Sciences (SLU). The nature values' sensitivity to different loads has been assessed by scientific experts together with associated assessment of uncertainties based on the level of knowledge for various components. Symphony calculates the sum of loads' impact on all nature values with different sensitivity at every location in the sea, in grids of 250 x 250 metres. The sum can be translated into a colour scale that makes it easier to see areas with a high and low impact.

Besides cumulative loads linked to the uses of the marine spatial planning, Symphony provides a summary of the sea's nature values. It has been used as input in the marine spatial planning under the name Symphony Green Map, also mentioned as Green Map 3. The map has formed one of several bases for the identification of areas for particular consideration of high nature values (so-called lower-case n-regions). Symphony has been used in the impact assessment to analyse how the nature values in various areas can be affected by energy extraction.

### *National marine mapping*

The National Marine Mapping project is run by SwAM and aims to develop comprehensive biological maps of the seabed and surrounding habitats for all of Sweden's marine areas. It is an on-going multi-year project with support from the coastal county administrative boards and will result in uniform and comparable mappings to be used in marine management.

### *National and regional action plan for marine area protection*

The management of marine protected areas is in an active phase. A national action plan for marine area protection (SwAM, 2016a) has been prepared. SwAM has also prepared a framework and three regional plans for marine area protection in collaboration with affected coastal county administrative boards (2021). The regional plans identify, among other things, common objectives of protection of various conservation values within the regional areas in the Baltic Sea, the division of which is consistent with the corresponding marine spatial planning areas, although with the distribution all the way to the coastline.

### *Regional action plans for green infrastructure*

Green infrastructure is a network of nature that contributes to functioning habitats for plants and animals and to human well-being.

The definition reads as follows: “*Green infrastructure is an ecologically functional network of habitats and structures, natural areas and constructed elements that are designed, used and managed in a way that preserves biodiversity and promotes ecosystem services that are important to society throughout the landscape.*” (SwAM, 2023e)

In 2015, the Government assigned all county administrative boards to prepare regional action plans for green infrastructure. The Swedish Environmental Protection Agency has overall coordinating responsibility and SwAM has assisted with coordination and knowledge in the work that concerns green infrastructure in the sea. An important part of SwAM's knowledge support has been to prepare a proposal for a framework for natural value assessment in a marine environment called Mosaic. With the help of the framework, methods and documentation that promote the preservation of nature values and ecosystem services can develop coherently in the coastal county administrative boards' administrative areas and create a basis for a well-functioning green infrastructure that takes the entire landscape into account. The county administrative board's regional action plans for green infrastructure are now in place. The plans are designed so that they can be used by various actors as knowledge and planning documents, such as in decisions on how land and water can be used.

#### *Conservation plans for Natura 2000 areas.*

The county administrative board is responsible for preparing conservation plans for Natura 2000 areas. The conservation plans describe what species and habitats are to be protected. The use of the sea in and near existing and planned protected areas must not damage identified protective values or expose the species to be protected to a disturbance that can significantly impede the conservation in the area.

#### *Additional needs*

From an overall perspective, there is a need for continued work on the mapping of the marine environment and for a developed understanding of how various uses affect it and the marine ecosystem services. More specifically, there is a special need for a developed planning documentation for high nature values with regard to climate refugia. The same applies to more detailed knowledge of the migration routes of migratory birds and bats that can be affected by permanent installations in the sea. There is also a need for increased knowledge about the resting and wintering areas and the dynamics for birds within them. For example, the extent to which long-tailed ducks shift between different shallow areas during the season, and between years, may be important to know in order to better be able to formulate relevant protective measures. There is also a need for more knowledge and a developed planning input regarding the impact of defence activities on high nature values.



## Recreation and tourism

Recreation and tourism in and by the sea include landscape and nature experiences and various outdoor activities. It also includes visits to cultural environments such as fishing villages, lighthouse stations and pilot stations as well as wreck diving. These environments are of significance to local identity, well-being and quality of life. The values that form the basis for outdoor recreation and tourism are therefore strongly tied to the landscape and the natural and cultural values that are in the landscape.

Opportunities for a rich outdoor recreation are valuable to many, both the individual and society at large. Being out in nature can entail a number of positive effects on health, such as reduced stress, strengthened cognitive ability and improved mental health. It also promotes physical activity at the same time that it provides the possibility of social contacts in a relaxing environment (Public Health Agency, 2023).

What outdoor recreation is and what it encompasses varies for different people. In the Ordinance on State Grants to Outdoor Recreation Organisations (2010:2008), it is defined as follows: Outdoor recreation is time spent outdoors in natural and cultural landscapes for well-being and to experience nature without a requirement of competition.

Areas that are attractive to visit are also important for regional development and for the development of maritime industries, such as tourism. Proximity to the sea, high natural and cultural historic values make the coastal landscape an attractive place to live and also invite recreational activities as well as growing national and international tourism.

Outdoor recreation and tourism occur to a greater extent on the coasts and to a more limited extent in the marine areas that are included in the national marine spatial plans, even if a lot of activities are also out at sea. Outdoor recreation and tourism on the coasts can, however, be affected in various ways by other activities at the sea, such as offshore wind energy production.

### Existing use

Existing statistics indicate that the amount of outdoor recreation has been relatively stable over the past 30 years, even if we can see an increased interest, not least during the years of the pandemic. There are no separate statistics for marine outdoor recreation, but figures for general outdoor recreation show that there are differences in outdoor recreation activity between different age groups, genders and socio-economic backgrounds (Skriver Hansen et al., 2021).

When it comes to tourism, a great deal of impact still remains after the pandemic years even if the sector is beginning to recover. Some changes that still remain are, for example, an increased interest in experiencing nature and that domestic tourism is an increasingly large part of the tourism in Sweden (Tillväxtverket, 2022).

Outdoor recreation is dependent on several conditions to come about. It is a matter of there being adequate access to natural and cultural heritage areas of good quality where it is possible to practise outdoor recreation. These areas also need to be accessible, both physically and in terms of experiences, to the outdoor recreation practitioners, who can be both local residents and visitors. Nature areas that are protected in various ways, such as national parks, Natura 2000 areas and nature reserves are especially important for outdoor recreation and its development.

Coastal areas and marine landscapes can have several different qualities that contribute to experiences and outdoor recreation that may need to be taken into account in the planning (Swedish EPA, 2022). In this context, qualities in the landscape can be:

- A large diversity of experiences in the same area.
- A large diversity of types of nature and species.
- Areas with nature and cultural environments representative of Sweden.
- A rich occurrence of rare types of nature and species.
- Geologically interesting places
- Good possibilities for views over the surroundings, with or without an unbroken horizon.
- Quiet areas.
- Other qualities in the landscape that are suitable for various activities, such as paddling, swimming, boating, fishing, hunting, cycling, climbing, horseback riding, etc.

Even if outdoor recreation and tourism mainly take place in coastal areas, several of these qualities may be affected to varying degrees by marine spatial planning. For example, quiet areas and unbroken horizons may be affected by offshore wind establishments, depending on proximity to the coast.

#### *Outdoor recreation activities in and at the sea*

Many different types of outdoor activities take place in or by the sea. Among the most common activities are walks and hikes along the coast and swimming in the sea or lake (Fredman et al., 2019). Other sea-related outdoor recreation activities include recreational boating, diving, seal safaris, stand-up paddle boarding and kayaking. During parts of the year in parts of the marine area, activities on ice, such as ice skating, also take place. Sweden has a rich biological marine life, which strengthens the conditions for outdoor recreation through varied experiences. For example, there are many well-preserved wrecks that are of interest to divers and snorkelling trails that have been established in certain places with the aim of promoting interest in the underwater environment.

Birdwatching is a popular outdoor activity that is, of course, dependent on the bird population. Hunting of sea birds, among other things, also occurs along the coast.

#### *Recreational boating*

In Sweden, there are around 865,000 sea-worthy recreational boats. The Swedish Transport Agency's 2020 boating survey shows that more people have developed an interest in boating in recent years. In a total of 16 per cent of the Swedish households, there is at least one recreational boat, and small boats and day-trip boats constitute the majority of this stock. During May-September 2020, the number of days when boats were used amounted to over 19 million and the number of overnight stays was 2.7 million during the season. The experience of freedom and experiencing nature is what the Swedes value most when it comes to boating (Swedish Transport Agency, 2021).

There are over 1,500 recreational boat marinas, of which more than 400 are classified as guest harbours (SweBoat, 2019). The number of maritime guest nights steadily increased until 2019, but a clear decrease occurred in 2020 from around 16 million maritime guest nights in 2019 to around 11.6 million in 2020. Some recovery has taken place in 2021, although to a lesser extent in terms

of cruise passengers (SwAM, 2023d). The Skagerrak/Kattegat and the Baltic Sea each account for around 45 per cent of guest nights, while the Gulf of Bothnia accounts for barely 6 percent. Of the overnight stays in guest harbours in 2018, 37 per cent were foreign-flagged boats, mainly from northern European countries. Day trips and fishing trips are the most common uses of motor boats, while sailing boats are used to a greater extent for longer trips with overnight stops. International cruise tourism steadily increased in Swedish ports before the pandemic, but has not recovered to previous levels (Traffic Analysis, 2023b).

### *Angling*

Angling is fishing for recreation or for consumption of the catch in one's own household. The catch may not be sold. There are good conditions for angling in Sweden and it is a popular activity. In 2021, around 1.5 million Swedish citizens between the ages of 16 and 80 at some point spent time angling in Swedish waters and jointly spent SEK 15.3 billion on expenses and investments, such as boat purchases, fishing licences and trips. Of the total number of angling days in Sweden, 30 per cent related to fishing in the sea and along the coasts (SwAM and SCB, 2022). Angling refers to all fishing that does not take place with the support of a fishing licence or personal fishing licence. Recreational fishing takes place mostly with rod and reel, but can also be conducted with fishing gear, such as longlines, nets, hoop nets and cages, but other gear is also used. Some of the angling takes place through organised excursion boat fishing or through guide boats. Excursion boat fishing makes the angling accessible at the same time as it provides local employment.

Angling is most popular in the summer, but is also conducted during the winter on the sea ice, mainly in the central Baltic Sea and the Gulf of Bothnia (SwAM and SCB, 2022). The majority of recreational fishing is conducted using just a simple fishing rod. Since recreational fishing is often conducted near the angler's town of residence, its intensity is often related to the population density and it is therefore spread out along the whole coast. But there are other factors that also affect where people choose to fish, such as areas that are protected from wind and weather, access to service and whether the fish population is sufficiently large to attract anglers.

### *Recreation and tourism in the Gulf of Bothnia*

Visiting and outlook locations at the sea as well as natural harbours and marinas for small boats are of major importance to recreation and tourism in the coastal areas of the Gulf of Bothnia. A particularly important area is the High Coast with its rolling coastline and traces of the world's highest uplift of land. The more than 4,000 islands of the Bothnia Bay archipelago, with excursion boat traffic, ice roads and many designated tourist destinations, are also of major importance. Haparanda Archipelago, furthest in the north, is a national park and an important area. If the ice permits, kick-sledding, skating and skiing on the ice are popular in the winter.

The recreation areas are important to regional development with regard to housing, recreation and tourism. It is estimated that there is great potential to develop the tourism industry, as a result of the relatively undeveloped Norrland coast being very attractive and having plenty of opportunities for angling.

Angling is a significant activity in the Gulf of Bothnia. Statistics show that Swedes spent around 500,000 fishing days in the Gulf of Bothnia's coastal and marine areas in 2021. The most

important target species in the Gulf of Bothnia are perch, trout, pike and whitefish and to some extent also herring and salmon (SwAM and SCB, 2022).

#### *Recreation and tourism in the Baltic Sea*

The Baltic Sea area encompasses the metropolitan regions of Stockholm and Malmö, Sweden's largest islands Gotland and Öland, unique cross-border archipelago environments, and areas of great importance for holiday homes and outdoor recreation.

Land conditions vary, from Skåne's sandy beaches via the limestone cliffs of the Gotland coastline to Stockholm's archipelago with its islands and skerries of gneiss and granite. In the more densely populated coastal areas of Skåne and Stockholm County, there is more pressure on the attractive coastal areas. On Gotland and Öland, the recreation sector and tourism are important to regional development. There are valuable areas for outdoor recreation in Stockholm's archipelago and the open sea.

The Öresund area is densely populated and one of the most developed areas in Sweden. Frequent recreational boating traffic and fishing tours are conducted there. Along Sweden's southern coast, there are valuable natural environments that form the basis for recreation, tourism and activities such as sports and wreck diving.

Large parts of the coast of Gotland coast have untouched and varied nature that is used for outdoor recreation by both residents and tourists. Along the coast, there are also many old and well-preserved fishing villages of high cultural heritage value. Hoburgs bank, Salvorev and Gotska sandön are Sweden's most important bird areas in the Baltic Sea, which together with the Natura 2000 areas in the coastal zone are important destinations for outdoor life, recreation and bird watching. Gotska Sandön is also protected as a national park.

Angling is a significant recreational activity in the Baltic Sea area. Statistics show that Swedes spent around 2.5 million fishing days in the Baltic Sea proper and Öresund in 2021 (SwAM and SCB, 2022). Angling in the Baltic Sea is mainly conducted close to the coast, but often in boat.

Pike and perch are the most caught species by angling in the Baltic Sea. Other species are cod, whitefish and flatfish. There is also trolling for migratory salmon, especially in the Simrishamn area, but also off other parts of the coast of Skåne and Blekinge.

#### *Recreation and tourism in Skagerrak and Kattegat*

In Skagerrak and Kattegat, tourism is increasing and development pressure is considerable in the coastal zone. During the summer, the population of Halland doubles and the population in northern Bohuslän increases fivefold. Recreational boating is extensive here, and 27 per cent of all boating-related overnight stays in Sweden occur in northern Bohuslän (SwAM, 2015b).

The entire coastal zone is important to regional development in terms of housing, recreation and tourism with activities such as swimming, diving and recreational boating. The Koster Archipelago in Skagerrak has a very high outdoor recreation value, which is illustrated by Kosterhavet National Park, established in 2009.

In Skagerrak, there are stretches with extensive recreational boat traffic between the Gothenburg area and Jylland and Læsø in Denmark. Also, in the southern part of the marine spatial planning

area, in Kattegat, there is extensive recreational boating, which makes the area one of the most congested.

Angling is also a significant recreational activity in Skagerrak and Kattegat. Statistics show that Swedes spent around 1,200,000 fishing days in Skagerrak and Kattegat's coastal and marine area during 2021. Most of the angling in Skagerrak and Kattegat takes place close to the coast. In Skagerrak, an overwhelming part of the fishing is done by boat, while in Kattegat it is evenly divided between fishing from a boat and from land. In terms of quantity, mackerel is by far the most significant species for angling in Skagerrak and Kattegat. Other species are cod, crab, lobster and flatfish (SwAM and SCB, 2022). Tour boat fishing on offshore shallows/archipelagos and guided tours to catch large crustaceans with cages occur in these areas.

### Claims

Recreation, angling and tourism have varying requirements for the sea, including high natural and cultural values, good accessibility and service, good water quality and abundant plant and animal life (e.g., strong fish populations with natural size distribution). The tourism industry is expected to continue to grow after a decline during the pandemic and can thereby create conditions for further development along the coasts. This may also increase the pressure mainly on the coastal zones of the metropolitan regions, and thereby affect and be affected by the development in the sea. Outdoor recreation is also expected to have an increased significance, which continues to provide a large need for access to nature and cultural heritage settings of good quality.

### National objectives and strategies

In 2012, the Swedish Parliament set ten national targets for outdoor recreation policy to be achieved by 2020. These were that:

- nature is to be accessible to all
- personal and volunteer engagement is central
- the right to public access is to be safeguarded
- sustainable use takes the needs of outdoor recreation into account
- the municipalities have a strong responsibility for nature close to urban areas
- outdoor recreation contributes to rural development and regional growth
- protected areas are an asset for outdoor recreation
- outdoor recreation has a given role in the work of schools
- physical activity and relaxation strengthen public health
- decisions on outdoor recreation are made with good knowledge.

Follow-up of the objectives was done in 2019 and indicated that protected areas, accessible nature and engagement and collaboration developed positively while the other objectives had unclear or negative development. In addition, there are some challenges, such as a lack of knowledge input to perform assessments and for other aspects, such as increased development pressure (Swedish EPA, 2019).

The environmental quality objectives under Sweden's environmental objectives cover outdoor recreation and have several specifications that concern outdoor recreation. Read more at [www.sverigesmiljomal.se](http://www.sverigesmiljomal.se).

In 2021, the Government decided on a Strategy for sustainable tourism and growing tourism industries (Government, 2021d). The vision is that Sweden in 2030 is the world's most sustainable and attractive destination built on innovation. To achieve this vision, a number of strategic areas are identified for sustainable tourism and growing tourism industries. These are easier entrepreneurship, jobs and skills, knowledge and innovation, accessibility and marketing. Four horizontal perspectives are linked to each area: sustainability, digitalisation, location development and collaboration.

### Developments and trends

Outdoor recreation is undergoing continuous development, such as using new outdoor recreation equipment, new ways of organising, digitalisation and diversification of activities. Outdoor recreation today is more multifaceted and a trend that has grown strong and diversified is the sportification of outdoor recreation. At the same time, the majority of outdoor recreation is characterised by fairly simple and everyday activities. Those who are new outdoor recreation practitioners mainly seek out accessible, prepared and well-known areas, which results in more experienced people looking further afield to places that are further away (Swedish EPA, 2022).

Since the beginning of the 2000s, tourism in Sweden has had a steady growth. Swedish and foreign visitors' consumption in Sweden amounted to SEK 249 billion in 2021 and tourism's share of GDP was around 2.6 per cent between 2015 and 2018 (Tillväxtverket, 2022). From a broader societal perspective, tourism also contributes to local and regional development, investments, service, conservation and development of natural and cultural environments and can strengthen the attractiveness of places.

The positive development of tourism and the tourism industry experienced an abrupt stop in the spring of 2020 at the outbreak of the COVID-19 pandemic. According to the OECD, the turnover for international tourism decreased by as much as 80 per cent in 2020. Domestic tourism could to some extent be maintained and was strengthened in some places. The pandemic has meant that people visited natural and cultural environments to a greater extent than before. Interest in nature tourism and outdoor recreation has increased. The pressure on many tourist destinations has been extensive and has therefore also entailed increased wear and tear in physical environments. It is still too early to evaluate the long-term consequences of the COVID-19 pandemic, but it is likely that tourism will change (Government, 2021d).

Climate change and adaptations are expected to affect both tourism and outdoor recreation, see more under the heading climate.

### National interest claims in accordance with Chapter 3 of the Environmental Code

The national interest claims for outdoor recreation are defined as areas with large outdoor recreation values due to special nature and cultural values. An area is deemed to be of national interest to recreation if its nature and/or cultural values and accessibility to the public mean that it is or can become attractive to visitors from all or most of the country, or to visitors from overseas. Other areas might also be of national interest to recreation if they are important to many people's



recreation and are often visited. This applies above all to the three metropolitan regions, where the need for nature close to urban areas shall receive special attention.

The Swedish Environmental Protection Agency together with SwAM decides on national interests for outdoor recreation, according to Chapter 3, Section 6 of the Environmental Code. Along the coast, there are national interest claims that can be indirectly affected by activities at sea. There are over 60 appointed national interest areas with the nature type sea and coast. The majority of the areas comprise both land and water, but few extend out into the marine spatial planning area.

#### National interests in accordance with Chapter 4 of the Environmental Code

Along the coast, there are several areas of national interest for outdoor recreation/active outdoor recreation that are geographically pointed out in the Environmental Code and approved by the Swedish Parliament. There are national interest areas according to Chapter 4, Section 2 of the Environmental Code that extend along the coast in Bohuslän, Halland, the Östergötland Archipelago, the Södermanland and Stockholm archipelagos, the High Coast and Norrbotten. These areas have such high nature and cultural values that they are, or could be, attractive to a great number of visitors from all or most of the country, or to visitors from overseas. The interests of tourism and outdoor recreation, mainly active outdoor recreation, must be especially taken into account in the assessment of development efforts or other interventions in the environment.

The boundaries set out in the Environmental Code are overall and can be delimited more precisely in the municipal comprehensive planning in dialogue with the county administrative board.

#### Other national interests of relevance to outdoor recreation

There are also other areas of national interest that have a bearing on outdoor recreation and to some extent tourism. Among other things, the areas that are of national interest to cultural heritage conservation according to Chapter 3, Section 6 of the Environmental Code include environments that are also of value to outdoor recreation. These can be, for example, mill environments or fields and pastures. Also see the section on cultural heritage for more information. Areas of national interests in nature conservation can also be of great value to outdoor recreation and tourism. However, in terms of nature conservation, areas with established protection at various levels are of even greater importance for outdoor recreation, such as national parks or nature reserves. Some areas of national interest for commercial fishing are also of importance for angling.

#### Development of planning documentation

There is a need for underlying planning input that reflects the significance of recreational values, including tourism and outdoor recreation, for the national marine spatial planning. Documentation at a local and regional level may be of relevance and contribute to a collective national documentation if it can be evaluated from a national perspective. The county administrative boards prepared a preliminary study with proposals of new planning documents for marine outdoor recreation that stated that future planning documents should distinguish between mapping of areas where activities are conducted today and which areas have conditions for valuable experiences, such as unbroken horizons, being untouched and magnificent. Planning

documentation should accordingly take into account conditions for experience values as well as existing use (County Administrative Boards, 2020).

#### International interaction

The recreation values along the Swedish coasts attract visitors from all over the world. Intensive recreational boat traffic and fishing tours are conducted between Sweden and our neighbouring countries, as well as growing international cruise traffic. Mainly during the summer, this may mean that it becomes crowded and there is competition for space in various marine areas.

Sweden is well known for good conditions and accessibility to magnificent natural experiences, not least linked to coastal and sea-based outdoor recreation. It is thereby of great importance to plan well to retain the experience values. At the same time that the development potential is met both nationally and in collaboration with other countries.

Map 24. Recreation: National interests and national interest claims

Marine spatial planning areas

National interests under Ch 4  
Environmental Code

Active outdoor recreation, Sect 2

National interest claims under  
Ch 3 Environmental Code

Outdoor recreation, Sect 6

(Swedish Environmental Protection Agency,  
Swedish Agency for Marine and Water Management)

N 0 25 50 100 km



Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet

## Environment and climate

Recreation and tourism involve a large number of activities that, to a varying degree, require access to a healthy sea and various ecosystem services. At the same time, tourism and recreation use ecosystem services from nature, the actual activities may negatively impact the environment in several ways.

Motor-powered traffic at sea, from large cruise ships to small motor boats, increases the number of discharges into the sea. Recreational boats can negatively affect the seabed through mechanical wear on valuable shallow areas, such as eelgrass beds. Docks can also cause eelgrass beds to disappear. Other forms of transportation used for recreation and tourism also use motor-powered transport to a large degree. Weekend/holiday homes and commercial accommodations produce sewage that results in nitrogen and phosphorus leaking out into the sea. In this way, even land-based tourism and recreation affects the eutrophication of the sea (SwAM, 2020; Moksnes et al., 2019).

Other pollutants in the sea come from various types of antifouling paint. These pollutants are found in the water and bottom sediment, and accumulate in fish and shellfish. Tourism and recreation by and in the sea also produce marine litter, which is washed ashore or left on the beach. The environmental effects of transport systems in the form of emissions, noise and consumption of finite resources are to some extent caused by tourism even if commercial transports account for a significantly larger share of these effects. Noise from jet skis and other motor-powered recreational craft is a growing problem. Disruptive recreational activities such as these have a negative effect on other types of tourism and recreation.

As tourism increases, there is also a risk of areas with high nature values becoming over-exploited and of plant and animal life being negatively affected by anchoring and the intensive use of natural harbours.

Increasing tourism can entail greater emissions of carbon dioxide, since many foreign tourists travel long distances, often by air. Cruise traffic and boating with motor boats also entail such emissions. Climate changes can affect the preconditions for tourism and recreation in several ways. A warmer climate can in the long term threaten ice formation in the Bothnian Bay Archipelago and shorten the tourist season in winter. At the same time, a warmer climate in the long term can make it more attractive to holiday in Sweden. On the other hand, increased rainfall during the summer could have the opposite effect. A warmer climate in other parts of the world can also entail increased tourism to Sweden with a relatively cooler climate. Changes in temperature and salinity in the sea affect fish stocks and conditions for angling, but also the intensity of algal blooms, the frequency of storms and increased precipitation. In northern Sweden, sea level rise can affect conditions on the coast in the very long term. In Skåne, where land is already sinking, this tendency may become more exaggerated and the erosion of shorelines may increase.



## Shipping

Shipping is a global sector of major significance to Sweden (UNCTAD, 2023). Shipping is also important for the transport of passengers, and in the EU alone, the number of passengers in EU ports exceeded 400 million per year before the COVID-19 pandemic (Eurostat, 2023). In Sweden, the vessels mainly move in an extensive network of shipping lanes and shipping routes in the sea and major lakes. Swedish industry is dependent on an effective transport system since this system affects the costs of geographic transactions. Shipping is the most significant mode in respect of the export of raw materials, which is intensive, and for other industrial sectors that export large volumes. Furthermore, shipping is of significance to the need of civil defence for a functioning supply of goods and services to Sweden.

### Existing use

Sweden's waterway system is divided into four classes; it is primarily classes one and two that are used for commercial shipping. Classes three and four are intended for smaller vessels and for recreational boat traffic. For all waterways there are restrictions regarding the size of vessels that may use them. They are marked in different ways that are adapted to the type of traffic for which they are intended. Outside of the archipelagos, in addition to the shipping lanes, there are direct, unmarked routes connecting the lanes. These direct routes change in the winter, since the vessels take the most accessible route with or without the assistance of icebreakers. Ships also move outside the shipping lanes that are presented in planning or as national interests. In reality, shipping traffic can use all areas that do not have direct restrictions or where there are no technical obstacles.

### Routing systems

Routing systems are intended to reduce the risks of accidents. The term "routing system" encompasses traffic separation systems (TSS), one- and two-way lanes, recommended lanes, deep-water lanes and prohibited areas.

The UN International Maritime Organization (IMO) is the international body that can establish and adopt regulations regarding routing systems for international shipping. Routing systems are recommended, but may be made compulsory through IMO decisions. These changes are negotiated with all member countries in the IMO.

### Freight flows

In 2021, the freight volumes over quay amounted to around 168 million tonnes (Traffic Analysis, 2022). Four-fifths were transported on cargo ships and one-fifth on ferries. The freight flows to and from Sweden especially concern the large transoceanic ports on the North Sea and the English Channel, such as Antwerp, Hamburg and Rotterdam. The shipping of goods overseas has increased in the last decade, while domestic transportation has remained relatively constant. In a normal year, domestic shipping only comprises about seven per cent of total shipping transports, calculated as a percentage of goods. Petroleum products, minerals and lime and cement are dominant types of goods.

## Passenger traffic

Passenger traffic is also of major importance. In addition to the important passenger traffic between the mainland and Gotland, there are a large number of international ferry connections. In 2021, a total of just under 21 million passengers travelled by ship in Sweden, down from around 38 million in the years before the COVID-19 pandemic (Swedish Maritime Administration, 2023). Sweden has ferry links with Norway, Denmark, Germany, Poland, Lithuania, Latvia, Estonia and Finland.

## Ports

The ports in Sweden are important logistics hubs in regional, national and international transport chains. In Sweden, there are over one hundred ports, of which around 50 are public ports and the others are industrial ports. The ports are of varying size and both handle goods and serve as combined terminals for transshipment between shipping and other modes of transport. The ports fulfil different functions within the transport system and this has affected their location and their specialisations in different types of goods. The EU has pointed out core ports in the TEN-T (Trans-European Transport Network), which are considered to be strategically important and especially prioritised as they link to the nine corridors of the European Core Network. Five of these core ports are in Sweden and belong to the Scandinavia-Mediterranean corridor: Luleå, Stockholm, Gothenburg, Malmö/Copenhagen (CMP) and Trelleborg. In addition, 21 Swedish ports are included in the overall TEN-T network (European Commission, 2022). Among the Swedish export ports, the largest flows of goods are in Gothenburg, Brofjorden, Helsingborg, Malmö, Trelleborg, Stockholm and Luleå (Swedish Maritime Administration, 2023).



The regional freight exports and imports handled by Swedish ports for the period 2018-2020 are shown in Figure 7.6-3 and Figure 7.6-4. Both the export and import flows are the largest in ports on the west coast, with Gothenburg as Sweden's largest port in terms of the amount of goods.

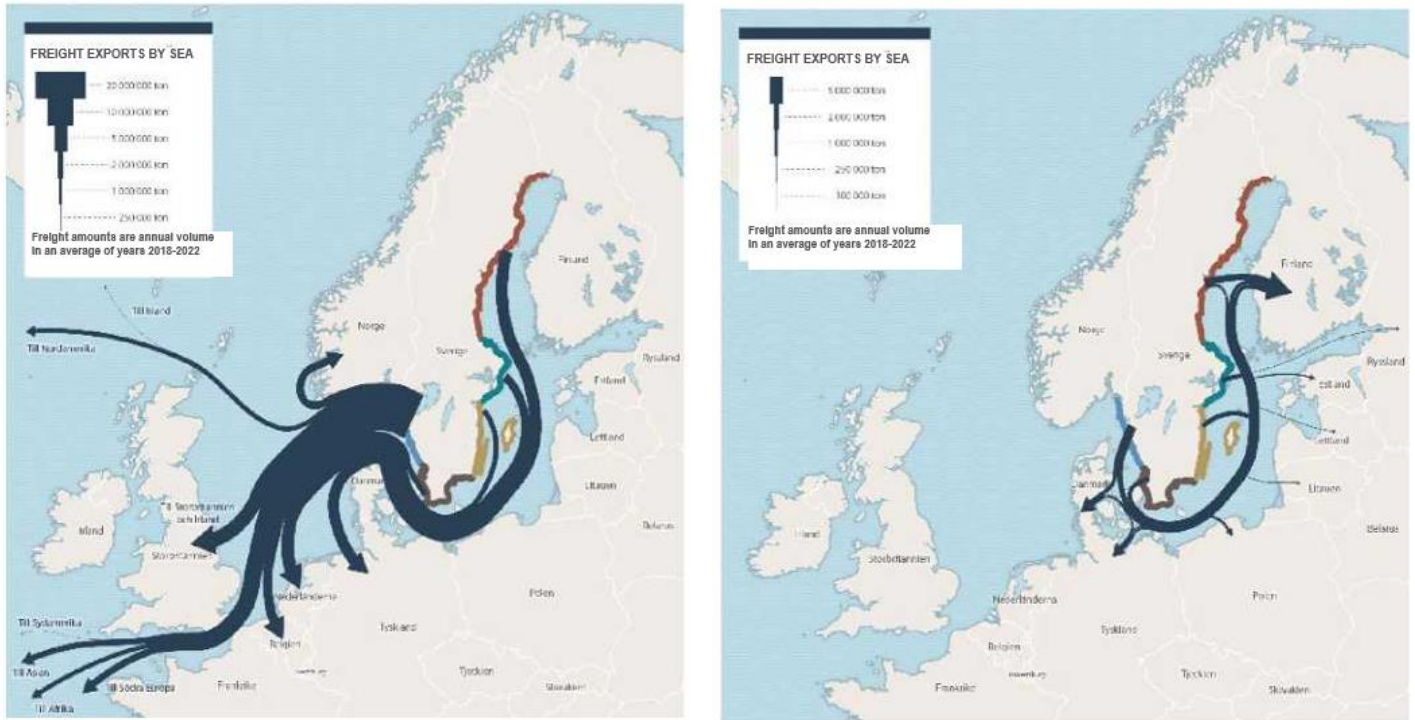


Figure 7.6-3 Freight exports by sea to countries outside (left) and in (right) the Baltic Sea, average in tonnes for the years 2018-2020 (Traffic Analysis, 2022)

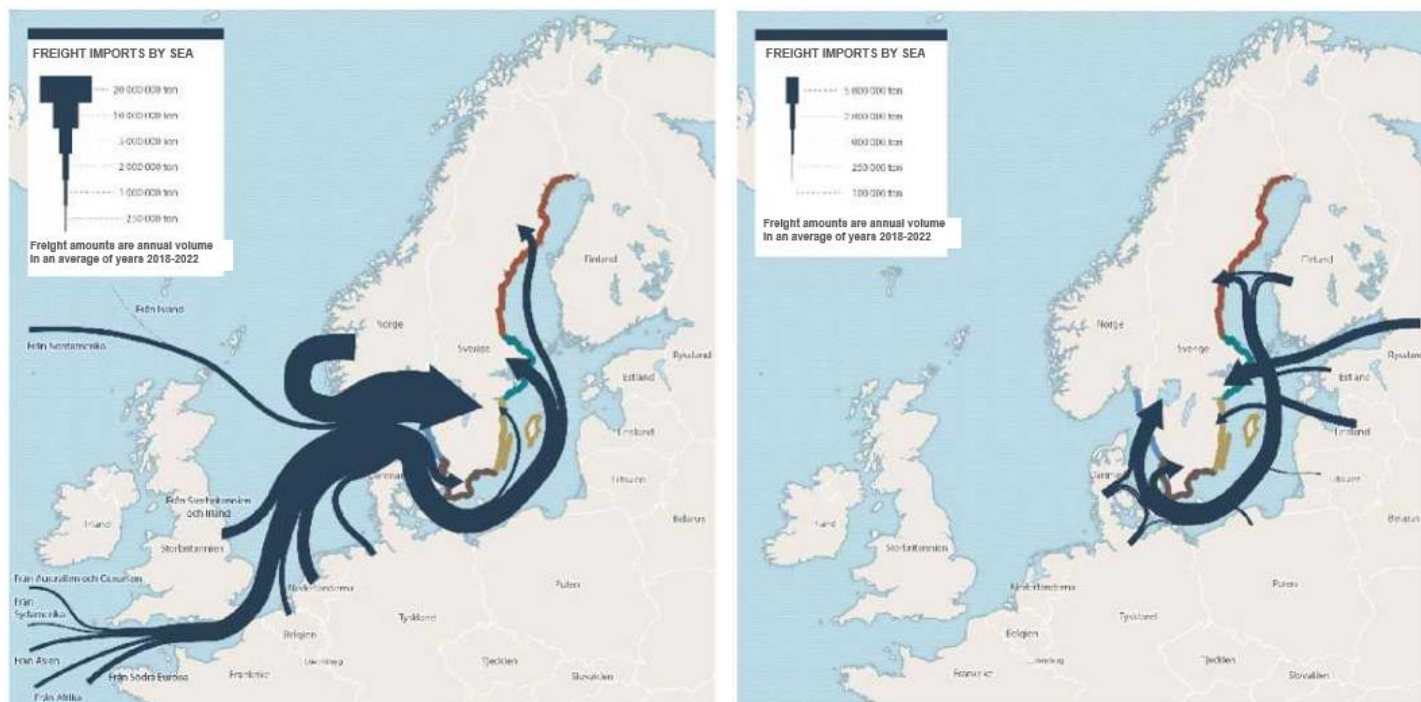


Figure 7.6-4 - Freight imports by sea from countries outside (left) and in (right) the Baltic Sea, average in tonnes for the years 2018-2020 (Traffic Analysis, 2022)

### Shipping in the Gulf of Bothnia

Many large and important industries in Norrland use shipping for their transports, with traffic to both Swedish and Finnish ports before the majority of the goods reach the end-user in Central Europe or in the UK. Shipping has limited room to manoeuvre in the Northern Bothnian Sea and North Kvarken and is divided into a traffic separation system (TSS) due to the depth conditions and the narrow passage. In addition, there are special conditions in winter in the Bothnian Bay with thick and extensive sea ice, but the Southern Bothnian Sea is also regularly affected by extensive ice formation. During a normal or hard ice winter, the entire northern Baltic Sea and the central Baltic Sea are covered by ice.

Extensive ice formation affects the conditions for shipping, which needs large areas and access to alternative shipping lanes to ensure navigability. Claims to large marine areas for permanent installations such as wind farms therefore constitute a particularly large challenge to winter navigation in the entire Gulf of Bothnia, as they risk limiting the flexibility that is considered to be necessary for accessibility. The knowledge of how ice conditions are affected by a large number of permanent installations is currently limited and the Swedish Maritime Administration has called for a special investigation of the impact of offshore wind energy on winter navigation before decisions on large-scale wind power expansion in the Gulf of Bothnia are made. The issue is especially relevant considering the expected increases in the freight volumes to and from Norrland's ports.

### Shipping in the Baltic Sea

Shipping is substantial in the whole of the Baltic Sea. There are several important ports along the Baltic Sea coast. Shipping traffic traverses both to the mainland coast, to Gotland, and further north or south to both Swedish and foreign ports. West of Gotland, there is mainly traffic with

Swedish destinations, while international traffic to and from the Gulf of Finland and the Baltic countries is dominant south and east of Gotland.

For shipping traffic to and from the Baltic Sea, there are three alternative routes: Öresund, the Kiel Canal and the Great Belt. The most trafficked shipping lane in the Baltic Sea is the Öresund route that runs through the South Baltic Sea along Sweden's southern coast in a system of traffic separations. Traffic through the Öresund route is limited, however, by the depth at Flintrännan between Copenhagen and Malmö of around 7.5 metres, which is why ships with a larger draft must use one of the alternative routes.

### Shipping in Skagerrak and Kattegat

Shipping traffic is extensive throughout Skagerrak and Kattegat, even close to the coast, and there are several ports of major significance to Swedish foreign trade. A significant part of the traffic to and from the Baltic Sea passes through Kattegat and Öresund. Through Skagerrak, shipping lanes extend further out into the North Sea and the ocean.

In Kattegat, shipping is important and extensive because the area is one of only two ways into the Baltic Sea for large vessels. The shipping lanes are widespread in the entire marine area with several lanes from north to south and into the ports along the coasts, on both the Swedish and Danish sides.

In the south, off of Stora and Lilla Middelgrund, there is the choice of routes of Öresund or Stora Bält, both of which limit the height and depth the vessels can have. The Stora Bält bridge limits the height. To guarantee safe shipping through the shallow waters in Kattegat, new traffic separation regulations were approved in 2018 on both sides of the offshore banks (International Maritime Organization, 2018). These measures entered into force in 2020.

Skagerrak and Kattegat are home to Sweden's two largest ports, the Port of Gothenburg and the Port of Brofjorden. Shipping therefore exists in the entire marine spatial planning area with several shipping lanes from Oslo in the north to Kattegat in the south and in towards the coast and out past Skagen towards the North Sea.

### Claims

The freight trend in shipping has been relatively stable since 2015, with regard to both imports and exports. The latest freight forecasts show a small estimated increase of four per cent in terms of imports, while exported goods are expected to increase by 21 per cent until 2030. The increase is expected to take place mainly in dry bulk where iron ore is considered to make up the largest part of the exports. The freight flows to and from ports in the region of Upper Norrland are expected to increase most, with an expected percentage increase in the import and export flows between 2022 and 2030 of as much as 32 per cent and 88 per cent, respectively (Swedish Maritime Administration, 2023). The national freight transport strategy stipulates that a shift of freight transports from road to rail and shipping is to be promoted, but this shift has been difficult to measure to date (Swedish Maritime Administration, 2023). It is therefore not possible to predict if the strategy will have a major impact on the shipping freight flows.

The increase in ship size is a global trend that has existed for many years and is expected to continue, including in Sweden and its immediate area. This development especially concerns the

ports, the infrastructure and equipment of which needs to be adapted to larger ships. Environmental and regulatory aspects also need to be adapted to ensure the ships' navigability and navigational safety. Together with continued containerisation, increasing ship sizes are two of the most important factors behind port investments, which drive other developments in e.g. digitalisation and automation (Swedish Maritime Administration, 2023).

The area needed for shipping on and over the sea is today heavily burdened. Shipping is conducted in all areas that the marine spatial plans cover and, in its entirety, has a significantly larger need than the marine spatial plan areas with the use shipping. Shipping is expected to increase in the future, which is why preservation of areas already specially pointed-out for shipping is of major importance to ensuring accessibility and navigability. Changed trade patterns and requirements for new connections can in the long term increase the needs for specially appointed areas.

### Technology development

New technology development is difficult to plan for at present. Automated vessels and ships with other designs and fuels are under development. A transition to more vessels that use liquefied natural gas (LNG), methanol and other alternative fuels can contribute to less dependence on oil. This might mean that some ports will need to rebuild or that the traffic intensity to bunker ports with LNG supplies will intensify. Electrification is also under way, including electric ferries between Helsingborg and Helsingör.

Development of systems for traffic control and navigation is under way, including route optimization (STM - Sea Traffic Management). The systems aim to increase safety, reduce environmental impact and increase efficiency at sea. Through information sharing in real-time where all parties share each other's routes, intentions and plans, the number of groundings and collisions is estimated to decrease by over 60 per cent (Swedish Maritime Administration, 2019; STM, 2021).

### The Future

New demands implying higher transport costs can affect developments in shipping. Cruise traffic in the Baltic Sea continues to grow, with more and bigger vessels. Developments within world shipping mean that vessels calling at Swedish ports are longer, wider and have a deeper hull, and this also increases the safety requirements of the lanes in which they sail. The need for investment has increased considerably in recent years, due to safety deficiencies in respect of ports and connected routes, and this need can be expected to increase still further in the future. Measures that might become relevant are mainly deepening and widening (Trafikverket, 2013).

### National interest claims in accordance with Chapter 3 of the Environmental Code

The Swedish Transport Administration decides on national interests for facilities for communications for shipping, road, rail and aviation according to Chapter 3, Section 8 of the Environmental Code. The claims refer to existing, planned and future facilities.






Highlighted national interests for shipping consist of direct shipping routes connected to each other and to an international network, the extent and scope of which is decided by routes established by the IMO and HELCOM as well as by RAIS analyses of actual vessel movements.



Map 25. Maritime shipping: National interest claims and other claims

Marine spatial planning areas

National interest claims for maritime shipping,  
Ch 3, Section 8 Environmental Code

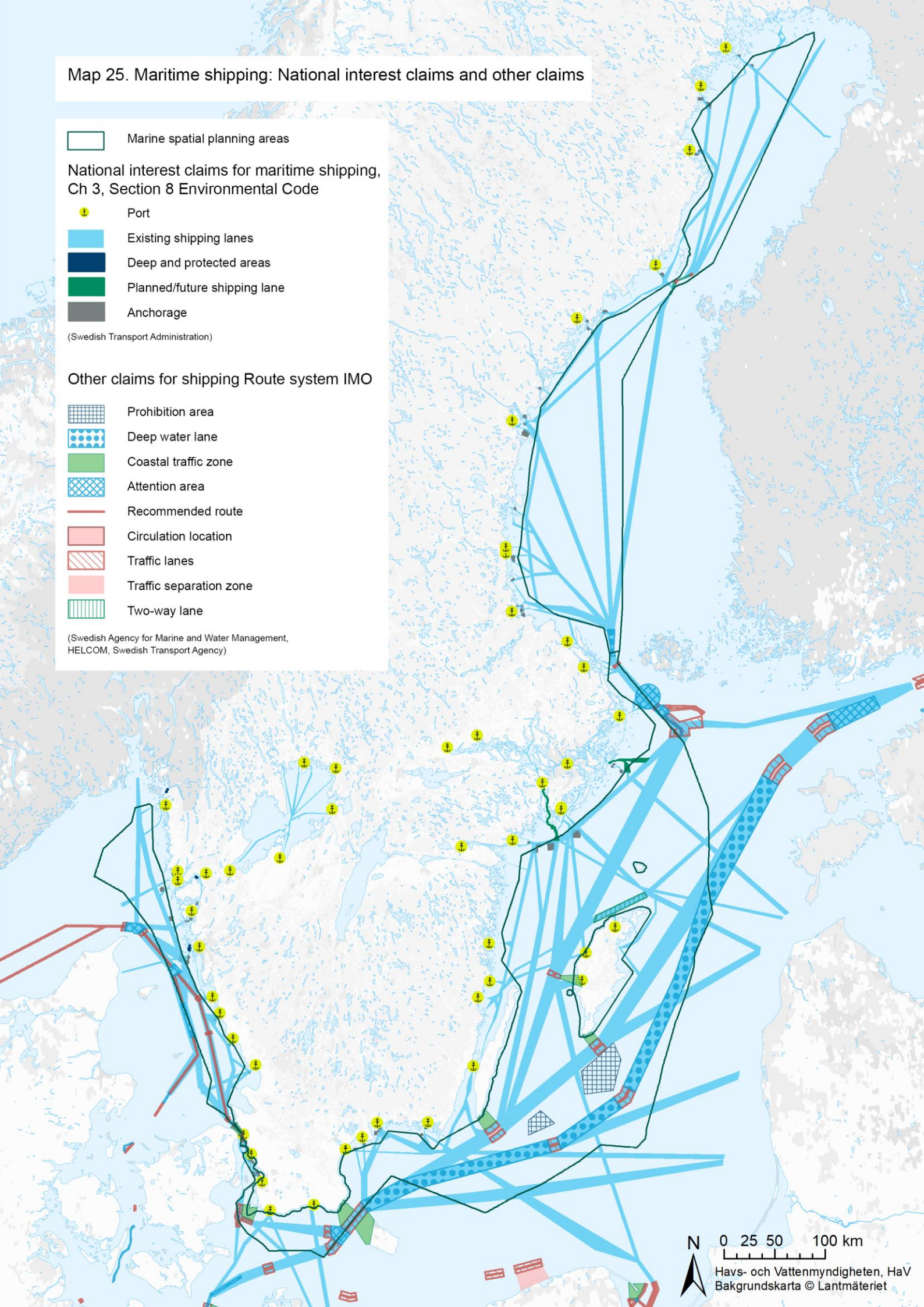
-  Port
-  Existing shipping lanes
-  Deep and protected areas
-  Planned/future shipping lane
-  Anchorage

(Swedish Transport Administration)

Other claims for shipping Route system IMO

-  Prohibition area
-  Deep water lane
-  Coastal traffic zone
-  Attention area
-  Recommended route
-  Circulation location
-  Traffic lanes
-  Traffic separation zone
-  Two-way lane

(Swedish Agency for Marine and Water Management,  
HELCOM, Swedish Transport Agency)



N 0 25 50 100 km

Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet

## Other claims

In the marine spatial planning process, shipping lanes have been identified that connect to shipping lanes to our neighbouring countries

## International interaction

A large part of the shipping is international and a comprehensive picture of shipping in Swedish waters presupposes collaboration with Sweden's neighbours.

Shipping lanes and traffic separations are largely shared for Sweden, Finland and Denmark, but large international shipping lanes also go through Swedish waters.

## Legal prerequisites

The regulation of shipping is based on the Convention on the Law of the Sea (SÖ 2000:1) and conventions under the International Maritime Organization (IMO). In the territorial sea, Sweden has sovereignty, which as a premise entails the uncurtail right to regulate various activities, with the exception of the right of innocent passage for foreign vessels. However, Sweden has some right to regulate traffic within the territorial sea, including shipping lanes and traffic separation systems. However, this right must be exercised considering the IMO's recommendations, among other things. Articles 17-26 regulate harmless passage within the territorial sea.

Within Sweden's exclusive economic zone, the freedom to shipping applies instead. In addition to its sovereign rights, the coastal state has jurisdiction in some respects within the exclusive economic zone, among other things to protect and preserve the marine environment. When the coastal state exercises its rights and obligations, it must show fair consideration of other states' rights and obligations, including the freedom to shipping. For the exclusive economic zone, there is, among other things, Article 60(7), which states that "*Artificial islands, installations and structures and the safety zones around them may not be established where interference may be caused to the use of recognized sea lanes essential to international navigation.*"

Consideration needs to be given to the regulations under IMO. Changes in international shipping lanes for environmental reasons are possible if they are approved by the IMO.

## Environment and climate

Shipping has an impact on the environment through discharges into both air and water. While a vessel is in operation it discharges gases into the air, lubricants and oils from propeller casings leak out into the sea, and waste from kitchens, toilets and cleaning accumulates and must be emptied. Non-native species are spread through ballast water and fouling; vessel operation and occasional accidents cause discharges of oil and chemicals into the water, which sometimes also reach land. Small, continuous emissions constitute the largest part of the oil emissions in the Baltic Sea. Recently, water pollution linked to the use of scrubbers, which are used to clean ship emissions from e.g. sulphur oxides, has also received attention, especially in areas where scrubber water is released into nature (Lunde Hermansson et al., 2023).

Shipping also affects the seabed and the coastline more directly in connection with shipping lanes and ports, such as through erosion and dredging, which can cause disturbances or risks



environmental toxins being released. Dumping dredged materials can also have an environmental impact.

In recent years, awareness has increased in respect of the environmental impact of underwater noise generated by shipping vessels, and research in this field has intensified. It has been noted that primarily marine mammals and fish may be affected by sound and by being forced away from various areas, but there is still a great knowledge gap regarding how continuous low-frequency sound affects marine organisms in the long term.

The majority of shipping regulations aimed at protecting the environment are international. Opportunities to adopt specific national regulations are limited. The International Maritime Organization IMO has pointed out the Baltic Sea as a particularly sensitive sea area (PSSA) within which specific measures can be implemented. These measures include traffic control, stricter application of emission requirements and requirements on equipment (Swedish Transport Agency, 2017).

Shipping affects the climate through emissions of greenhouse gases due to the use of fossil fuels. At the same time, there are often advantages to shifting transports from road to shipping and thereby reducing the climate impact, but it has recently been established that the distribution of freight between different modes of traffic has been stable over time in Sweden and in Europe (Swedish Maritime Administration, 2023). Together with international aviation, international shipping is one of the fastest growing emission sources in the transport sector, even if road transport still accounts for the largest share of the sector's emissions. The need to limit shipping's emissions of greenhouse gases is today the largest driver behind technical development in the sector (Swedish Maritime Administration, 2023).

## Mining and quarrying

### Existing use

Sand extraction means that fractions of sand and gravel are extracted from the seabed to be used mainly in the production of building materials or for coastal restoration measures. At present, there are no permits for sand, gravel and stone extraction in Sweden. In Ystad Municipality, however, a ten-year permit has recently been completed (2021). In the municipalities of Ängelholm and Höganäs, the permit review for extraction of sand in Skälderviken is under way (16 August 2023) for the purpose of coastal replenishment and counteracting coastal erosion in the area.

Marine sand extraction activities are usually conducted through sand dredging with trailer suction technology. This means that a ship with equipment drags a suction dredger, which can be compared with a vacuum inlet, along the seabed. The suction inlet suctions up an even layer of sand from the seabed. The tracks after the sand extraction are one to three metres wide and up to half a metre deep. The trailer suction technique follows the guidelines from the International Council for the Exploration of the Sea (ICES) regarding how the extraction activities shall be done for minimal environmental impact. The dredged material is loaded on board ships. The ships that normally conduct operations in the Baltic Sea load a maximum of 8000 tonnes, but there are ships that can load up to 50,000 - 80,000 tonnes (SGU, 2017, 2018b).

### Claims

An alternative to natural gravel from land is to use marine occurrences of sand and gravel. Extraction of sand and gravel might be of major significance to the production of building materials, concrete and concrete goods. This also applies to concrete structures for offshore wind energy production

The areas where marine sand and gravel can partly replace natural gravel are the coastal regions that have a large consumption of natural gravel and at the same time have small natural gravel assets on land that are expected to continue to have expansive construction and industry. For these regions, marine sand and gravel can be an economically and environmentally sustainable alternative to natural gravel on land. However, its sustainability is largely affected by distances between the extraction and use areas, and associated transport costs (SGU, 2017).

Stockholm-Mälardalen, Skåne and Gothenburg and Västra Götaland are the most relevant regions for the use of marine sand and gravel as a part of the material supply. The need for materials in these regions means that marine sand and gravel can compete with the market price of natural gravel from sources on land. Within these regions, there are also ports that have the possibility to receive, store and refine marine sand and gravel and transport the material further by truck and train. In addition to the areas of use in the construction industry, there is also an interest in using marine sand and gravel as coastal erosion protection via coastal replenishment. This use is mainly of interest in southern Sweden, which is most affected by coastal erosion.

Within a Government assignment, the Geological Survey of Sweden in consultation with SwAM investigated nine geographic areas of interest for the extraction of marine sand and gravel (SGU, 2017).

Four of the nine areas on the Swedish continental shelf have been identified as most suitable for sand extraction in light of nature values, biological and geological factors, technical characteristics and sediment dynamics. These four areas are Sandflyttan, Sandhammar bank and Klippbanken in the southern Baltic Sea and Svalan and Falkens grund in the Bothnian Bay. This suitability refers to selected parts of these areas. The area at Sandflyttan is within a Natura 2000 area.

In the report, examples are provided of prerequisites that must be met for extraction activities to be able to begin. Before extraction activities can be established, an area must be carefully evaluated in terms of physical, archaeological and biological aspects, among other things. To ensure that negative effects do not arise from a potential extraction activity, it is necessary that the activity is continuously evaluated using suitable control programmes. In the presentation, there are also proposals on guidelines for how extraction activities should be carried out.

In terms of sand extraction in a Natura 2000 area, such operations may only take place if they are consistent with Chapter 7, Sections 28a-29 of the Environmental Code.

#### National interest claims in accordance with Chapter 3 of the Environmental Code

The Geological Survey of Sweden (SGU) decides on national interests for the extraction of marine sand and gravel, according to Chapter 3, Section 7 of the Environmental Code. At present, there are no national interest claims.

However, according to Chapter 3, Section 7, Paragraph 1 of the Environmental Code, land and water areas that contain valuable substances or materials shall to the furthest possible extent be protected from measures that can substantially impede their extraction.

#### Developments and trends

Interest is growing in investigating the possibilities of using sand, gravel and rock from the continental shelf for construction, infrastructure and coastal restoration measures. The environmental quality objective of good quality ground water means that gravel deposits of major significance for the drinking water supply, energy storage and the natural and cultural landscape must be preserved. This means that withdrawals of natural gravel deposits on land for use in the material supply need to decrease.

Coastal development and climate change can entail an increased need for coastal replenishment. These problems have thus far been especially clear in south-eastern Skåne. Sand and gravel extraction on land increasingly comes into conflict with the drinking water supply. At the same time, imports of marine sand entail an environmental impact that is difficult to quantify and control.

Extraction of minerals in the sea is being discussed in several places in the world, including Europe. In the Baltic Sea area, the discussion on the extraction of iron manganese nodules has been discussed for a long time where mainly Russia has been an active party. Within the projects MINDeSEA (Seabed Mineral Deposits in European Seas: Metallogeny and Geological Potential for Strategic and Critical Raw Materials) and GeoERA (European Geological Surveys Research Area) have map data on the occurrence of minerals in Europe's seas, including the Baltic Sea and Skagerrak and Kattegat. There is a permit granted in 2023 for the investigation of the seabed within Sweden's exclusive

economic zone in the Bothnian Bay prior to the project planning of mineral-rich nodule extraction in the area in question (Ministry of Climate and Enterprise, 2023). The permit is valid for five years.

This and other knowledge input are needed for possible future planning for the extraction of minerals in marine areas. Work is also under way to apply for a permit for the extraction of mineral-rich nodules in the Bothnian Bay. That project is a private initiative that is currently in a preparatory and investigative phase.

There are desalination plants, so-called brackish water desalination plants, in Sandvik on Öland and in Kvarnäckershamn and Herrvik on Gotland. The aim is to meet the need for drinking water, as the groundwater levels during some periods in recent years have reached critically low levels.

#### International interaction

Sand extraction takes place in several of Sweden's neighbouring countries. Danish sand extraction in southern Kattegat and Öresund has historically taken place close to Swedish waters. However, operations will be phased out where granted permits are expiring, since the Danish Government decided in November 2018 to stop the possibility of seeking new permits in Öresund (Danish Parliament, 2018).

The Continental Shelf Act prohibits the extraction of oil and gas in the Swedish continental shelf area. Within the Polish and Russian continental shelf area in the Baltic Sea, however, oil and gas are extracted. Latvia and Lithuania also have deposits in their continental shelf areas, but no known extraction takes place at present. Lithuania last issued licenses for exploration in 2018. In Latvia's continental shelf area, there are two exploration and extraction permits, but no extraction activities have yet taken place (SGU, 2021b).

#### Legal prerequisites

Depending on the scope and the potential of significant harmful effects, the Government or the Geological Survey of Sweden (SGU) issues permits for sand, gravel and stone extraction within public waters on the continental shelf according to the Continental Shelf Ordinance (1966:315). SGU also supervises compliance to regulations and terms for permits according to the Continental Shelf Act. Any activity or measure that might significantly impact the environment in a Natura 2000 area also requires a special Natura 2000 permit according to Chapter 7, Section 28(a) of the Environmental Code. The requirement of such a permit applies both in the territorial sea and in the exclusive economic zone. The review is done by the Land and Environmental Court if the permit application otherwise is to be decided by the court and by the county administrative board when the permit application pertains to a facility in the exclusive economic zone.


If sand extraction entails an impact on ancient remains, a permit is also required pursuant to Chapter 2, Section 12 of the Heritage Conservation Act (1988:950). When sand extraction is desired, it must be determined if the effort would affect any ancient remains and consultations must be held with the county administrative board.




Map 26. Extraction of materials: Claims

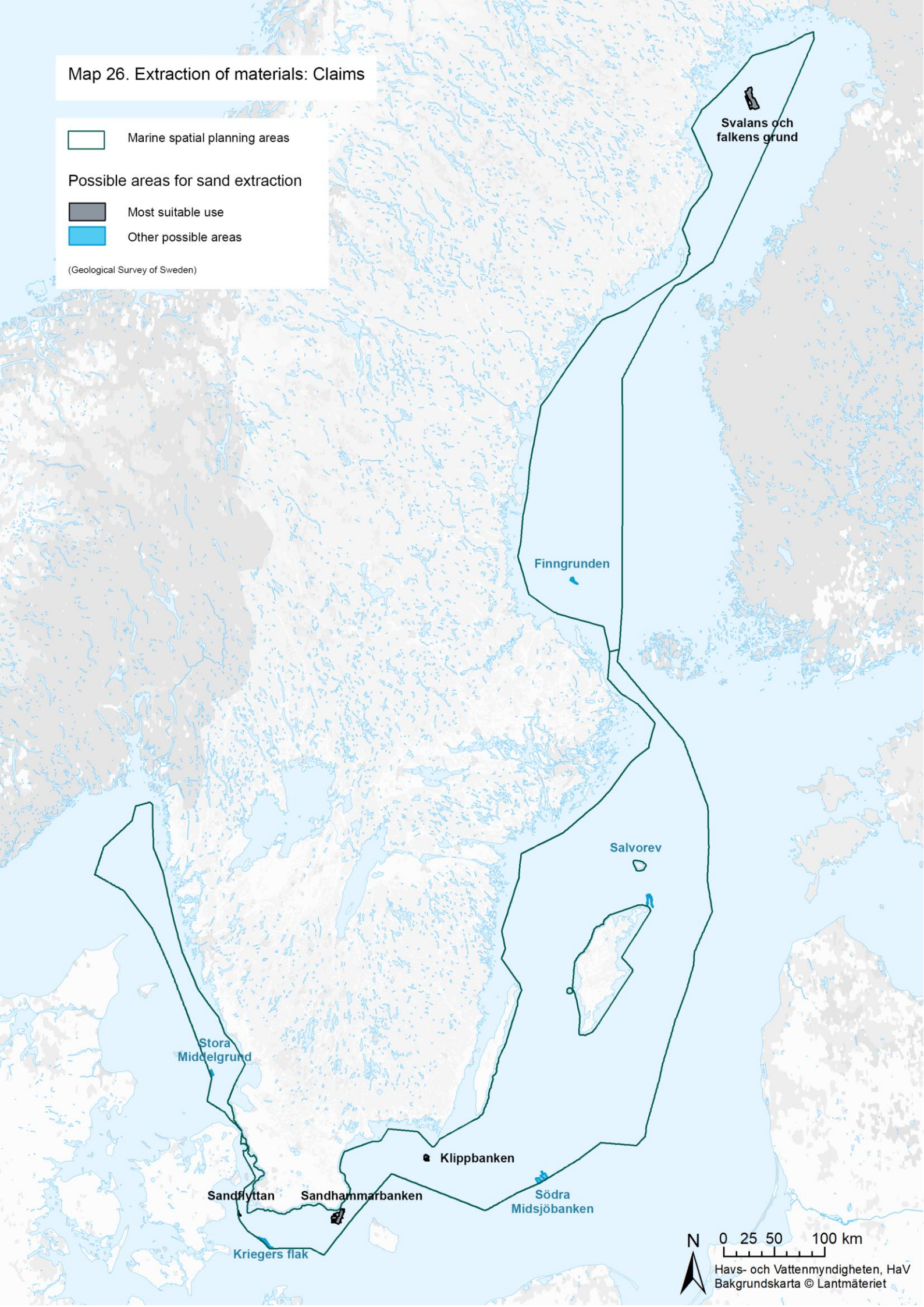
 Marine spatial planning areas

Possible areas for sand extraction

 Most suitable use

 Other possible areas

(Geological Survey of Sweden)



## Environment and climate

The extraction of natural gravel from the seabed means that sediment and its associated benthic fauna and flora are removed. In addition to the direct negative impact on the bottom, it can also have negative effects on bird and fish populations and other marine animals that normally feed on these resources. Disruptions in egg-laying can occur in spawning fish who find themselves in such areas. Recovery of benthic fauna and flora normally occurs a few months or years after extraction, but there is considerable variation between the different types of habitats. The International Council for the Exploration of the Sea (ICES) and many of its member states have designed guidelines for how, for example, extraction activities are to be conducted with minimal environmental impact (ICES, 2016).

Extraction of marine sand and gravel can also lead to various physical changes in the coastal zone and cause the loss of shorelines, reduce natural protection against coastal erosion and affect current and seabed conditions. When extracting marine sand, measures should be taken to minimise the risk of the formation of depressions (seabed areas deeper than their surroundings) in which there is a risk of a lack of oxygen in the water on the seabed.

In terms of environmental load from a future extraction of nodules, there are knowledge gaps to fill in regarding the scope of the impact on the environment in and around the seabed. Extraction of nodules from the seabed is at risk of having a large physical impact on the seabed biologically and geologically; today, we do not know enough about the recovery time mainly for micro and macro fauna linked to the benthic environments. More research is needed on the method of extraction linked to underwater noise and sedimentation/turbidity.



## Aquaculture and blue biotechnology

Aquaculture is a collective name for breeding and cultivating aquatic animals or plants, such as fish, crustaceans, clams, oysters, sea squirts or algae. Blue biotechnology is about exploring and utilising various marine organisms to develop new products.

Aquaculture in Sweden is comprised of the farming of fish, shellfish and algae. Sweden's good water resources provide conditions for aquaculture in several places around the country. At the same time, the nutrient load is high in several marine areas, which limits the possibility of establishing net farming of fish in these areas.

Farming of micro and macro algae has the potential of producing products, such as oils, vitamins and special proteins. These can in the long term constitute ingredients for food, animal feed, medicines or fuel. Cultivation of algae, sea squirts and clams can at the same time contribute to an improved marine environment through nutrient uptake. Altogether, this can contribute to both the development of the blue bioeconomy and provide environmental benefits.

### Existing use

In the Gulf of Bothnia, aquaculture is today only conducted close to the coast and not in the marine spatial plan area.

In the Baltic Sea, there is limited aquaculture. Cultivation takes place in the coastal waters and not in the marine spatial planning area. For the Baltic Sea, aquaculture is especially interesting, and it also contributes to improved marine environments by, for example, e.g. nutrient uptake because eutrophication is present in the marine area. Blue mussels and algae are examples of species that may be of interest under certain conditions. Blue mussels can form the basis of production of animal feed. Off of Söderköping, there is a cultivation of clams as an environmental measure.

In Skagerrak and Kattegat, mainly blue mussels are cultivated for consumption, but there is also commercial cultivation of macro algae, oysters and sea squirts. Research is also under way on expanded cultivation and use of these species.

### Objectives

Together with SwAM, the Swedish Board of Agriculture has a common strategy for commercial fishing, aquaculture, angling and fishing tourism with associated sector-specific action plans (Swedish Board of Agriculture, 2021). The strategy and the action plans provide a common objective and create a clear focus for the development of Swedish fishing and aquaculture. The strategy underscores the importance of well-functioning and well-managed ecosystems as a basis for profitable and competitive industries, and the need to take into account all three perspectives of sustainability – environmental, economic and social sustainability. It also highlights the need for better knowledge, competence development and communication to support management and sector development.

Fishing and aquaculture are also included in a *Food strategy for Sweden – more jobs and sustainable growth in the whole country (Government bill 2016/2017:104)*. The strategy, which aims for 2030 and covers the entire food chain, shall contribute to the full use of the potential of

the entire food chain. This means an increased and sustainable production of food that can lead to more jobs and sustainable growth throughout the country and provide consumers, regardless of background, with better conditions to make informed choices.

The Swedish Board of Agriculture has been granted funding in the form of an aquaculture package to implement projects to develop Swedish aquaculture linked to the objectives of the food strategy.

## Claims

Today, research and technology development are under way, both in terms of various species and in terms of farming methods. In the future, aquaculture projects may become relevant in the open sea.

At present, there is no compiled mapping of possible geographic development areas for aquaculture in the planning areas. However, researchers at the Royal Institute of Technology have done a location study on macro algae on the west coast (Thomas, 2019).

## Public interest in aquaculture

The Environmental Code contains no provisions regarding national interests for aquaculture, but indicates aquaculture as a public interest. Chapter 3, Section 5, Paragraph 1 of the Environmental Code states that marine areas of significance to aquaculture shall be protected to the greatest possible extent from measures that can substantially impede the industry's operation.

## Developments and trends

Well-informed consumers who demand innovative, environmentally adapted and beneficial alternatives mean that there is significant development potential for the cultivation of marine food. Algae farming is an industry in early development in Sweden in terms of creating biogas and for providing food. The farming of macroalgae is a substantial and growing global market and there is good potential for this type of farming to also grow in Sweden. Technological developments in respect of the farming of clams and ascidians are in progress, involving among other things sunken farms that are less sensitive to the impact of waves and ice. This type of farming may, in the long-term, even be possible outside the archipelagos at sea.

Through increased knowledge and development of blue bio-technology, the future may see the extraction of genetic resources for other industrial uses or as drugs (European Commission, n.d.).

Within the EU's algae initiative, algae have been identified as a promising marine resource, largely untapped in Europe, which can turn negative trends, such as climate change, environmental degradation, loss of biodiversity and unsustainable food production into new business opportunities for Europe. Thanks to algae's rich nutrient value and low carbon footprint, algae offer an enormous potential for a variety of food and non-food products: animal and fish feed or feed additives, pharmaceuticals, nutraceuticals, biostimulants, biopackages, cosmetics or even biofuels. The European Green Deal recognises algae's important role as a source of alternative protein for a sustainable food system in Europe. Various initiatives, such as Farm to Fork, the Bioeconomy strategies, the Blue Bioeconomy Forum and the Renewable Energy Directive, call for measures to better use algae's potential

An ever-larger share of the fish, shellfish, molluscs and algae consumed in the world is produced through aquaculture. Aquaculture also contributes new innovative materials in biotechnology, such as replacement materials for plastics, oils, proteins for pharmaceuticals, cosmetics and animal feed for a growing bioeconomy.

Production of animals and plants can have direct positive effects on human health and the environment. Fish is one of our most efficient animals for meat production and estimates indicate that two-thirds of all fish consumption in 2030 will come from aquaculture (World Bank, 2013). Production of algae and clams, for example, can also have positive environmental effects through uptake of nutrients from the water

The aquaculture industry has shown interest in co-locating aquaculture with offshore wind energy. The conditions for this have been analysed by SwAM and the Swedish Energy Agency in the knowledge compilation “Coexistence between offshore wind energy, commercial fishing, aquaculture and nature conservation” (SwAM, 2023c).

### International interaction

International interaction pertains primarily to market development for farmed fish, access to feed and the extent to which the shared marine environment can withstand greater fish farming

### Legal prerequisites

Permits from the county administrative board are required to build and operate a fish farm pursuant to Chapter 2, Section 16 of the Ordinance (1994:1716) for fishing, aquaculture and the fishing industry. Fish farming also refers to the cultivation of certain aquatic molluscs and aquatic crustaceans, compare with Section 4 of the Fishery Act (1993:787). A fish farm (although not a shellfish farm) can also be subject to registration and permit as an environmentally hazardous activity under Chapter 9 of the Environmental Code. The case is reviewed in accordance with the Environmental Impact Assessment Ordinance (2013:251) by the county administrative board or, if it is subject to registration, by the affected municipality depending on how much feed is used in the farming.

### Environment and climate

Fish farming in open systems negatively affects the environment through additions of nutrients from the cultivation, a risk of escapes and the spread of infection, and through various chemicals used in the cultivation reaching the surrounding environment.

Mussel farming has a less negative environmental impact mainly because it is limited locally. Directly below and immediately around the cultivation, there can be an increased organic load and sometimes also a local oxygen deficit in the sediment. However, the mussels' consumption of microalgae means that nutrients are absorbed from the sea, which could reduce eutrophication.

Environmental impact in the cultivation of algae has been deemed to be small after environmental studies. However, they can be seen from land and occupy space in the open sea (F. Gröndahl, personal communication, 26 November 2018)

Aquaculture can offer an energy-efficient and climate-smart way of producing food. Multitrophic farms where algae, clams and fish are grown together can open possibilities for more environmentally friendly breeding of fish in open systems.

Facilities further out to sea are a future scenario where good water quality can be combined with increased production in aquaculture. Through the cultivation of clams, oysters and algae, which take up nutrients from the sea, it can also provide society with a contribution in the work for a healthier sea.

Fish-farming in Scandinavia primarily involves species of salmonidae that require cold water for their survival. A warmer climate with warmer sea water could have a negative effect on the conditions for farming these species. On the other hand, other species, such as pike, pike-perch and perch, are benefited by higher water temperature. The prevalence of disease and parasites may also be assumed to increase with warmer water temperatures. Discharges into the sea and an increasing carbon dioxide content in the atmosphere contribute to the acidification of sea water, something which could be problematic for the farming of clams and oysters, since the layering of calcium would become more difficult. A change in weather conditions, resulting in different wind and wave conditions, could also affect farming. Climate changes affecting the salinity of the water flowing into the Baltic Sea and the Gulf of Bothnia could have major consequences for aquaculture in these areas.

## Commercial fishing

Commercial fishing, i.e. the commercial fishing that provides consumers and provide manufacturers with fish, also contributes to jobs and to maintaining the identity and vitality of coastal communities. Commercial fishing and related activities also strengthen the local cultural environment as a bearer of culture in many places and attract tourism in many cases. Fishing is conducted more or less intensively in all of Sweden's marine areas. There is a dynamic in fishing that means that the fishing pressure varies both geographically and over time. Small-scale fishing in Sweden is normally conducted within more limited areas near the coast due to the boats' capacity and fishing focus, while other fishing is more dynamic and moves over larger areas, including areas outside of the Swedish territorial waters or exclusive economic zone. Where fishing takes place varies by season, and also depends on how the fishing possibilities develop over time, meaning how the fish stocks and the regulations on fishing develop.

### Existing use

Swedish commercial fishing is conducted more or less intensively in the Baltic Sea, including the Gulf of Bothnia, Kattegat and Skagerrak, but also periodically farther afield in the North Sea and the Norwegian Sea. In the Gulf of Bothnia, commercial fishing is seasonally characterised by ice-free periods.

The Gulf of Bothnia, the Baltic Sea and Skagerrak and Kattegat have different physical and ecological conditions for the occurrence of marine animal species, such as fish and shellfish, which in turn affects fishing. The ecosystems of the Gulf of Bothnia and the Baltic Sea have a relatively simple structure with few dominating species, which also makes the ecosystem very sensitive. Many of the species here live near their tolerance limit for salinity and could be exceptionally sensitive to impact. Skagerrak and Kattegat, on the other hand, show great biodiversity with higher productivity in every part of the food chain. In the Gulf of Bothnia and the Baltic Sea, the composition of species changes from south to north as a consequence of the decreasing salinity, which means that the proportion of marine species decreases. Several important species of fish, for example herring and sprat, occur in all three areas, while others are unique to their respective marine areas. In the Baltic Sea and Kattegat, the cod stock has been at a low level for several years. Currently (2023), it is prohibited to have targeted commercial fishing of cod in the Baltic Sea.

Of the total amount of landed fish, the majority is used as fish for animal feed. In 2022, a total of 77 per cent of the total landings were made up of fish for animal feed (Statistics Sweden, 2023). Some species are used to a greater extent as fish for animal feed, such as herring and sprat, while other species, such as cod, Northern prawn and Norway lobster, are primarily used for human consumption.

The coastal commercial fishing is affected by seals and cormorants. Seals cause damage to fishing gear, and both seals and cormorants compete for the fish catches. In some areas, it is periodically difficult to conduct profitable fishing. In order to control the seal and cormorant populations, culling is conducted of both species. According to the Swedish Hunting Ordinance (1987:905), the Swedish Environmental Protection Agency may, after consulting the Swedish Agency for Marine and Water Management, decide on a licensed hunting of grey seal and harbour seal. The Swedish Environmental Protection Agency can also decide on culling to prevent serious damage and protect fish.

Fishing from the vessels of other EU countries occurs in both Sweden's territorial waters and exclusive economic zone. At the same time, Swedish fishing vessels often land their catches in foreign ports in the Baltic Sea and Skagerrak and Kattegat regions.

#### *Commercial fishing in the Gulf of Bothnia*

Commercial fishing in the Gulf of Bothnia is conducted on a small scale and is geographically distributed, with the largest concentration in the Southern Bothnian Sea. The economically most important species are whitefish and herring (SwAM, 2023a). Fishing is sparse in the deep sea, but more frequent in the coastal waters. The coastal fishing in the Southern Bothnian Sea takes place mostly with passive gear. An occasionally intensive fishing mainly for herring and sprat is conducted around the offshore banks and in the south-eastern parts of the marine area.

Commercial fishing conducted in the Northern Bothnian Sea is limited and takes place with passive gear and in coastal environments, with elements of pelagic fishing in the southern part of the Northern Bothnian Sea.

Fermented Baltic herring and whitefish roe are two well-known products from the Gulf of Bothnia. Fishing for vendace takes place outside the marine spatial plan area closer to the coast. In the Gulf of Bothnia, Finnish fishing for herring is also conducted in Swedish territorial waters and exclusive economic zone. Lövskär Harbour in Luleå, Storön in Kalix Municipality, Renöhamn in Piteå and Norrsundet Harbour just north of Gävle are important landing ports in the Gulf of Bothnia.

#### *Commercial fishing in the Baltic Sea*

Fishing in the Baltic Sea marine spatial planning area is a large part of Swedish commercial fishing both in terms of value and catch amounts. Fishing is conducted by fishing companies based mainly on the east coast, but also some vessels from the west coast.

The most important species economically and quantitatively in the last five years (2018-2022) in the Baltic Sea are sprat and herring (SwAM, 2023a). Historically, cod has also been of major significance to fishing in the Baltic Sea. Since 2020, the catches of cod are very small due to the stock being very weak. Other species targeted by commercial fishing, but of considerably less importance, are flounder and turbot. There is also coastal eel fishing. The fishing is conducted both passively, with for example nets, and actively with trawlers. In Öresund, only fishing with passive gear is performed.

In connection with the Baltic Proper, important ports for landing are Västervik in Småland, Byxelkrok on Öland, Ronehamn on Gotland, Nordersund and Karlskrona in Blekinge and Simrishamn in Skåne.

#### *Commercial fishing in Skagerrak and Kattegat*

On the west coast, there is a long tradition of using and process fish and shellfish from the sea.

In Skagerrak and Kattegat, commercial fishing is varied, and the most important species for commercial fishing are Northern prawn and Norway lobster (Statistics Sweden, 2023). There is also a mixed fishing of bottom-dwelling species, such as haddock and saithe and pelagic species, such as mackerel, herring and sprat. There is also both passive fishing with, for example, cages



and active fishing with trawlers and seines The majority of important ports for landings border on Skagerrak and Kattegat. In Halland County, there is, among others, Träslövsläge, and in addition to the large number of larger landing ports in Bohuslän, such as Rönnäng, Ellös, Grebbestad and Mollösund, there is also a significant port for landing and Sweden's largest fish auction here in Gothenburg.

## Claims

One prerequisite for fishing is access to healthy fish stocks. Attractive, profitable and sustainable activities that are conducted within the ecosystem's viability limits are points of departure in the vision in the national strategy for Swedish fishing and aquaculture from 2021 to 2026. Healthy fish stocks require that fish have access to the right habitats during their life cycle. Not least, areas for the fish's reproduction, growth and in some cases migrations are important. For commercial fishing, it is therefore necessary that there is enough knowledge and protection of the habitats. The need for improved knowledge about fish stocks is closely linked with assessments made within the scope of marine environmental management. Commercially important fish and shellfish species are important parts of the work on national marine mapping. The need for improved knowledge about the relationship between the fish's habitats and anthropogenic pressures is also identified in the work on an ecosystem-based fish management.

To conduct commercial fishing, it is important to have functional infrastructure in the form of accessible fishing places, ports and landing locations and that the vessels can move between them. One particular challenge is that fishing is dynamic over time and that an adaptation of fishing takes place based on the stock development, both in terms of the size, density and spread of the stocks. There is also an economic dynamic related to market conditions and the fishing companies' profitability.

## Developments and trends

Good professional knowledge and well-informed consumers who demand innovative, environmentally adapted and beneficial alternatives mean that there is development potential for commercial fishing. As in other industries, a streamlining of the fishing sector has long been under way, which has meant fewer commercial fishers and fishing vessels. In addition, the stock status for commercially important fish stocks affects the possibility of conducting commercial fishing, where, for example, declining stock status of the commercially important species cod has led to cod fishing being severely limited. At the same time, there are societal goals that aim to promote small-scale coastal fishing. Other factors that can change fishing activities are changes in consumption patterns and technical developments and adaptations to reduce fishing's impact on, for instance, bottom habitats. In addition, other claims to various areas in the seas may affect future fishing.

Alongside the prevailing dynamics, climate change might also mean that commercial fishing needs to change fishing patterns and fishing areas as the ranges of different fish species change.

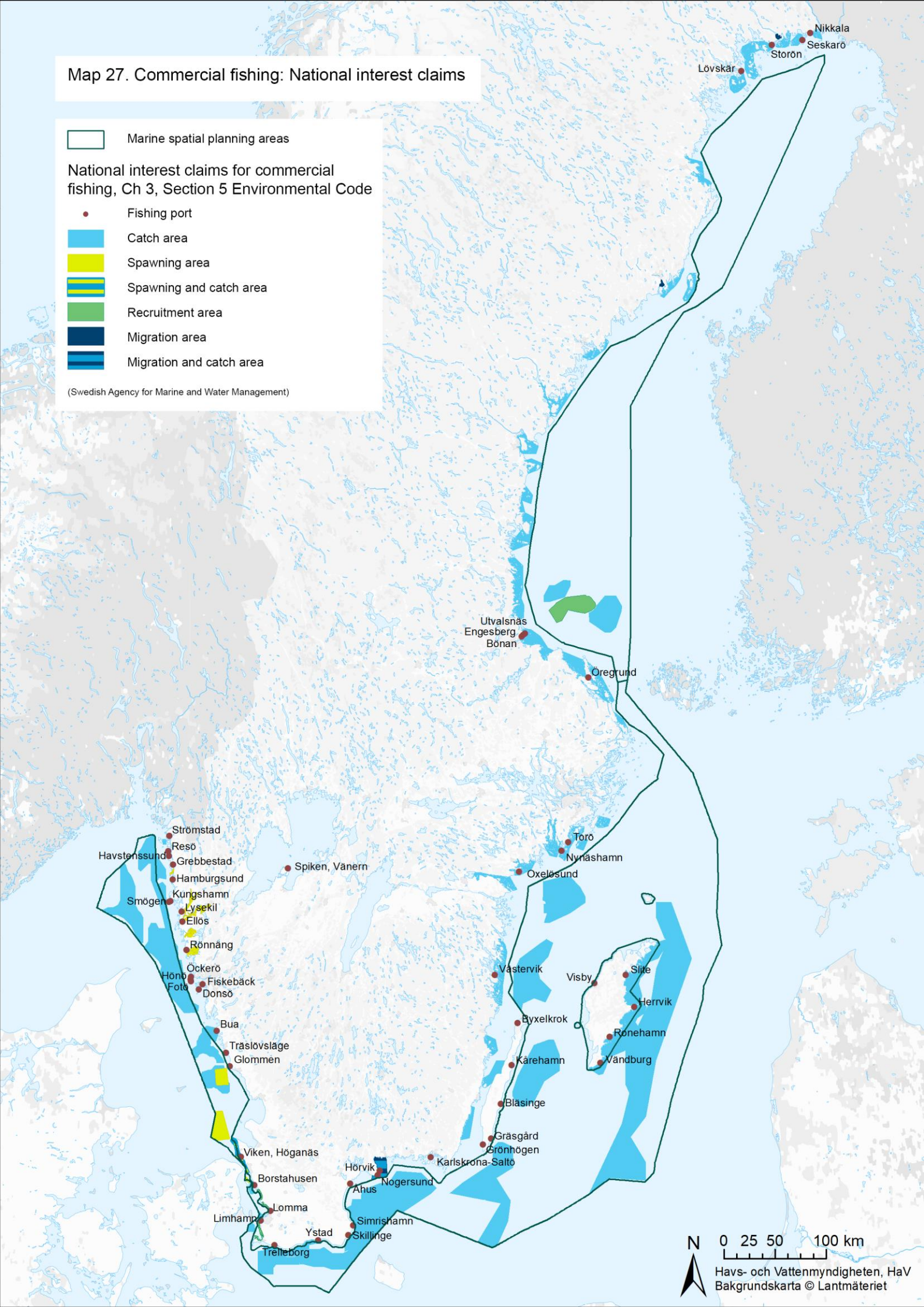
Map 27. Commercial fishing: National interest claims

Marine spatial planning areas

National interest claims for commercial fishing, Ch 3, Section 5 Environmental Code

- Fishing port
- Catch area
- Spawning area
- Spawning and catch area
- Recruitment area
- Migration area
- Migration and catch area

(Swedish Agency for Marine and Water Management)



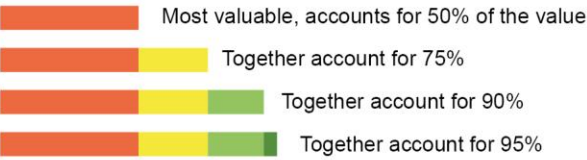


Map 28. Commercial fishing: Other claims

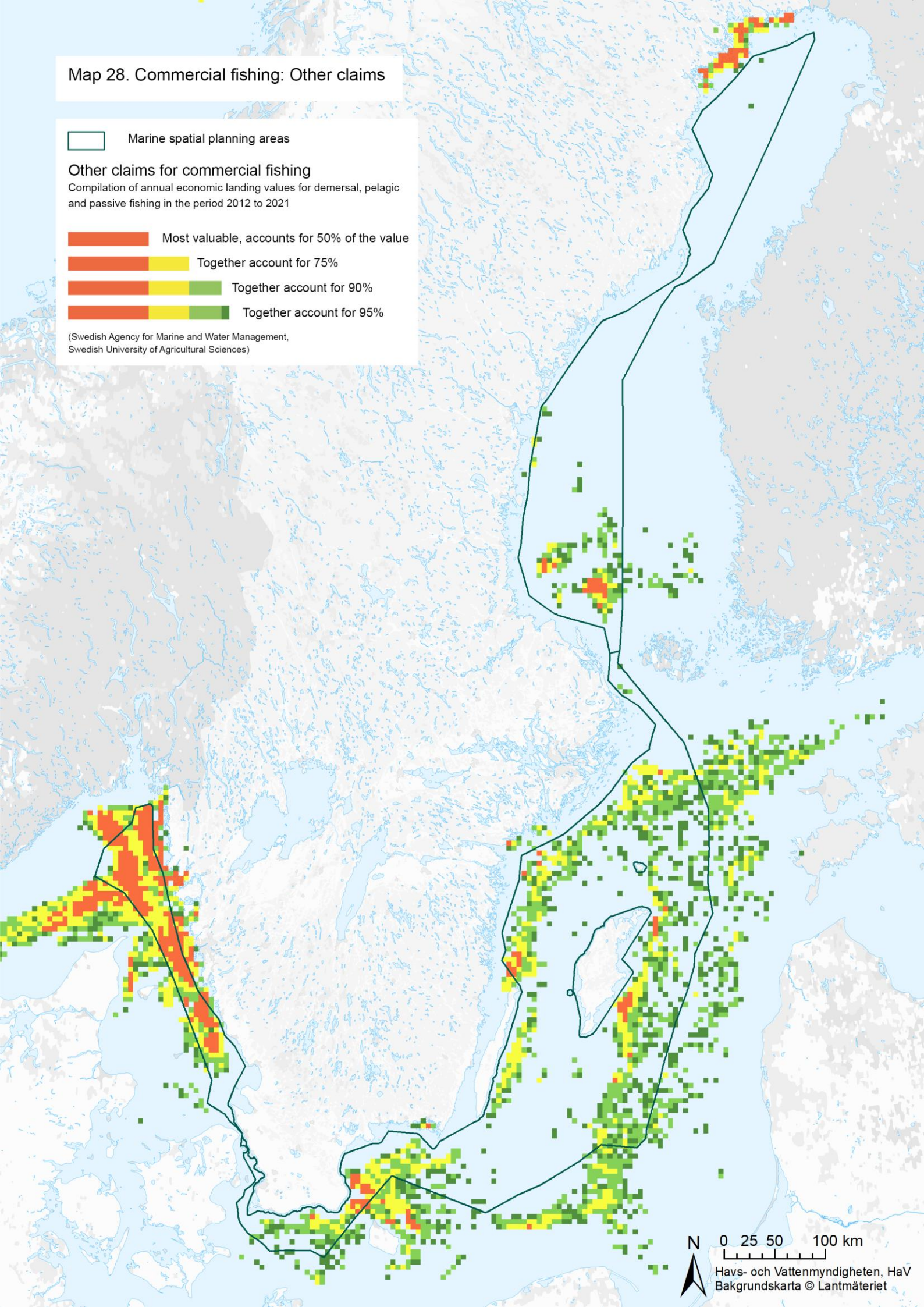
 Marine spatial planning areas

**Other claims for commercial fishing**

Compilation of annual economic landing values for demersal, pelagic and passive fishing in the period 2012 to 2021



(Swedish Agency for Marine and Water Management,  
Swedish University of Agricultural Sciences)



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Bakgrundskarta © Lantmäteriet



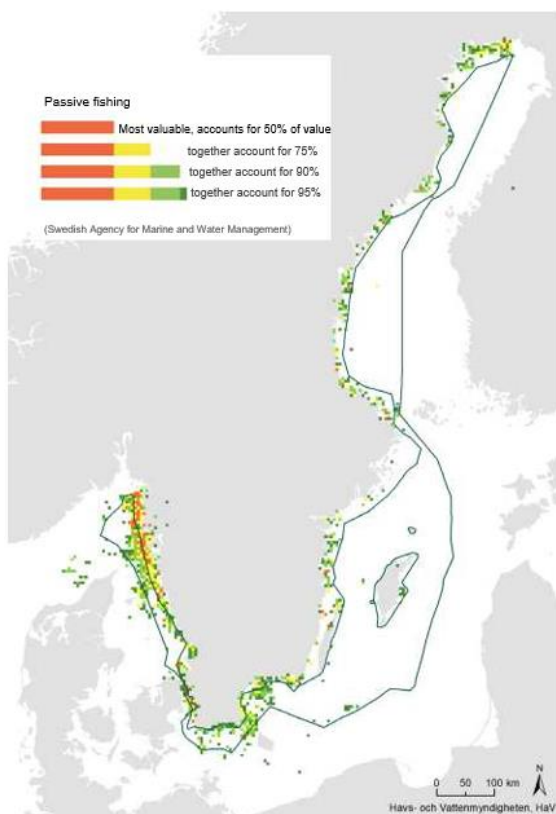


Figure 7.6-5 Passive fishing

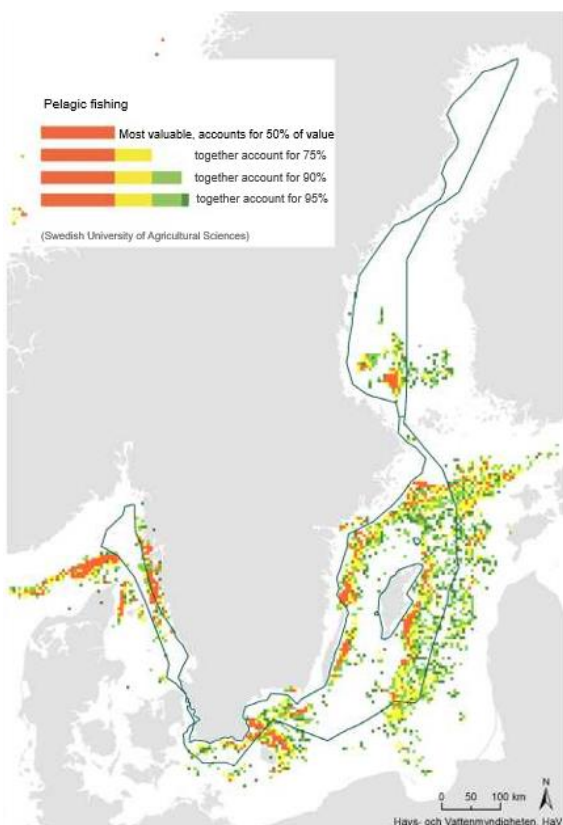
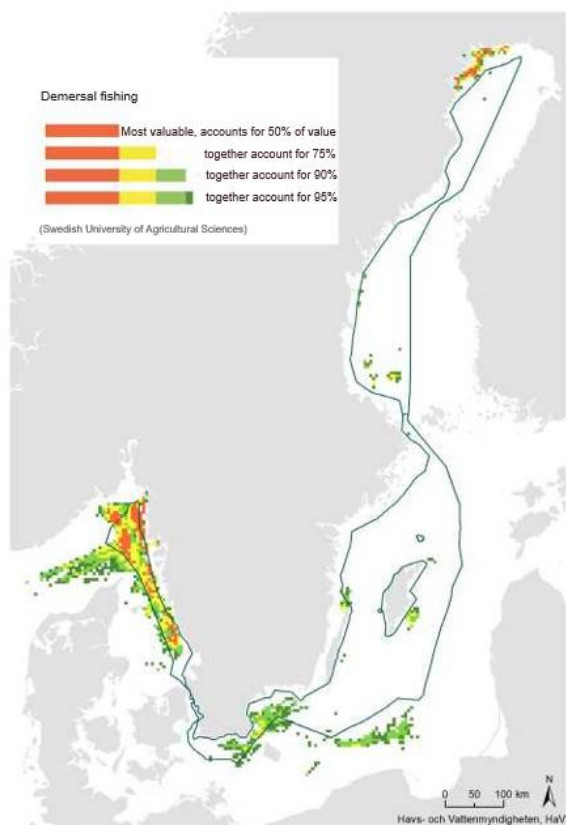


Figure 7.6-6 Pelagic fishing



### Fishing with various kinds of gear

The figures on this page break down the data shown in Map 28 on the various kinds of fishing conducted in Swedish waters.

Figure 7.6-5 - 7.6-7 show a compilation of annual economic landing values for Swedish fisheries during the period 2012-2021: Passive fishing (Upper-left) (SwAM, 2023b); Pelagic trawl fishing (Upper-right) (SLU, 2023); Demersal trawl fishing (Lower-left) (SLU, 2023).

## Work in progress

Together with the Swedish Board of Agriculture, the Swedish Agency for Marine and Water Management has a common strategy for commercial fishing, aquaculture, angling and fishing tourism with associated sector-specific action plans. The strategy and action plans are based on the ecosystem approach and shall contribute to strengthening the goal attainment in the Maritime Strategy and the Food strategy for Sweden – more jobs and sustainable growth in the entire country (Government bill 2016/2017:104). The strategy is a guide for the two authorities' work for sustainable fishing.

SwAM works continuously, with support from scientific evidence, to introduce necessary fishing regulations in protected marine areas, based on the needs pointed out by the county administrative boards concerned. Through a government assignment, SwAM has worked for a necessary fishing regulation in protected marine areas in Kattegat, and in July 2022, a new delegated regulation from the European Commission came into force. It is intended to protect biodiversity and counteract by-catch of harbour porpoises and sea birds. The protected marine areas covered by fishing regulation for commercial fishing and angling are Fladen, Lilla Middelgrund, Stora Middelgrund, Röde bank and Morups bank.

In February 2021, SwAM received a government assignment to prepare joint recommendations on conservation measures with a focus on the protection of harbour porpoises in Hoburgs bank and The Midsea banks, South-western Skåne's offshore waters, the sea around Ven, as well as the North-western Skåne marine area. In January 2022, SwAM was commissioned to proceed with several protected marine areas: Finngrundet – Western, Northern and Eastern banks, Svenska Högarna, Ottenby reef, Falsterbo Peninsula's marine area, the Fotevik area, Bunkeflo coastal meadows, mouth of the Löddeån River, Salviken's coastal meadows, Lundåkrabukten and Balgö. In all of these areas, ships from other Member States also have the right to fish, which is why an agreement with affected countries is required within the scope of the EU Common Fisheries Policy. Both assignments must be finalised once an agreement on fishing regulation exists for the designated protected marine areas. SwAM submitted a progress report in May 2022 for all areas. SwAM is working to prepare joint recommendations on conservation measures in all affected marine protected areas and in some areas, there is regulation in place. A delegated regulation from the European Commission came into force in February 2022. It comprises the regulation of net fishing and requirements on pingers (acoustic deterrent devices) in order to protect the acutely threatened population of Baltic harbour porpoises. The protected marine areas covered by fishing regulation for commercial fishing are Hoburgs bank and The Midsea banks including The Southern Midsea bank and South-western Skåne's offshore waters in the Baltic Sea.



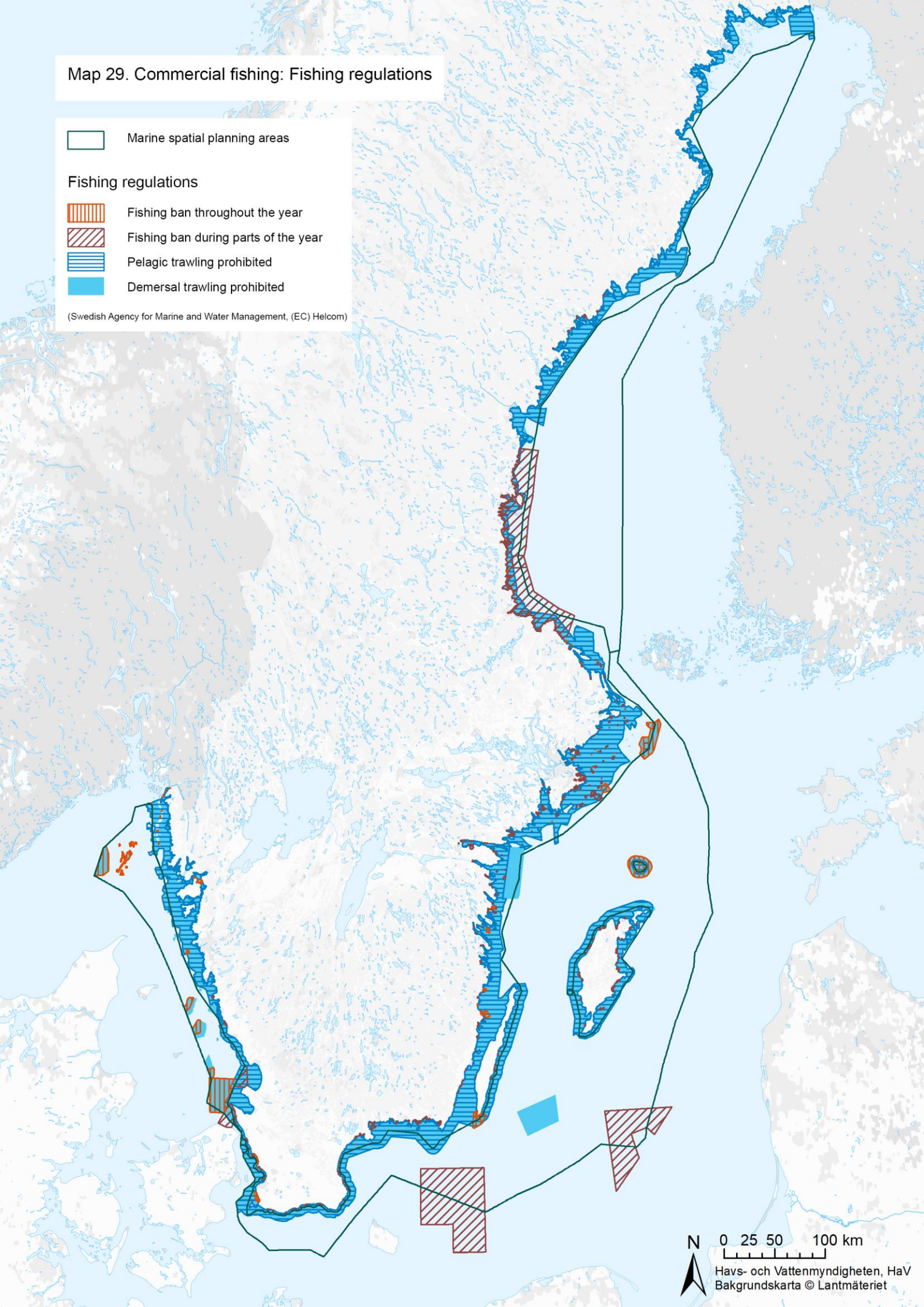
Map 29. Commercial fishing: Fishing regulations

Marine spatial planning areas

Fishing regulations

- Fishing ban throughout the year
- Fishing ban during parts of the year
- Pelagic trawling prohibited
- Demersal trawling prohibited

(Swedish Agency for Marine and Water Management, (EC) Helcom)



N 0 25 50 100 km

Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet



In parallel, SwAM has decided on national fishing regulation in around thirty protected marine areas where only Swedish vessels have fishing opportunities.

SwAM also works for fisheries control and monitoring that shall ensure that the regulations are complied with. For a few years, there has been a follow-up programme to study effects of fishing regulation linked to conservation values in protected marine areas

In addition, work is under way to implement a limited-term scientific project that corresponds to a relocation of the trawling boundary for vessels fishing for pelagic species in the Baltic Sea. The objective of the project is to evaluate the effects on herring stock biomass and their size, stock and age structure.

In addition, SwAM is working to review the demersal fishing system, i.e. the system that regulates the fishing possibilities for vessels fishing for bottom-dwelling species and to present proposals on what a new system could look like. A change in the system can, among other things, affect the structure of the fishing fleet.

#### National interest claims in accordance with Chapter 3 of the Environmental Code

National interest claims for commercial fishing according to Chapter 3 Section 5 of the Environmental Code relate to the areas in the sea, lakes, rivers and home and landing ports. SwAM decides on national interests for commercial fishing. These areas in the sea encompass internal waters, territorial waters and the exclusive economic zone. For the seas, the national interest claims for commercial fishing refer to catch areas, spawning and nursery areas and migration routes for fish and shellfish.

National interest claims for commercial fishing that pertain to the catch areas are mainly defined based on catch value per surface unit, which is an economic criterion. The areas are identified based on a selection of data over annual landing values in 12 fisheries over a longer period of time. Applied economic criterion refers to relative values.

The national interest claims for commercial fishing that pertain to spawning and nursery areas and migration routes are defined based on the ecological significance for different stages of life of commercially important fish and shellfish species.

#### International interaction

Commercial fishing is mainly managed within the scope of the EU Common Fisheries Policy (CFP). This refers to fisheries that are shared with other EU countries, such as Danish fishing in Swedish territorial waters and exclusive economic zone and other EU countries' fishing around the Baltic Sea in the Swedish exclusive economic zone. Regulation of fishing outside Sweden's current national trawling boundary, but in Swedish territorial waters requires agreements with the neighbouring countries concerned and decisions within the EU. Foreign fishing vessels from, among other things, Denmark, Poland, Norway and Finland land catches in Swedish ports. In the Gulf of Bothnia, Finnish fishing is conducted on a Finnish quota in Swedish territorial waters and exclusive economic zone with Norrsundet as a significant landing port for foreign vessels. In the Baltic Sea, Västervik and Simrishamn have had a significant share of foreign landings in the past five years. In Skagerrak and Kattegat, fishing is conducted with Norwegian and Danish fishing vessels and other foreign vessels in Swedish territorial waters. In the Swedish exclusive

economic zone in Skagerrak and Kattegat, there are also German vessels in addition to Norwegian and Danish fishing vessels. Foreign landings take place at several ports on Skagerrak and Kattegat, including Smögen and Strömstad. In Skagerrak and Kattegat, extensive Swedish fishing is conducted in Norwegian waters. Swedish commercial fishermen land large quantities in Denmark, where Skagen and Hirtshals are important landing ports.

### Legal prerequisites

Commercial fishing is regulated in the scope of the EU Common Fisheries Policy (CFP) with supplemental national Swedish fishing legislation. The regulation is based on the Convention on the Law of the Sea. Geographically, the fisheries policy regulates commercial fishing out to the outer boundary of the exclusive economic zone, but it applies to EU vessels even outside EU waters according to Regulation (EC) No 1380/2013 of the European Parliament and of the Council. For fishing that is not commercial, most of the provisions are in national legislation, which in Sweden is in the Fishery Act (1993:787), as well as ordinances and regulations. The EU Member States have free access to fish in the EU waters up to 12 nautical miles from the baselines outside other Member States' coasts. In terms of Swedish waters, Denmark and Norway have access up to four nautical miles from the base line in Skagerrak, Denmark up to three nautical miles from the coastline in Kattegat, and Denmark and Finland up to four nautical miles from the base line in the Baltic Sea (including the Gulf of Bothnia). According to the agreements that Sweden has with Denmark, Norway and Finland, the fishing state may conduct fishing according to its own rules, meaning the flag state's rules. Within Öresund, fishing is shared for Swedish and Danish fishermen. How the fishing may be conducted there is set out in Chapter 2, Section 2 of the Swedish Board of Fisheries regulations (2004:36) on fishing in Skagerrak, Kattegat and the Baltic Sea.

### Environment

Fishing has different environmental impact depending on the fishing method involved. The fishing affects the size and structure of the fish populations both for the species that the fishing is directed at and those that are caught unintentionally.

In mainly passive fishing, other parts of food chains are also affected as marine mammals and birds get stuck in the nets. Also fishing gear lost in the sea creates problems as it continues to catch animals long after it is lost. The reduction in the number of fish at different levels of the food chain also has consequences for the ecosystems at large.

Bottom trawling leaves traces in the soft sea beds that affect bottom living organisms and seabed structure, which can result in changes to species compositions and benthic environments. According to reports for the Government assignment M2017/02522/Nm on the effects of bottom trawling, six per cent of the species disappear in a trawler move on a previously unaffected seabed. Recovery time for a benthic environment the biological value of which has been cut in half, may be six years (SLU, 2018).

Fishing also affects the environment in the same way as other shipping traffic through emissions to air and water with a large variation depending on the catch method.

### *Stock size*

Periodic monitoring and surveys form the basis of scientific assessments regarding the size of the fish population and the quantity of fish that may be caught. Based on these limits, assessments are made of whether a particular fish population is sustainable and whether it falls within safe biological limits. Some species, mainly species with a large range that move across large areas, are jointly managed in the EU, and other more local and stationary species are managed nationally. The scientific assessment for the jointly managed species takes place within the International Council for the Exploration of the Sea, ICES, and is then an advisory input for the quota allocation between the EU Member States that is done annually by the EU's Council of Ministers. For nationally managed species, the Swedish University of Agricultural Sciences assists with scientifically based stock estimates.

Changes in the fish's surrounding ecosystem may affect the structure of the fish population and the conditions for fishing, but the amount of fishing can also give rise to changes in the ecosystem. Eutrophication from agriculture and sewage treatment works, for example, can affect ecology in the sea. The supply of nutrients leads to the increased production of algae which has a huge impact in certain areas. For many years, environmental pollutants such as dioxin, PCB and mercury have found their way into the sea; these pollutants do not easily break down and can collect and become stored in the fatty tissue of animals and humans.

Increased shipping has meant that the spread of invasive species has increased. Emissions from ships can also damage fish and shellfish habitats. A shallow habitat can be affected by the wake from boat traffic. Also, areas with high concentrations of seals and other fish predators can entail more predation pressure and reduced conditions for fishing. The fish resource is also affected by physical disruptions in the ecosystems, which may be due to dredging, installations, lost fishing gear and noise. An important impact factor is coastal development that can mean that fish spawning habitat is destroyed.

Changes in climate can affect not only the geographic distribution of fish but also their reproduction, growth and their access to food, factors that need to be taken into consideration in the management of fish populations. In the Baltic Sea, large-scale climate changes are reflected in an expected increase in the average sea water temperature, but also through a reduced salinity due to runoff and a change in the rate of discharge (SwAM, 2017a, 2017d). Changes in the distribution of one or more species of fish can have consequences for commercial fishing in so far as a fish population can move away from a traditional catch area, or a population might become severely reduced. Climate change is also expected to be able to lead to a change in wind conditions that in turn will make consistent fishing more difficult, especially fishing with nets and trawling with smaller vessels.

### *Climate*

Changes in climate can affect not only the geographic distribution of fish but also their reproduction, growth and their access to food, factors that need to be taken into consideration in the management of fish populations. When the climate changes and becomes warmer, the seas are also warmed up. Other possible effects of climate change, such as acidification, changed precipitation patterns, changed ice formation and increased leakage of nutrients are also at risk of affecting the fish stocks. The Baltic Sea is a more isolated basin than Skagerrak and Kattegat. In the Baltic Sea, climate change besides higher temperatures can also lead to a lower salinity

through increasing precipitation and fresh water outflow from land, which affects species composition and the ecosystems. The climate's impact on marine ecosystems and species will ultimately affect fishing. The degree of impact on fishing differs between different types of fish (Bartolino et al., 2023).

## **7.7. Risks**

“Risks and anthropogenic pressures” refer to the risks of accidents and other incidents that can have harmful consequences for people, animal and plant life in the sea. The largest risks are in connection with accidents, such as collisions in shipping. Such accidents can lead to the discharge of oil, chemicals or other hazardous substances. Environmentally hazardous substances can also end up in the water via discharge from land. Risks can also arise due to the leakage of harmful substances that are already in the sea. This can happen, for example, with fibre banks, which contain historical industrial waste comprising harmful substances. It could also involve waste or ammunition and chemical weapons dumped in the sea.

### **Spills**

Accidents or active actions and sunken wrecks can be a cause of emissions of oil and various chemicals. In the event of emissions to sea or on the Swedish coast, marine ecosystem services can be strongly impacted at a local or regional level. The main concerns are environmental protection interests and possibly cultural heritage, but also other interests, such as recreation values in outdoor recreation and tourism, as well as commercial fishing, aquaculture and living environments along the coast.

### **Discharges of oil and oil products**

Oil emissions in the sea can come from land-based activities, drift in from international waters, or occur as a result of shipping accidents. Larger oil emissions as a result of shipping are rarer today than a few decades ago, thanks to stricter rules, greater environmental monitoring and improved possibilities to take care of waste oil in ports (SwAM, 2018h).

Even sunken, leaking wrecks entail a risk of oil discharges. There are around 300 identified environmentally hazardous wrecks on Swedish sea beds, where many wrecks are at risk of oil leakage (Swedish Maritime Administration, 2011, 2015). The risks are different in Swedish seas depending on the marine environment and activities. Prominent impact is corrosion of the wreck's hull, military activities and also commercial fishing with trawlers as fishing often occurs in close proximity to the wrecks since they constitute reef structures that attract fish (Chalmers, 2023). Single, large oil emissions from the wrecks often have a fatal effect on animals and plants that come into contact with the oil. Environmental impact from smaller, but continuous oil emissions is also a source of environmental problems. Effects of these can be reduced reproduction, genetic impact, cancer and reduced resistance. Such effects can over a long time entail as large or larger effects than a single large oil spill.

### **Discharges of other harmful substances**

The risk of serious consequences in the event of a discharge of chemicals may be less than it is for oil, since most chemicals constitute a less serious environmental hazard. However, the

consequences depend on the type of chemicals and where the discharge occurs. This type of discharge is more cost- and resource-intensive to manage than an oil discharge. There are some areas with concentrated levels of environmentally hazardous substances from historical dumping, which affects opportunities for modern activities to develop there. For example, there are around 23,000 barrels of mercury-laden waste in the sea at Sundsvallsbukten. Mines and dumped chemical weapons from the two world wars also constitute a risk to mankind and the environment. Ammunition from military exercises can constitute pollution.

Sunken and leaking wrecks also entail a risk of emissions of chemicals. A significant share are ships full of chemical weapons that were dumped after World War II. Such an area is located off of Måseskär in Skagerrak where sampling of fish in recent years shows levels of mustard gas that confirms that there is leakage and spread in the environment (SwAM, 2018f).

### Fibre banks

Fibre banks can primarily be found along the coast of the Bothnian Sea. Historical pollutants from the pulp industry accumulate into large deposits on the seabed there, in the form of fibre banks and fibre-rich sediment. Along the Bothnian Sea coast, there are also polluted sediments without any elements of fibres.

Many environmentally harmful substances have been identified in the fibre banks, including high levels of environmental toxins, such as PCB, DDT and arsenic, and heavy metals, such as mercury, lead and cadmium (SGU, 2016a). The need to decontaminate polluted sediment in the Bothnian Sea may increase as the fibre banks are neither physically nor chemically stable. There is a risk that environmental toxins can spread to deeper areas, where they can be taken up by benthic organisms and carried further upward in the food chain.

Storms and wave effects, changed bottom currents and various human activities, such as shipping, dredging and trawling, can also contribute to the spread of polluted sediments (SGU, 2018a). Land uplift means that the polluted sea beds that currently lie under water will, in the long term, lie above the water surface and be subjected to erosion in the form of waves and wind, and this implies a risk of the pollution spreading.

### Shipping accidents

Shipping-related accidents occur regularly, and can often be traced to traffic intensity or groundings. The risks are oil emissions and disruptions in transportation. In the narrow waters around Öresund and Bornholm and at the entrance lanes to the various ports, there is a higher probability of accidents (MSB, 2016). The risks of accidents at sea have been assessed within the EU project BRISK (Sub-regional risk of spill of oil and hazardous substances in the Baltic Sea). According to BRISK, the major risks within Swedish marine areas can be found at Svenska Björn, north-east of Öland's southern shallows, and at Bornholmsgattet and in Öresund. Every year, 38,000 ships pass through Öresund, which means that the actual traffic intensity is a risk in itself. Around 51,000 vessels pass through Bornholmsgattet every year. With its intersecting and connecting lanes this means that Bornholmsgattet, according to BRISK, is the most intensely trafficked area in the Baltic Sea, and the location where the likelihood of a serious accident is greatest.

## Offshore wind energy

Offshore wind energy entails new permanent installations at sea. These then become obstacles to navigation for ships. In the permit review of a wind farm, the safety distance needed on the site is examined. The distance depends on the traffic on the route, but also the geographic conditions. In an accident, there is a risk that environmentally hazardous substances, such as oil, will be released into the sea, either from ships or from a turbine. Wind farms also entail an increased local service traffic between the park and the service port. In the construction of wind power at sea, other risks must be taken into account, such as environmentally hazardous wrecks and unexploded ammunition.



Map 30. Risks: Dumped weapons

Marine spatial planning areas

Dumped weapons

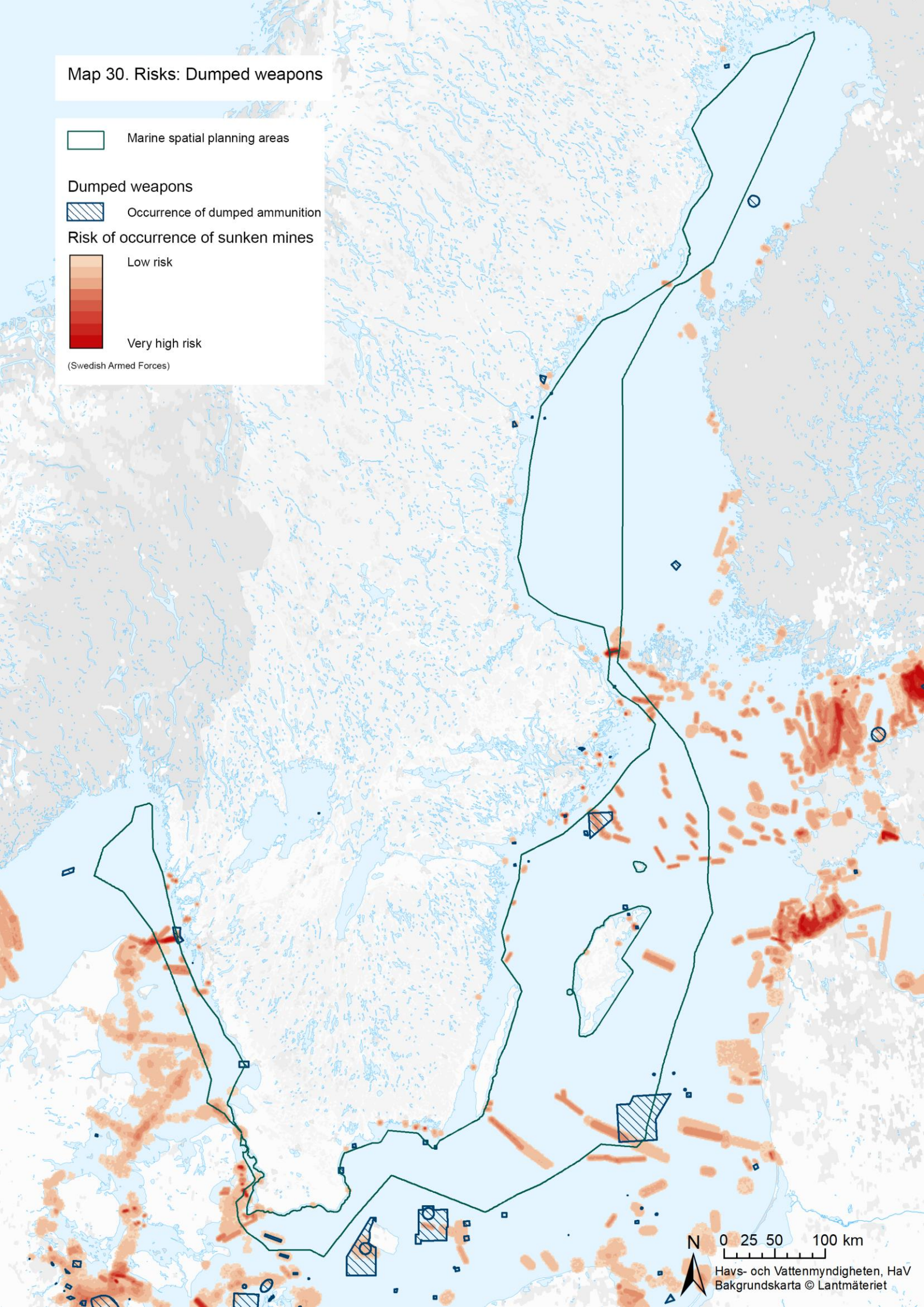
Occurrence of dumped ammunition

Risk of occurrence of sunken mines

Low risk

Very high risk

(Swedish Armed Forces)



N 0 25 50 100 km

Havs- och Vattenmyndigheten, HaV  
Bakgrundskarta © Lantmäteriet

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