MARINE SPATIAL PLAN PROPOSAL

EARLY STAGE — CONSUL-TATION — REVIEW — FINAL PROPOSAL — GOVERNMENT DECISION

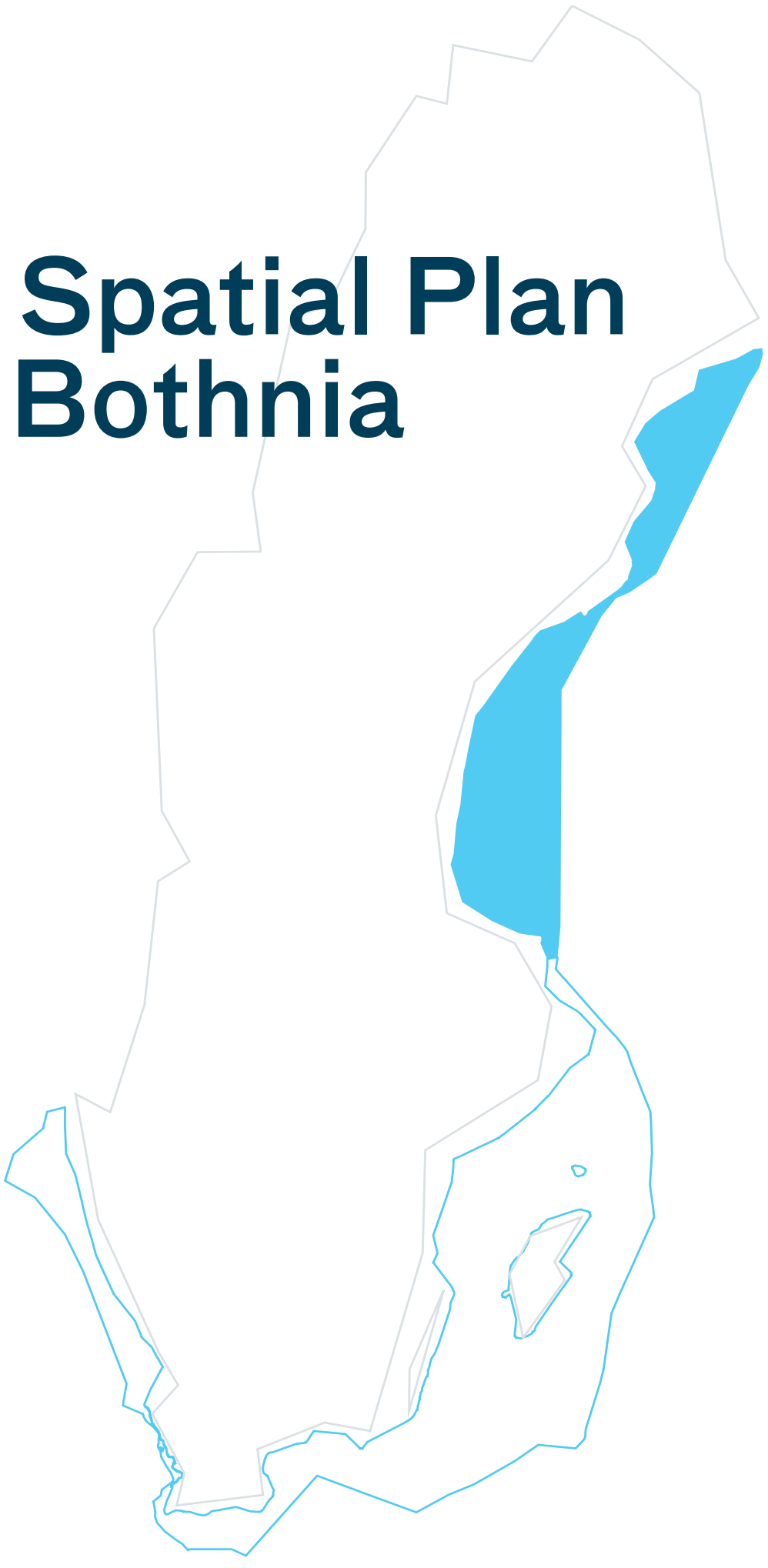
Swedish Agency for Marine and Water Management

Proposal for the

Marine Spatial Plan Gulf of Bothnia

Consultation document

15/02/2018



Maritime Spatial Plan - Gulf of Bothnia

National planning in territorial waters and exclusive economic zone

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Swedish Agency for Marine and Water Management
Marine Spatial Planning Unit

Ref. no. 396-18

15/02/2018

Swedish Agency for Marine and Water Management
Box 11 930
SE-404 39 Gothenburg
Sweden
Tel. +46-10-698 60 00
www.havochvatten.se
havochvatten@havochvatten.se

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 plan provides 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 sustainable development and should combine economic, social, and environmental objectives.

The marine spatial plan contains guidance on **most suitable use**. The use or uses that are presented in an area take priority over other uses. In almost the entire Gulf of Bothnia different uses can coexist, with or without adaptions. In other places some uses cannot coexist, which is reflected in the designation of most suitable uses in the area.

The marine spatial plan sets out eight **uses** in the Gulf of Bothnia: attractive living environments, energy extraction, defence, general use, nature, sand extraction, shipping, and commercial fisheries.

The marine spatial plan also sets out areas where **particular consideration** should be taken to areas of high nature value or the interests of national defence.

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

The consequences of the marine spatial plan are assessed from ecological, economic, and social perspectives. The work of assessing the consequences has been conducted in parallel with the planning and has been integrated into it. The consequences are also analysed in a separate SEA and a separate sustainability assessment.

The marine spatial planning has its **points of departure** in laws, ordinances, societal goals, reports, and not least the long-term dialogue that SwAM has conducted with others.

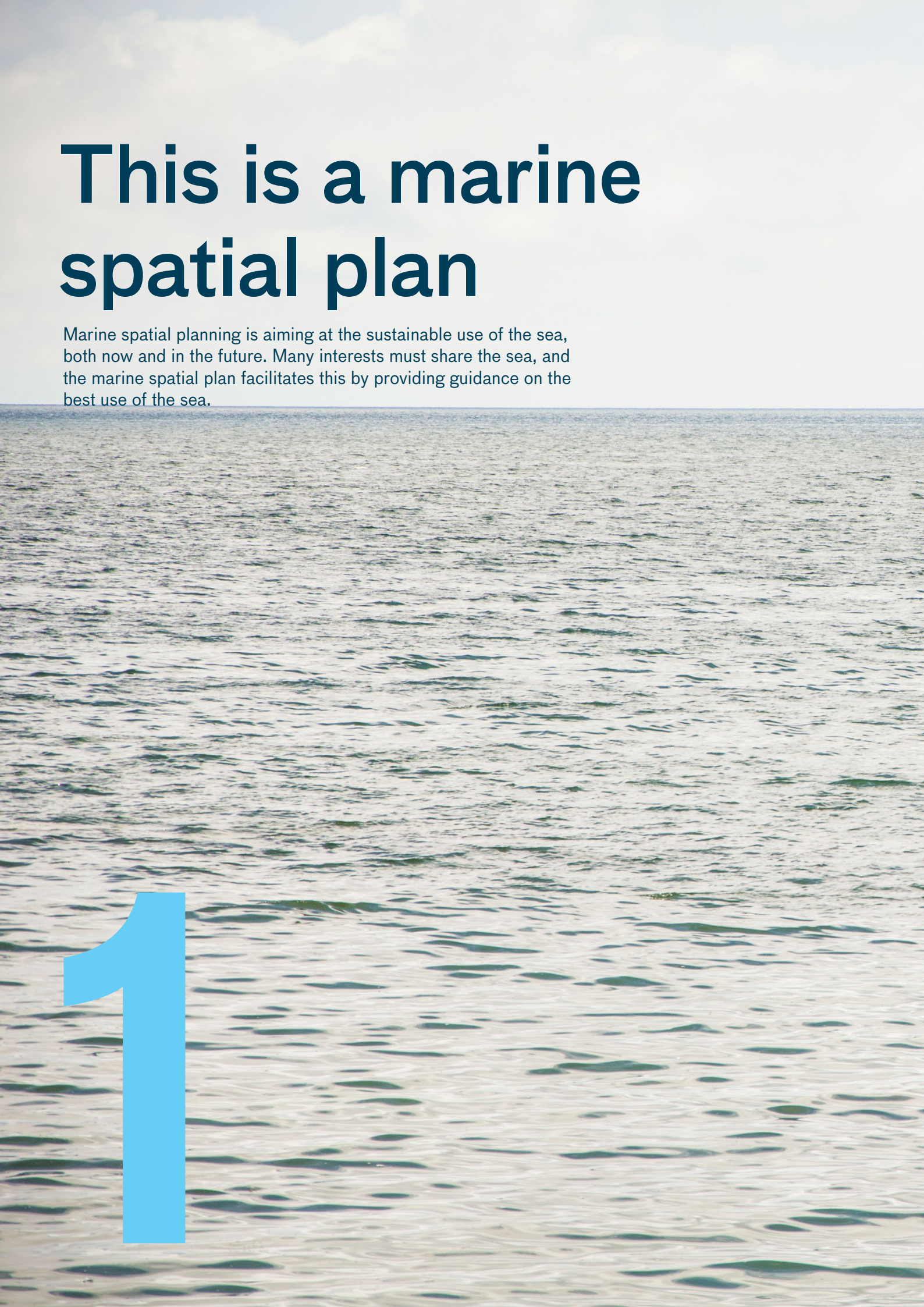
The consultation on the marine spatial plan means that others have the opportunity to provide input on this marine spatial plan proposal so that SwAM can then revise it accordingly.

Content

List of maps

This is a marine spatial plan

Marine spatial planning is aiming at the sustainable use of the sea, both now and in the future. Many interests must share the sea, and the marine spatial plan facilitates this by providing guidance on the best use of the sea.



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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 combines economic policy with social and environmental objectives. It should 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

A marine spatial plan should also provide the guidance necessary to be able to use the areas for the purposes that they are best suited for considering the area's character, location, and needs[1].

The marine spatial planning work results in marine spatial plans that provide guidance and at the same time contribute to new knowledge. This is the first time that Sweden is preparing marine spatial plans.

Reading instructions

You can read the plan as a document or as web pages

This document is the marine spatial plan. It is this document that is the formal proposal for consultation. In addition to this, the marine spatial plan is also available as web pages.

The web version of the marine spatial plan is an aid in exploring the plan in a different way. Some maps are clickable and sometimes the texts are arranged in a different way. But the content in the web version and this document is the same. You can find both the web version and this document at *www.havochvatten.se/havsplanering*.

This document is structured as follows

Chapter 1. This is a marine spatial plan briefly explains what a marine spatial plan is and what areas Sweden is preparing marine spatial plans for.

Chapter 2. Points of departure describes the conditions that form the basis of the planning. Among other things, the chapter presents the legal conditions, the relationship to the planning of municipalities and neighbouring countries, national objectives and strategies, environmental status, and how the work of preparing marine spatial plans is done.

Chapter 3. A future we want to achieve describes a future that society wants to achieve by 2050 and the planning objectives that apply for marine spatial planning.

Marine spatial plans' geographic delimitation

The marine spatial plans cover Sweden's exclusive economic zone and the Swedish territorial sea from one nautical mile outside the Swedish baseline. Privately owned water is excluded. One nautical mile is equivalent to 1,852 metres.

The municipal boundary between Östhammar and Norrtjälje forms the boundary between the Gulf of Bothnia and the Baltic Sea marine spatial planning areas. The southern municipal boundary between Helsingborg and Höganäs represents the boundary between the Baltic Sea and the Skagerrak/Kattegat marine spatial planning areas.

The municipalities have planning responsibilities for the marine area that is within their municipal boundaries, meaning the internal waters and territorial sea. The municipalities' and the state's planning responsibilities thereby have overlapped in most of the territorial sea since 2015 in connection with the Marine Spatial Planning Ordinance.

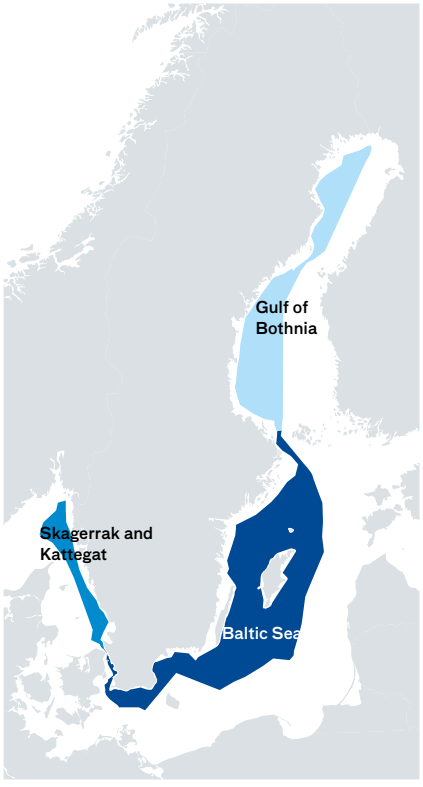


Figure 2. Sweden's three marine spatial plans

1 *Section 4 of the Marine Spatial Planning Ordinance (2015:400).*

Chapter 4. Guidance on most suitable use consists of guidelines in the planning map and associated text that set out what uses are proposed to take precedence in different areas. This guidance also includes particular consideration of areas of high nature value and defence interests. How different uses can coexist and approaches to such coexistence are also described. The planning map is presented in this chapter as an overall planning map of the Gulf of Bothnia's marine spatial planning area.

Chapter 5. Marine sub-regions begins with the plan's main features for the Gulf of Bothnia and then describes the standpoints for each marine sub-region. This chapter has a planning map for each marine sub-region in the approximate scale that the marine spatial plans are to be interpreted in. The description includes especially important conditions and motivations for why the planning looks the way it does. Here, any conflicting objectives between different interests in the same areas are explained and what trade-offs have been made.

Chapter 6. Themes describes the many interests in the sea divided into themes. Each theme is described in maps and texts based on their conditions, future, and interaction with the surroundings. National interest claims and public interests of material significance for the theme are presented separately in maps and texts.

Chapter 7. Implementation and application describes how the plan should be used and at whom the marine spatial plan is directed.

Chapter 8. Consequences is a description of the work to assess the plan's consequences from ecological, social, and economic perspectives. The SEAs are available in their entirety as separate documents.

Chapters 1-3 and 7 are largely the same in the three marine spatial plans for the Baltic Sea, the Gulf of Bothnia, and Skagerrak and Kattegat.

A strategic environmental assessment[2], a sustainability assessment[3], and a list of documents per area are provided with each plan[4]. The list of documents per area presents the documents that are relevant to the respective geographic area. For example, information is available there on what kinds of national interests or other public interests form the basis for the trade-offs of the marine spatial plan. The list is a complement to the maps and descriptions of the marine spatial plan that present information in different ways.

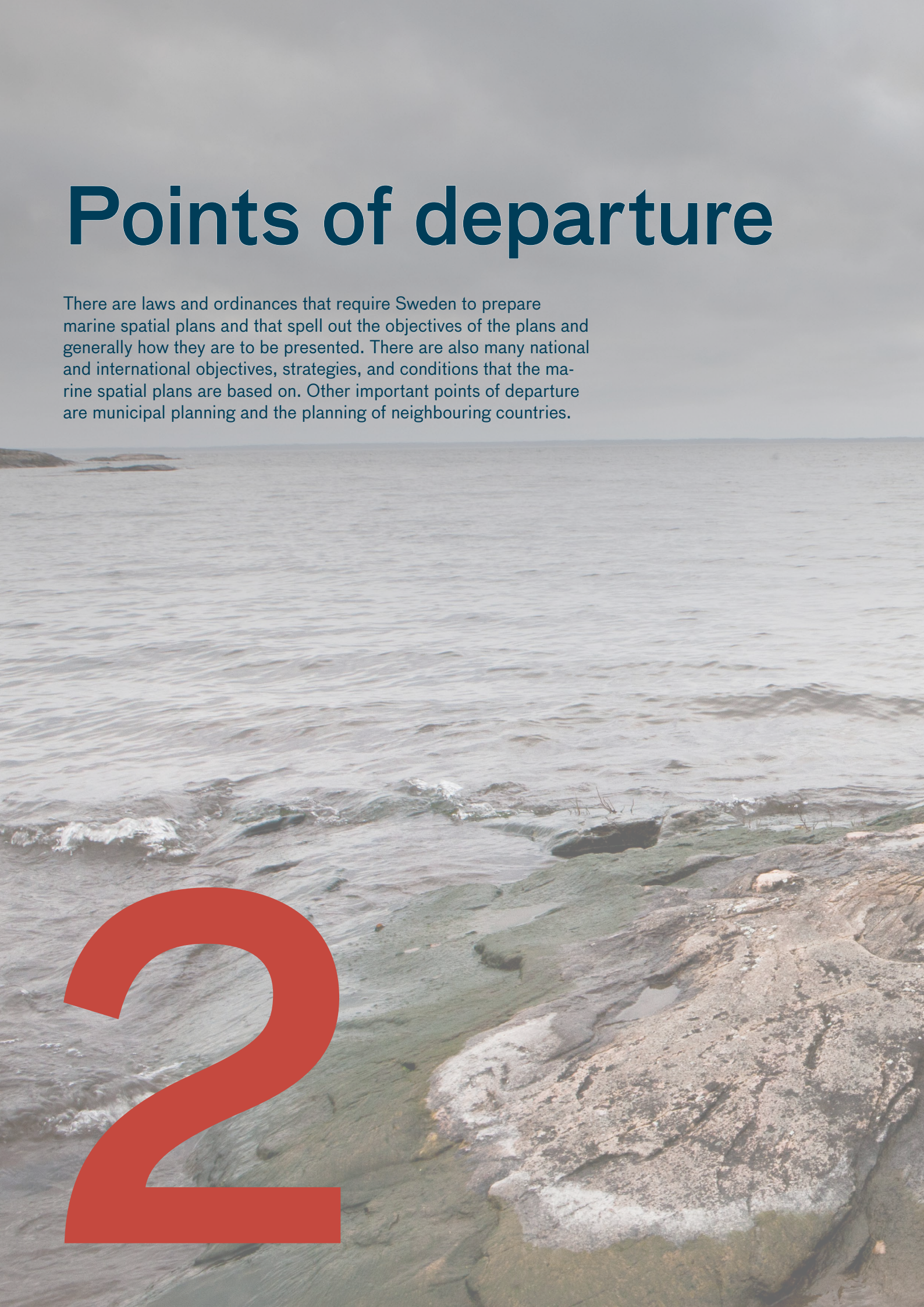
2 Swedish Agency for Marine and Water Management. 2018. Strategic Environmental Assessment for the Gulf of Bothnia MSP

3 Swedish Agency for Marine and Water Management. 2018. Sustainability Assessment for the Gulf of Bothnia MSP

4 Swedish Agency for Marine and Water Management. Document per area. Marine Spatial Plan for the Gulf of Bothnia 15/02/2018.

Points of departure

There are laws and ordinances that require Sweden to prepare marine spatial plans and that spell out the objectives of the plans and generally how they are to be presented. There are also many national and international objectives, strategies, and conditions that the marine spatial plans are based on. Other important points of departure are municipal planning and the planning of neighbouring countries.



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The Marine Spatial Planning Ordinance and the Swedish Environmental Code form the basis.

Through the Swedish Environmental Code[5] and the Marine Spatial Planning Ordinance[6], Sweden has transposed the EU Framework Directive on Maritime Spatial Planning[7] into Swedish legislation.

Under the Swedish Environmental Code, there shall be three national marine spatial plans – one for the Gulf of Bothnia, one for the Baltic Sea, and one for Skagerrak and Kattegat. The plans shall provide guidance to public authorities and municipalities in the planning and review of claims for the use of the areas. The marine spatial plans shall 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 outside the baseline that are considered to be located within Swedish territorial waters[8]. The marine spatial plans are approved by the Swedish Government. The Government may pronounce regulations on such prohibitions or limitations regarding operations and measures in an area subject to marine spatial planning as necessary to achieve[9].

The Marine Spatial Planning Ordinance regulates the implementation of marine spatial planning. It states that the SwAM shall prepare marine spatial plan proposals, what the plans shall contribute to, that an ecosystem approach shall be applied, that environmental impact shall be analysed, and that follow-up shall take place.

The marine spatial plan shall guide and contribute to sustainable development.

The objective of the arine spatial plan is to contribute to long-term *sustainable development*. It shall provide guidance to public authorities and municipalities in the planning and review of claims for the use of the area subject to the marine spatial plan. The guidance shall aim for the marine sub-regions covered by the plan *to be used for the purpose or purposes that they are most suited for* considering the areas' characteristics, location, and the needs [10].

The foremost task of the marine spatial planning is to make a trade-off between different public interests, which are presented in the preparatory work for the marine spatial planning legislation[11]. National interests are a part of the public interests. The other public interests, in addition to the national interests, that the marine spatial plans are to cover are not defined in the legislation. They shall, however, be public interests of *material significance*.

5 *The Swedish Environmental Code (1998:808)*
6 *Marine Spatial Planning Ordinance (2015:400)*
7 *Directive 2014/89/EU of the European Parliament and of the Council establishing a framework for maritime spatial planning.*
8 *Act concerning the Territorial Waters of Sweden (1966:374). Act concerning the Territorial Waters and Maritime Zones of Sweden (2017:1272),* effective 1 March 2018.
9 Ch. 4 Section 10 of the Swedish Environmental Code
10 Chapter 4 Section 10 of the Environmental Code and Section 4 of the Marine Spatial Planning Ordinance. Compare with the text in Chapter 3 Section 1 of the Swedish Environmental Code.
11 *Conservation of marine areas (Government bill 2013/14:186 p 17)*

According to Section 3 of the Marine Spatial Planning Ordinance, the marine spatial plan shall consist of a map and a plan description. The map shall present

- the main outlines for the use of the marine area
- the areas of national interest, in accordance with Chapter 3 of the Environmental Code
- other public interests of material significance

The plan description shall

- specify the aim and direction for the use of the marine area
- specify and describe any areas of national interest in accordance with Chapter 3 of the Environmental Code
- account for other public interests of material significance, the current use of the marine area, and the other planning conditions
- present the considerations that formed the basis for the plan
- indicate how issues regarding incompatible purposes should be resolved
- present the implications and consequences of the utilisation as stipulated in the plan

The plan shall promote coexistence between various activities and areas of use. The plan shall also provide the guidance necessary for the marine subregions covered by the plan to be used for the purpose or purposes that they are most suited for considering the areas' characteristics, location and needs [12]. The marine spatial plan proposal shall be consistent with Chapters 3 and 4 of the Swedish Environmental Code.

National interests in accordance with the Swedish Environmental Code

The areas and facilities that are or may be covered by national interest claims are presented by Chapters 4 and 3, respectively, of the Swedish Environmental Code. When an area is a national interest or is covered by a national interest claim, it means that it outweighs other public interests in the spatial planning and that its value or importance may not be significantly damaged.

Ancillary management provisions are pointed out by public authorities and are regulated in Chapter 3 of the Swedish Environmental Code. Such a national interest claim does not always entail a ban on other measures in or around the area, but means that its value shall be protected in the planning. If there are conflicting national interest claims, the marine spatial plan may contain a judgement and prioritisation of the use that best promotes sustainable management of the land, the water, and the spatial environment in general. According to Chapter 3 of the Swedish Environmental Code, the national defence interests always outweigh other national interest claims.

Geographically linked management provisions are given in Chapter 4 of the Swedish Environmental Code. Areas of particularly great value in terms of

12 Compare the text in Chapter 3 Section 1 of the Swedish Environmental Code (1998:808).

natural and cultural preservation, tourism, and outdoor recreation are directly defined in Chapter 4, and these areas are of national interest in their entirety. This includes major coastal and archipelago areas that may not be subjected to exploitation that significantly damages their value. At the same time, the provisions do not hinder the construction of facilities for national defence purposes or the development of existing urban areas or local industry in these areas if there are no other viable alternatives. It may also be allowed to extract deposits of different substances or materials. Natura 2000 areas are also of national interest in accordance with Chapter 4 of the Environmental Code. In these areas, special permit reviews are necessary for activities or measures that might significantly affect the natural environment.

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 met. The county administrative board's work shall be based on the marine spatial plan in the areas covered by a marine spatial plan according to Section 3 of the Ordinance on Land and Water Management[13]. In other areas, the county administrative board's work is based on documentation from the respective national interest authority.

Public interests

As stated above, the foremost task of the marine spatial planning is to weigh up different public interests. Public interests in the planning of land and water are interests that contribute to achieving societal objectives for economically, socially, and environmentally sustainable development. The public interests and the national interests that the marine spatial plans are to cover are not defined in further detail. They shall, however, be public interests of *material significance*. Public interests of material significance can, for example, be interests that are pursuant to the first paragraphs of Chapter 3 of the Environmental Code or municipal interests that are considered to be of national interest.

What is counted as a public interest in municipal planning is described in the Planning and Building Act. Public interests in municipal planning include natural and cultural aspects, consideration for the environment, and certain provisions of the Environmental Code. National interests according to the Environmental Code are also a part of public interests.

13 *Ordinance (1998:896) on Land and Water Management*

Assessment of use

The marine spatial plans set out the uses. The basis of the stated use builds on various national interest claims and other public interests according to the Environmental Code. The box below explains how:

Read more about coexistence in Chapter 4 Guidance on the most suitable use.

Uses are based on different public interests

The uses in the marine spatial plan are based on three kinds of interests:

- national interests in accordance with Chapter 4 of the Environmental Code
- national interest claims in accordance with Chapter 3 of the Environmental Code
- other public interests of material significance

The uses comprise these three to differing extents.

When the interests overlap

In large parts of the sea, several public interests overlap, such as different national interest claims.

The marine spatial plan address overlapping interests in the following ways:

A. Several interests are considered compatible

→ The marine spatial plan indicates several interests as the most suitable use in the same area since they can coexist.

B. A national interest claim according to Chapter 3 is an area that is also of national interest according to Chapter 4 of the Environmental Code.

→ National interest claims according to Chapter 3 will not become a use in the marine spatial planning if the use conflicts with the provisions in Chapter 4.

C. Different national interest claims according to Chapter 3 of the Environmental Code are considered incompatible.

→ The marine spatial plan gives priority to the national interest claim or claims that is/deemed to be the most suitable in the area. The motivation of the chosen use is then stated under the respective marine area. Defence interests are always given priority if the area is needed for a facility for total defence, in accordance with the provisions of the Environmental Code.

D. An area with a national interest claim according to Chapter 3 of the Environmental Code is also covered by a public interest of material significance. The national interest claim and the public interest are incompatible.

→ The marine spatial plan gives the national interest claim priority when it is deemed to be relevant.

A national interest claim being given priority over another national interest claim does not mean that a national interest claim disappears.

Boundaries in the sea

The UN Convention on the Law of the Sea[14] regulates the maritime law boundaries in the sea, i.e. what constitutes internal waters, territorial sea, a contiguous zone, and an economic zone. The territorial sea extends a maximum of 12 nautical miles from the baseline. The exclusive economic zone is the area outside, although no more than 200 nautical miles from the baseline. The Swedish territorial sea and the economic zone have varying extents depending on where they meet other countries' boundaries and zones. The contiguous zone can extend to a maximum of 24 nautical miles from the baseline. In the contiguous zone, Sweden may carry out certain policing functions among other activities. Sweden also has a right to protect the marine cultural heritage on the sea bottom in the zone.

In the territorial sea, Sweden has sovereignty. This implies the unlimited right to regulate various activities, with the exception of other states' right of innocent passage with vessels. In the exclusive economic zone, Sweden has the sovereign right to explore, utilise, and manage natural resources. Sweden also has jurisdiction with respect to the protection and preservation of the marine environment, the establishment and use of artificial islands and other structures, and scientific research. At the same time, other states have the right to lay down cables and lines on the Swedish continental shelf and have the freedom of shipping and overflight. The regulation of fisheries 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.

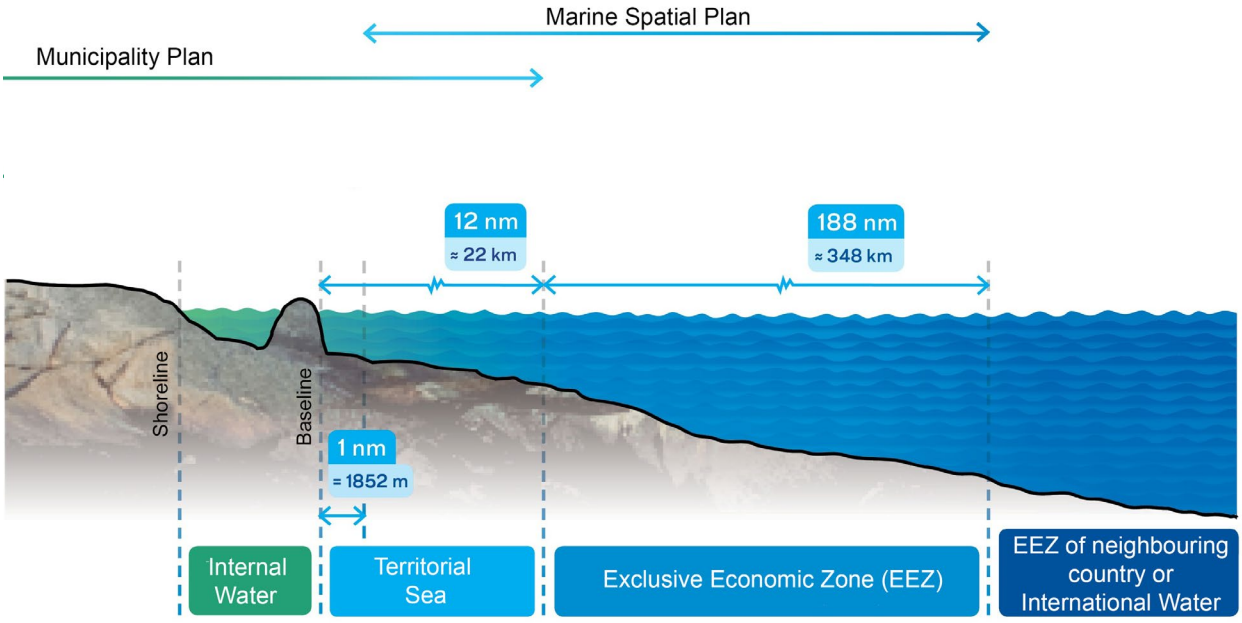


Figure 3. Terms, boundaries, and planning responsibility. In the territorial sea, the state shares planning responsibilities with the municipalities. In the exclusive economic zone, the state has planning responsibility.

14 *UN Convention on the Law of the Sea (SÖ 2000:1)*

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

The planning of the marine areas must also relate to other international law (besides the Law of the Sea) and EU law, which provides both opportunities and limitations in planning. A marine spatial plan cannot restrict an activity or an interest beyond what is made possible, for example, by the Law of the Sea.

There are also legislation and policies at the EU level that concern the sea or activities linked to the sea. These include, among other things, the EU's Marine Strategy Framework Directive[15] and other environmental protection directives and the Union's transportation, fisheries, shipping, and energy policies.

Municipal planning of the territorial sea

According to the Planning and Building Act[16], the municipalities have planning responsibility for Sweden's territory, which also includes internal waters and territorial sea. Through the introduction of the marine spatial planning in Sweden, there are 65 municipalities where the planning responsibility overlaps between the municipality and the state in the territorial sea. 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 plan is the basis for the municipalities' right to decide on detailed planning and to interpret the substance of public interests. Today, there are some 20 municipalities that have adopted comprehensive plans that encompass the entire territorial sea and present well-conceived municipal standpoints[17]. However, areas near land and in the coastal zone are addressed in the plans more often than the areas farther out in territorial waters. The reasons for this might be the sea's tradition of free use and the lack of properties in offshore waters. In 2016 and 2017, many coastal municipalities either began preparatory work for the planning of the marine area or began work on comprehensive planning according to the Planning and Building Act. In Stockholm County, there is regional planning according to the Planning and Building Act, and Stockholm County Council has standpoints that concern the archipelago environments in its regional plan. The Göteborg Region Association of Local Authorities, a regional planning body under the Planning and Building Act appointed by the Government, has produced a preliminary study on inter-municipal coastal planning.

On 16 November 2017, the Swedish Parliament decided to pass the Government bill on Sweden's marine territory and maritime zones (Government bill 2016/17:215). The bill proposes a new coherent act that sets out the geographic scope of Sweden's marine territory and maritime zones with uniform geographic coordinates expressed in the Swedish reference system SWEREF 99.

Through the decision, Sweden's baselines are revised, which affects the delimitation of Sweden's territorial sea and exclusive economic zone. The decision also means that a contiguous zone is established. The new legislation also defines the extent of the line that designates one nautical mile from the baseline, meaning the marine spatial planning area's delimitation in relation to the coast.

This new legislation came into force on 1 March 2018.

In this consultation proposal on marine spatial plans, a preliminary delimitation of the marine spatial planning area is used. In the next stage, meaning the review stage, the delimitation for the marine spatial planning area will be updated based on the new legislation.

15 *Directive 2008/56/EC of the European Parliament and of the Council*
16 *Planning and Building Act (2010:900)*
17 National Board of Housing, Building and Planning. 2017. Spatial planning – land, coast, and sea (working draft 21/12/2017)

Many neighbouring countries to collaborate with

The Swedish marine spatial plans border on nine neighbouring countries' territorial waters or exclusive economic zones. Moreover, Åland is an autonomous region with its own jurisdiction in terms of planning of its territorial waters.

The neighbouring countries have made extensive progress in the planning of their marine areas. 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. Article 11 of the

Figure 4. Stages in the marine spatial planning in neighbouring countries. Light blue marks countries where the first national marine spatial planning process is under way. Dark blue marks countries where the first national marine spatial planning process has been completed. In Russia, preparations are under way for marine spatial planning legislation.

Directive sets forth the obligation to cooperate with neighbouring countries. Here, Sweden is taking an active role by leading and participating in the EU-financed projects Baltic SCOPE in 2015–2017, Pan Baltic SCOPE in 2018–2019, Baltic LINES in 2016–2019, and NorthSEE in 2016–2019.

The neighbouring countries work together on the projects in order to coordinate planning issues that concern various sectors, such as shipping and fisheries, and to coordinate data and documentation. In Baltic SCOPE, for example, energy, fisheries, nature, and shipping were addressed. The participating countries' responsible planning authorities participated in the project, and the sector authorities were invited to participate in the discussions. Based on needs and the joint work in the project, recommendations were drafted for the handling of cross-border issues[18]. In Pan Baltic SCOPE, the cross-border collaboration is continuing in support of the national marine spatial planning processes. This includes cooperation on green infrastructure, collective (cumulative) impact, economic and social impact analyses of the marine spatial plans, and coordination of land spatial planning and marine spatial planning.

Cooperation is also taking place within the scope of the regional marine environment conventions, including the Baltic Sea Convention (Helcom) (including the Gulf of Bothnia) and Kattegat, and the Convention for the Protection of the Marine Environment of the North-East Atlantic (the "OSPAR Convention"), which includes the North Sea, Skagerrak, and parts of Kattegat. There is also a special forum for cooperation between the ministries that have responsibility for spatial planning in the Baltic Sea region, namely Vision and Strategies Around the Baltic Sea (Vasab). Vasab and Helcom have formed a working group for spatial planning of the sea that has developed guidelines for consultations and how the ecosystem approach can be applied to marine spatial planning.

The neighbouring countries had the opportunity to submit comments on the drafts of the marine spatial plans at an early stage in 2017 during a dialogue that SwAM held with stakeholders. The specific comments received are described in *Chapter 6 - Themes*.

Global Sustainable Development Goals

The UN has adopted 17 Global Sustainable Development Goals[19]. These cover the economic, environmental, and social dimensions of sustainable development. The Swedish marine spatial plans mainly have points of contact with the following goals:

Goal 3 *Good health and well-being* is planned for by protecting the areas with attractive living environments in order to promote health and well-being.

Goal 9 *Industry, innovation and infrastructure* and Goal 7 *Affordable and clean energy* are planned for by promoting good shipping routes and energy extraction and research in renewable energy at sea.

18 *Baltic SCOPE (2017). Recommendations on Maritime Spatial Planning across Borders*
19 *UN Global Sustainable Development Goals*

Goal 13 *Climate action* is planned for by integrating climate refuges in the marine spatial planning.

Goal 14 *Life below water* and Goal 15 *Life on land* are planned for through a focus on sustainable use and on more areas with greater protection of nature and ecosystems.[20]

A climate refuge is an area that might need special protection in order to preserve important plants and animals, the distribution of which decrease when the climate changes. These areas often constitute the more stable areas that are expected to remain of a species' larger range when salinity and temperature change. A climate refuge is deemed to be important for the species to continue to exist in the marine area. The documentation that is available for climate refuges is preliminary and needs to be developed when moving forward. The term climate refugia can also be used to describe a climate refuge.

National environmental objectives

In addition to the overall generation objective, which is a guide for the environmental efforts at all levels in society, several of Sweden's 16 national environmental quality objectives have ties to the marine environment[21]. The environmental quality objective of *Seas in balance and living coasts and archipelagos* has a particularly prominent connection to marine spatial planning because the objective's specifications tie into ecosystem services and a good environmental status and thereby also the *environmental quality standards that SwAM established* in the scope of the Marine Environment Ordinance and the Water Authorities and in the scope of the Water Management Ordinance.[22]

The following environmental quality objectives were deemed to be[23] the most relevant to marine spatial planning as a whole in the marine spatial planning roadmap:

- *A Balanced Marine Environment, Flourishing Coastal Areas and Archipelagos* – the central thematic objective for the sea and coastal zone.
- *A Rich Diversity of Plant and Animal Life* – concerns marine plant and animal life, including birds and bats.
- *A Non-Toxic Environment* – concerns the emission and dispersion of pollutants.
- *Reduced Climate Impact* – concerns emissions of greenhouse gases from, for example, shipping and concerns the conversion to renewable energy sources.
- *Zero Eutrophication* – concerns emissions of nitrogen compounds and phosphorus compounds into the air and water.

Sweden's maritime strategy

In 2015, the Government decided on a Swedish national maritime strategy for *competitive, innovative, and sustainable maritime industries that can contribute to increased employment, reduced environmental pressure, and an attractive living environment*[24].

20 The Swedish Agency for Marine and Water Management's response in Government assignment Fi2016/01355/SFÖ Appendix 2.
21 *Sweden's environmental objectives*
22 *The Marine Environment Ordinance (2010:1341)* and *the Water Quality Management Ordinance (2004:660)*
23 *Swedish Agency for Marine and Water Management. Report 2016:21, Färdplan havsplanering [Marine Spatial Planning Roadmap].*
24 *A Swedish national maritime strategy – for people, jobs, and the environment*

This vision is based on three equally important perspectives:

- a balanced marine environment
- competitive maritime industries
- attractive coastal areas.

The strategy comprises and integrates many areas of policy and is thereby an instrument for implementing a Swedish integrated marine policy. The maritime strategy identifies national marine spatial plans as an important instrument to control the development of Sweden's offshore areas. The maritime strategy is of major relevance to the marine spatial plans and is integrated into the planning objectives.

Climate adaptation

Climate change will impact the seas and the opportunity for people to use the sea as a resource in many different ways. There is a considerable likelihood that a changed climate will also entail significant changes in the ecosystems, ice cover patterns, salinity, currents, oxygenation, and wind and wave patterns[25]. Man-made emissions of carbon dioxide also entail increased acidification of the seas, with potentially far-reaching consequences for organisms and ecosystems. Climate change is also linked to the actual demands made on the use of the sea. The impending need to reduce emissions of greenhouse gases in a short period of time will entail greater use of the sea for the extraction of various forms of fossil-free energy, such as sea-based wind and wave power. Effects on land may entail a greater interest in activities at sea through changed transport patterns that lead to a shift from road to maritime transports and for beach replenishment activities at sea to adapt coastal zones to the climate and combat coastal erosion. The possibility of conducting activities at sea has secondary effects on land or in neighbouring countries and thereby affects the total emissions of greenhouse gases[26].

Altogether, the climate as an environmental issue is linked to the marine spatial planning through both direct and indirect effects on use and claims and the impact on the ecosystems in general and the services they provide. Marine spatial planning can also prevent effects of climate changes and the contribution of the use of the sea to this by pointing out areas for sustainable energy conversion and fuel-efficient shipping lanes.

Planning for good environmental status

To reverse negative environmental developments and to stimulate the sustainable use of the sea's resources, the European Community (now the EU) prepared and adopted the Marine Strategy Framework Directive[27], which

25 *Swedish Agency for Marine and Water Management. Report 2017:26. Havsplanering med hänsyn till klimatförändringar [Marine spatial planning in consideration of climate change].*

26 Swedish Agency for Marine and Water Management. Report 2018:5. Miljösystemanalys för svensk havsplanering [Environmental system analysis for Swedish marine spatial planning].

27 *Directive 2008/56/EC of the European Parliament and of the Council*

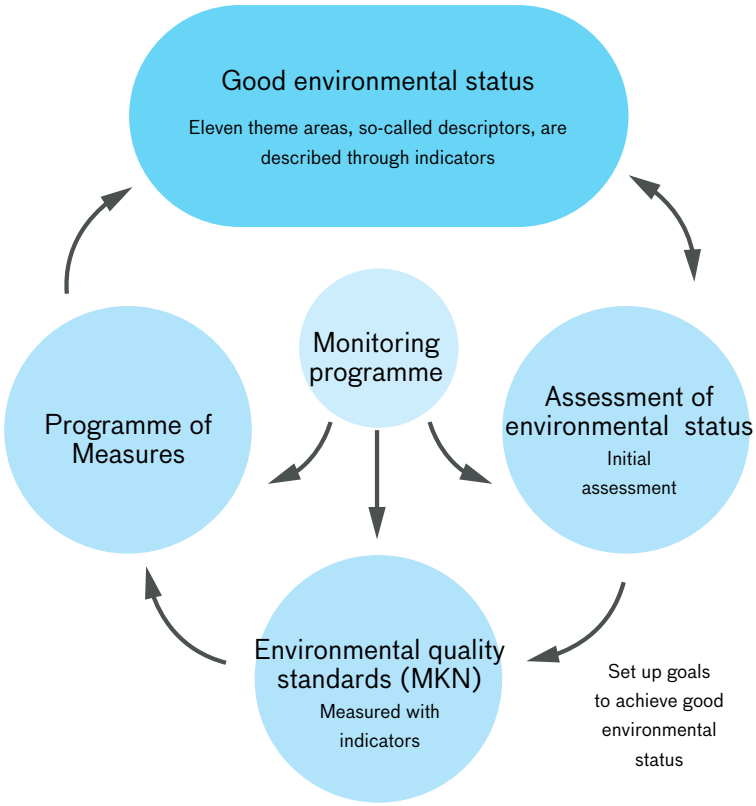


Figure 5. Overall illustration of the Marine Strategy Framework Directive's process and concepts.

in Sweden was introduced through the Marine Environment Ordinance[28]. The Marine Strategy Framework Directive aims to achieve or maintain a good environmental status in Europe's seas by 2020. For Sweden, this involves the management areas of the North Sea and the Baltic Sea. According to the Marine Strategy Framework Directive, the Baltic Sea's management area consists of the Gulf of Bothnia and the Baltic Sea Proper. In the marine spatial planning, the latter is called the Baltic Sea. The definition and assessment of good environmental status, environmental quality standards with associated indicators, action programmes, and monitoring programmes for the marine environment are tools in the Marine Environment Ordinance to reduce the load. Definition and assessment of good environmental status is summarized in *Initial assessment 2018*[29].

According to the Swedish Marine Spatial Planning Ordinance, the marine spatial planning should contribute to achieving and maintaining a good environmental status. To achieve a good environmental status by 2020, the use of the sea must change so that the burden the use entails is reduced. The marine spatial plan's guidance on the most suitable use and the particular consideration of high nature values can contribute to achieving and maintaining good environmental status.

28 *Marine Spatial Planning Ordinance (2010:1341)*
29 *Swedish Agency for Marine and Water Management. Report 2017:32. Samråd om inledande bedömning 2018, genomförande av havsmiljöförordningen [Consultation on initial assessment 2018, implementation of the Marine Environment Ordinance]*

Environmental quality standards

Environmental quality standards are legal means of control that are intended to ensure that a good environmental status is achieved or maintained. The starting point when establishing an environmental quality standard is knowledge about what mankind and nature can endure without consideration of economic or technical conditions. The standard should therefore reflect the lowest acceptable environmental quality or the desired environmental status, but it usually does not set its sights on how human activities should be structured.

The overall environmental quality standard with the implication that a good environmental status shall be achieved or maintained in the North Sea and Baltic Sea by 2020 is found in Section 17 of the Marine Environment Ordinance. What a good environmental status entails is specified in SwAM's regulations[30] on what characterises good environmental status and environmental quality standards with indicators for the North Sea and Baltic Sea. In these regulations, there are also other environmental quality standards with indicators that aim to for us to be able to achieve a good environmental status in the long term.

The marine spatial plan's guidance on the use of various marine areas is an important tool in the work on meeting the environmental quality standards. For example, activities with a potential negative impact on hydrographic conditions are steered away from the areas where such impacts might have negative effects on biological diversity and ecosystems.

Marine protected areas

An important part of the marine environment management is the development of an ecologically representative, coherent, and functional network of marine protected areas[31]. The marine spatial planning completes this network by presenting areas outside the protected areas where particular consideration shall be taken to nature values.

Green infrastructure

Green infrastructure is the nature areas, biotopes, structures, and elements in the landscape, including seas and coasts, that create an ecological context. Coherent structures are important for preserving rich plant and animal life that preserves both species-specific characteristics and the ecosystems' functionality. Green infrastructure is a specification of the environmental quality objective of *A rich plant and animal life*. The marine spatial planning contributes to coherent green structures by providing guidance on where different uses are most suitable and indicating areas where particular consideration must be taken with regard to nature values.

30 *SwAM's regulations (HVMFS 2012:18) on what characterises a good environmental status and environmental quality standards with indicators for the North Sea and Baltic Sea.*

31 *Swedish Agency for Marine and Water Management. Report 2016. Handlingsplan för marint områdesskydd, myllrande mångfald och unika naturvärden i ett ekologiskt nätverk under ytan. [Action plan for marine area protection, rich diversity, and unique nature values in an ecological network below the surface.] Final report on the Government assignment M2015/771/Nm.*

Ecosystem services

Ecosystem services are services and products that ecosystems provide to humans, such as food, air, or places for recreation. In marine spatial planning, it is important to have knowledge of the significance of ecosystem services in order to be able to analyse, evaluate, and motivate why an area is suitable or unsuitable for various uses.

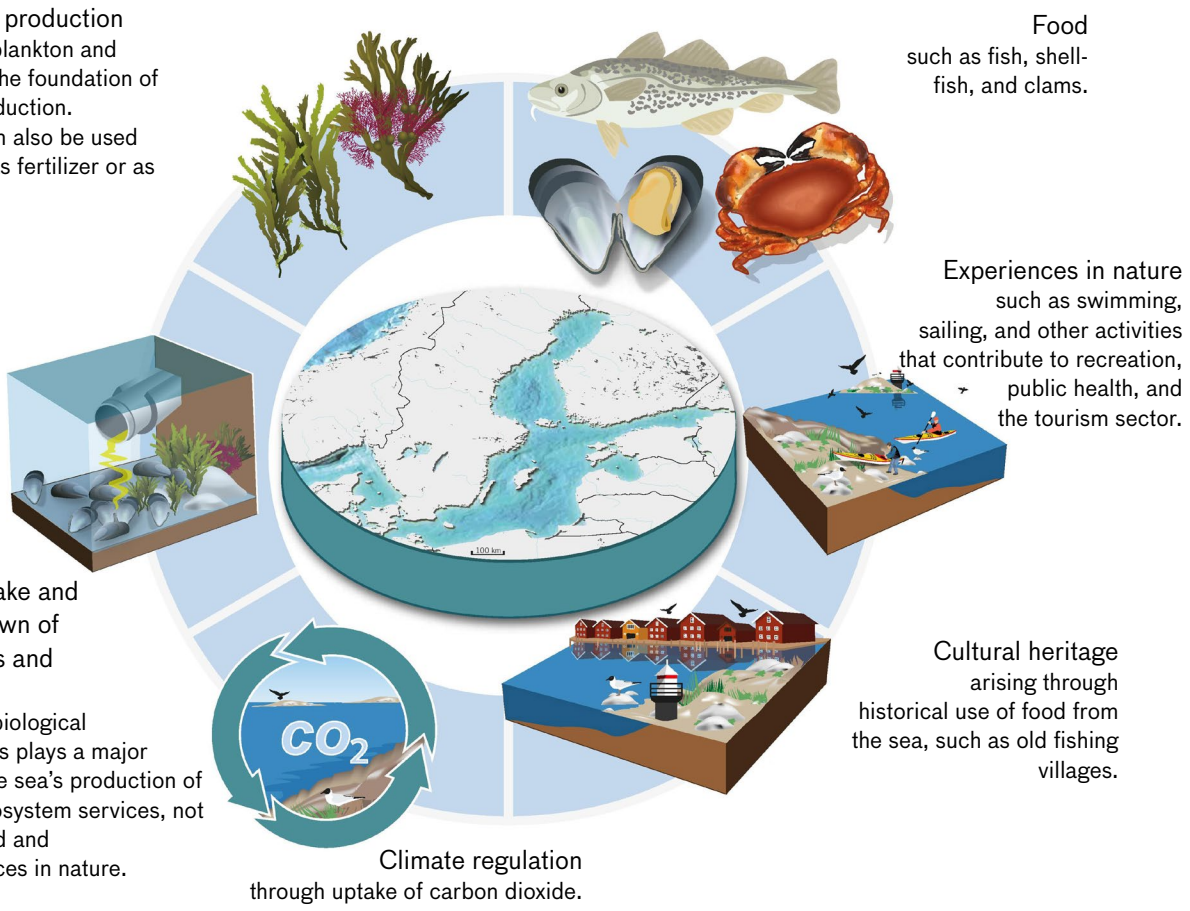


Figure 6. The sea's ecosystems contribute several functions critical to society, such as the production of food. The more visible ecosystem services affect and are dependent on others that are not as visible, such as fish being dependent on other organisms and processes for breaking down nutrients and toxins.

Work on preparing proposals for marine spatial plans

SwAM prepares proposals on marine spatial plans, while coastal county administrative boards and central authorities support this work and assist with input for the planning. Affected municipalities, regional planning bodies, municipal collaboration bodies, and county councils have the possibility to participate in the proposal work. This way the marine spatial plans can take local and regional conditions and needs into consideration. Sweden also cooperates with other countries so that the Swedish marine spatial plans are coordinated with the neighbouring countries' marine spatial plans. SwAM has also held a dialogue with trade associations and interest groups in order to be able to take their conditions and needs into consideration.

The process of preparing marine spatial plans is done in multiple stages where revisions and extensive dialogue take place at each stage. Discussions at an *early stage* were conducted in 2016–2017 based on drafts of the marine spatial plans. During these discussions, more than 150 stakeholders participated and a large number of comments and suggestions for improvement were submitted on the three draft marine spatial plans and SEAs. The discussions were conducted in the form of a large number of large or small dialogue meetings that were held nationally, regionally, and with neighbouring countries. The coastal county administrative boards were responsible for the dialogue with the municipalities and actors responsible for regional development.

Now, *consultations* are being held based on these proposals for the marine spatial plans. Before the marine spatial plans are approved, they will be subject to *review*. During the review, a possibility to submit comments will also be provided.

Sweden and the other EU countries must have established marine spatial plans no later than 2021. Regulations that can be linked to the marine spatial plans with prohibitions against or limitations to activities or measures are not proposed in connection with the consultation proposals for the marine spatial plans, but these might become relevant at a later phase. The marine spatial plans and any regulations will be adopted by the Government. When necessary, or at least every eight years, new proposals must be prepared so that the marine spatial plans are kept up-to-date and can fulfil their purpose.

Planning with the ecosystem approach as a basis

According to the Marine Spatial Planning Ordinance, an ecosystem approach shall be applied in the work on drafting the marine spatial plans. The ecosystem approach is an international strategy for the integrated management of land, water, and living resources that promotes conservation and sustainable use in an equitable way. The goal is to ensure that ecosystems are used without compromising their long-term survival in terms of their structure, dynamics, and function[32].

The ecosystem approach is applied through an inclusive dialogue process in the planning work, knowledge-based planning, the application of the precautionary principle, and planning that is based on the requirement of a good environmental status as set out in the scope of the Marine Environment Ordinance. There is a more detailed presentation of how the ecosystem approach is applied in the planning work in the *Marine Spatial Planning Roadmap*.

32 *Swedish Agency for Marine and Water Management. Report 2012:14. Tillämpning av ekosystemansatsen i havsplaneringen [Application of the ecosystem approach in marine spatial planning] and Schmidtbauer Crona, J. 2017. The Ecosystem Approach in Maritime Spatial Planning – A Checklist Toolbox.*

The precautionary principle and dealing with a lack of knowledge

The planning is based on the best available knowledge regarding marine activities and ecosystems. In the planning, consideration has been taken for the current state of knowledge and the knowledge shortcomings that have been identified.

The precautionary principle requires that a lack of knowledge regarding environmental effects is not to be used as an argument to permit an activity. The marine spatial plan is comprehensive and strategic, and in-depth knowledge may be required in the review of various marine activities and in the development of the management based on the guidance of the marine spatial plan.

Strategic environmental assessment and sustainability assessment

An SEA is performed for every marine spatial plan according to the Marine Spatial Planning Ordinance. The objective of the SEAs is to integrate environmental consideration into the marine spatial plans. In addition to the SEAs for the marine spatial plans, sustainability assessments are performed with a broader perspective. The objective of the sustainability assessments is to analyse the marine spatial plans' impact from economic, social, and environmental perspectives. Read more in *Chapter 8. Consequences.*

Current status description, roadmap, and documentation

The work on marine spatial planning in Sweden has been under way for several years, and a large number of documents have been prepared and are being prepared. In *Marine Spatial Planning – Current Status 2014,*[33] a description of the current situation was provided regarding interests and conditions, as well as an analysis of cooperating and competing interests. The planning objectives were established in the *Marine Spatial Planning Roadmap,*[34] as well as planning strategies that guide the work to develop the marine spatial plans and the delimitation of the SEAs. The objective was to create clarity and support for the continued planning process.

Read more about the starting points for the Marine spatial plans in Marine spatial planning – Current status 2014 and Marine Spatial Planning Roadmap. Reports and documents on marine spatial planning are available here.

33 *Swedish Agency for Marine and Water Management Report 2015:2. Marine Spatial Planning – Current Status 2014.*

34 *Swedish Agency for Marine and Water Management. Report 2016:21. Färdplan havsplanering. [Marine Spatial Planning Roadmap.]*

A future we want to achieve

A marine spatial plan is future-oriented and should lead to the future we want to have. The marine spatial plans set their sights on the year 2030. At the same time, 2050 is used to paint a future further out that stimulates discussions and thoughts on the long-term perspective of the plan.

3

The sea in 2050

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 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 view, advanced planning, and predictability. In 2050, we continue to live in peace and freedom in the Baltic Sea and North Sea region.

Planning objectives

The marine spatial plan should integrate economic policy and social and environmental objectives in accordance with the Marine Spatial Planning Ordinance. The main focus of the planning is that marine resources should be used in a way that allows maritime industries to develop and grow while preserving and restoring ecosystems. The marine spatial plans should contribute to achieving and maintaining a good marine environment. According to the Environmental Code, marine spatial plans should contribute to long-term sustainable development. The planning also takes into account the UN Global Sustainable Development Goals as well as goal formulations in the scope of our national legislation, which in many cases can be traced to international agreements.

The marine spatial planning has identified 10 planning objectives based on societal objectives, existing legislation, national strategies, and other input. The planning objectives consist of an overall objective that is supported by the other nine objectives. The overall objective is a *Good marine environment and sustainable growth*. The other nine are divided into two groups: creating conditions and establishing preparedness. This division captures the difference between the claims that are clear and comprehensive in the short term, i.e. conditions, and the issues that are deemed to possibly have comprehensive claims in the sea in a longer future perspective, i.e. preparedness.

The preparedness objectives mean that the marine spatial planning must provide margins for future needs and activities, such as growing aquaculture or more mineral extraction and carbon dioxide storage. This figure shows the planning objectives and legislation, strategies, and other overall objectives.

The planning objectives' implications are described in detail in the Marine Spatial Planning Roadmap.

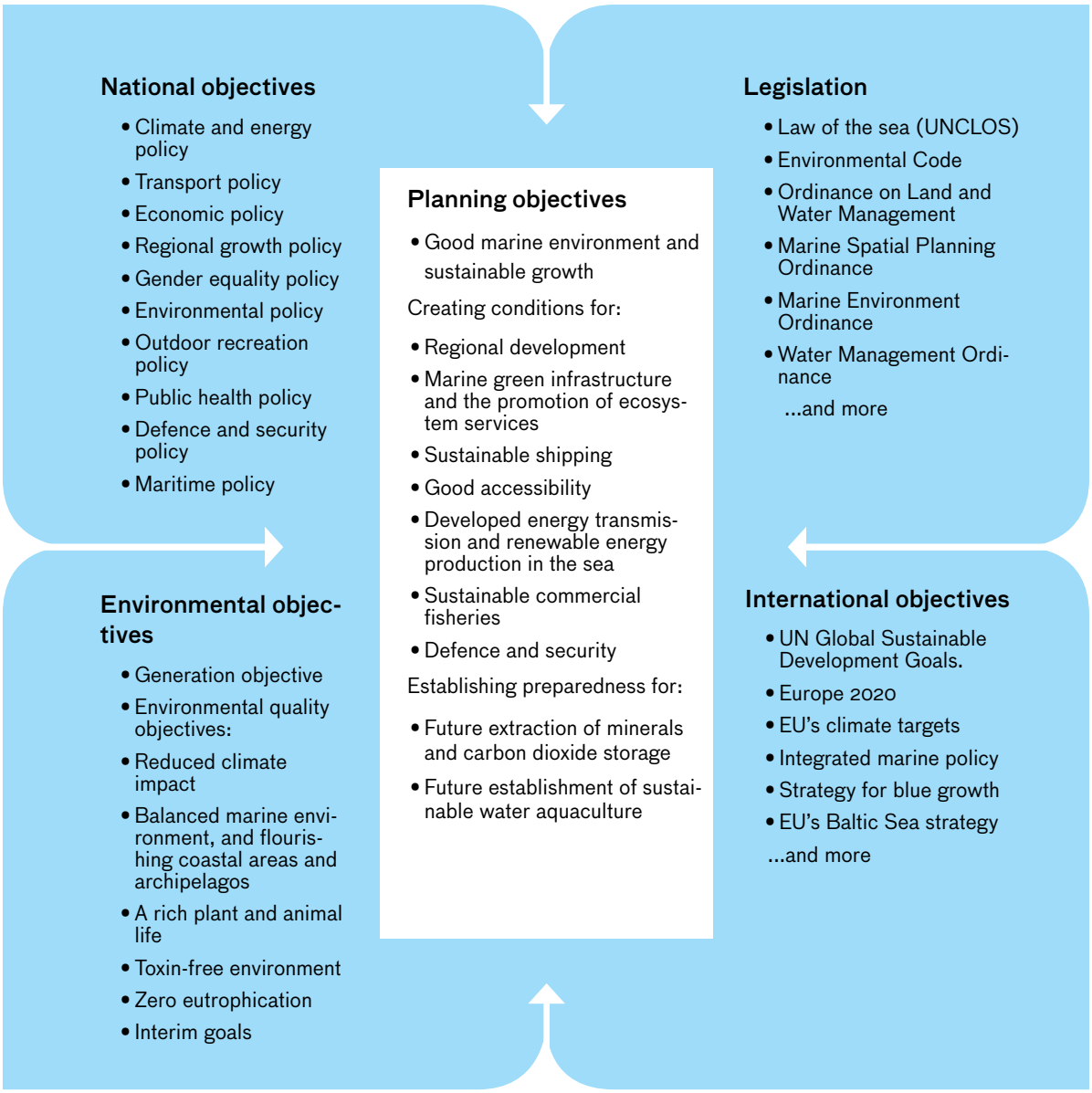
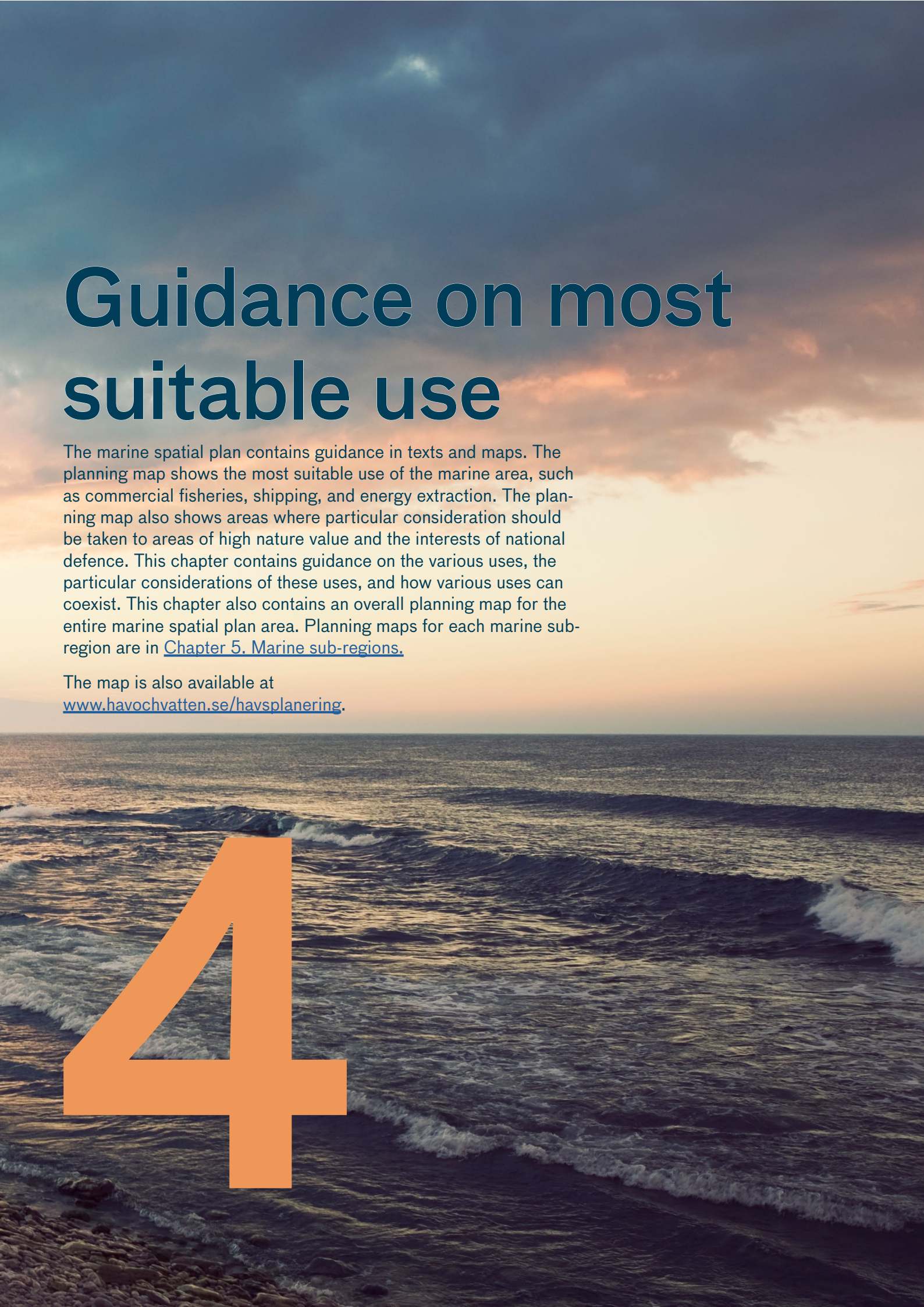


Figure 7. Marine spatial planning objectives

Guidance on most suitable use

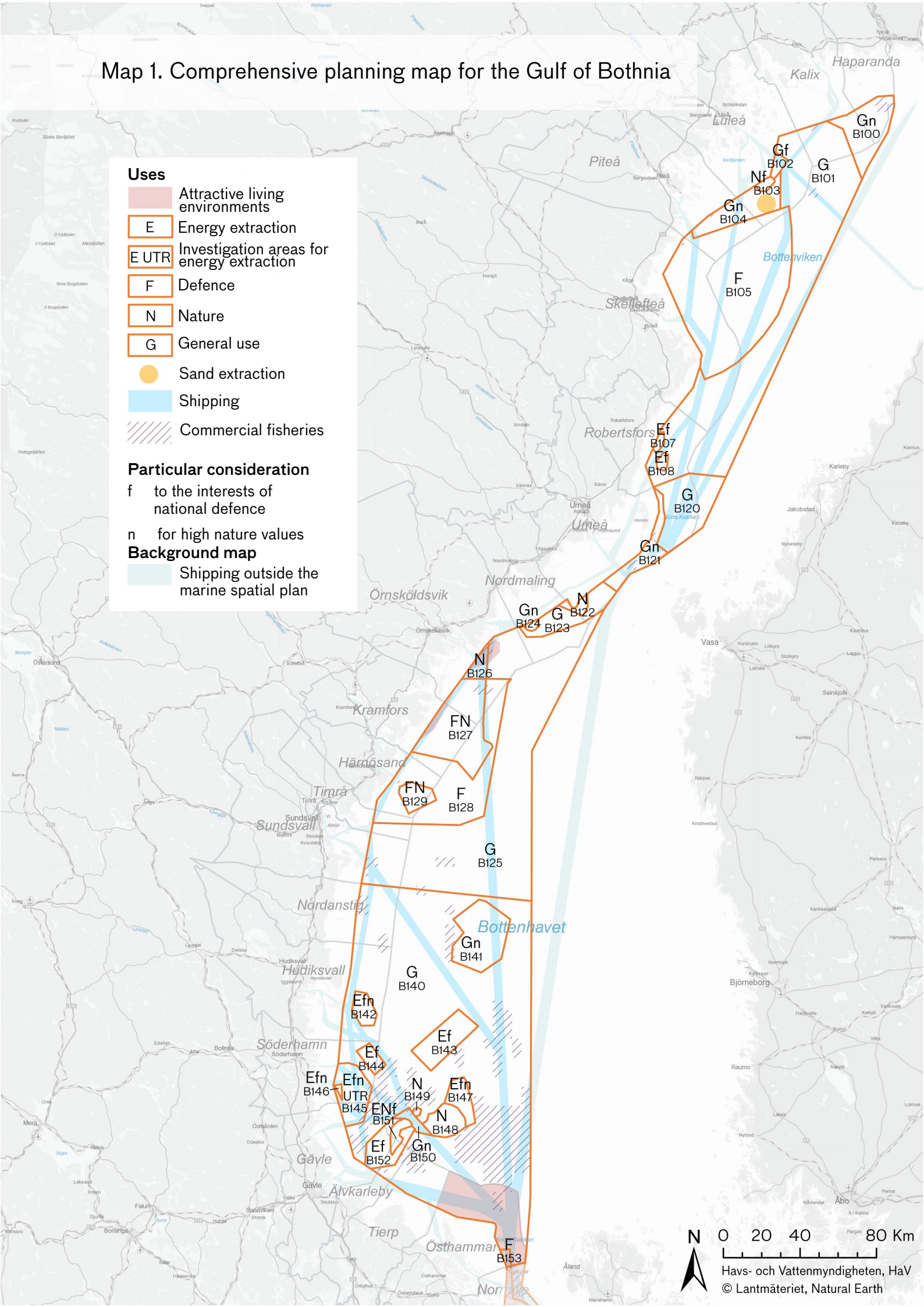
The marine spatial plan contains guidance in texts and maps. The planning map shows the most suitable use of the marine area, such as commercial fisheries, shipping, and energy extraction. The planning map also shows areas where particular consideration should be taken to areas of high nature value and the interests of national defence. This chapter contains guidance on the various uses, the particular considerations of these uses, and how various uses can coexist. This chapter also contains an overall planning map for the entire marine spatial plan area. Planning maps for each marine sub-region are in Chapter 5. Marine sub-regions.

The map is also available at www.havochvatten.se/havsplanering.



4

Map 1. Comprehensive planning map for the Gulf of Bothnia



The 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.

The planning map should be interpreted in the approximate scale between 1:700,000 and 1:1,000,000.

Most suitable use

The uses presented by the planning map have been deemed to be the most suitable uses and take precedence over other uses. Therefore, all other use in the area should adapt to the conditions and needs of the uses shown.

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 has been deemed to be possible. The uses where coexistence is deemed possible might, however, still need to adapt to each other. If any of the uses are based on national interest claims, the assessment that coexistence is possible entails a preliminary assessment that there is no risk of substantial damage to the national interest.

Uses are presented in different ways in the planning map:

- The four uses of **energy, defence, general use**, and **nature** are presented with a letter and are delimited with lines that define the areas. Each area has a number, such as B100.
- The other uses are delimited by their own markings.

The following applies to the entire planning area:

- the laying, operation, and maintenance of data and telecommunication cables, power cables, pipelines, and gas lines must be made possible where appropriate.

The uses are described below. In general, the values are described that are important to the use, and these should not be negatively impacted by other uses.

Attractive living environments

Areas for recreation, cultural heritage, natural environments, and tourism.

For attractive living environments, good conditions for recreation activities and nature and cultural experiences are important. Accessibility to the public should be good, meaning the possibility of travelling to the areas and partaking of their values. Valuable natural and cultural environments need to be preserved for current and future generations. The use is based on areas of national interest according to the Environmental Code.

E

Energy extraction
Area for energy extraction.

The extent, depth, and wind conditions of the areas are important for the possibility of energy extraction with wind power. The stability of the seabed is also important for the laying of foundations for wind turbines. Ships need good accessibility to the areas for construction, operation, and maintenance. To be able to distribute and transmit electricity, there need to be possibilities for connections on land.

E UTR

Investigation areas for energy extraction
Areas for further investigation to determine if energy extraction is the most suitable use.

F

Defence
Area for defence activities.

Defence areas can comprise different activities and installations, such as training and artillery ranges and influence areas.

G

General use
Area for general use.

General use means that no special use is indicated as the most suitable. If general use coincides with **shipping, commercial fisheries, sand extraction** or **attractive living environments,** these uses take precedence over all other uses.

N

Nature
Area for nature.

Vigorous ecosystems and good conditions for the spread of species and types of nature, long-term survival, and the ability to recover are especially important in the nature areas.

Sand extraction
Area for sand extraction.

The composition of the seabed material is important for the extraction of sand and gravel that can be used for building material, filling, and coastal replenishment measures. The accessibility needs to be good for ships, which are needed during extraction.

Shipping
Area for shipping.

Shipping needs to be able to traverse the sea between ports in safe and sustainable ways. This most often takes place along appointed routes with adequate depth and room to manoeuvre. In narrow, highly trafficked areas, shipping is organised into traffic separation schemes. Important shipping areas also include anchorages.

Commercial fisheries
Area for commercial fisheries.

To be able to conduct sustainable fisheries, commercial fishing vessels must have access to fishing areas and ports.

Read more about the interests that form the basis of the uses in Chapter 6, Themes.

Particular consideration

f – particular consideration to the interests of national defence
Within this area, all use should show particular consideration for the interests of national defence.

In an area designated as Gf, consideration refers to limitations of tall objects due to aviation activities.

In an area designated Ef or Ef UTR, it is possible from a defence perspective to build permanent installations for energy extraction, but not always in every part of the area.

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

Particular consideration to the interests of national defence can also entail adaptation in design relative to several energy areas that together can 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.

n – particular consideration for high nature values

Within this area, all use shall show particular consideration of the area's high nature values, which are listed below.

Read more in the document *Documentation per area, Marine Spatial Plan, Gulf of Bothnia* .

Area number	High nature values
B100	Spawning and marine mammal area.
B104	Spawning and marine mammal area with especially low environmental impact.
B121	Reef environment with spawning, marine mammal, and bird area.
B124	Reef environment with spawning, marine mammal, and bird area.
B141	Reef environment and spawning area.
B142	Spawning and marine mammal area.
B145	Reef environment and spawning area with high biodiversity.
B146	Reef environment and spawning area with high biodiversity.
B147	Spawning and bird area.
B150	Reef environment and spawning and bird area with high biodiversity.

Table 1. Values for particular consideration to nature.

Coexistence

The marine spatial plan shall promote coexistence between various activities and uses. The examples under the following three headings aim to provide guidance on how coexistence can work and explain how the marine spatial plan relates to coexistence between the various uses that it presents.

The planning map presents coexistence by overlapping uses. A colour marking can, for example, occur in the same place as a letter, and several letters after each other can occur in the same area.

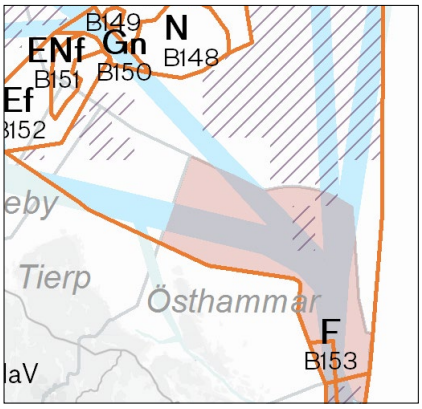


Figure 8. Examples of what coexistence might look like in the planning map. The planning map presents coexistence by overlapping uses. In area B153, the uses of attractive living environments, defence, and shipping coexist.

Where coexistence can require some adaptation

Attractive living environments, defence, commercial fisheries, and shipping

In many cases, the aforementioned uses can coexist without problem – and sometimes there are even synergistic effects between the uses. The uses therefore overlap in many areas. For example, **shipping** and **commercial fisheries** with moving equipment can often be conducted in the same area. Another example is **shipping** and **defence**. Shipping traffic, even fishing traffic, might need to be suspended in the marine training areas when Swedish Armed Forces exercises are under way, but can otherwise be conducted without restriction in the same place. Both **commercial fisheries** and **shipping** are often considered as being a part of the landscape that is appreciated in areas of **attractive living environments**, for example where fishing has been grounds for the development of coastal communities and where shipping is foundation for the possibility of housing and tourism.

Energy extraction and nature

An example of coexistence that can become a synergy is the potential of a wind farm at sea to form an artificial reef that creates protected feeding grounds for fish.

Defence and nature

In several cases, defence activities overlap with valuable nature areas, and the marine spatial plan indicates both **defence** and **nature** as most suitable use**.** In some of the areas, nature values are mostly located on the seabed. Under such conditions, both defence activities and shipping can continue without disruption. In other areas, the defence activities might need to be adapted so that the nature values are not damaged.

Figure 9. Where coexistence can require some adaptation

Read more about the assessment of use in Chapter 2 Points of departure

Where coexistence can require more adaptation

Commercial fisheries, shipping, defence, energy extraction, sand extraction, and nature

Most of the areas with the use **nature** are covered by existing or planned marine area protection, such as Natura 2000. This means that the need for protection of the indicated nature values sets the limits for activities in these areas. For the already protected areas, existing regulations ensure that the indicated nature values are not damaged or destroyed.

Figure 10. Shipping and nature.

In the areas with the use **nature**, steps might need to be taken by responsible authorities and/or operators. The measures might mean that a certain use should be limited, but that it nonetheless can otherwise coexist with the use **nature** within the same area.

A few examples of measures:

- Certain kinds of fisheries entail by-catch of protected species and are limited or therefore not allowed in a certain location.
- Shipping traffic causes turbulence at shallow passages and is therefore limited by depth or speed in a certain location.
- The Swedish Armed Forces' exercises that include explosives damage identified nature values and are therefore avoided in a certain location.

Attractive living environments

Wind power stations impact the landscape and are not always suitable in locations near the coast where valuable natural and cultural landscapes can be affected. Wind farms can also affect accessibility, both actual or perceived, for activities such as recreational fishieries and boating. How the landscape and accessibility are at risk of being affected and what adaptation is required needs to be assessed in a local perspective.

Cultural relics on the seabed are at risk of being damaged by several different activities in the sea, both in construction works and in activities such as trawling and defence. More knowledge is needed about where the cultural relics are located, and specific measures might be needed in different management areas.

Where coexistence might require extensive adaptation or is not possible

There are uses that compete and where coexistence is not possible. Therefore, these uses are not presented together. The use that is deemed most suitable in the location is given priority.

Energy extraction and commercial fisheries

One example where coexistence requires adaptation is **energy extraction** and **commercial fisheries.** This might, for example, be about a certain type of fishing gear not being able to be conducted, or that the design of the facilities for energy extraction need to be adapted. In other cases, the uses are deemed not to be able to coexist because permanent installations, for example, mean that there is not room to conduct fishing activities.

Figure 11. Commercial fisheries and energy extraction.

Energy extraction and shipping

Shipping usually cannot pass through an area with a wind farm. The use of **shipping** is therefore usually not proposed within an area for **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 characteristics or conditions that there is major uncertainty that wind power can be established without damaging or impeding nature conservation.

Energy extraction and sand extraction

Wind power stations need a stable seabed for their foundations. In sand extraction, sand is sucked up or dug up from the seabed, which changes its stability. The use **sand extraction** is therefore not proposed in the same areas as the use **energy extraction**.

Energy extraction and defence

Wind farms affect the possibility of conducting defence activities. The use **energy extraction** is therefore usually not proposed in areas with the use of **defence.**

Several national defence interests can be negatively affected by wind turbines and other tall objects. The details of such impacts might in some cases not be described openly considering that the information is covered by military secrecy. Read more *in* *Section 6.3, Defence*.

Conditions can change such that energy extraction and defence in the future can coexist in locations where the plan currently does not provide for the energy extraction interest. For example, technical developments might take place within both the energy and the defence sectors.

Marine sub-regions

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

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

This chapter begins with the planning's main features for the Bothnian Bay. For each marine sub-region, the planning's standpoints are then described together with a planning map on a scale of 1:1,000,000, one to one million. Tables clarify the areas within which an interest is given priority over another interest, where coexistence requires extensive adaptation, and which areas are investigation areas.

The plan should be interpreted in an approximate scale between 1:700,000 and 1:1,000,000.

5

5.1 Main planning features for the Gulf of Bothnia

Good conditions for various activities

In the Gulf of Bothnia's marine spatial plan area, there are high nature values and many attractive living environments for people. There are good conditions for various activities, but at the same time the environmental status must be improved to achieve a good environmental status. Many large and important industries in Norrland use shipping for their transports. In the south, there are suitable areas for renewable energy extraction through marine wind power, and the marine spatial plan presents an area in the Bothnian Bay that might be suitable for the extraction of sand. Sweden has national defence interests in the marine spatial plan area, including a marine training area in the northern Bothnian Sea and the influence areas for activities on land.

Many activities work well together in the planning area, meaning that they coexist. This might 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.

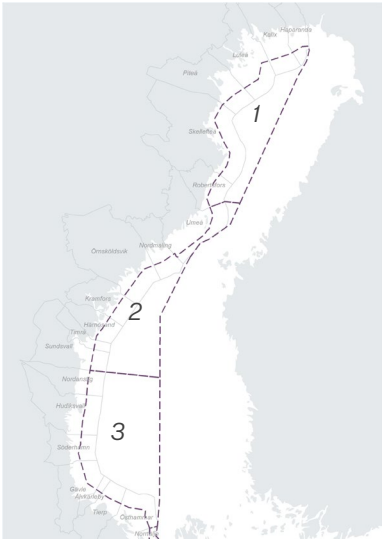


Figure 12. The three marine sub-regions in the Gulf of Bothnia.

1. Bothnian Bay Northern
2. Bothnian Sea and North Kvarken
3. Southern Bothnian Sea

Renewable energy production

The marine spatial plans should contribute to achieving the societal objective of 100 per cent renewable energy production by 2040. In some geographic areas, there is competition between different uses, such as between wind power and nature values or defence interests. In the planning, an effort has therefore been made to find more areas for wind power in addition to the existing national interest claims for wind power. 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 without risking other societal objectives. The Southern Bothnian Sea, above all, has been deemed to have good conditions to be able to make considerable contributions to this. Some areas for energy extraction 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.

World heritage and small-scale fisheries

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 take particular consideration of high nature values.

The World Heritage site of Höga kusten is heavily visited by tourists year-round, but mainly in the summer. Tour boats and recreational boating for space in the harbours in the area. The early autumn sees the production of fermented Baltic herring, which is also widely spoken of and brings many visitors.

Commercial fisheries in the Gulf of Bothnia is mostly conducted on a small scale. Fishing vessels are sparse in the deep sea, but more frequent in the coastal waters, and thus the use of commercial fisheries is geographically widespread, but the largest concentration is in the Southern Bothnian Sea.

5.2 Bothnian Bay

The Bothnian Bay has special winter conditions. Important ports for Sweden's basic industry are located here, and there are also valuable coastal and archipelago landscapes.

See the planning map of Bothnian Bay.

Standpoints

Special winter conditions and important areas for defence activities

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. Fixed infrastructure, such as foundations for wind power stations, can be exposed to extremely severe strain from sea ice. Several important ports, including the port of Luleå, are along the coast of the Bothnian Bay. Maritime traffic is important for industry in northern Sweden. The approaches to the ports are often long and pass through the shallow archipelago.

The aviation training area at Kallax is one of the world's largest, and even other countries' air forces conduct exercises here. A small portion of a prohibited area for tall objects overlaps the marine spatial plan area.

The Tåme artillery range in Skellefteå Municipality has a large influence area that extends out into the marine spatial planning area. Here, the plan indicates the use **defence**.

The planning contributes to the planning objectives:

- Create conditions for good accessibility
- Create conditions for sustainable shipping
- Create conditions for peace and security

Interests given priority	Area
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. Wind power 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.	B104, B105
Furthest out in Luleå Municipality's outer sea, at Svalans and Falkens grund, there is an interest area for sand extraction that partially enters the influence area for Tåme artillery range. From a risk perspective, sand extraction is not suitable in the artillery range's influence area. Sand extraction is, however, deemed to be suitable in the adjacent area (B104).	B105

Table 2. Interests given priority

Many values close to the coast

Extensive areas with valuable coastal and archipelago landscapes extend along the entire Bothnian Bay. There are three areas with valuable nature that are protected through the use of **nature** (B103) or with *particular consideration to high nature values* (B100 and B104).

The stable winter ice in the Bothnian Bay characterises the marine environment in the deep sea. The ice forms a basis 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 stable ice, the northern parts of the Bothnian Bay will become increasingly more crucial for these activities[35].

Commercial fisheries are sparse in the offshore areas of the Bothnian Bay. The fishing that is conducted uses passive equipment and takes place close to the coast. In springtime, fishing targeted for vendace for their roe is important. This fishing takes place close to the coast and mainly outside the marine spatial planning area.

In Robertsfors Municipality in the south at Rata Storgrund, there are two areas with the use **energy extraction** (B107 and B108). Wind power is deemed to be a public interest of material significance in these areas as indicated in municipal comprehensive plan.

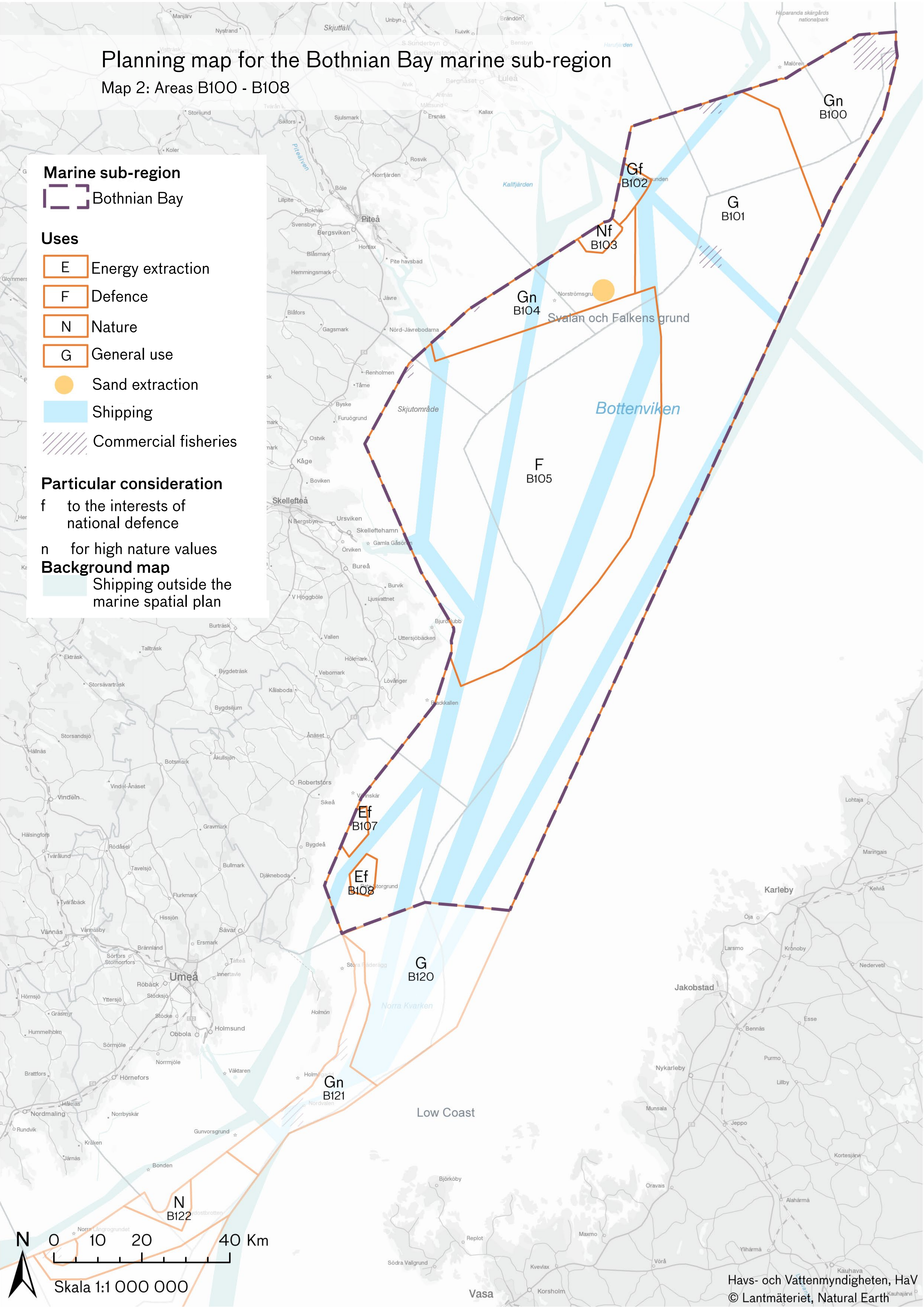
The planning contributes to the planning objectives:

- Create conditions for green infrastructure and the promotion of ecosystem services
- Create conditions for regional development
- Create conditions for sustainable commercial fisheries
- Create conditions for the development of energy extraction and renewable electricity production

35 Swedish Agency for Marine and Water Management. Report 2017:37. *Möjliga klimatrefugier i Östersjön baserat på två olika scenarier* [Possible climate refuges in the Baltic Sea based on two different scenarios]

Planning map for the Bothnian Bay marine sub-region

Map 2: Areas B100 - B108



5.3 Northern Bothnian Sea and North Kvarken

See the planning map for the Northern Bothnian Sea and North Kvarken.

The Northern Bothnian Sea is surrounded by two World Heritage sites that are characterised by high nature values and origins. The narrow shipping passage through The North Kvarken, which links the Bothnian Bay with the Bothnian Sea is crucial to industry in the north.

Standpoints

Shipping passage through The North Kvarken's narrow sound

From Holmöarna in the north to Sydostbrotten and Vallinsgrundet in the south, there are several areas with valuable nature. They areas are safeguarded through the use **nature** or *particular consideration of high nature values.* On the Finnish side, there is the World Heritage site of the Finnish Kvarken Archipelago.

The North Kvarken is very important for shipping. Shipping has limited room to manoeuvre and is divided into a traffic separation system (TSS) due to the depth conditions and the narrow passage. There are several important ports along the coast in the Northern Bothnian Sea. Shipping traffic is important with traffic both to the local coast and further north through The North Kvarken to both Swedish and Finnish ports in Bothnian Bay. The use shipping is therefore indicated in the existence of several shipping lanes to and from The North and The South Kvarkens. In its comprehensive plan, Umeå pointed out an area for a permanent connection to Vaasa, Finland. Today, a ferry line goes there that joins the E12 road from Mo i Rana in Norway to Helsinki.

The planning contributes to the planning objectives:

- Create conditions for good accessibility
- Create conditions for sustainable shipping
- Create conditions for regional development

Höga kusten's nature

Höga kusten's World Heritage site extends out into the sea and includes unique natural and cultural environments. National interest claims for nature conservation extend far out into the marine spatial plan and are safeguarded, like the area's nature reserves and Natura 2000 areas, through the use **nature**. South of Vänta Litets grund is one of the Natura 2000 areas. This bank has been classified as one of the most valuable offshore banks in the Gulf of Bothnia[36]. The bank is within the Härnön marine training area and the influence area of the Skärsviken artillery range. The marine training area extends from the coast through the territorial sea and out to the Swedish exclusive economic zone outside the municipalities of Örnsköldsvik, Kramfors, and Härnösand. Here, the marine spatial plan indicates the use **defence**. Despite the high values along the coast, **nature** and **defence** are deemed to be able to coexist through consideration in the planning of the defence activities (B127 and B129).

36 Swedish Environmental Protection Agency. Report 5576. *Inventering av marina naturtyper på utsjöbankar.* [Inventory of marine nature types on offshore banks.]

Large areas with sparse activities

The southern parts of the marine area's deep sea host shipping and general use. Because the ice moves unpredictably, shipping needs large open areas and alternative routes. Commercial fisheries in the Northern Bothnian Sea are limited. The fishing that is conducted uses passive equipment and takes place close to the coast. Some pelagic fisheries take place in the south. In its entirety, the marine area is characterised by low use, and the environmental impact is relatively low with high naturalness[37].

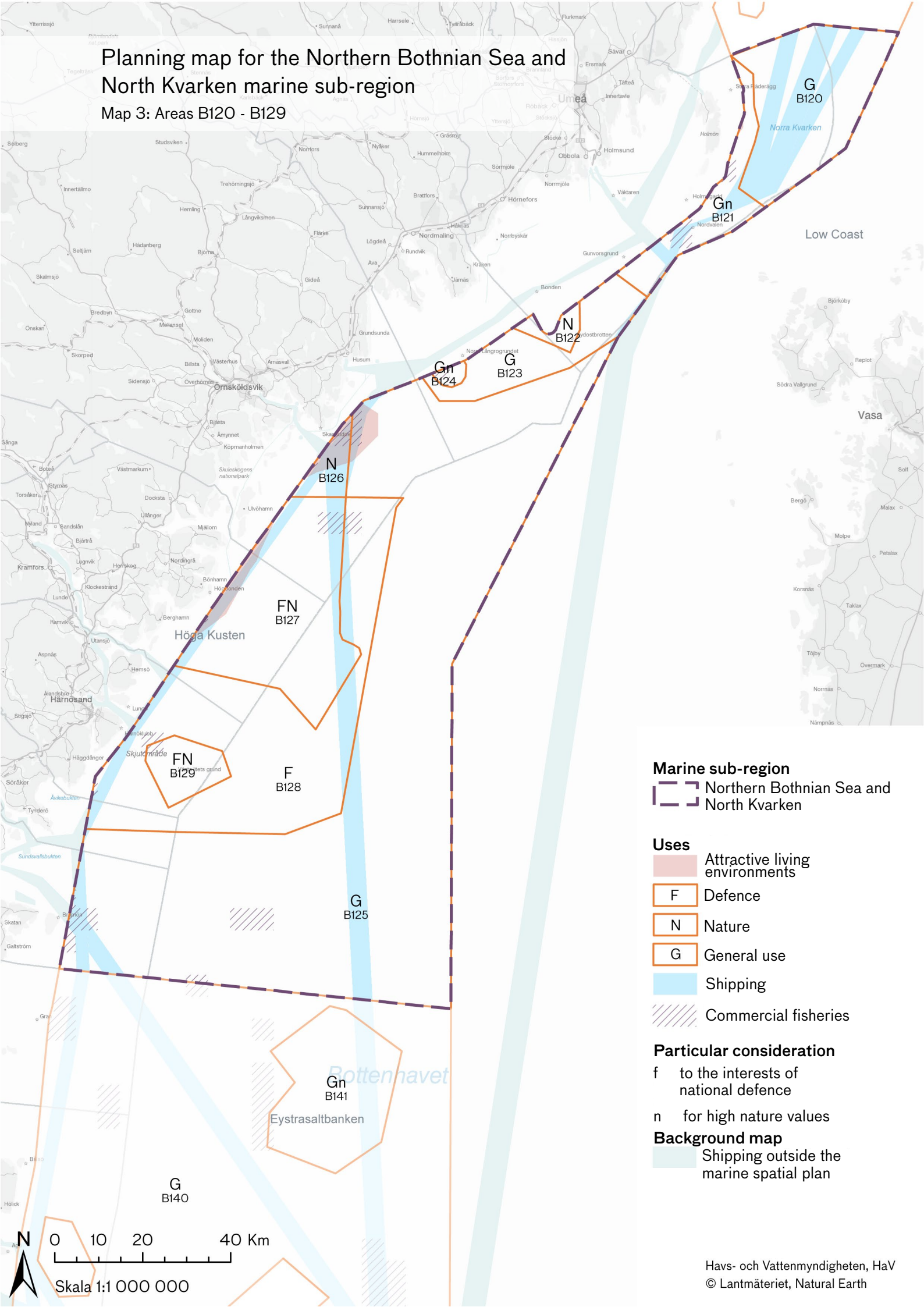
The planning contributes to the planning objectives:

- Create conditions for sustainable commercial fisheries

37 Swedish Agency for Marine and Water Management. Report 2018:1. *Symphony - Integrerat planeringsstöd för statlig havsplanering utifrån en ekosystemansats.* [Symphony - Integrated planning support for national marine spatial planning based on an ecosystem approach.]

Planning map for the Northern Bothnian Sea and North Kvarken marine sub-region

Map 3: Areas B120 - B129



Marine sub-region

Northern Bothnian Sea and North Kvarken

Uses

- Attractive living environments
- F Defence
- N Nature
- G General use
- Shipping
- Commercial fisheries

Particular consideration

f to the interests of national defence

n for high nature values

Background map

Shipping outside the marine spatial plan

5.4 Southern Bothnian Sea

The Southern Bothnian Sea has shallow archipelagos with genuine fishing villages and open sea with several offshore banks. The banks have both high nature values and the potential for energy extraction. Due to the marine area's shifting ice, winter shipping needs access to several alternative routes.

See the planning map for the Southern Bothnian Sea.

Standpoints

Shallow banks and wintering sea birds

Areas with valuable coastal and archipelago landscapes extend along the entire coast. The marine spatial plan indicates the use **attractive living environments** in the southern part of the marine area, off of Gräsö towards The South Kvarken, because it is of national interest according to Chapter 4 of the Environmental Code. Offshore, there are large areas almost untouched by mankind[38]. Several such areas are offshore banks, of which some, the shallowest, are characterised by ecologically valuable seabeds with algae-covered reefs. At Finngrunden, there are also 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. On all three of Finngrunden's banks, nature values are safeguarded by the use **nature** (B148, B149, B151). On other offshore banks, the marine spatial plan indicates *particular consideration of high nature values*.

The planning contributes to the planning objectives:

- Create conditions for regional development
- Create conditions for marine green infrastructure and the promotion of ecosystem services

Important marine area for energy supply

From Gretas Klackar in the north to Gävlebukten in the south, there are several national interest claims for wind power. The wind conditions, seabed conditions, and proximity to good connection points make the conditions favourable for wind power. From a national energy perspective, Gävlebukten is a strategic area for sea-based wind power[39].

Several wind power projects are active in the marine area, of which Storgrundet off of Söderhamn has received a permit (B146). Around the project at Storgrundet there is room for more wind power, as well as other interests, and an **energy extraction investigation area** (B145) is therefore also located here. The possibility of wind power should be investigated further, mainly in relation to shipping interests, national defence interests, and nature values.

The planning contributes to the planning objectives:

- Create conditions for the development of energy transmission and renewable electricity production in the sea
- Create conditions for green infrastructure and the promotion of ecosystem services
- Create conditions for peace and security

38 Swedish Agency for Marine and Water Management. Report 2018:1. *Symphony - Integrerat planeringsstöd för statlig havsplanering utifrån en ekosystemansats.* [Symphony - Integrated planning support for national marine spatial planning based on an ecosystem approach.]

39 Swedish Agency for Marine and Water Management. 2018. *Finngrundet och Storgrundet – Underlagsrapport till havsplanering avseende energiproduktion samt miljökonsekvenser för lokala naturvärden* [Finngrundet and Storgrundet – Input report on marine spatial planning regarding energy production and environmental impact on local nature values]

Finngrunden's western, northern, and eastern banks all have good conditions for wind power, which is confirmed by national interest claims for wind power. Natura 2000 areas have also been introduced on the banks to protect valuable types of nature. A compilation of documentation from earlier wind power project planning, permit reviews, and establishment of Natura 2000 areas has been undertaken to gather the large amount of statements and information regarding the area[40]. The compilation shows that uncertainty around how wind power might impact wintering long-tailed ducks has been a crucial factor that has contributed to wind power on Finngrundet's eastern bank not being deemed compatible with the Natura 2000 legislation. Knowledge of the long-tailed duck's migration pattern indicates that Finngrunden's eastern and northern banks are the most important wintering places in the marine area. In contrast to the other banks, Finngrunden's eastern bank has been pointed out as particularly important to exclude from all forms of development[41]. Finngrunden's eastern and northern banks therefore have the use **nature** (B148 and B149) while other bank areas at Finngrunden have the use **energy extraction** with *particular consideration to high nature values* (B147) or coexistence with the uses **energy extraction** and **nature** (B151).

Thus the wind power that can be established on parts of Finngrunden is considered to be able to coexist with the areas' nature values. Large-scale wind power's impacts on the seabed environment is small in terms of area and is transitory in terms of time because the seabed consists of sand and gravel. The planning creates room for wintering sea birds even if displacement effects arise around the wind turbines. It is nonetheless important that the structure of potential installations be designed with particular consideration for the nature values, which also applies to wind power at Storgrundet and Gretas Klackar.

In the expansion of energy extraction, particular consideration must be taken of national defence interests. The many areas for energy extraction that the marine spatial plan indicates within the marine area entail a risk for cumulative impacts on national defence interests (B142-147, B151-152). This risk must be taken into account, and this might entail limitations to the scope of the expansion, either altogether or in individual areas. Also refer to the section on particular consideration for the national defence interests Chapter 4 - Guidance on the most suitable use.

40 Swedish Agency for Marine and Water Management. 2017. *Finngrundet och Storgrundet – Underlagsrapport till havsplanering avseende energiproduktion samt miljökonsekvenser för lokala naturvärden* [Finngrundet and Storgrundet – Input report on marine spatial planning regarding energy production and environmental impact on local nature values]

41 Swedish Environmental Protection Agency. Report 5576. *Inventering av marina naturtyper på utsjöbankar.* [Inventory of marine nature types on offshore banks.]

Interests that are given priority, where a large amount of adaptation is required for coexistence or investigation area	Area
At Camps grund in the south, there are national interest claims that are not deemed to be compatible with each other. National interest claims for national defence and shipping are given priority over part of the national interest claim for wind power in Tierp and Älvkarleby municipalities that are located in the area.	B140
Throughout the areas, there are also national interest claims for shipping. To meet the goal of 100 per cent renewable electricity production, the general interest of material significance to energy extraction is given priority over national interest claims for communications for shipping in the area. Accessibility to the southern Norrland coast's ports is deemed to be met in the adjacent open sea.	B143, B144
The greater area at and around Storgrundet has beneficial conditions for wind power, but it also has areas of high nature value and significant amounts of shipping traffic. This area can be host to expanded energy extraction projects and is therefore proposed as an investigation area for energy extraction. Further information on energy potential, shipping traffic, defence, fisheries, and nature is needed for an assessment of the area's most suitable use. Also refer to the text on standpoints above.	B145
The national interest claims for wind power are given priority over the national interest claim for shipping. Accessibility to the southern Norrland coast's ports is deemed to be met in the adjacent open sea.	B147
Within the areas, there are national interest claims for wind power and Natura 2000 areas that are deemed incompatible. Nature is given priority over national interest claims for wind power. Refer to the text on standpoints above.	B148-149
Within the area, there are national interest claims for wind power and national interest claims for shipping that are deemed incompatible. Shipping is given priority over national interest claims for energy.	B150

Table 3. Interests that are given priority, where a large amount of adaptation is required for coexistence or for investigation areas

General use of large areas

Several important ports are found along the coast in the Southern Bothnian Sea. Shipping traffic 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 room for several alternative routes. The use **shipping** is therefore widespread in the entire marine area with several shipping lanes to and from The South Kvarken in the south.

Commercial fisheries are spread over the Southern Bothnian Sea. The coastal fisheries that characterise many of the smaller coastal communities mostly takes place with passive gear in and off of the coastal area. Occasionally intensive pelagic fisheries occur mainly around the offshore banks and in the south-eastern parts of the marine area. The scope of Finnish fisheries should be further investigated in the entire Gulf of Bothnia.

On the eastern bank of Finngrunden, there is an area that might be of interest for sand extraction. Because the area has high nature values, the sand resource here has not been identified as one of the most suitable locations[42], and sand extraction is therefore not indicated in the marine spatial plan..

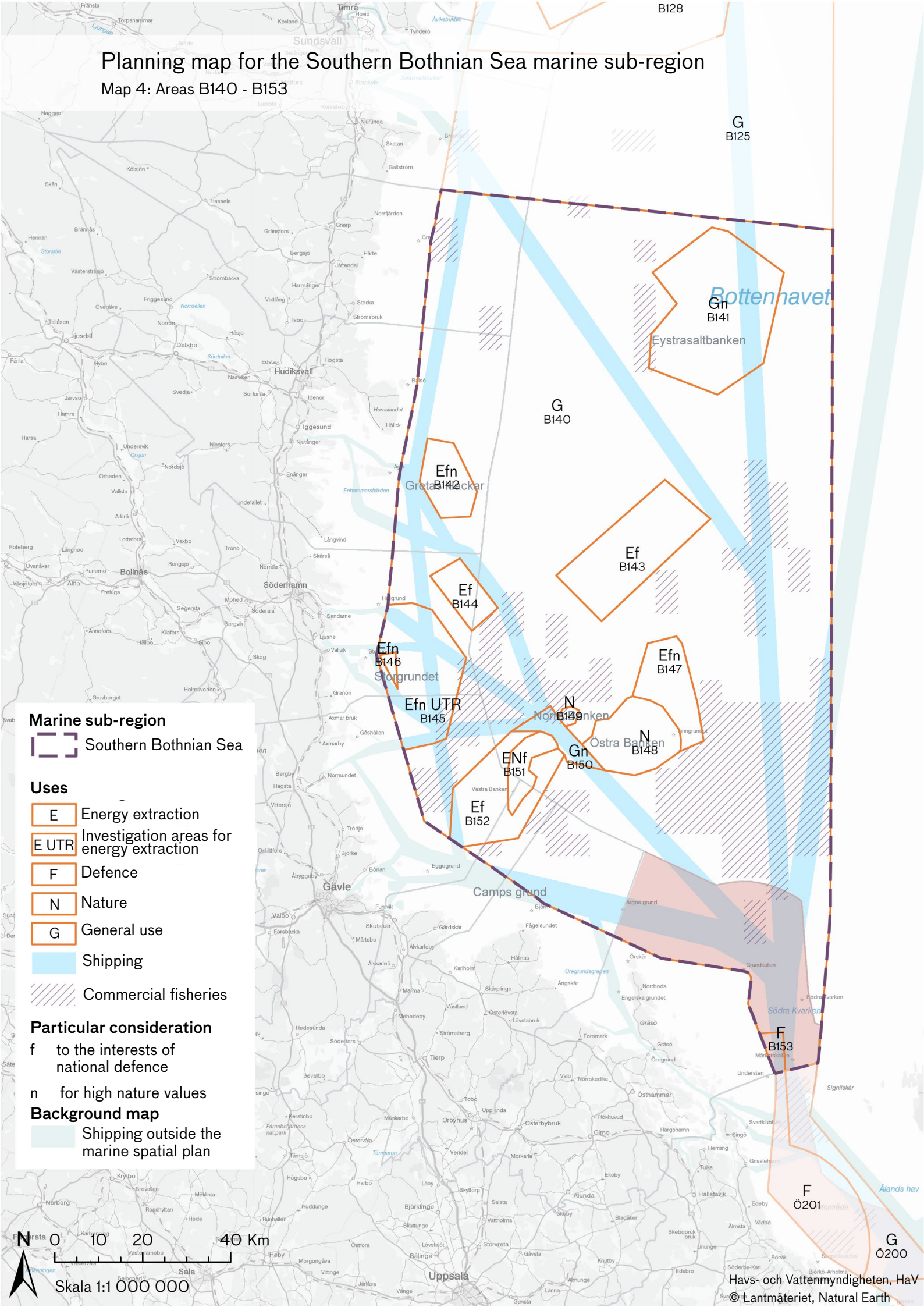
The planning contributes to the planning objectives:

- Create conditions for good accessibility
- Create conditions for sustainable shipping
- Create conditions for marine green infrastructure and the promotion of ecosystem services

42 *Geological Survey of Sweden. Report 2017:05. Förutsättningar för utvinning av marin sand och grus i Sverige. [Conditions for extraction of marine sand and gravel in Sweden.]*

Planning map for the Southern Bothnian Sea marine sub-region

Map 4: Areas B140 - B153



Marine sub-region

Southern Bothnian Sea

Uses

- E — Energy extraction
- E UTR — Investigation areas for energy extraction
- F — Defence
- N — Nature
- G — General use
- Shipping
- Commercial fisheries

Particular consideration

- f — to the interests of national defence
- n — for high nature values

Background map

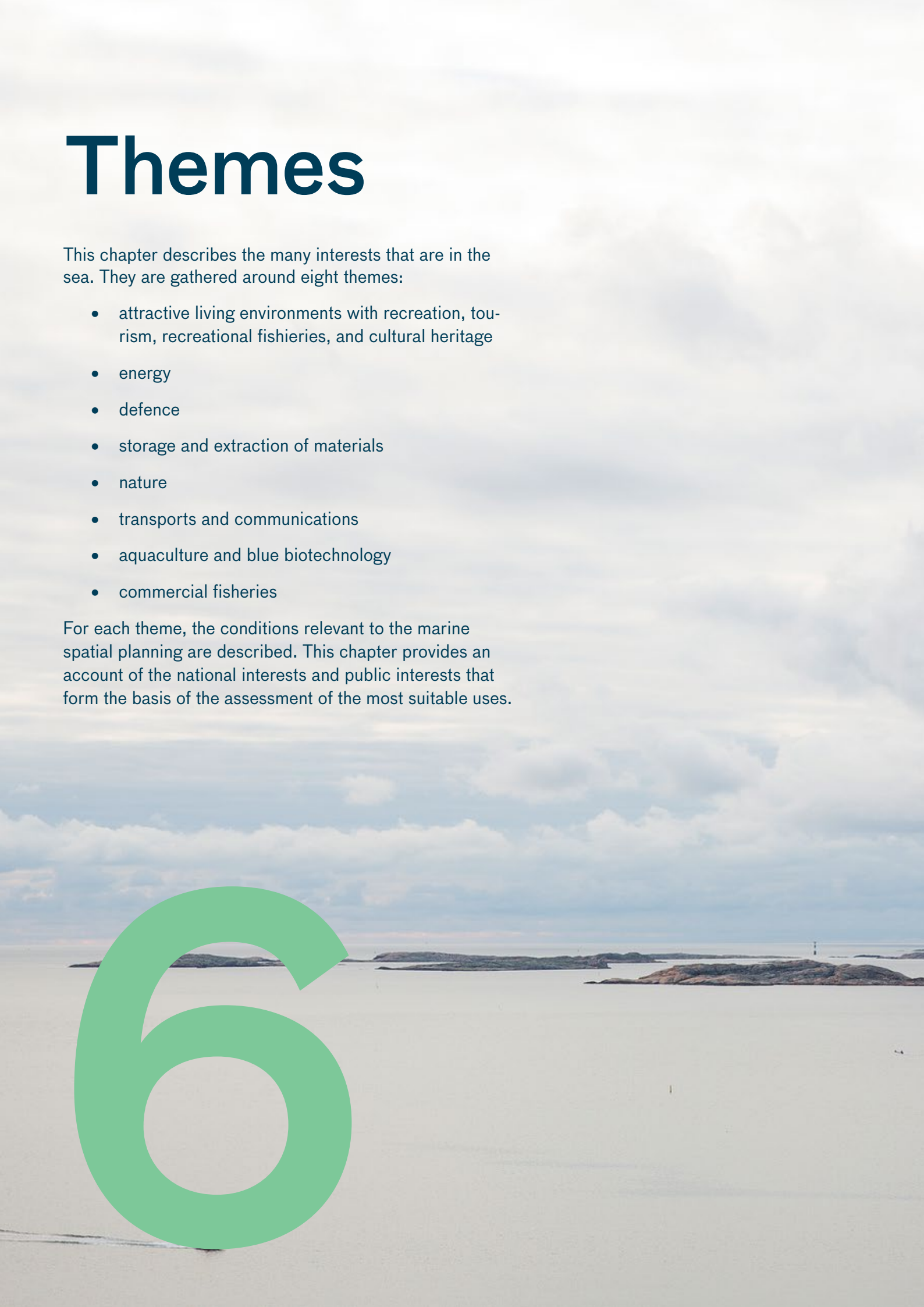
Shipping outside the marine spatial plan

Themes

This chapter describes the many interests that are in the sea. They are gathered around eight themes:

- attractive living environments with recreation, tourism, recreational fishieries, and cultural heritage
- energy
- defence
- storage and extraction of materials
- nature
- transports and communications
- aquaculture and blue biotechnology
- commercial fisheries

For each theme, the conditions relevant to the marine spatial planning are described. This chapter provides an account of the national interests and public interests that form the basis of the assessment of the most suitable uses.



6

6.1 Attractive living environments

Areas that are attractive to visit, live in, and work in are important for regional development and for the development of maritime industries. In the marine spatial plan, attractive living environments refers to areas for recreation, tourism, and cultural environments along the coast – environments that are attractive to visit and live in. Spending time in these coastal areas contributes to health and well-being, and they are important for the tourism industry. The value also consists of the landscape and cultural history, among other aspects.

This section describes common conditions for attractive living environments. The upcoming section first describes recreation, recreational fishieries, and tourism and then describes cultural heritage.

The planning objectives that attractive living environments relate to are: *Create conditions for a good marine environment and sustainable growth* and *Create conditions for regional development.*

Use in the marine spatial plan for the theme:

Attractive living environments

The use of **attractive living environments** is based on the national interest areas in the sea for active outdoor recreation, an unbroken coastline, and a highly developed coastline; national interest claims for cultural heritage and outdoor recreation, including recreational fishieries; and UNESCO's World Heritage sites. These are described below.

National interests

There are geographically delimited national interest areas set out in the Environmental Code[43].

- active outdoor recreation, Chapter 4 Section 2
- unbroken coastline, Chapter 4 Section 3
- highly developed coastline, Chapter 4 Section 4.

Considering their natural and cultural values, these areas are of national interest in their entirety. Use may not substantially damage the areas' natural and cultural values.

43 *The Swedish Environmental Code (1998:808)*

Map 5. National interests for the attractive living environments theme

Areas of national interest

- Areas for national interest for outdoor recreation Ch.4 §2 Env. Code
- Areas for national interest coastal values Ch.4 § 3 Env. Code
- Areas for national interest coastal values Ch.4 § 4 Env. Code

Attractive living environment in the marine spatial plan

- Use: Attractive living environment

Haparanda
Kalix
Luleå
Piteå
Skellefteå
Robertsfors
Umeå
Nordmaling
Örnsköldsvik
Kramfors
Härnösand
Timrå
Sundsvall
Nordanstig
Hudiksvall
Söderhamn
Gävle
Älvkarleby
Tierp
Östhammar
Norrtälje

N

0 20 40 80 km

Havs- och Vattenmyndigheten, HaV

National interest claims

Recreation, Chapter 3, Section 6 of the Swedish Environmental Code

Recreation refers to time spent outdoors in the natural and cultural landscape for well-being and experiences of nature.

An area is deemed to be of national interest to recreation if its natural and/or cultural qualities and accessibility to the public mean that it is or can become attractive to visitors from far away. Other areas might also be of national interest to recreation if they are important to many people's recreation and are used a great deal. This applies above all to the three metropolitan regions, where the need for nature close to built areas shall receive special attention.

In addition, an area might be of national interest to recreation if it has especially good conditions for:

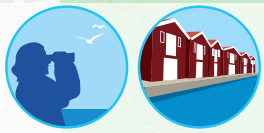
- enriching experiences in natural and/or cultural environments
- recreation activities and thereby enriching experiences.

In addition to this, there are special support criteria.

Cultural heritage preservation, Chapter 3. Section 6 of the Swedish Environmental Code

Today, there are no highlighted areas of national interest for cultural heritage preservation in the area covered by the marine spatial plans. The Swedish National Heritage Board has begun drafting assessment grounds and a plan for how national interest claims in the sea shall be indicated. Along the coast, there are national interests that can be indirectly affected by activities at sea.

Read more about the national interests on the websites of the Swedish Environmental Protection Agency, the Swedish National Heritage Board, and the Swedish Agency for Marine and Water Management.



Map 6. National interest claims for the attractive living environments theme

Claims for areas of national interest

Areas for national interest for cultural environment Ch. 3 § 6 Env. Code

Areas for national interest for outdoor recreation Ch. 3 § 6 Env. Code

Attractive living environment in the marine spatial plan

Use: Attractive living environment

Haparanda
Kalix
Luleå
Piteå
Skellefteå
Robertsfors
Umeå
Nordmaling
Örnsköldsvik
Kramfors
Härnösand
Timrå
Sundsvall
Nordanstig
Hudiksvall
Söderhamn
Gävle
Älvkarleby
Tierp
Östhammar
Norrtälje

N

0 20 40 80 km

Havs- och Vattenmyndigheten, HaV

Public interests and other planning conditions

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[44].

Core values of cultural history value are presented in a report by the Swedish National Heritage Board. The core values coincide to a significant extent with the areas that are covered by the Environmental Code's geographic management provisions. The report is the Swedish National Heritage Board's presentation of a Government assignment to describe the interests of cultural heritage preservation in relation to expansion of wind power in coastal and marine areas, among others[45].

Out of Sweden's 1.8 million registered ancient remains, approximately 20,000 are maritime objects[46]. The majority of these are vessel remains and wrecks. Based on the Swedish National Heritage Board's ancient remains information system, FMIS, an analysis has been done of where the concentrations of wrecks and sinkings are the highest[47].

Maritime strategy

In the maritime strategy, the Government has formulated three perspectives, one of which is an attractive coast[48]. One of the five highlighted industries that are most strongly associated with attractive living environments is recreation and tourism, which includes ferry traffic, cruise activities, archipelago tourism, recreational fishieries, the trade in recreational craft, and marinas. Areas that are attractive to visit, live in, and work in are important for regional development and for the development of maritime industries. The coastal areas need to be accessible with access to necessary public services in order to support recreation and natural and cultural experiences. Preserved and attractive areas of natural and cultural value are an important part of the development of long-term sustainable regional development and maritime tourism.

44 *The Swedish National Heritage Board's questions and answers regarding world heritage sites*

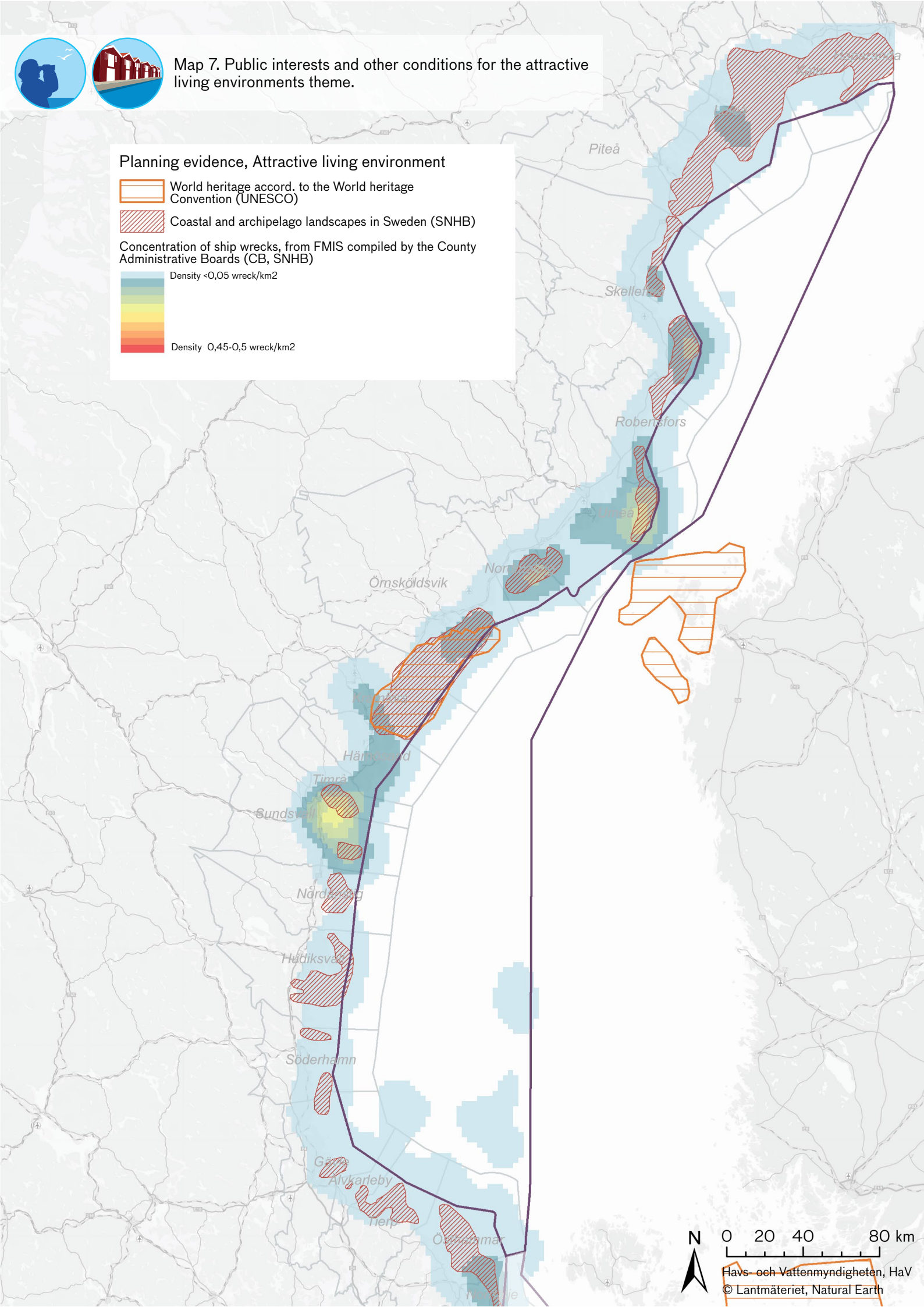
45 Swedish National Heritage Board. Report 2003:4. *Sveriges kust- och skärgårdslandskap: kulturhistoriska karaktärsdrag och känslighet för vindkraft.* [Sweden's coastal and archipelago landscape: cultural history characteristics and sensitivity to wind power.]

46 *Swedish Agency for Marine and Water Management Report 2015:2. Marine Spatial Planning – Current Status 2014.*

47 County Administrative Board. 2017. *Länsstyrelsernas redovisning av Uppdrag 2017-06-välj värdeområden.* [County administrative boards' report on the June 2017 assignment to identify areas of value.]

48 *A Swedish national maritime strategy – for people, jobs, and the environment*

Map 7. Public interests and other conditions for the attractive living environments theme.



Ecosystem services

Ecosystem services create conditions for attractive living environments, partly indirectly through, e.g. purification of water, and partly directly in the form of landscapes to spend time in and that provide experiences of rich animal life and various natural and cultural environments. The values also include sites of natural and cultural heritage for current and future generations.

Activities associated with recreation and tourism can affect different ecosystem services through noise, emissions of hazardous substances from recreational craft, litter, and anchoring that disrupts the seabed environment and cultural environments.

Spatial planning of the sea and coastal zone can work to both reduce burdens and strengthen ecosystem services and thereby work to create attractive living environments for health and well-being, quality of life, recreational activities, regional development, local identity, and employment.

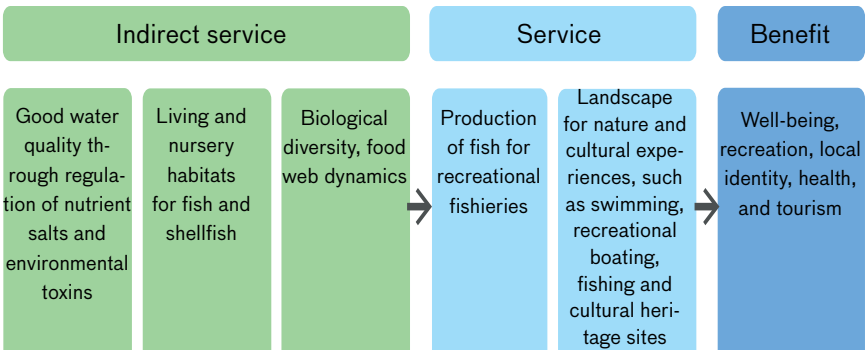


Figure 13. Important ecosystem services for an attractive living environment

Relevant environmental aspects

Activities and operations in this theme can be related to various impacts on the environment, the thematic areas in the Marine Strategy Framework Directive, and various environmental quality objectives. These relationships are important in the assessment of the theme's environmental impact and are shown in the table below.

Activity	Potential impact or pressure	Theme area Marine Strategy Framework Directive (descriptors)	Sweden's environmental quality objectives
Recreational fishieries	Selective extraction of species, marine litter (lost fishing gear), underwater noise	D1 Biodiversity D10 Marine litter	Balanced seas and vibrant coastal areas and archipelagos A rich plant and animal life
Recreational craft	Underwater noise, marine litter, pollutants, anchoring, and seabed impact	D1 Biodiversity, D8 Contaminants, D10 Marine litter, D11 Introduction of energy	Balanced seas and vibrant coastal areas and archipelagos A rich plant and animal life Toxin-free environment
Cruise ships	Atmospheric emissions in the form acidifying and climate-impacting compounds, pollutants, the addition of nutrients (e.g. dumping of sewage and other waste), underwater noise Introduction/relocation of foreign, potentially invasive species	D1 Biodiversity D2 Invasive species D5 Eutrophication D8 Contaminants D11 Introduction of energy	Balanced seas and vibrant coastal areas and archipelagos A rich plant and animal life Only natural acidification Reduced climate impact Zero eutrophication Toxin-free environment
Ferry traffic	Atmospheric emissions in the form of acidifying of climate-impacting compounds, pollutants, underwater noise Coastal erosion	D1 Biodiversity D2 Invasive species D5 Eutrophication D8 Contaminants D11 Introduction of energy	Balanced seas and vibrant coastal areas and archipelagos A rich plant and animal life Only natural acidification Reduced climate impact Toxin-free environment

Table 4. The relationship between attractive living environments and relevant environmental aspects

Read more about conditions in the marine spatial planning current status description, roadmap, the thematic report on regional development, and the report on ecosystem services from Swedish seas that you can find at www.havochvatten.se.

Recreation, recreational fishieries and tourism

Recreation, recreational fishieries, and tourism at sea include landscape and nature experiences and activities such as boating, bird watching, swimming, and canoeing. It also includes visits to cultural environments such as fishing villages, lighthouse stations, and pilot stations and wreck diving. These environments are of significance to local identity, well-being, and quality of life and are often included in the national interest for recreation. Nature and marine protected areas can also be important for recreation, recreational fishieries, and tourism.

Tourism in the area contributes to the growing national tourism industry in terms of employment, income, and a possible increase in international visitors. This development mainly takes place in the coastal zones, but it affects and is affected by the spatial planning at sea.

Recreation and tourism in the Gulf of Bothnia

Visiting and outlook locations at the sea and guest and natural ports for small boats are of major importance to recreation and tourism in the Gulf of Bothnia's coastal areas. A particularly important area is Höga kusten with its rolling coastline and traces of the world's largest land uplift. 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.

These areas are important to regional development with regard to housing, recreation, and tourism, and 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 sport fishing.

Recreational fishieries in the Gulf of Bothnia

Recreational fishieries is a significant recreational activity in the Gulf of Bothnia. It provides quality of life to many people and contributes to an attractive living environment along the coast. Statistics show that Swedes spent around 520,000 fishing days in the Gulf of Bothnia's coastal and marine areas in 2016[49].

Recreational fishieries refer to all fishing that does not take place with the support of a fishing licence or personal fishing licence. It can be divided into sports fisheries and household needs fisheries, depending on what type of gear is used and what the purposes of the fisheries are. This is fisheries for recreation or for consumption of the catch in one's own household. The catch may not be sold.

49 Statistics Sweden. 2018. Fritidsfisket i Sverige 2016 [Recreational fishieries in Sweden 2016]

There is a lack of more detailed information on how the fishing days are distributed between the Gulf of Bothnia's marine spatial planning area and the area closest to the coast. However, it is reasonable to assume that recreational fishieries in the planning area are of limited scope in relation to its total scope and that most of the recreational fishieries take place close to the coast. In the Gulf of Bothnia, around 60 per cent of the fishing is done by boat. The most important species are salmon, perch, whitefish, herring, and pike[50].

Interaction between land and sea

The interaction between land, coast, and sea is important for the context and the surroundings where sea-based activities are conducted. Activities at sea can change the landscape and navigability on land as well and can affect recreation and the tourism industry, and thus the planning of the sea is clearly linked to the municipal planning of the coastal zone. Important aspects that can influence or be influenced by activities on land and on the coast are how people live in the coastal zone, the existence of transportation and ports, the scope of the recreational boat traffic, etc.

International interaction

Recreational boat traffic and fishing tours are conducted between Sweden and Finland. Mainly during the summer, this means that it can become crowded and there can be competition for space in some places in the marine spatial plan area.

The Future

The proximity to the sea makes the coastal landscape attractive for living, recreation, and tourism. The tourism industry is expected to continue to grow and can thereby create conditions for further development along the coasts. Tourism might also increase pressure on the coastal zones of the larger cities and thereby affect and are affected by developments in the marine spatial plan areas.

Continued work

The county administrative boards will continue their work of identifying values and areas for recreation and tourism in coastal and marine environments. For example, new documentation and criteria for assessment in the marine spatial planning can be drafted.

50 Swedish University of Agricultural Sciences. 2018. PM – Fiskars och kräftdjurs lekhabitat i havsplaneringen. [Memorandum – Fish and crustacean spawning habitats in marine spatial planning.]

Cultural environment

Swedish waters have an extensive cultural heritage consisting of vessel remains, settlements from the arly stone age, pilings, harbour facilities, and so on. Shipping has been very intensive over the last century, and this has resulted in a large number of shipwrecks in Swedish waters. However, there is little knowledge of where the remains are, mainly due to a lack of systematic inventories.

Cultural heritage values promote our well-being, build our identity, and put our existence into context. Cultural heritage is also important to local and regional economic development. Coastal and archipelagic landscapes have largely been characterised by traditional industries such as fisheries, shipping, agriculture, and tourism, all of which arose where they did due to their link with the sea. Precious environments, landscapes, and buildings are therefore linked to archipelagic agriculture, fishing villages, and seaside resorts, ports, fortifications, lighthouses, and pilot stations, as well as to coast-linked industry. Cultural values at sea can often be explained and given context by relics or environments on land.

For activities in the sea, an archaeological investigation might be needed. A decision on an archaeological investigation is made by the county administrative board, and a change to an ancient artefact requires permission from the county administrative board.

Early consultations with the county administrative board according to the Heritage Conservation Act should take place to reduce the risk of impact on cultural environments. For example, it might be more difficult to change the location of a land connection at a late stage. When a marine area is developed, the impact area on the seabed might be significantly larger than the actual development area.

Ancient remains are protected according to the Heritage Conservation Act regardless of whether they are known or not, but there is often a lack of knowledge about such artefacts and a lack of planning evidence for cultural environments in the sea. Archaeological investigation according to the Heritage Conservation Act should be taken into account in the planning of operations that might affect cultural environments in the sea.

The act prescribes that a shipwreck shall be considered as ancient remains if it is from before the year 1850. However, the county administrative board can decide that a younger shipwreck is to be counted as ancient remains if it has sufficient cultural heritage value.

Legal prerequisites

The Heritage Conservation Act (1988:950)regulates permit processes for activities that can affect ancient remains.

On 16 November 2017, the Swedish Parliament decided that Sweden would establish a **contiguous zone.** This new legislation came into force on 1 March 2018. The Heritage Conservation Act will also be changed to protect archaeological and historical objects that are encountered in the contiguous zone.

Cultural environments in the Gulf of Bothnia

In the Gulf of Bothnia, cultural heritage remains are often well preserved due to unique conditions. The low salinity and low water temperature mean that there are very few organisms to break down wooden objects.

Höga kusten and the Finnish Kvarken Archipelago are World Heritage sites according to the World Heritage Convention. The land uplift has characterised the landscape in the two topographically different areas. In activities in the sea, the landscape needs to be taken into account.

Interaction between land and sea

The cultural heritage values in and on the sea are of different types, and this means that the use of the sea can affect different values in multiple ways. The landscape and historical ties can be affected, as well as individual remains and cultural environments.

Structures near the coast can change the visual impression and with it the perception of cultural environments on land. In locating and designing installations in the sea, such as wind farms, the landscape and contexts must be taken into account in a holistic perspective. Valuable cultural environments in coastal and archipelago landscapes that are at risk of being affected visually by wind power are presented in a report by the Swedish National Heritage Board[51].

Remains can be damaged during construction work and by activities such as shipping and fisheries through, for example, erosion, anchoring, and bottom trawling. Both commercial and recreational fishieries are done around ancient remains based on the reef-forming effect that attracts fish to the area. Other potentially harmful activities are dredging, dumping, extraction or storage of materials, or recreation in the form of diving. Land connections for activities in the sea, such as cables for energy installations, can affect cultural environments both on the seabed and on land.

In activities in the sea, the impact on cultural environments must be assessed for every individual project at an early stage.

International interaction

The countries around the Baltic Sea are cooperating in the EU project *BalticRIM* with the aim of integrating the sea's cultural heritage into the marine spatial planning.

51 Swedish National Heritage Board. Report 2003:4. *Sveriges kust- och skärgårdslandskap: kulturhistoriska karaktärsdrag och känslighet för vindkraft.* [Sweden's coastal and archipelago landscape: cultural history characteristics and sensitivity to wind power.]

The Future

Claims from different sectors to use the sea along with technological developments might entail a greater impact on cultural environments in the future. Environmental toxins and the water's chemical composition and microorganisms content, among other things, can affect the cultural heritage in the sea. Climate change can affect the speed of natural processes such as shoreline displacement and seabed movements and can entail impacts from invasive species and wood-eating organisms.

Continued work

The coastal county administrative boards have begun improving the planning evidence for marine spatial planning regarding cultural heritage interests in the sea and along the coast. The documents need to be coordinated between the counties and also developed based, among other things, on the significance of the spatial planning. The coastal county administrative boards are also involved in the Swedish National Heritage Board's work of preparing national interest claims for cultural environments in the sea, and new documents might affect the guidance found in the continued marine spatial planning. New documents may affect the guidance in the continued marine spatial planning. For ancient remains under water, guidance might be needed regarding particular consideration based on coordinated and developed planning evidence.

6.2 Energy

The energy sector is under constant development, and political objectives in the environmental and climate area are driving a transformation towards a renewable energy system. Political objectives in the environmental and climate area are driving a transformation towards a renewable energy system. At present, wind power is the type of energy being expanded fastest in Sweden, and sea-based wind power will probably constitute increasingly important additions to the energy supply in the future. As wind power contributes a larger share of Sweden's electricity production, greater requirements are put on the power infrastructure. Electricity grids are interconnected both within the country and internationally to make them more robust. New electricity production at sea and new connections to other countries' electrical grids increases the need for new power cables at sea.

The planning objective related to energy is to *create conditions for developed energy transmission and renewable electricity production in the sea.*

Uses in the marine spatial plan for the theme:

E **Energy extraction**

E UTR **Investigation areas for energy extraction**

The areas in the planning map where **energy extraction** is indicated as a use are either areas covered by national interest claims for energy production (wind power) or areas that are considered to be of significant public interest for energy production.

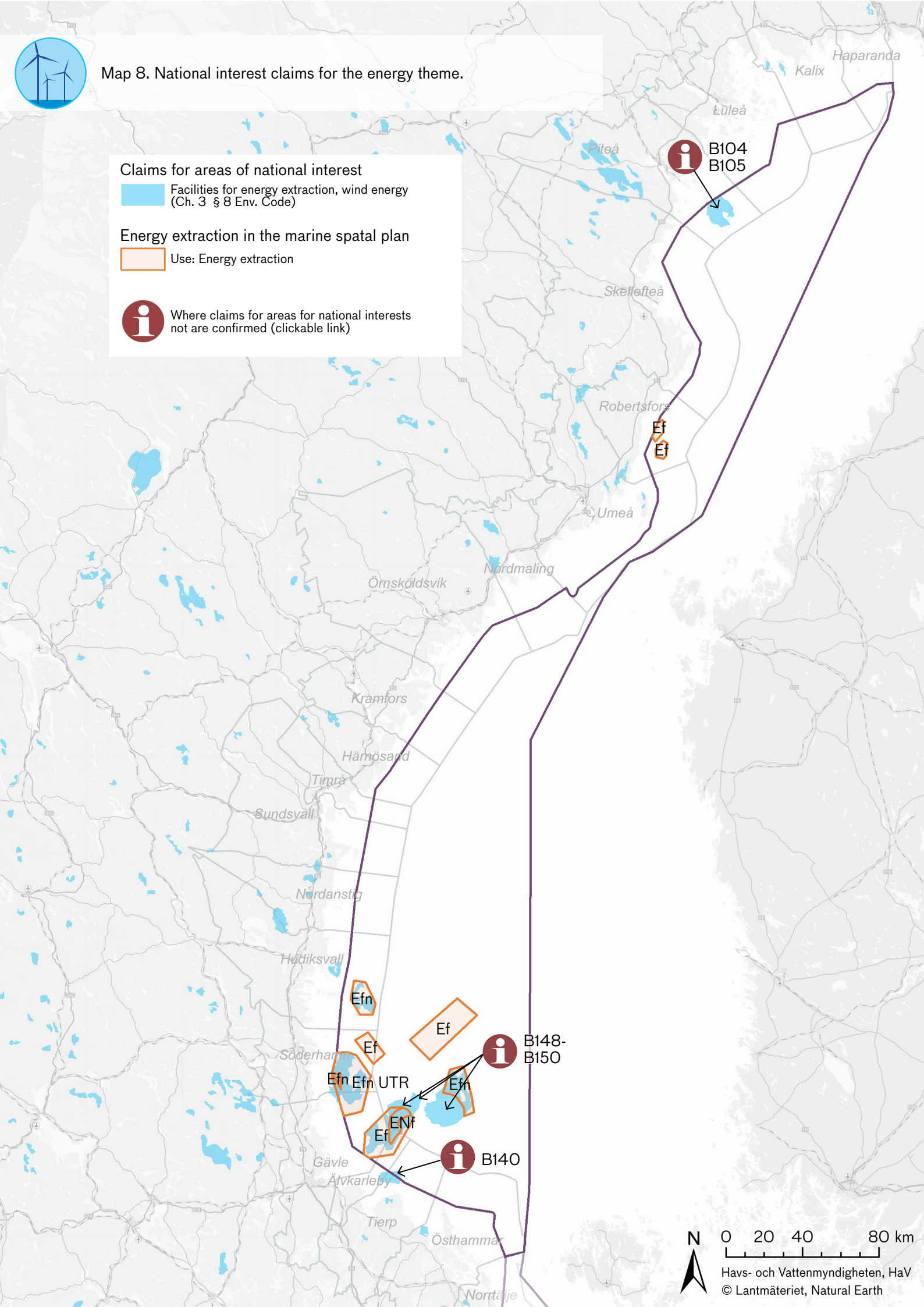
Read more about national interest claims on the Swedish Energy Agency website.

National interest claims

Facilities for energy production, Chapter 3 Section 8 of the Swedish Environmental Code

National interest claims for facilities for energy production, in the form of wind power at sea, have been prepared based on criteria such as average annual wind speed and sea depth and area. These areas largely correspond to existing and planned wind power projects. These areas are to be protected from measures that can substantially impede the creation or use of such facilities.

No national interest claims have been indicated for sea-based energy distribution or transmission.


Map 8. National interest claims for the energy theme.
Claims for areas of national interest
Facilities for energy extraction, wind energy (Ch. 3 § 8 Env. Code)
Energy extraction in the marine spatal plan
Use: Energy extraction
Where claims for areas for national interests not are confirmed (clickable link)
Haparanda
Kalix
Luleå
Piteå
B104
B105
Skellefteå
Robertsfors
Ef
Ef
Umeå
Nordmaling
Örnsköldsvik
Kramfors
Härnösand
Timrå
Sundsvall
Nordanstig
Hudiksvall
Efn
Ef
Ef
Söderhamn
Efn
Efn UTR
Efn
ENf
Ef
B148-
B150
B140
Gävle
Älvkarleby
Tierp
Östhammar
Norrtälje
N
0 20 40 80 km
Havs- och Vattenmyndigheten, HaV
© Lantmäteriet, Natural Earth

Public interests and other planning conditions

Areas of interest for wind power

To meet the needs of 100 per cent renewable electricity production by 2040, the Swedish Energy Agency assesses that around an additional 100-120 TWh will need to be produced in Sweden in total. The planning need for areas that have the conditions to contribute to renewable electricity production in the sea is estimated to amount to the equivalent of 50 TWh of the total production[52].

The marine spatial planning process shows that the areas that the Swedish Energy Agency has pointed out as national interest claims for wind power will not be enough to reach the target, due in part to competing interests. Additional interest areas for energy extraction have therefore been worked out in the marine spatial planning process.

Public interests of a material significance for wind power are generally based on the following types of documentation:

1. *Projects*
   Projects in various phases. A compilation made by *vindlov.se* from October 2017 was used.

2. *Wind power in municipal comprehensive plans*
   Areas that a municipality has pointed out for wind power through comprehensive planning under the Plan and Building Act. A compilation made by the county administrative boards was used. Every area has been assessed individually, and all areas that are presented in municipal comprehensive plans have not been assessed to be of public interest of material significance.[53]

3. *Other areas identified in the marine spatial planning process*
   The areas have been pointed out based, among other things, on
   - depth (down to 40 m for permanent seabed installations and in deeper water for floating wind power plants)
   - stable, flat, and homogeneous seabed
   - average wind speed (at least around 9 m/s annual average wind speed)
   - distance from land, proximity to connection to the electrical grids on land, and proximity to areas with high energy consumption.

The Swedish Energy Agency's LCOE data[54] for wind power was used in the

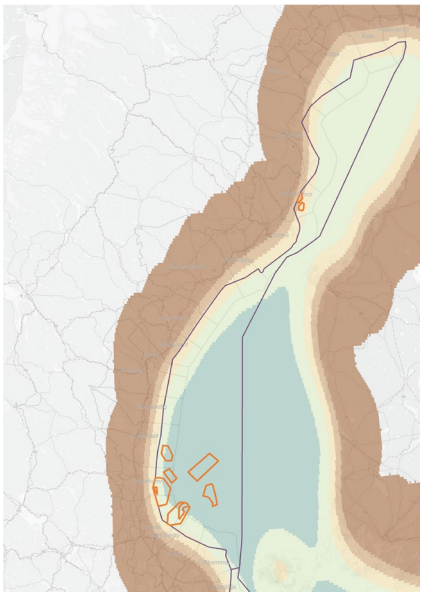


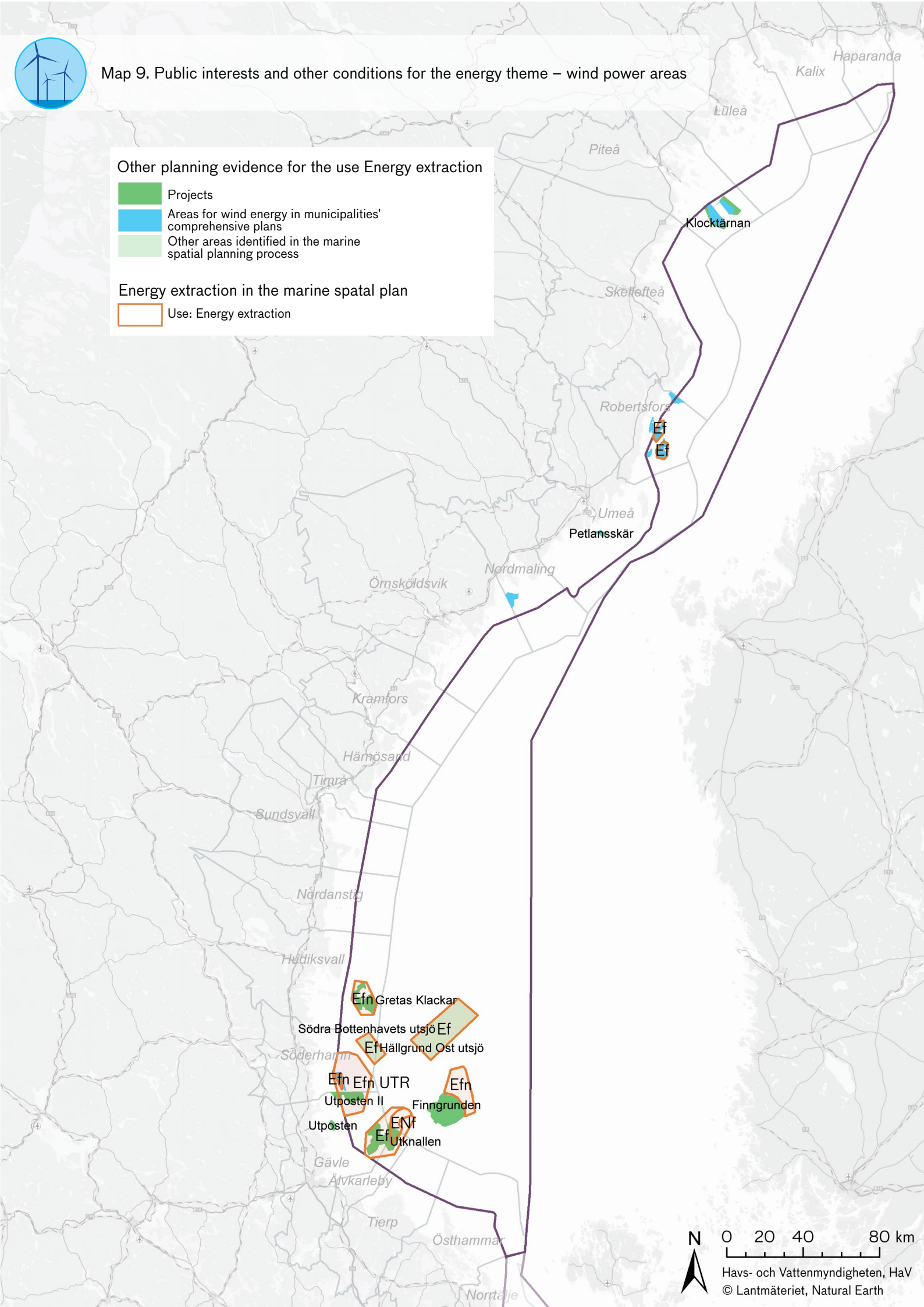
Figure 14. Production expenses for wind power at sea (LCOE). Main scenario 2025 with 6% average weighted cost of capital.

52 Swedish Energy Agency. *Energimyndighetens genomgång av energiområden i havsplaneringen, 2017-10-06* [The Swedish Energy Agency's review of energy areas in marine spatial planning, 06/10/2017]

53 County Administrative Board of Västra Götaland County, Geografisk information om energi i kommunala planer [Geographic information on energy in municipal plans], 03/07/2013

54 Swedish Energy Agency. ER 2017:3. *Havsbaserad vindkraft - En analys av samhällsekonomi och marknadspotential.* [Sea-based wind power - An analysis of socioeconomic and market potential].

Map 9. Public interests and other conditions for the energy theme – wind power areas



calculations. LCOE stands for Levelised Cost of Energy, which is the production cost. The areas have been identified by SwAM together with other participants in the marine spatial planning process.

Power cables

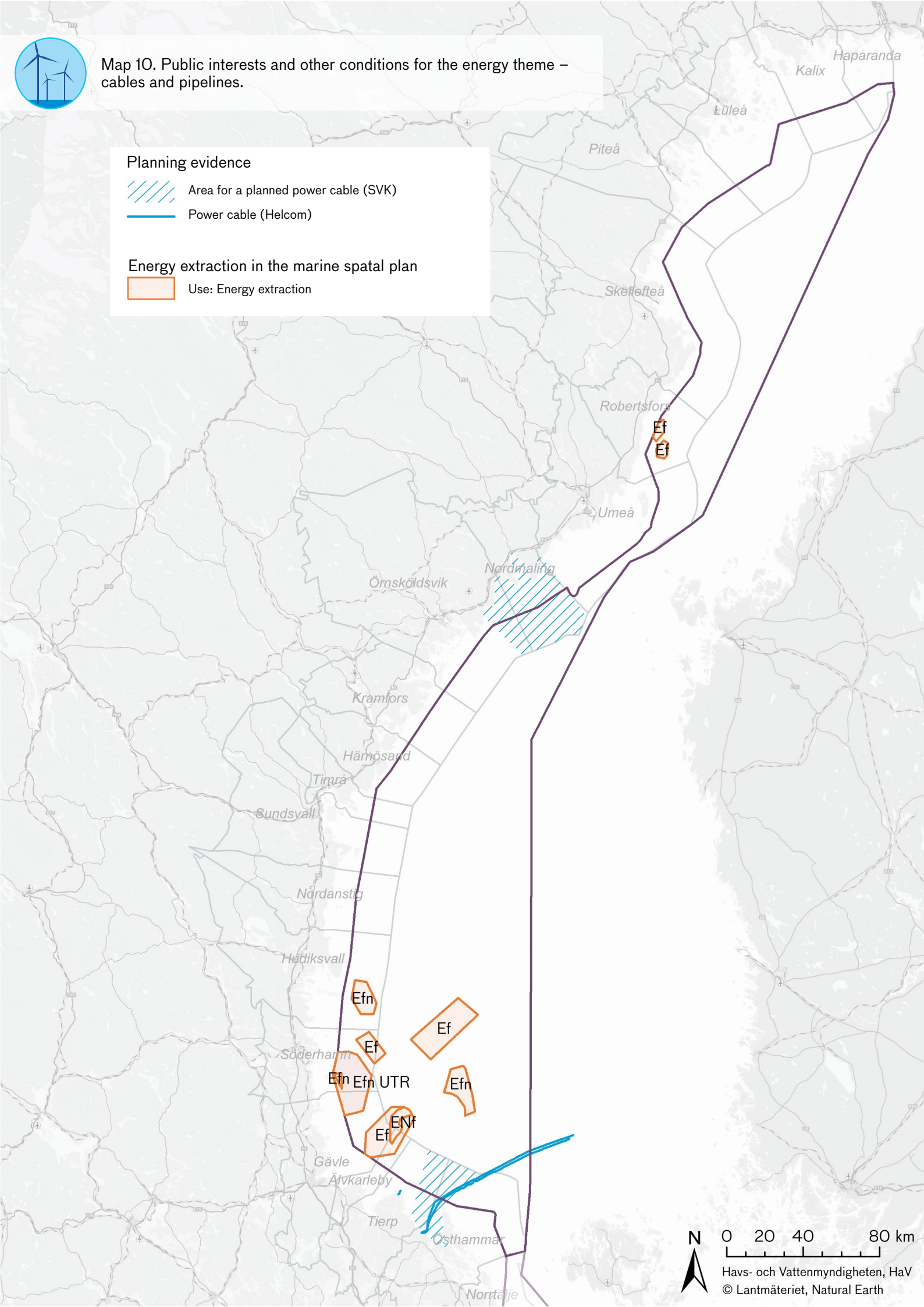
The Swedish electric system is characterised by high production in the north and large consumption in the south, and the imbalance is expected to increase if more nuclear power stations are closed. This will increases the demand for cables and other resources in the transmission system that enables transport of electricity from the hydroelectric power stations in the north to the consumers in the south.

The system is largely land-based, but the expanded planning scope for wind power at sea places new demands on a flexible transmission system that will be able to handle a large share of variable energy from wind power.

The marine spatial plan provides an overall guide that the laying of cable must be taken into account where appropriate. Specific areas for energy transmission and distribution are not presented in the planning map in this version of the marine spatial plan. The Swedish Energy Agency and Svenska Kraftnät believe that it is not appropriate to do so because the planning horizon exceeds ten years and the uncertainties are too large. The areas for cable laying should be identified as early as possible to reduce conflicts with other claims.

Legal prerequisites

In order to build a wind farm at sea within the territorial sea, permits are required according to Chapters 9 and 11 of the Environmental Code. 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). For the laying of lines and cables within the territory, permits are required according to other national laws. When an activity or measure might affect the environment in a Natura 2000 area in a significant manner, a special Natura 2000 permit according to Chapter 7 of the Environmental Code is also required. The requirement of such a permit applies both in the territorial sea and in the exclusive economic zone, and the application is reviewed by the Land and Environmental Court if the permit application is otherwise to be decided by the court and by the county administrative board if the permit application pertains to a facility in the exclusive economic zone.


Map 10. Public interests and other conditions for the energy theme – cables and pipelines.
Planning evidence
Area for a planned power cable (SVK)
Power cable (Helcom)
Energy extraction in the marine spatal plan
Use: Energy extraction
Haparanda
Kalix
Luleå
Piteå
Skellefteå
Robertsfors
Umeå
Örnsköldsvik
Nordmaling
Kramfors
Härnösand
Timrå
Sundsvall
Nordanstig
Hudiksvall
Söderhamn
Gävle
Älvkarleby
Tierp
Östhammar
Norrtälje
Ef
Ef
Efn
Ef
Ef
Efn
Efn
UTR
Efn
ENf
Ef
N
0
20
40
80 km
Havs- och Vattenmyndigheten, HaV
© Lantmäteriet, Natural Earth

Interaction between land and sea

The planning has taken general consideration of there being wind power stations near the parts of the country that have extensive energy consumption, meaning from Gävleborg County southward (electricity areas 3 and 4). Because the laying of cable is costly, it is also an advantage if wind turbines are built near the coast. Likewise, existing infrastructure on land should be used to the greatest extent possible, such as in areas close to today's nuclear power plants. The impact on the landscape is addressed in *Section 6.1 Attractive living environments*.

International interaction

An increase in exchange and trade is in line with the EU objectives for energy system development. Svenska Kraftnät is already looking at new connections to Finland in the planning area of the Gulf of Bothnia. The connections to the European grid are not underdimensioned today, but there is pressure to create more connections to further strengthen the stability of the system. Because development in the electricity market is on-going and because large changes can arise relatively quickly, the electricity transmission needs both internally and to neighbouring countries are continuously being developed. This means that additional foreign connections in Sweden, in addition to those mentioned here, might be necessary.

The Future

It is predicted that by 2030 and 2050 the profitability of sea-based energy extraction will increase and that expansion will gain speed. At the same time, the on-going energy transformation also entails larger goals for wind power at sea.

During the planning process, it has come clear that several areas that would otherwise be suitable for wind power do not have wind power as the most suitable use due to the interests of national defence. In the future, with new conditions and new technology, these areas might be re-evaluated and considered suitable for energy extraction.

New technologies, such as wave power and floating wind power stations, are under development. Room is needed at sea for pilot projects and test platforms. Technology development in the energy field affects the significance of various types of traffic to the energy system.

Analyses of sea-based wind power have been prepared by the Swedish Energy Agency, and analyses of wave power are in preparation. The cost effectiveness for sea-based energy extraction is expected to increase until 2050[55].

55 Swedish Energy Agency. ER 2017:3. Havsbaserad vindkraft - En analys av samhällsekonomi och marknadspotential. [Sea-based wind power - An analysis of socioeconomic and market potential].

Maritime strategy

In the maritime strategy, the Government has pointed out *the sea as a natural resource* as one of the five industries that the strategy comprises and where energy from waves, water, and wind are included. An expansion of the energy supply in sea areas entails development opportunities for other industries, such as construction companies, equipment manufacturers, and companies that provide service and maintenance. The most important prerequisite for companies in the service area is the development in other maritime industries.

The sea is also a potential energy resource as a producer of biomass for various areas of use. Extraction and cultivation of biomass for biogas production can also be combined with water purification.

Ecosystem services

Energy extraction in the marine spatial plans mainly comprises sea-based wind power, which is not dependent on ecosystem services. However, wind power can indirectly reduce the burden on climate-regulating ecosystem services by replacing climate-loading energy with renewable energy and fossil-free energy.

Energy extraction might entail a burden on the ecosystems and their services, including degradation of living environments and competition for space. For example, the wind power stations' lines, cables, and noise can damage the living environments. The landscape can be affected, and with it also cultural environments, recreation, and tourism.

Possible advantages:

- reduced burden from climate gases and a need for climate-regulating services
- greater biodiversity at sea through artificial reefs and reduced local impact from trawling.

Relevant environmental aspects

Activities and operations in this theme can be related to various impacts on the environment, the thematic areas in the Marine Strategy Framework Directive, and various environmental quality objectives. The relationships, which are shown in the table below, are important in the assessment of the theme's environmental impact.

Activity	Type of potential impact or pressure	Theme area Marine Strategy Framework Directive (descriptors)	Environmental quality objectives
Wind power	Physical damage/ loss Biological disruption Underwater noise	D1 Biodiversity D6 Seabed integrity D11 Introduction of energy	A balanced marine environment and flourishing coasts and archipelagos Limited climate impact Rich plant and animal life
Power from waves, currents, tides, and salinity gradients	Physical damage/ loss and disruption Underwater noise	D1 Biodiversity D6 Seabed integrity D7 Hydrological conditions D11 Introduction of energy	A balanced marine environment and flourishing coasts and archipelagos Limited climate impact Rich plant and animal life
Pipelines/ cables	Physical damage (seabed), electromagnetic fields	D6 Seabed integrity D11 Introduction of energy	A balanced marine environment and flourishing coasts and archipelagos Rich plant and animal life

Table 5. The relationship between energy extraction and relevant environmental aspects

Read more about conditions in the marine spatial planning current status description, roadmap, the thematic report on energy, and the report on ecosystem services from Swedish seas that you can find at www.havochvatten.se.

6.3 Defence

Sweden's national defence consists of military activities (military defence) and civil activities (civil defence).

The task of the Swedish Armed Forces is to maintain and develop a military defence with the capability for armed combat. The Armed Forces must be able to defend Sweden and to promote Swedish security through both national and international missions. They must also be able to detect and repel any infringements on Swedish territory and safeguard Sweden's sovereign rights and national interests outside of Swedish territory.

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.

The planning objective related to defence is to create conditions for defence and security.

The Swedish Armed Forces' marine sector conducts signal tracing and monitoring. Both parts have a technical function, but monitoring is also physical. In contrast to the army, the marine activities are constantly conducted live due to monitoring. This means that what applies in crises or war also applies in other times. To achieve and develop armed combat capability on, above, and under the water, naval exercise areas and artillery ranges have been established around the Swedish coast.

Use in the marine spatial plan for the theme:

F **Defence**

The use **defence** and *particular consideration to national defence interests* are based on national interest claims for national defence or the areas considered to be of public of material significance interest for national defence.

National interest claims

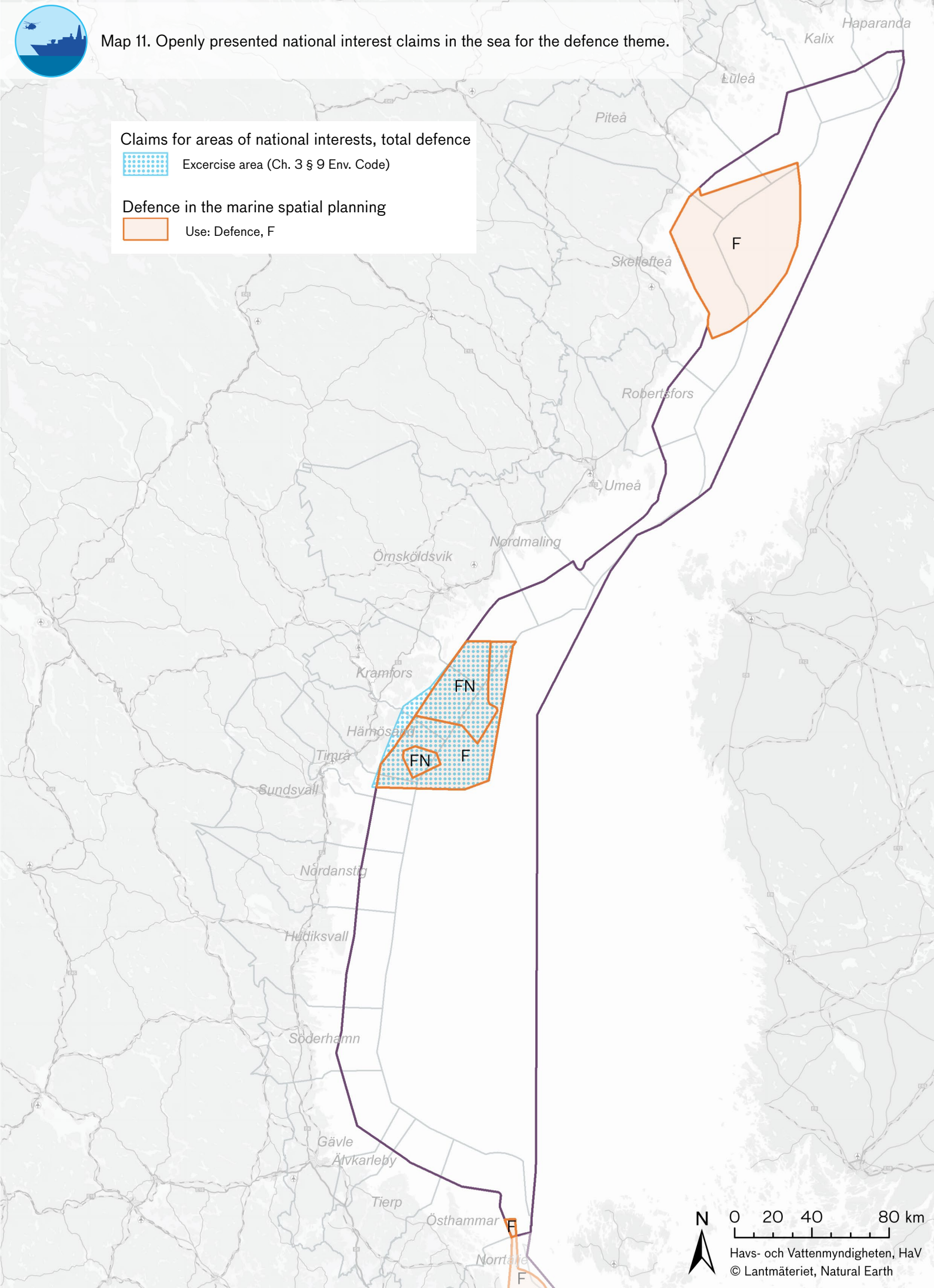
National defence facilities, Chapter 3 § 9 of the Swedish Environmental Code

Areas that are of national interest due to them being needed for national defence facilities must be protected from measures that can substantially impede the creation or use of the facilities.

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. Areas that relate to marine spatial planning will form a basis for the upcoming planning cycles.

Map 11. Openly presented national interest claims in the sea for the defence theme.



Military component of national defence
The Swedish Armed Forces point out national interest claims and their areas of influence and other areas of significance to the military component of national defence. Within the areas pointed out as national interests by the Swedish Armed Forces, there are the training and artillery ranges, technical facilities, and military airbases. Value descriptions are found on the Swedish Armed Forces' website. The Swedish Armed Forces' national interests are comprised in part of national interests that can be presented openly and national interests that cannot be presented openly for reasons of secrecy. Even the areas that in consideration of military secrecy cannot be presented openly are taken into account in the marine spatial planning.

In addition to national interest claims, there are other areas that the Swedish Armed Forces consider to be of major public interest, and such areas may be covered by secrecy. Such areas may be confidential.

Description of national interest categories in national defence's military component and influence areas

National interest marine training area
In a marine training area, operations are conducted both at sea and in the air. Temporary closures of areas occur. Permanent facilities are at risk of damaging the national interest.

National interests with influence areas – impacts on the surroundings
National interest areas (training and artillery ranges or airbases) that have an influence area linked to them in the form of noise and risk areas. Temporary closures of areas occur.

Areas with a particular need to be obstacle-free (influence areas)
Influence areas for military artillery ranges where the actual function of military activities in the form of, for example, target planes and other joint exercises between land and air constitute the national interest. Within such an area, tall objects can disrupt the activities the Swedish Armed Forces conduct.

The influence area can also concern coastal weather radar. Within the weather radar's influence area, tall objects can be a disturbance. It is prohibited to erect wind power stations close to the weather radar. In the surrounding area, an assessment of the impact can be made in individual cases.

Prohibited areas for tall objects (influence area)
Influence areas for military airbases, where the actual function of military aviation activities constitutes the national interest. Within these areas, no new tall objects can be built considering applicable rules on operational security and the Swedish Armed Forces' tactical activities in the airspace.

MSA area (influence area)

MSA areas (Minimum Safe Altitude, military definition) are influence areas for airspace and entail the protection of all air traffic at take-off and landing. Such an area constitutes the area within which there are set heights for the highest permitted objects that can occur in the area around an airport. The military MSA area is 46 kilometres, while the civil MSA area is 55 kilometres. Permanent installations that are taller than the set MSA height are not permitted.

Other influence areas

The influence areas for national interests that cannot be presented openly. Here, individual reviews are done in each case for both tall objects and other establishment to assess whether a risk of conflict arises. Permanent installations should be avoided.

Read more about national interest claims on the Swedish Armed Forces website.

Map 12. 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 included on the map.

Claims for areas of national interests, total defence

Excercise area (Ch. 3 § 9 Env. Code)

Influence areas

Surrounding impact area

Areas with a need to be obstacle free

Stop high objects

MSA-area

Other influence area

Haparanda
Kalix
Luleå
Piteå
Skellefteå
Robertsfors
Umeå
Nordmaling
Örnsköldsvik
Kramfors
Härnösand
Timrå
Sundsvall
Nordanstig
Hudiksvall
Söderhamn
Gävle
Älvkarleby
Tierp
Östhammar
Norrtälje

N

0 20 40 80 km

Havs- och Vattenmyndigheten, HaV

Impact on permanent installations

In some 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 confidential. In general, wind power stations can be said to entail harm to military interests in the form of:

- impact on technical systems and the possibility of using them to implement surveillance of Sweden's territory,
- limitations to the possibility of training and practising the abilities that are a prerequisite for the Swedish Armed Forces to achieve operational effectiveness,
- limitations to the possibility of protecting the country's territory in a possible future conflict in strategically important areas.

Establishment of wind turbines and other tall objects might in some areas entail conflicts with national interests for the military component of national defence. Facilities for energy extraction might be compatible with the military interests, but the exact design of wind farms and placement of individual wind turbines needs to be assessed in each individual case in order to determine the exact effect on military interests.

Legal prerequisites

Defence activities in the territorial sea 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 for 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 permit or registration.

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.

Interaction between land and sea

The Swedish Armed Forces' interest areas in the sea are linked to land-based areas for defence activities, and consideration is taken to the aviation approach areas, etc.

International interaction

Defence issues in marine spatial planning are addressed nationally and are not part of the collaboration with other countries. Possible impacts on the interests of national defence are taken into account when cross-border planning issues in other sectors are addressed.

The Future

In June 2015, the Swedish Parliament decided that Sweden's military operational capacity must increase. This includes, among other things, more exercises in marine areas, and It is expected that the Swedish Armed Forces will increase their use of highlighted national interest areas linked to the sea. It is expected that the Swedish Armed Forces will increase their use of national interest claims areas linked to the sea.

The defence policy situation has changed in recent years, as has the situation for civil defence, which means that the freedom to act is important. An important issue is to keep shipping lanes open, including both main shipping lanes and alternative shipping lanes.

The 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.

Ecosystem services

Defence-related activities entail a physical impact on living environments, noise, and the spread of environmental toxins, which increases the load on regulating ecosystem services. Defence activities might also affect other interests' possibilities of using ecosystem services, such as access to natural and cultural environments, recreation, tourism, and fishing.

Read more about conditions in the marine spatial planning current status description, roadmap, the thematic report on defence and security, and the report on ecosystem services from Swedish seas that you can find at www.havochvatten.se.

Relevant environmental aspects

Activities and operations in this theme can be related to various impacts on the environment, the thematic areas in the Marine Strategy Framework Directive, and various environmental quality objectives. The relationships, which are shown in the table below, are important in the assessment of the theme's environmental impact.

Activity	Type of potential impact or pressure	Theme area Marine Strategy Framework Directive (descriptors)	Environmental quality objectives
Artillery range/training area	Underwater noise and impact on water environments	D1 Biodiversity, D8 Contaminants D10 Marine litter D11 Introduction of energy	A balanced marine environment and vibrant coastal areas and archipelagos Rich plant and animal life A toxin-free environment
Dumped ammunition	Introduction of hazardous substances	D1 Biodiversity D8 Contaminants	A balanced marine environment and vibrant coastal areas and archipelagos Rich plant and animal life A toxin-free environment

Table 6. The relationship between defence and relevant environmental aspects

6.4 Storage and extraction of materials

Storage and extraction of materials encompasses carbon dioxide storage and sand extraction. Carbon dioxide storage means that carbon dioxide from emissions to the air is separated and stored in geological formations deep below the seabed. Sand extraction means that financially interesting fractions of sand and gravel are extracted from the seabed to be used mainly in the production of building materials, for filling, or for coastal replenishment measures.

Today, no carbon dioxide storage is done in Sweden, but the potential for future storage is being investigated. The potential for future storage is being investigated.

Sand extraction only takes place to a limited extent. The potential for future sustainable extraction of marine sand and gravel has been investigated, and a number of interesting areas are presented as the most suitable use in the marine spatial plans for the Baltic Sea and the Gulf of Bothnia[56].

There is no Swedish interest in or legal possibility of bringing about the extraction of fossil fuels in Swedish territorial waters or in Sweden's exclusive economic zone. In 2009, the Government denied a request for an extension of exploration permits for prospecting of oil in the south-eastern Baltic Sea[57], which SwAM has taken as guidance in the Gulf of Bothnia as well. Sweden has also not incorporated the parts of the EU Safety of Offshore Oil and Gas Operations Directive[58] that concerns permits for gas and oil extraction.

Activities in extraction and storage of materials may entail a physical impact on habitats of species.

56 *Geological Survey of Sweden. Report 2017:05. Förutsättningar för utvinning av marin sand och grus i Sverige. [Conditions for extraction of marine sand and gravel in Sweden.]*
57 *Supreme Administrative Court, 2009-3771 Supreme Administrative Court ruling on 04/11/2009, Case no. 3771-3772-09 Stockholm*
58 *Directive 2013/30/EU of the European Parliament and of the Council*

Carbon dioxide storage

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 research is needed before any areas for storage can be proposed in the marine spatial plan. A preparation for potential future carbon dioxide storage has been created because it is possible to point out such areas in the marine spatial plan at a later phase.

Public interests and other planning conditions

Areas for geological storage of carbon dioxide, Chapter 4 Section 9 of the Swedish Environmental Code

In the future, carbon dioxide storage might become relevant in areas where the conditions allow it. In a report, the Geological Survey of Sweden pointed out areas for further investigation of the suitability for carbon dioxide storage[59]. The report shows that there might be a significant potential for storage in southern Sweden. There are no appointed areas with this potential in the Gulf of Bothnia. The most numerous and largest possible storage locations have been identified in the Baltic Sea.

Coastal areas and neighbouring countries

Altogether, the Nordic countries have a high theoretical storage capacity, corresponding to storage of more than 500 years of emissions at current levels[60]. Research and data collection on the large-scale storage of carbon dioxide is conducted through international cooperation.

The Future

Technical development is considered to be crucial to what role carbon dioxide storage will have in the future and in Sweden's ambitions of minimising climate change. The possibility of carbon dioxide storage will be reflected in future marine spatial plans.

The planning objective related to carbon dioxide storage is to *establish preparedness for the possible future extraction of minerals as well as for carbon dioxide storage*

Legal prerequisites

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 territorial sea from one nautical mile outside the baseline, according to the Ordinance on geological storage of carbon dioxide (2014:21), in other words, corresponding to the area designated for marine spatial planning.

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.

Read more about conditions in the marine spatial planning current status description, roadmap, and the report on ecosystem services from Swedish seas that you can find at www.havochvatten.se.

59 *Geological Survey of Sweden. Report 2016:20. Koldioxidlagring i Sverige – sammanställning och resultat från NORDICCSGU. [Carbon dioxide storage in Sweden – compilation and results from NORDICCSGU.]*

60 As above

Sand extraction

Extraction of sand and gravel might be of major significance for the production of building materials and for coastal replenishment measures. When these geological resources are extracted on land, this entails negative consequences for the drinking water supply.

Use in the marine spatial plan for the theme:

Sand extraction

The areas in the planning map where sand extraction is indicated as a use are based on areas that are considered to be of significant public interest for the extraction of sand.

The planning objective is to *Establish preparedness for the possible future extraction of minerals as well as for carbon dioxide storage.*

National interest claims

No national interest claims have been pointed out for the extraction of marine sand and gravel by the Geological Survey of Sweden, which is the responsible authority.

Public interests and other planning conditions

Pursuant 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.

Nine different areas have been proposed as being of interest for the extraction of marine sand and gravel in the Government assignment that the Geological Survey of Sweden conducted together with SwAM in 2017[61]. Two of these areas are in the Marine Spatial Plan for the Gulf of Bothnia. One of these areas is at Finngrunden in the Southern Bothnian Sea, and the other is at Svalans and Falkens grund in Bothnian Bay.

Four out of the nine areas, including the one at Svalans and Falkens grund, are deemed to be the most suitable from a sustainability perspective. The assessment is based on geological and ecological criteria.

In the report to the Government from the Geological Survey of Sweden, 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.

Legal prerequisites

Depending on the scope, 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 (1966:314).

61 *Geological Survey of Sweden. Report 2017:05. Förutsättningar för utvinning av marin sand och grus i Sverige. [Conditions for extraction of marine sand and gravel in Sweden.]*

Map 13. Public interests and other conditions for sand extraction.

Interest areas sand extraction (SGU)

Most suitable areas

Other potential areas

Sand extraction in the marine spatial plan

Sand extraction

Haparanda
Kalix
Luleå
Piteå
Skellefteå
Robertsfors
Umeå
Nordmaling
Örnsköldsvik
Kramfors
Härnösand
Timrå
Sundsvall
Nordanstig
Hudiksvall
Söderhamn
Gävle
Älvkarleby
Tierp
Östhammar
Norrtälje

N

0 20 40 80 km

Havs- och Vattenmyndigheten, HaV

Interaction between land and sea

Sand and gravel are redistributed through natural processes, and there is often a strong connection between beaches and the sand or gravel found in deeper waters off of the coast. Sand that disappears from the coast through erosion caused by storms, currents, or hydrographic changes ends up in deposits in deep waters or moves back and forth in the area. Sand extraction close to the coast can therefore in some cases reduce the amount of sand at the beach and also accordingly impact an area's value for housing and recreation.

International interaction

Sand extraction takes place in several of Sweden's neighbouring countries. Above all, sand extraction in southern Kattegat and Öresund takes place close to Swedish waters. However, no sand extraction takes place near the Marine Spatial Plan for the Gulf of Bothnia.

The Future

From several areas, interest is growing in investigating the possibilities of using sand, gravel, and rock from the continental shelf for construction, infrastructure, and coastal replenishment measures. The need for coastal replenishment measures might increase with coastal exploitation and climate changes. 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, and the importation of marine sand entails an environmental impact that is difficult to control.

The areas that are indicated as suitable for sand extraction in the marine spatial plan are not clearly delimited, and those parts of the areas that can support sustainable extraction must be investigated further based on the materials prepared by the Geological Survey of Sweden and SwAM[62]. What parts of the areas that can enable sustainable extraction must be investigated further, based on the report prepared by the Geological Survey of Sweden and SwAM[63].

62 *Geological Survey of Sweden. Report 2017:05. Förutsättningar för utvinning av marin sand och grus i Sverige. [Conditions for extraction of marine sand and gravel in Sweden.]*
63 *Geological Survey of Sweden. Report 2017:05. Förutsättningar för utvinning av marin sand och grus i Sverige. [Conditions for extraction of marine sand and gravel in Sweden.]*

Relevant environmental aspects

Activities and operations in this theme can be related to various impacts on the environment, the thematic areas in the Marine Strategy Framework Directive, and various environmental quality objectives. The relationships, which are shown in the table below, are important in the assessment of the theme's environmental impact.

Activity	Potential impact or pressure	Theme area Marine Strategy Framework Directive (descriptors)	Sweden's environmental quality objectives
Quarries: Sand, gravel, and shells	Physical damage/ loss and disruption	D1 Biodiversity D6 Seabed integrity D7 Hydrographical conditions	A balanced marine environment and vibrant coastal areas and archipelagos Rich plant and animal life

Table 7. The relationship between extraction and relevant environmental aspects

Read more about conditions in the marine spatial planning current status description, roadmap, and the report on ecosystem services from Swedish seas that you can find at www.havochvatten.se.

6.5 Nature

The sea is an indispensable resource for mankind and society. The marine ecosystems offer a rich range of goods and services that mankind is dependent on, so-called ecosystem services. Examples are food, oxygen, and cultural experiences that contribute to people's well-being. Vigorous ecosystems are therefore the foundation of sustainable use of the sea's resources.

The sea's ecosystems are complex and have diminished resilience due to anthropogenic pressures. This means that the long-term ability of the system to handle changes and to continue to develop has decreased. The mobility of organisms and in the marine system means that impacts in one place can spread and have effects on other places. How the ecosystem is affected depends on the collective effect of various types of loads.

Protection of marine environments is one of the tools for achieving good environmental status in the sea, and support from the marine spatial planning can contribute to achieving the goals for the entire marine environment. Through marine spatial planning, valuable areas for marine organisms and birds, so-called green infrastructure, can be secured. Such planning also contributes to strengthening distribution corridors that create conditions for achieving the goal of an ecologically representative and cohesive network of protected areas.

The planning objective related to nature is to *create conditions for marine green infrastructure and the promotion of ecosystem services.*

Use in the marine spatial plan for the theme:

N **Nature**

The areas in the planning map where nature is indicated as a use are either:

- protected according to the Natura 2000 legislation,
- areas where marine area protection is planned,
- areas that are covered by other marine area protection,
- or areas that are covered by national interest claims for natural values.

Particular consideration to high nature values is based on areas that are of public interest of a material significance for nature as well as spawning and nursery areas that are national interest claims for commercial fisheries.

National interests

Natura 2000 areas, Chapter 4 Section 8 of the Swedish Environmental Code

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. The network exists to increase the possibilities of preserving plant and animal life in Europe for future generations. Approved Natura 2000 areas are an important foundation for preserving a representative selection of natural environments in Sweden. 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. The Natura 2000 areas are one of the foundations for the use **nature.**

National interest claims

Nature conservation, Chapter 3, Section 6 of the Swedish Environmental Code

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, due to 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.

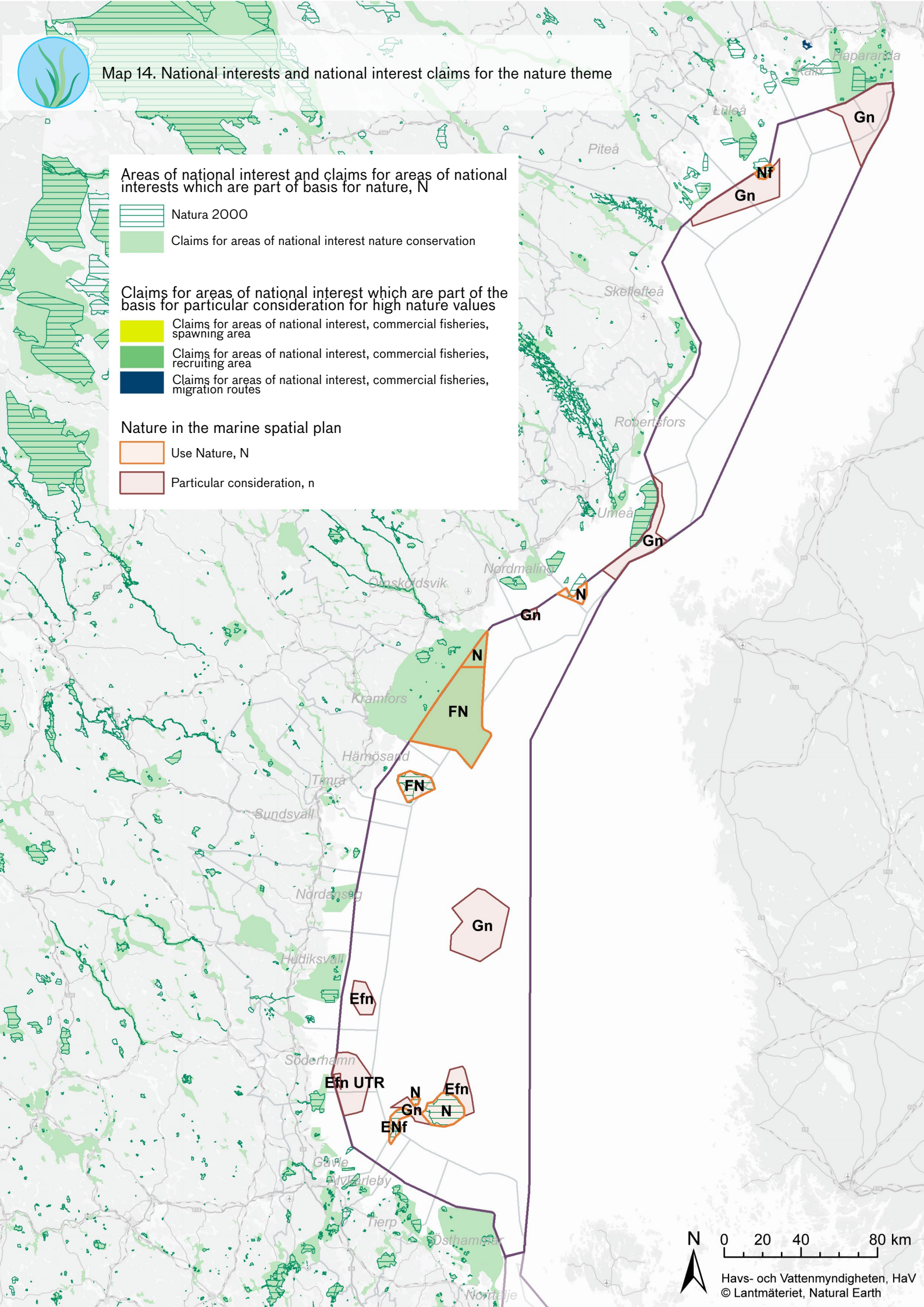
The areas with national interest claims for nature conservation form one of the bases for the use **nature.**

Commercial fisheries, Chapter 3, Section 5 of the Swedish Environmental Code

National interest claims for commercial fisheries are defined and delimited based on the areas' significance to specific fish species. Besides catch areas, spawning and nursery areas as well as migration routes are also covered.

The areas of national interest claims for commercial fisheries that pertain to spawning and nursery areas are one of the bases for *particular consideration of high nature values*.

Read more about national interest areas on the websites of the Swedish Environmental Protection Agency and the Swedish Agency for Marine and Water Management.


Map 14. National interests and national interest claims for the nature theme
Areas of national interest and claims for areas of national interests which are part of basis for nature, N
Natura 2000
Claims for areas of national interest nature conservation
Claims for areas of national interest which are part of the basis for particular consideration for high nature values
Claims for areas of national interest, commercial fisheries, spawning area
Claims for areas of national interest, commercial fisheries, recruiting area
Claims for areas of national interest, commercial fisheries, migration routes
Nature in the marine spatial plan
Use Nature, N
Particular consideration, n
Haparanda
Luleå
Piteå
Skellefteå
Robertsfors
Umeå
Örnsköldsvik
Nordmaling
Kramfors
Härnösand
Timrå
Sundsvall
Nordanstig
Hudiksvall
Söderhamn
Gävle
Hofors
Tierp
Östhammar
Norrtälje
Gn
Nf
N
FN
Efn
Efn UTR
ENf
0 20 40 80 km
Havs- och Vattenmyndigheten, HaV
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Public interests and other planning conditions

Marine protected areas according to Chapter 7 of the Environmental Code

Marine protected areas include nature reserves, national parks, and biotope protection.

The areas with marine protected areas are one of the bases for the use **nature.**

Other bases and assessments of the areas with particular consideration of high nature values, n

Land and water areas that are especially sensitive from an ecological perspective shall to the greatest extent possible be protected from measures that can harm the natural environment according to Chapter 3. Section 3 of the Environmental Code.

The use **nature** is comprised of areas that are already covered by marine area protection in the form of, for example, Natura 2000, which is of national interest for nature conservation according to Chapter 3 Section 6 of the Environmental Code and/or is planned for marine area protection. The use **nature** accordingly does not cover all valuable or sensitive nature areas that should be protected according to the Environmental Code, the ecosystem approach, and the objective of sustainable development. The marine spatial plans need to also clearly present these other valuable and sensitive areas. Guidance on *particular consideration to high nature values* is used to show that all uses at the actual location need to show consideration of the high nature values. *Particular consideration to high nature values* is indicated for areas that have high or especially sensitive nature values compared with their surroundings.

The marine spatial plans do not specify what measures may be appropriate to fulfil the particular consideration. Appropriate measures can, when necessary, be specified by the Government or by other authorities both in permit reviews and in other management activities.

Despite earlier and on-going efforts within marine mapping, there is today substantial uncertainty about the 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. Therefore, the identification of areas with *particular consideration to high nature values* was done based on a national analysis based on selected criteria.

The identification of areas with *particular consideration to high nature values* is based on a large amount of supporting information. However, the process and criteria should be adjusted and improved in along with improvements in methods and the state of knowledge.

The following documentation has been used to identify areas with *particular consideration to high nature values*:

- *Commercial fisheries' national interest claims regarding spawning and nursery areas.*

- *County Administrative Board.* Coastal county administrative boards' documentation on especially high nature values in the sea[64].

- *Green Map 2.* This documentation is an aggregation of nature values and shows important areas for bottom-dwellers, fish, marine mammals, and sea birds. Green Map 2 shows whether an area is important for at least three of the four categories[65].

- *Green Map 3.* This documentation is an aggregation of 32 different ecosystem components and shows what areas have the highest collective values. The 32 components include bottom environments, fish, marine mammals, and sea birds. Green Map 3 identifies whether an area has values that are markedly higher than their surroundings[66].

- *Symphony cumulative environmental impact.* This documentation shows the distribution of cumulative environmental impacts in Sweden's seas and identifies areas that constitute the 10 per cent most affected areas in the marine spatial plans[67].

- *Symphony naturalness.* This documentation shows the distribution of the cumulative environmental impact in Sweden's seas where particularly low environmental impact indicates naturalness on condition that the area at the same time has high ecological value. This documentation identifies the areas that constitute the 10 per cent least affected areas in the marine spatial plan if the area at the same time is identified according to the indicator in Green Map 3[68].

Symphony is an assessment method that calculates the cumulative environmental impact from a spatial perspective. For every area in the marine spatial plan, an estimated value is given that describes to what extent people affect the marine environment. The method builds on three main components: maps of loads, maps of ecosystem components, and a table showing how sensitive every ecosystem component is to every load.

Read more in *Symphony - Integrated planning support for national marine spatial planning based on an ecosystem approach.*

64 County Administrative Board. 2017. *Länsstyrelsernas redovisning av Uppdrag 2017-06-välj värdeområden.* [County administrative boards' report of assignment June 2017 for choosing areas of value.]
65 Swedish Agency for Marine and Water Management. Report 2018:1. *Symphony - Integrerat planeringsstöd för statlig havsplanering utifrån en ekosystemansats. [Symphony - Integrated planning support for national marine spatial planning based on an ecosystem approach.]*
66 Geological Survey of Sweden. *Gröna Kartan baserat på Symphony ekosystemkomponenter. [Green Map based on Symphony ecosystem components.]* 20/11/2017. Unpublished.
67 Swedish Agency for Marine and Water Management. Report 2018:1. *Symphony - Integrerat planeringsstöd för statlig havsplanering utifrån en ekosystemansats. [Symphony - Integrated planning support for national marine spatial planning based on an ecosystem approach.]*
68 Swedish Agency for Marine and Water Management. Report 2018:1. *Symphony - Integrerat planeringsstöd för statlig havsplanering utifrån en ekosystemansats.* [Symphony - Integrated planning support for national marine spatial planning based on an ecosystem approach.]

- *Uncertainty map.* This documentation shows the uncertainty in the environmental data that are included in Green Map 3 and Symphony. The category of a *good model* indicates low uncertainty, while the category of a *weak model/extrapolation* indicates high uncertainty[69].

- *HELCOM/OSPAR area protection.* Proposals on marine protected areas (MPA) pointed out by regional marine environment conventions[70].
- *Proposals on climate refuges.* This documentation provides proposals on areas that should be protected in order to preserve key species in the future Baltic Sea. Climate change is expected to result in major changes in salinity and temperature, among other aspects[71].

- *Assessment of good environmental status in the sea.* This documentation provides an indication of which organism groups do not have good ecological status under the *Marine Environment Ordinance* in different areas. The working material from SwAM's consultation regarding the initial assessment was used[72].

Areas are designated to be with *particular consideration to high nature values - n* if one or more of the following applies:

A. The area is *a national interest claim for commercial fisheries that pertains to spawning and nursery areas.*

B. The area has nature values or consideration needs confirmed multiple times. This criteria is met if at least two of the following documents have identified the area: *County administrative board, Green Map 2, Green Map 3, Symphony cumulative environmental impact, Symphony naturalness, HELCOM/OSPAR area protection.*

C. The area has certain nature values or consideration needs. This criteria is met if the County Administrative Board's documentation on its own if especially well-supported with data or if either of the documents *Green Map 3* and *Symphony cumulative environmental impact* have identified the area, at the same time that uncertainty is low according to the *uncertainty map*. This means that values that have been identified based on documentation with low uncertainty (meaning high certainty) can individually result in particu*lar consideration to high nature values* while less certain documentation needs to be confirmed from multiple sources (as per the point above).

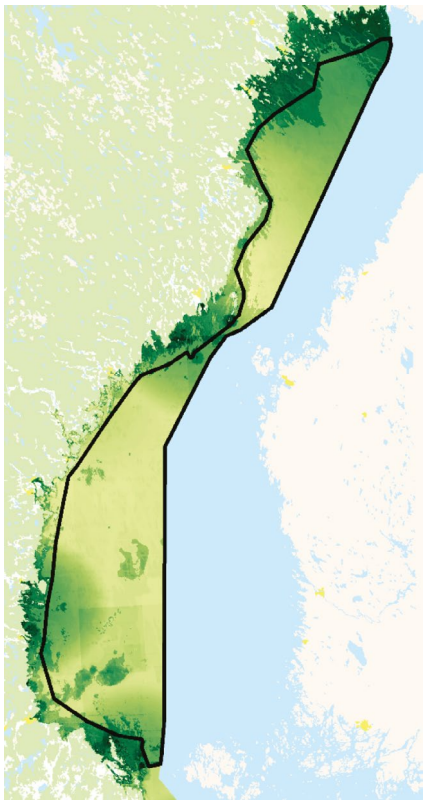


Figure 15: Map image from the Green Map that shows aggregated nature values.

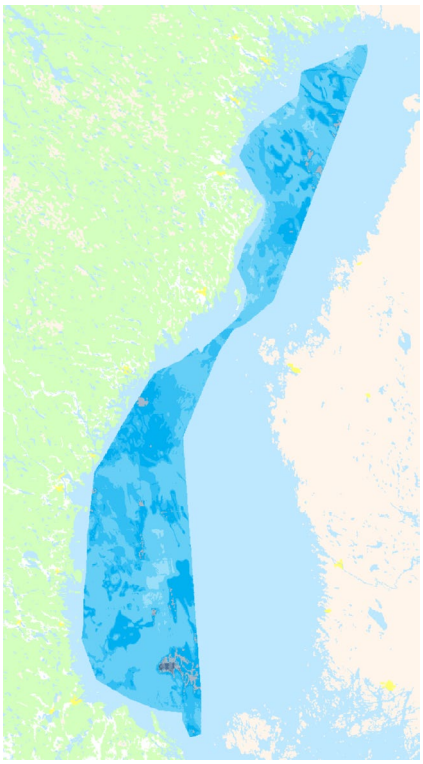


Figure 16: Map image from Symphony that shows the cumulative environmental impact.

69 Swedish Agency for Marine and Water Management. Report 2018:1. *Symphony - Integrerat planeringsstöd för statlig havsplanering utifrån en ekosystemansats.* [Symphony - Integrated planning support for national marine spatial planning based on an ecosystem approach.]

70 HELCOM Maps & Data website and OSPAR website 2018.

71 Swedish Agency for Marine and Water Management. Report 2017:37. *Möjliga klimatrefugier i Östersjön baserat på två olika scenarier* [Possible climate refuges in the Baltic Sea based on two different scenarios]

72 Swedish Agency for Marine and Water Management Report 2017:32. *Samråd om inledande bedömning 2018, genomförande av havsmiljöförordningen.* [Consultation on initial assessment 2018, implementation of the Marine Environment Ordinance]

D. The area has especially high naturalness. This criteria is met if the indicator *Symphony naturalness* is shown at the same time that the uncertainty is low according to the *uncertainty map*. This means that areas that are among the 10 per cent least affected areas in the see meet the criterion if it can be confirmed at the same time that the uncertainty in the documentation is low.

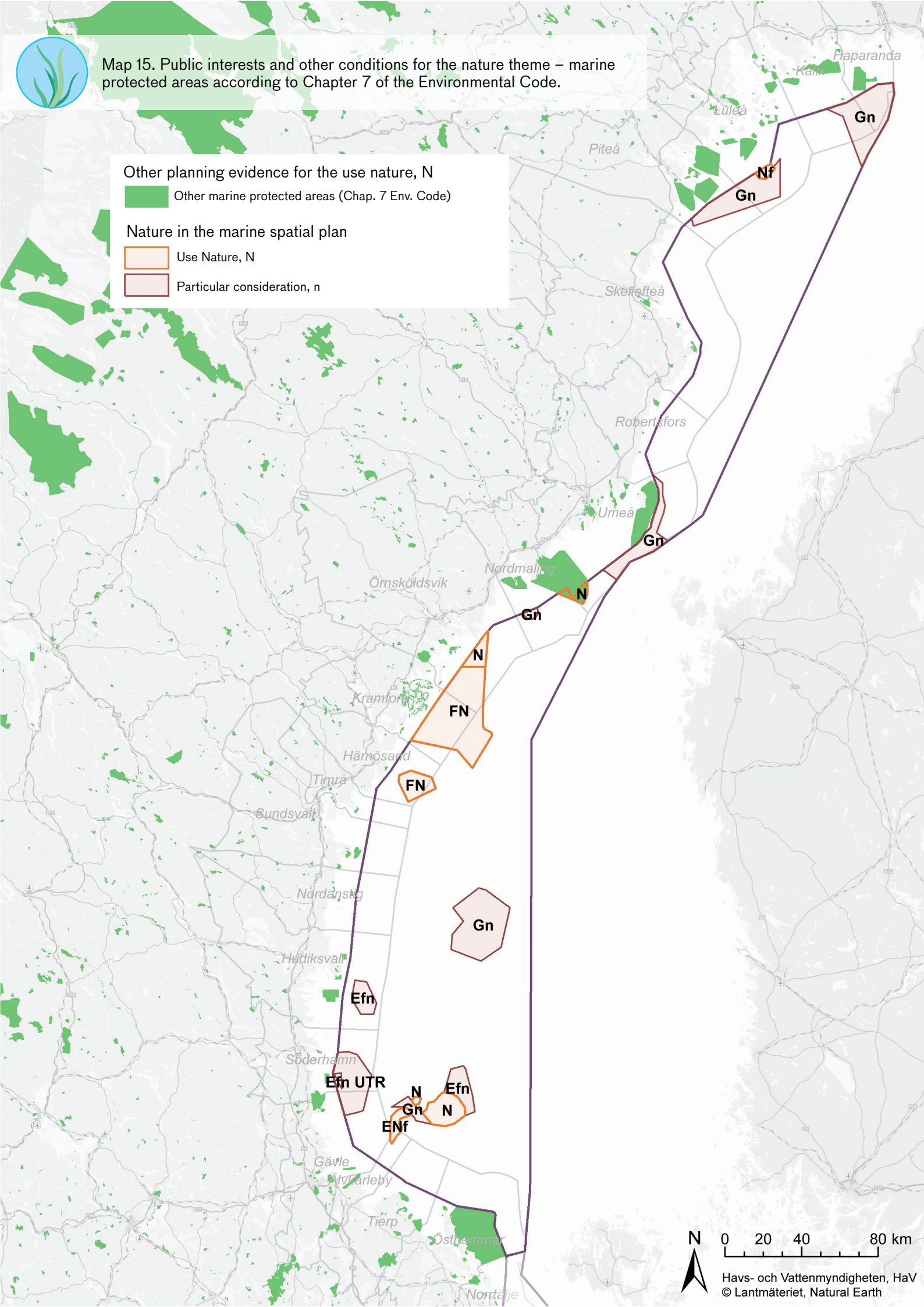
E. The area has a need for consideration due to future threats. This criterion is met if the area has been proposed as a future climate refuge.

All of the areas with green infrastructure have not received the consideration designation *particular consideration to high nature values*, but rather only those that are in need of particular consideration. Areas with *particular consideration to high nature values* accordingly do not represent a mapping of green infrastructure, but rather are a result of trade-offs between interests and the areas' need for particular consideration based on existing knowledge about their marine nature values.

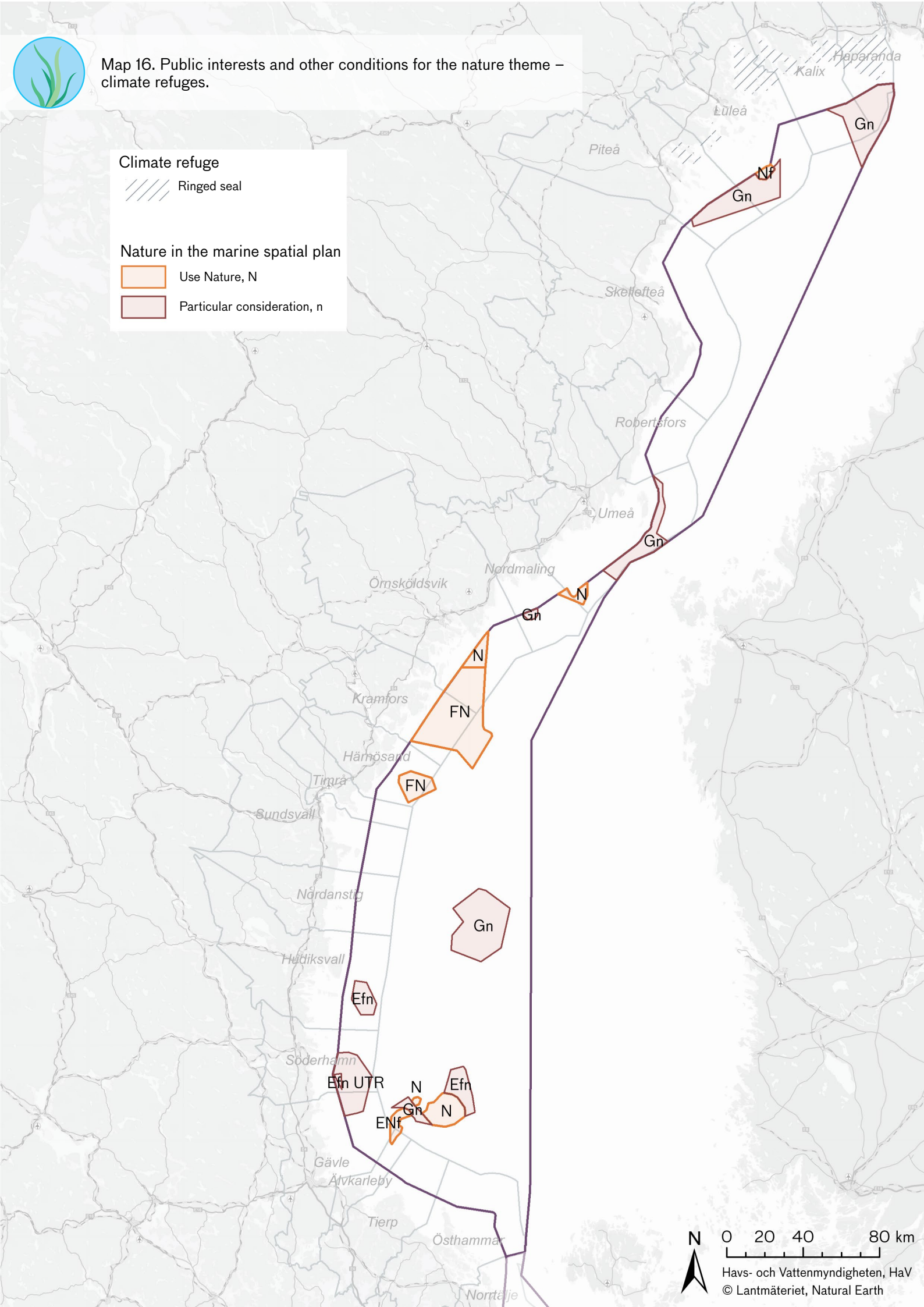
Monitoring and investigations at sea

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 locales in the marine spatial planning area where monitoring is done of sediment with regard to metals and organic toxins. The monitoring is local and concerns small areas, and the areas for environmental monitoring are therefore not presented in the marine spatial plan. The areas for environmental monitoring are therefore not presented in the marine spatial plan.

Map 15. Public interests and other conditions for the nature theme – marine protected areas according to Chapter 7 of the Environmental Code.



Map 16. Public interests and other conditions for the nature theme – climate refuges.



Interaction between land and sea

There are clear connections between land and sea. Activities on land affect the natural environment in the sea through, among other things, run-off and emissions of both nutrients and pollutants. There happens through, among other things, run-off and emissions of both nutrients and pollutants.

The documentation for loads that has been used to analyse the cumulative environmental impact includes data for the impact from land, such as nutrients, metals, and synthetic compounds

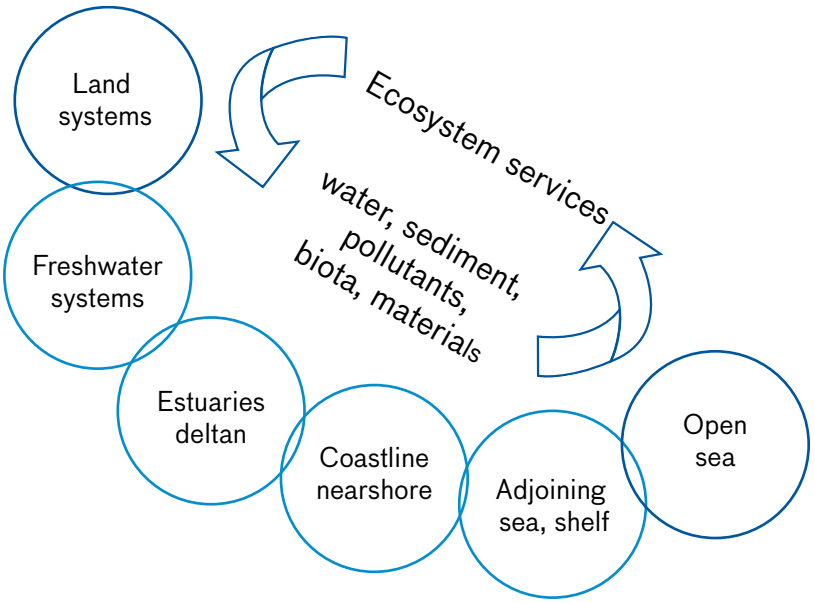


Figure 17: Everything is interrelated from source to sea. Marine spatial planning is a part of a larger context. The planning must take into consideration both how it affects and is affected by the surrounding world in a broader system perspective.

Particular consideration to high nature values and good environmental status.

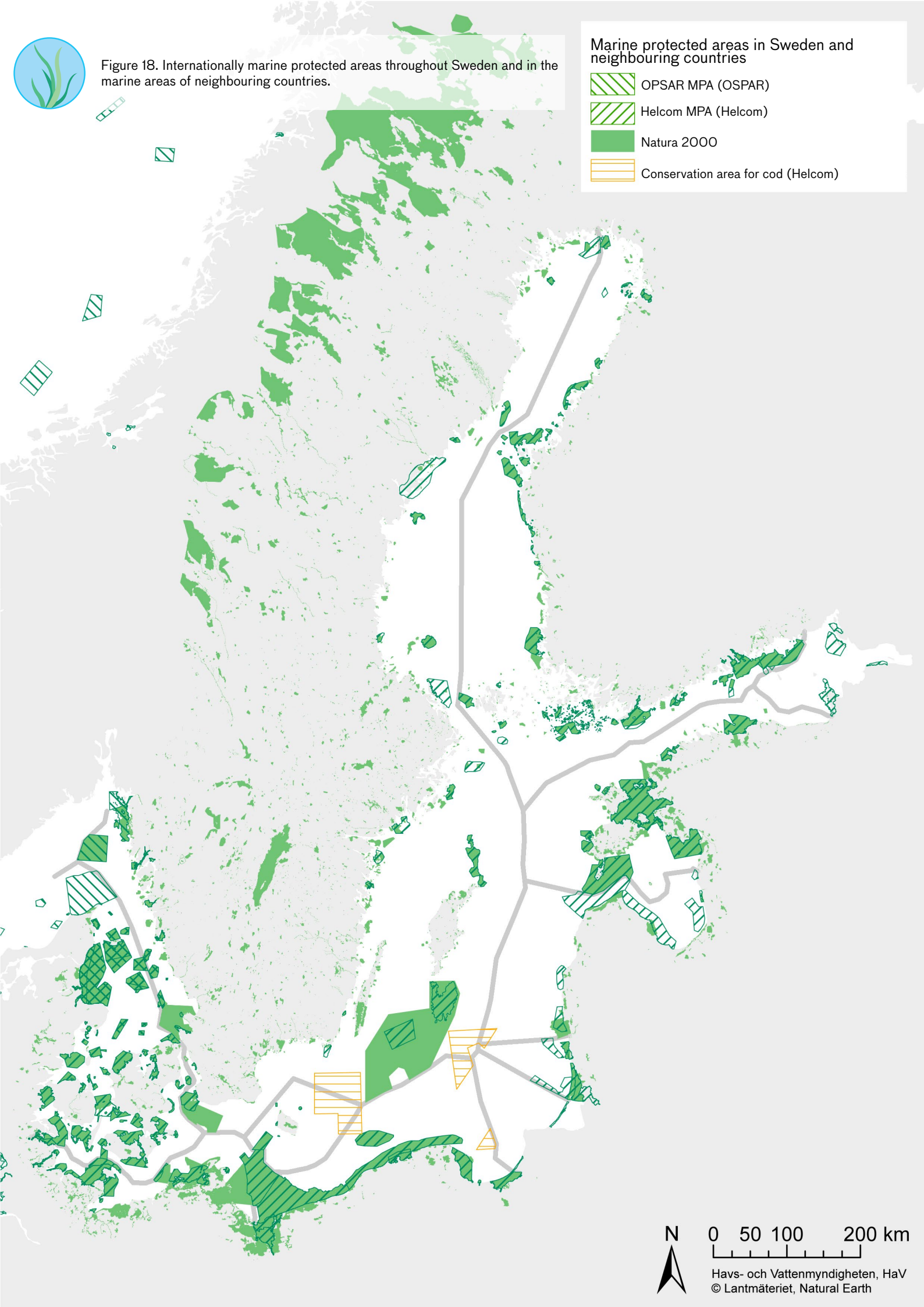
The selection of areas with *particular consideration to high nature values* has taken consideration of the environmental status of known species. In *proposals on the initial assessment* of the marine environment, it is reported that wading birds, grey seals, ringed seals, bottom-feeding birds and coastal fish do not achieve a good environmental status in either Skagerrak and Kattegat or the Baltic Sea (including the Gulf of Bothnia).

In the Baltic Sea with the Gulf of Bothnia, harbour seals, porpoises, bottom-dwelling species, such as cod, or fish and habitats in open water, such as herring, also do not achieve a good environmental status. Good environmental status not being achieved makes it even more important to point out areas with *particular consideration of high nature values*.

International interaction

Administration and planning of the sea requires cooperation between neighbouring countries. In the Swedish marine spatial planning, discussions have been held with neighbouring countries regarding their planning and networks of marine protected areas.

Figure 18. Internationally marine protected areas throughout Sweden and in the marine areas of neighbouring countries.



The Future

The management of marine protected areas is in an active phase. A national action plan for marine area protection has been prepared, and three regional plans for area protection are under development.

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 may not harm appointed protection values. Conservation plans are being prepared for recently established Natura 2000 areas.

At the same time, the analysis of the status in the marine environment shows that many environments and species do not have a good environmental status. Sweden has an obligation to ensure that the marine environment achieves a good environmental status by 2020, which is in two years, according to the Marine Environment Ordinance[73], which is based on the Marine Strategy Framework Directive[74].

In addition, there are more long-term goals in the UN's Agenda 2030. The UN Global Sustainable Development Goal 14 on the seas and marine resources includes requirements on protection and restoration of coastal and marine areas. The objective is to preserve biodiversity and fishing resources, but also to strengthen resilience to climate change.

Maritime strategy

The Government's vision for development of the maritime industries presupposes environmentally, economically, and socially sustainable growth. The point of departure is that environmental and cultural values related to marine and coastal areas are preserved or restored in order to contribute to the development of these industries.

Strong growth in the maritime industries, increased claims to marine and coastal areas, and increased use of marine resources entail challenges to society. For example, this concerns the need to achieve sustainable utilisation of land and sea, to contribute to climate and environmental objectives, and to ensure possibilities of recreation as well as to retain cultural values in marine and coastal areas.

The management of the sea and its resources forms the basis for the sea continuing to be able to provide goods, services, and other value. A good environmental status according to the Marine Strategy Framework Directive must therefore be achieved. Pollutants need to be addressed at every source, both on land and in maritime activities. The coastal area protection should secure access to nature areas for recreation and tourism.

73 *Marine Environment Ordinance (2010:1341)*
74 *Directive 2008/56/EC of the European Parliament and of the Council*

Ecosystem services

Nature areas and values include basic structural and functional ecosystem services, such as living environments, spawning and nursery areas for fish, food webs, and biodiversity. These supportive services create conditions for direct services, such as fish and shellfish for commercial and recreational fishieries and natural environments for outdoor life and recreation, that are significant to health and well-being. Natural environments can in turn contribute to regional development in, for example, sustainable tourism.

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

Nature thus encompasses services that are the prerequisites for long-term sustainable management of the sea and for ensuring long-term sustainable use of marine resources.

Read more about conditions in the marine spatial planning current status description, roadmap, the thematic report on nature, and the report on ecosystem services from Swedish seas that you can find at www.havochvatten.se.

Continued work

Sweden is developing a marine environment management system that uses the Marine Environment Ordinance as a point of departure. The marine spatial planning has a role to play in this context and will contribute to good environmental status being achieved and maintained. Pointing out areas with particular consideration to high nature values is a new addition in marine environment management.

As a part of the continued implementation of the Marine Environment Ordinance, SwAM will decide in 2018 on an initial assessment of the status of Swedish seas, i.e. how the sea is doing, how it is used, and what activities have an impact on it. In 2018, the agency will make necessary changes to its regulations (HVMFS 2012:18) about what characterises good environmental status and environmental quality standards with indicators for the North Sea and Baltic Sea.

SwAM was commissioned by the Government to identify areas in 2018 that might constitute marine protected areas with strong protection against local human impact and to prepare proposals on processes for the continued work on such areas[75]. In this work, the agency will pay particular attention to the action plan for marine area protection and a government assignment regarding conservation measures in terms of fishing in marine protected areas[76]; read more in Section 6.8 Commercial fisheries.

75 *Ministry of the Environment and Energy, 21/12/2017. Public service agreement for the 2018 budget year for the Swedish Agency for Marine and Water Management*

76 *Ministry of the Environment and Energy, 19/10/2017. Assignment regarding conservation values with regard to fishing in protected areas*

SwAM has also been assigned by the Government during 2018 to propose necessary supplements and adjustments to the network of Helcom and Ospar Marine Protected Areas (MPAs). This work will focus on the areas that today are partly or entirely protected.

Regional action plans for green infrastructure are an important measure in the Government bill on a *Swedish strategy for biological diversity and ecosystem services*[77]. The county administrative boards must have prepared action plans for their counties by 2018. A framework for marine nature value assessment, called MOSAIC[78], has been developed and has been circulated for comment and has been tested in several counties. In the continued marine spatial planning process, MOSAIC documentation and regional action plans for green infrastructure that comprise marine areas will be included as planning evidence.

77 *A Swedish strategy for biological diversity and ecosystem services (Government bill 2013/14:141).*

78 Swedish Agency for Marine and Water Management. Förslag om ramverk för naturvärdesbedömning i marin miljö – MOSAIC [Proposed framework for nature value assessment in marine environments – MOSAIC], 20/06/2017

6.6 Transportation and communications

Transportation and communications refer to the four modes of transport of road, rail, air, and shipping and to cables for telecommunication and data traffic. Shipping is a global sector of considerable significance to Sweden and concerns more than 90 per cent of the country's exports and imports by volume[79]. The vessels mainly move through an extensive network of shipping lanes and shipping routes in Sweden's seas and major lakes. Shipping has an extensive need for flexibility in terms of area for safe and efficient transport, while only a few roads and railways have claims in the sea through bridges and ferry connections. 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).

The planning objectives that relate to transportation and communication are to: *Create conditions for sustainable shipping* and *Create conditions for good accessibility.*

Use in the marine spatial plan for the theme:

Shipping

The areas in the planning map where shipping is indicated as a use are either areas covered by national interest claims for communication and shipping or areas that are considered to be of significant public interest for communication.

Read more about interest claims on the websites of the Swedish Transport Administration and the Swedish Post and Telecom Authority.

Read more about terms in the Swedish Maritime Administration's Glossary and concept diagram - Shipping lanes and ports

National interest claims

Facilities for communications, Chapter 3 Section 8 of the Swedish Environmental Code

Existing and planned facilities for shipping, ports, roads, railways, and aviation are national interest claims for the facilities of the modes of transportation. No national interest claims have been pointed out for sea-based data and telecommunications.

79 Swedish Transport Administration. 2013. *Kunskaps- och planeringsunderlag för en nulägesbeskrivning av havet.* [Knowledge and planning documentation for a current status description of the sea.]

Map 17. National interest claims for the transportation and communications theme.

Claims for areas of national interest, communication

- Port, existing
- Shipping: Shipping routes inc. buffer zones
- Aviation: MSA-area

Transports in the marine spatial plan

- Use Shipping

Haparanda
Kalix
Piteå
Skellefteå
Robertsfors
Umeå
Nordmaling
Örnsköldsvik
Kramfors
Härnösand
Timrå
Sundsvall
Nordanstig
Hudiksvall
Söderhamn
Gävle
Älvkarleby
Tierp
Östhammar
Norrtälje

N

0 20 40 80 km

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Public interests and other planning conditions

Other suitable areas for shipping

During the marine spatial planning process, the transport authorities have prepared supporting evidence for other especially suitable areas for shipping in addition to the national interest claims that formed the basis for the use shipping.

About routing systems

Routing systems are intended to reduce the risks of accidents. The term "routing system" encompasses traffic separation schemes, 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 by the Swedish Transport Agency, which on behalf of the Swedish Government represents Sweden in the negotiations.

Legal prerequisites

In the territorial sea, Sweden has sovereignty, which implies the unlimited right to regulate various activities, with the exception of other states' right of innocent passage with vessels. Sweden has a right to regulate traffic within the territorial sea by setting shipping lanes and establishing traffic separation schemes. However, this right must be exercised in consideration of IMO's recommendations, among other things.

The vessels of other countries have the right to travel within Sweden's exclusive economic zone. Within the exclusive economic zone, the coastal state has limited possibility to legislate in order to e.g. protect the marine environment due to IMO norms. Changes in international shipping lanes for environmental reasons are nonetheless possible if they are supported by the neighbouring countries and approved by IMO.

Map 18. Public interests and other conditions for the transportation and communications theme – routing systems

Routeing system IMO (Helcom)

- Traffic lane
- Traffic separation scheme
- Deepwater route

Planning evidence for the use Shipping from transportation agencies

- Claims, shipping

Haparanda
Kalix
Luleå
Piteå
Skellefteå
Robertsfors
Umeå
Nordmaling
Örnsköldsvik
Kramfors
Härnösand
Timrå
Sundsvall
Nordanstig
Hudiksvall
Söderhamn
Gävle
Älvkarleby
Tierp
Östhammar
Norrtälje

N

0 20 40 80 km

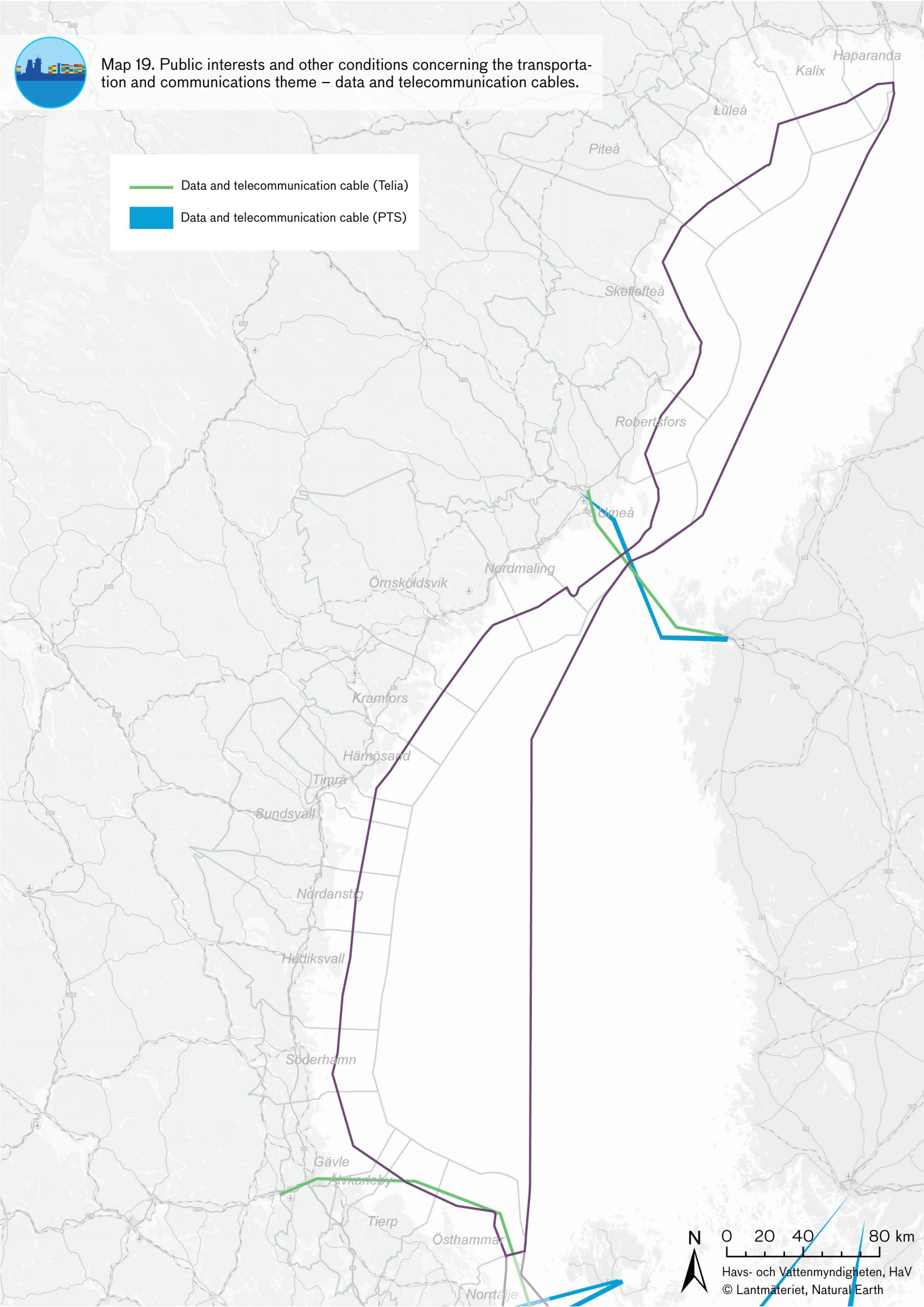
Havs- och Vattenmyndigheten, HaV
© Lantmäteriet, Natural Earth

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.

Even if the transmission capacity in the cables is growing, more cables are needed to create space and security in the networks.

Map 19. Public interests and other conditions concerning the transportation and communications theme – data and telecommunication cables.



Interaction between land and sea

In the planning process, the land locations connected to existing or planned traffic nodes, such as roads and railways over bridges or ferry connections have been taking into account. Moreover, the national interest areas for shipping include approaches and fairways to and from ports. Sweden's ambition to increase domestic and locally bound as well as coastal and lake shipping can entail greater use of shipping lanes close to and along the coast in the long term, which is taken into account in the plan through adequate areas for shipping.

International interaction

Shipping lanes and traffic separation schemes are largely shared between Sweden and Finland. During planning, dialogues have been held with neighbouring countries regarding the shipping areas. Specific requests have been received from Finland regarding permanent connections between Finland and Sweden across the The Kvarken These issues will be addressed further during the marine spatial planning process and will be discussed in

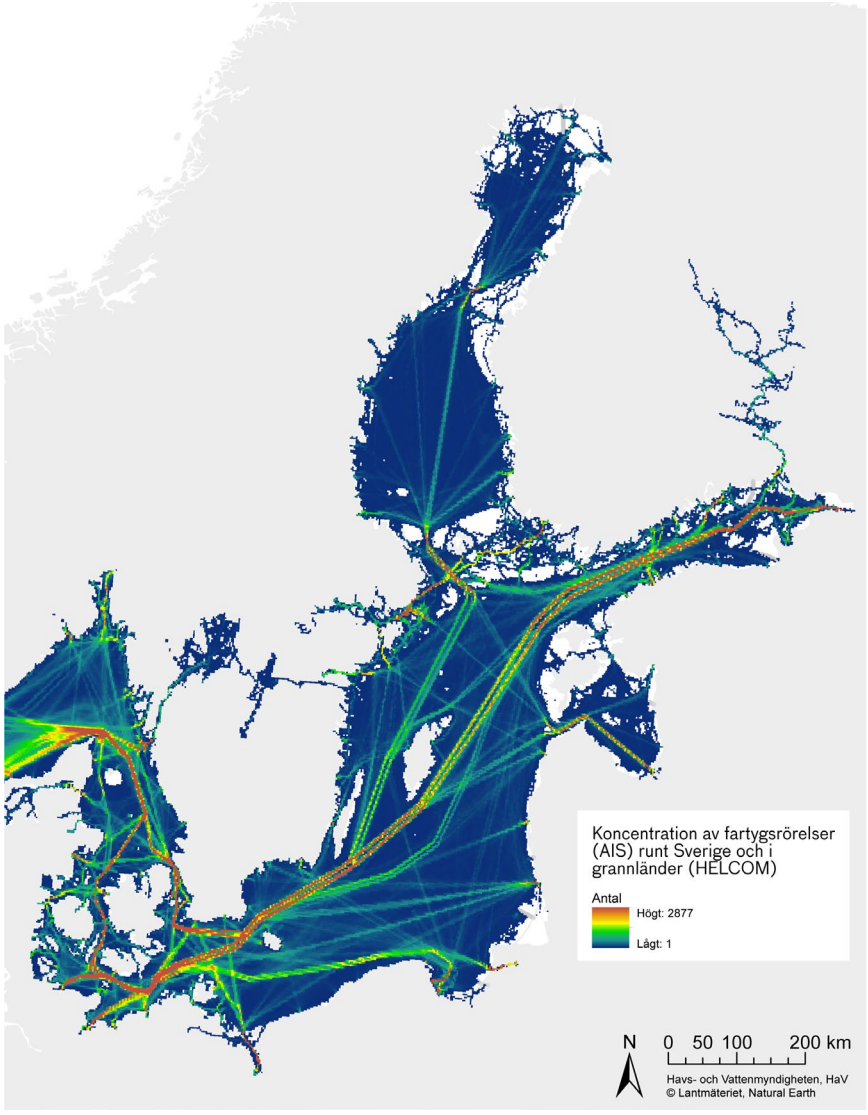


Figure 19: Concentration of ship movements (AIS) around Sweden and in neighbouring countries.

The Future

The area needed for communications on and across the sea is not expected to change in the foreseeable future, but preservation of existing areas is of major importance for securing navigability and accessibility. Changed trading patterns and requirements on new connections might, however, change the spatial needs in the long term.

New technology such as automated vessels and vessels with other designs and fuels are under development but are difficult to plan for at present. However, there might be a need to identify areas for pilot projects and test facilities. The amount of goods transported by sea is predicted to increase until 2030 and 2050[80].

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.

Maritime strategy

In the strategy, the Government has pointed out *transport*, including shipping companies, ports, and logistics companies, as one of the five industries that the strategy covers. To contribute to a more developed transport system and ultimately in order for Swedish industry to be able to maintain and develop its competitiveness, it is important that Swedish ports and Swedish shipping are competitive. In terms of the amount of goods transported in relation to its environmental impact, shipping is an environmentally efficient way of transporting goods. The transfer of goods from land to sea transports contributes to reducing both the environmental impact from the transport sector and congestion on land.

Ecosystem services

Transportation and communications can affect ecosystem services. Cables and lines might entail physical damage and wear to marine environments and cultural relics. Animal and bird life can also be affected. Shipping can entail noise, water flow and sediment impact (such as coastal erosion), and emissions of hazardous substances and climate gases. This increases the need for regulation of, for example, air pollution and acidification substances such as nitrogen oxides.

80 *Swedish Agency for Marine and Water Management. Report 2016:24. Sjöfart – rapport från havsplaneringens tematiska arbete från oktober 2015 till mars 2016. [Shipping – report from marine spatial planning thematic work from October 2015 to March 2016.]*

Relevant environmental aspects

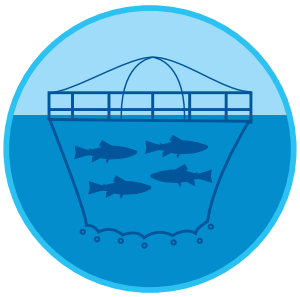
Activities and operations in this theme can be related to various impacts on the environment, the thematic areas in the Marine Strategy Framework Directive, and various environmental quality objectives. The relationships, which are shown in the table below, are important in the assessment of the theme's environmental impact.

Read more about conditions in the marine spatial planning current status description, roadmap, the thematic report on shipping, and the report on ecosystem services from Swedish seas that you can find at www.havochvatten.se.

Activity	Potential impact or pressure	Theme area Marine Strategy Framework Dir. (descriptors)	Sweden's environmental quality objectives
Maritime transports	Underwater noise Air emissions such as acidifying, climate-impacting compounds, pollutants Introduction/relocation of foreign, potentially invasive species Coastal erosion	D1 Biodiversity D2 Invasive species D5 Eutrophication D8 Contaminants D11 Introduction of energy	A balanced marine environment and vibrant coastal areas and archipelagos Rich plant and animal life Only natural acidification Reduced climate impact Zero eutrophication A toxin-free environment
Shipping lanes - dredging and dumping dredged materials	Physical damage Biological disruption Dispersion of pollutants	D1 Biodiversity D6 Seabed integrity D7 Hydrographical conditions	A balanced marine environment and vibrant coastal areas and archipelagos Rich plant and animal life

Table 8. The relationship between transportation/communications and relevant environmental aspects

6.7 Aquaculture and blue biotechnology



Aquaculture and blue biotechnology are examples of activities in what is called the blue economy. Aquaculture is the cultivation of all kinds of animals and plants in water such as fish, crayfish, clams, and algae. Blue biotechnology is about exploring and utilising various marine organisms to develop new products. In the Gulf of Bothnia, aquaculture is today only conducted close to the coast and not in the marine spatial plan area. There is on-going research and technology development, both in terms of the use of various species and in terms of farming methods.

At present, there is no compiled mapping of possible geographic development areas for aquaculture in the planning area. In the national strategy for aquaculture, one of the objectives is that a majority of Sweden's municipalities identify and include suitable locations for aquaculture in their comprehensive plans. Such new supporting documentation together with developed cultivation technology might lead to planning conditions for aquaculture in the marine spatial plan area in the long term. In this phase, the marine spatial plan creates preparedness for aquaculture, but it assigns no specifically delimited areas intended for aquaculture in the marine spatial plan area.

The planning objective that relates to aquaculture and blue biotechnology is to *establish preparations for the future establishment of sustainable aquaculture.*

Public interests and other planning conditions

Pursuant to 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.

Almost all Swedish sea-based cultivation of fish takes place close to the coast in the Gulf of Bothnia. In 2016, this cultivation was related to rainbow trout at eight coastal-water sites.

Legal prerequisites

Permits from the county administrative board are required to build and conduct a fish farm pursuant to Chapter 2 Section 16 of the Ordinance for fishing, aquaculture and the fishing industry (1994:1716). Fish farming also refers to the cultivation of aquatic molluscs and aquatic crustaceans, compare with Section 4 of the Fishery Act (1993:787).

A fish farm (not shellfish) can also be subject to registration and permitting 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 is subject to registration with the affected municipality depending on how much feed is used in the farming.

Interaction between land and sea

The sea-based cultivation requires infrastructure on land.

International interaction

International interaction pertains primarily to market development for farmed fish, access to fish food, and the extent to which the shared marine environment can withstand greater fish farming in the Baltic Sea and the Gulf of Bothnia.

The Future

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.

Maritime strategy

In the strategy, the Government has pointed out the *Sea as a natural resource*, which includes food, substrates for biofuels, and minerals, as one of the five industries covered by the strategy. Aquaculture has grown strongly globally and is deemed to have growth potential in Sweden. However, the conditions for aquaculture are limited considering water quality status, mainly with regard to eutrophication and increased impact of nutrient salts. Farming of fish and shellfish should therefore take place with the least possible impact.

Farming of micro- and macro-algae has major potential for producing high-value products such as oils, vitamins, and special proteins and for replacing products that today come from unsustainable fisheries. Aquaculture can therefore contribute to the development of industries and companies, food production, and employment at a regional level.

Ecosystem services

Through aquaculture, fish, shellfish, and algae are provided. The cultivation is dependent, among other things, on the existence of ecosystem services in the form of biological diversity and good water quality.

Aquaculture affects ecosystem services through emissions of nutrients, eutrophication, genetic impact, and emissions of hazardous substances. Farming of algae and clams and their uptake of nutrient compounds can, however, contribute to reducing eutrophication and thereby have positive effects on ecosystems.

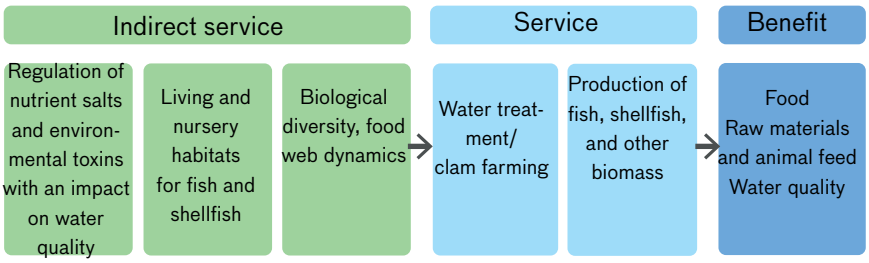


Figure 20 Important ecosystem services for aquaculture.

Relevant environmental aspects

Activities and operations in this theme can be related to various impacts on the environment, the thematic areas in the Marine Strategy Framework Directive, and various environmental quality objectives. The relationships, which are shown in the table below, are important in the assessment of the theme's environmental impact.

Activity	Potential impact or pressure	Theme area Marine Strategy Framework Directive (descriptors)	Sweden's environmental quality objectives
Farming fish, shellfish, and algae	Impact through increased regulating capacity, nutrient salt reduction, and reduced eutrophication.	Introduction of nutrients and organic material Introduction of pollutants Biological disruption	A balanced marine environment and vibrant coastal areas and archipelagos Living lakes and watercourses A toxin-free environment

Table 9. The relationship between aquaculture and relevant environmental aspects

Read more about conditions in the marine spatial planning current status description, roadmap, the thematic report on regional development, and the report on ecosystem services from Swedish seas that you can find at www.havochvatten.se.

6.8 Commercial fisheries

There is a long tradition of using and handling fish in the Gulf of Bothnia, and fisheries provides important local employment and provides the market with products in demand. Fermented Baltic herring and whitefish roe are two well-known products from the Gulf of Bothnia. Fisheries contribute to the identity and vibrancy of the coastal communities through both fishing in itself and its significance to industries on land, such as port operations and fish processing. The tourism industry also benefits from vibrant local commercial fisheries.

Small-scale fisheries normally take place within more limited areas due to the boats' capacity and fishing focus, while other fisheries are more dynamic and with activities spread over larger areas. Where fisheries are conducted vary by the season, and also depends on how the fishing possibilities develop over time, meaning how the fish stocks and the regulations surrounding them develop.

In the Gulf of Bothnia's marine spatial plan area, herring fisheries are important, and the catches are landed locally. Fishing for vendace takes place outside the marine spatial plan area closer to the coast. In the Gulf of Bothnia, there is also foreign fisheries in Swedish territorial waters and in the Swedish exclusive economic zone.

A basic prerequisite for commercial fisheries is access to good fish stocks. Moreover, good fish stocks are dependent on different habitats during different lifestages of the fish. Coastal areas in particular are spawning and nursery areas for many marine organisms, but the spawning areas also occur even farther out to sea. Protection is required mainly of important spawning, nursery, and fish migration areas in relation to development pressure in the surroundings in order to ensure vibrant fish stocks. Besides protection of the fish's habitats, continued commercial fisheries need space to use the resources where they occur and to travel to and from catch areas and fishing ports.

Use in the marine spatial plan for the theme:

The planning objective related to commercial fisheries is to *create conditions for sustainable commercial fisheries.*

Commercial fisheries

The areas in the planning map where commercial fisheries is indicated as a use are areas considered to be of public interest of material significance for commercial fisheries.

National interest claims

Commercial fisheries, Chapter 3, Section 5 of the Swedish Environmental Code

In the Gulf of Bothnia, there are national interest claims for commercial fisheries close to land, but not in the marine spatial plan area.

National interest claims for commercial fisheries relate to the areas in the sea, lakes, rivers, and home and landing ports. The national interest areas were announced by the former Swedish National Board of Fisheries in 2006. For the sea, national interest claims relate to catch areas or spawning and nursery areas and migration routes for fish.

The areas of national interest should be protected from measures that can substantially harm such interests.

Legal prerequisites

Commercial fisheries are regulated in the scope of the EU Common Fisheries Policy with supplemental national Swedish fishing legislation.

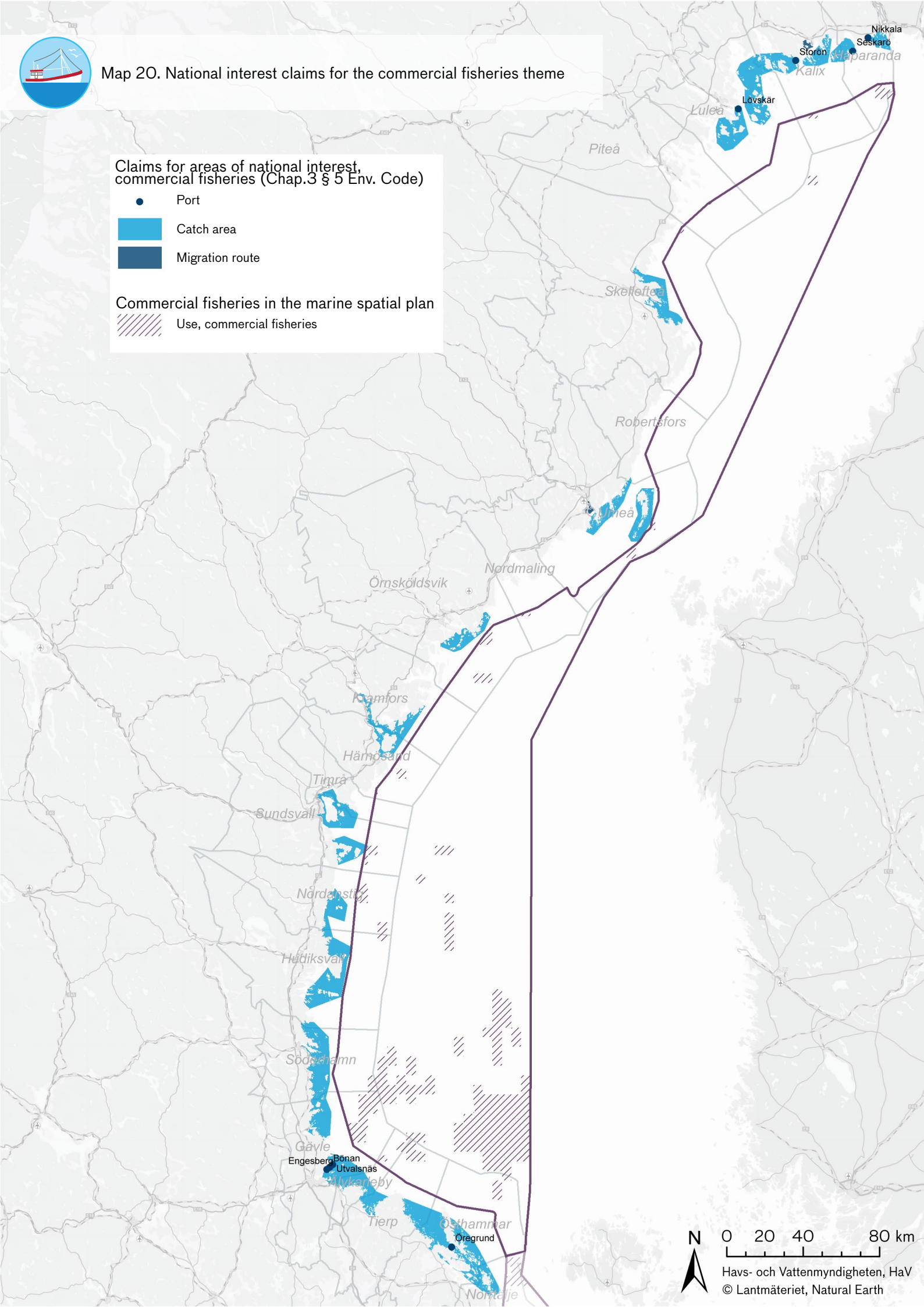
Geographically, the fisheries policy regulates commercial fisheries out to the outer boundary of the exclusive economic zone, but applies to EU vessels even outside EU waters according to Regulation (EC) No 1380/2013 of the European Parliament and of the Council. The Member States can have some rules of their own within the territorial boundary and also some rules for the country's fishing fleet in all EU waters. For fisheries that are not commercial, most of the provisions are in national legislation, which in Sweden is in the Fishery Act (1993:787).

The EU Member States have free access to the EU waters up to 12 nautical miles from the baselines outside other Member States' coasts. With regard to Swedish waters, Denmark and Finland also have access up to 4 nautical miles in the Baltic Sea (including the Gulf of Bothnia). According to the access agreements that Sweden has with Finland and Denmark, the fishing state may conduct fishing according to its own rules, meaning the flag state's rules.

The delimitation is the same that applies for the so-called trawling boundary. The trawling boundary means that trawler fishing is prohibited within the trawling boundary

Read more about the national interest claims on the SwAM website.

Map 20. National interest claims for the commercial fisheries theme



Public interests and other planning conditions

Public interest of a material significance for commercial fisheries is based on the largest landing values for 12 different defined fisheries over the years 2003–2015. For each fishery, 75 per cent of the catch value was included when the sum of the value for the respective fishery was calculated[81].

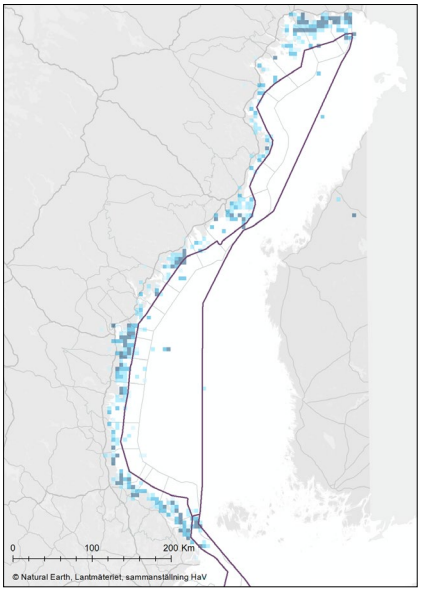


Figure 21. Economic landing value of fishing with passive gear in the Gulf of Bothnia during the period 2003–2015. Light blue shows low values and dark blue shows high values.

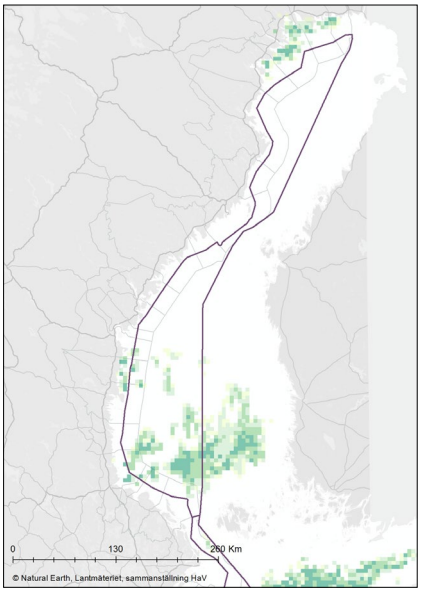
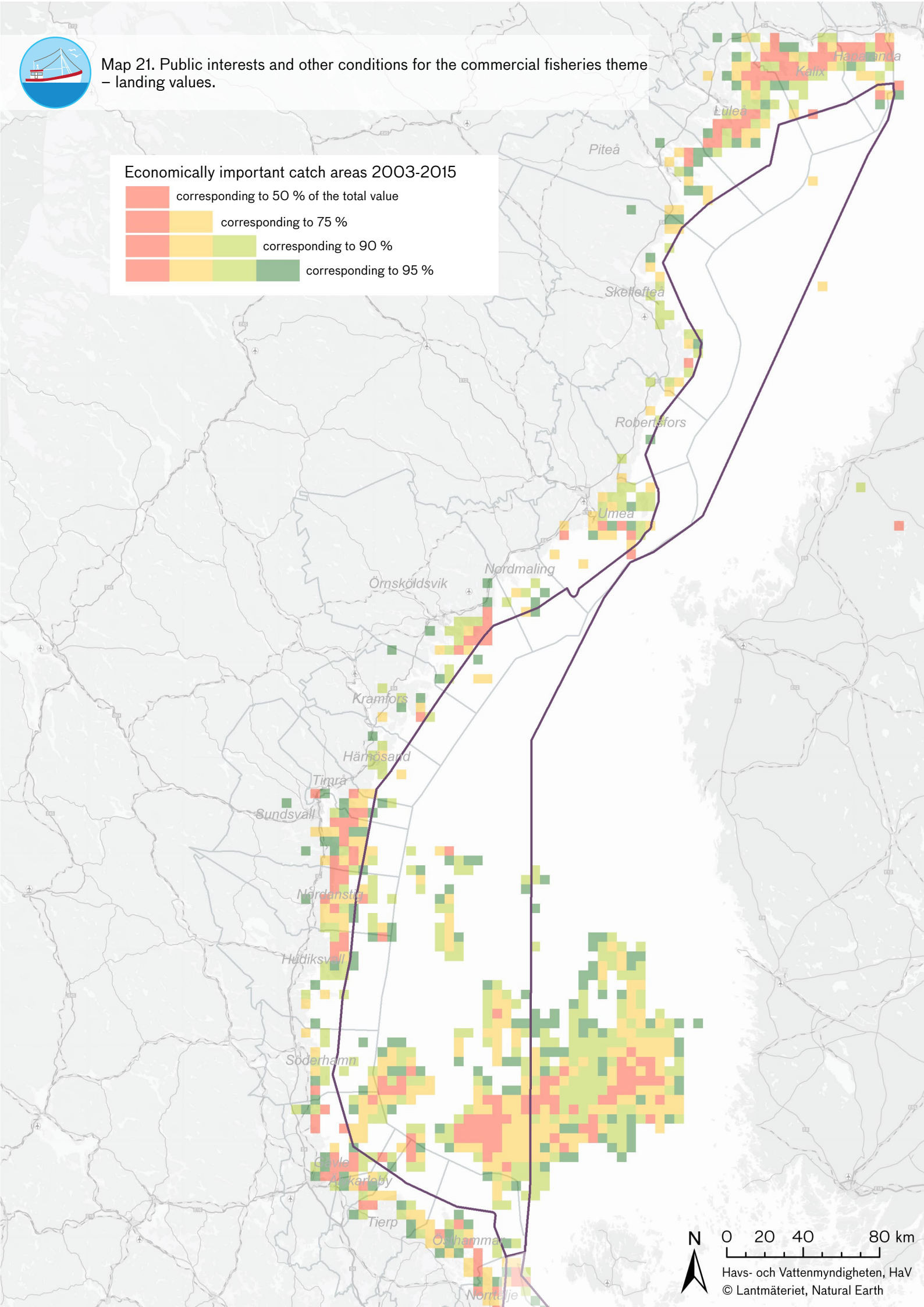


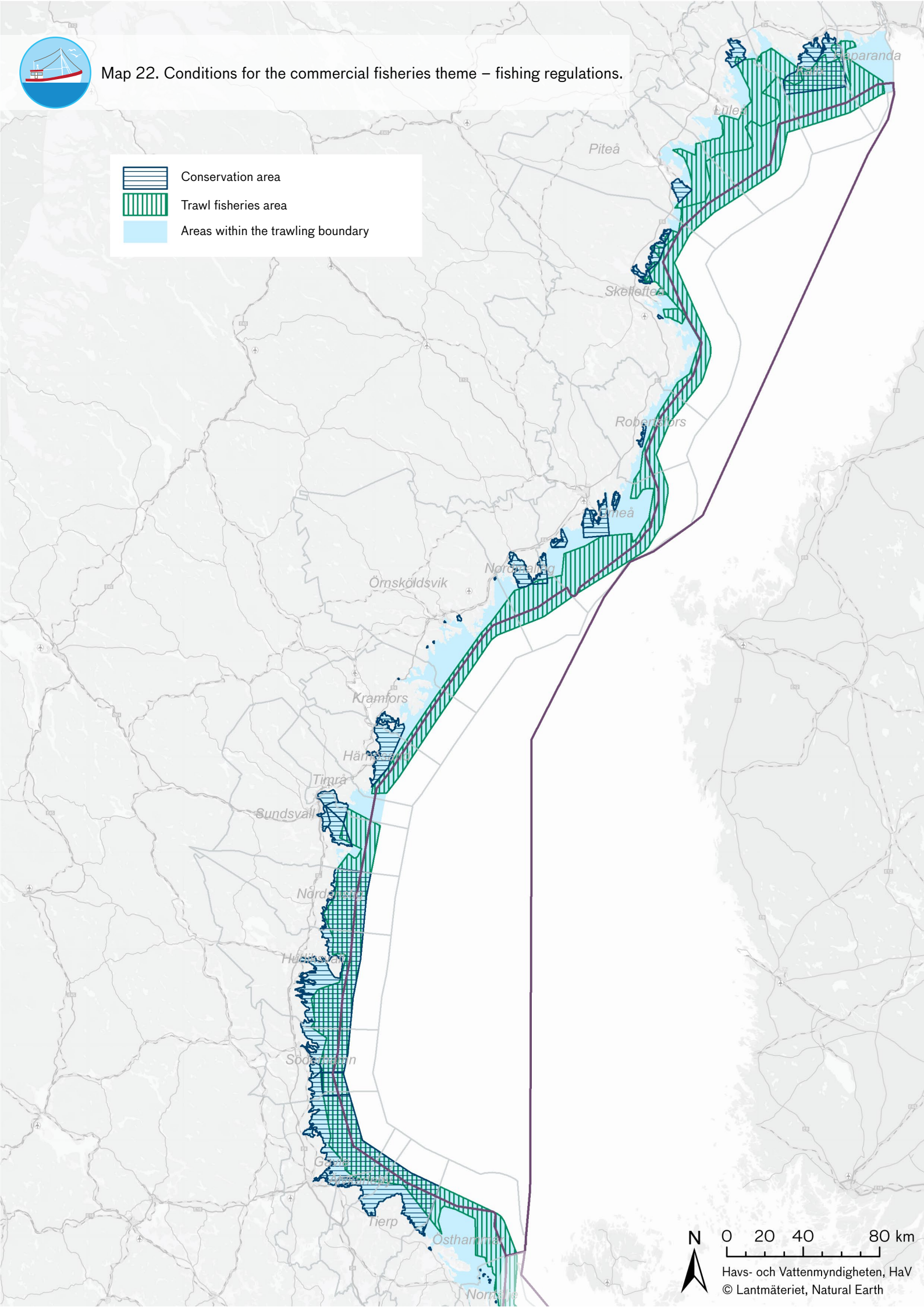
Figure 22. Economic landing value of pelagic fishing in the Gulf of Bothnia during the period 2003–2015. Light green shows low values and dark green shows high values.

81 Swedish University of Agricultural Sciences. 2018. *Sammanställning och analys av yrkesfiskets utbredning.* [Compilation and analysis of the spread of commercial fisheries.]

Map 21. Public interests and other conditions for the commercial fisheries theme – landing values.



Map 22. Conditions for the commercial fisheries theme – fishing regulations.



Interaction between land and sea

The interaction between land and sea involves landing and home ports and other necessary infrastructure for the commercial fisheries industry, and it is important that these activities contribute to the local economy. Especially the production of roe from vendace and fermented Baltic herring are important locally.

Commercial fisheries are important as a bearer of culture in many places along the coast. The plan takes these aspects into account by providing spatial conditions for fisheries in the marine spatial plan area. Different kinds of fisheries have also been taken into account in the planning process, including both large-scale and small-scale commercial fisheries.

International interaction

Finnish fishing is conducted following Finnish quotas in Swedish territorial waters and in the Swedish exclusive economic zone. This is particularly true of herring fishing in the Bothnian Sea. Data and documentation for these fisheries have been taken into account in the planning. Regulation of fisheries off of the Swedish trawling boundary requires agreements with Finland and decisions within the EU.

The Future

Good professional knowledge and well-informed consumers who demand innovative, environmentally adapted, and beneficial alternatives mean that there is significant potential for development in commercial fisheries.

As in other industries, the rationalisation and streamlining of commercial fisheries has long been under way, esulting in fewer commercial fishermen and fishing vessels. At the same time, there are societal goals that aim to promote small-scale coastal fisheries. Other factors that can change fishing activities are changes in consumption patterns and technical developments and adaptations to reduce the impact of fisheries on, for instance, bottom habitats.

Alongside the prevailing dynamics, climate change can further entail that commercial fisheries needs to change fishing patterns and catch areas as different fish species' ranges change. This places demands on the marine spatial plan to provide space for commercial fisheries to remain flexible and dynamic in the future.

Maritime strategy

In the strategy, the Government has pointed out the *Sea as a natural resource* where food is included as one of the five industries covered by the strategy. A prioritised issue for the Government is strengthening the fish stocks and maintaining them at a sustainable level in the long term. This is important, partly to achieve sustainable management of all stocks, and partly to increase the conditions for a higher yields. Long-term predictable conditions and a balance between the size of the fishing fleet and available fishing opportunities are central to continued development in the fisheries. For the small scale fisheries which conduct in a limited range, good logistics possibilities and a local reception of the fishing raw materials are requiered.

Ecosystem services

Commercial fisheries and the extraction of marine food products are dependent on multiple ecosystem services, directly and from fish and shellfish. Examples of conditions are good living and nursery environments for various species and strong food web dynamics. Fisheries also affects ecosystem services. Examples of the impact are changes in food webs caused by catches, the effects on marine cultural environments, and effects on habitats through, among other things, physical damage, erosion, litter, and lost fishing gear.

The sustainable use of ecosystem services can create conditions for regional business development. This is partly based on food supply and raw materials and partly on local identity and cultural values. This can in turn entails other ecosystem services that are important to the community and to industries such as tourism.

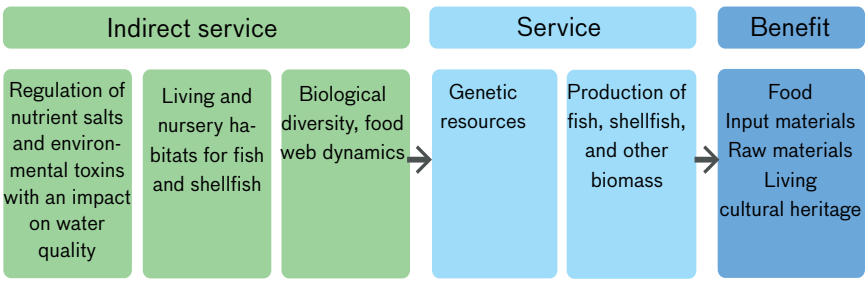


Figure 23. Important ecosystem services for commercial fisheries.

Relevant environmental aspects

Activities and operations in this theme can be related to various impacts on the environment, the thematic areas in the Marine Strategy Framework Directive, and various environmental quality objectives. The relationships, which are shown in the table below, are important in the assessment of the theme's environmental impact.

Activity	Potential impact or pressure	Theme area Marine Strategy Framework Directive (descriptors)	Sweden's environmental quality objectives
Benthic trawling (bottom trawling)	Selective extraction of species, physical damage (seabed), by-catch of fish, birds, and mammals Vessels, noise, emissions of hazardous substances, and air emissions and climate gases	D1 Biodiversity D3 Fish and shellfish D4 Marine food webs D6 Seabed integrity	A balanced marine environment and vibrant coastal areas and archipelagos Rich plant and animal life
Pelagic trawling (trawling in open water)	Selective extraction of species, by-catch of fish, birds, and mammals Vessels, noise, emissions of hazardous substances, and air emissions and climate gases	D1 Biodiversity D3 Fish and shellfish D4 Marine food webs	A balanced marine environment and vibrant coastal areas and archipelagos Rich plant and animal life
Other fisheries	Selective extraction of species, by-catch of fish, birds, and mammals, marine litter (e.g., ghost nets) Vessels, noise, emissions of hazardous substances, and air emissions and climate gases	D1 Biodiversity D3 Fish and shellfish D4 Marine food webs D10 Marine litter	A balanced marine environment and vibrant coastal areas and archipelagos Rich plant and animal life

Table 10. The relationship between commercial fisheries and relevant environmental aspects

On-going work

SwAM will begin a review of the national interests for commercial fisheries in 2018.

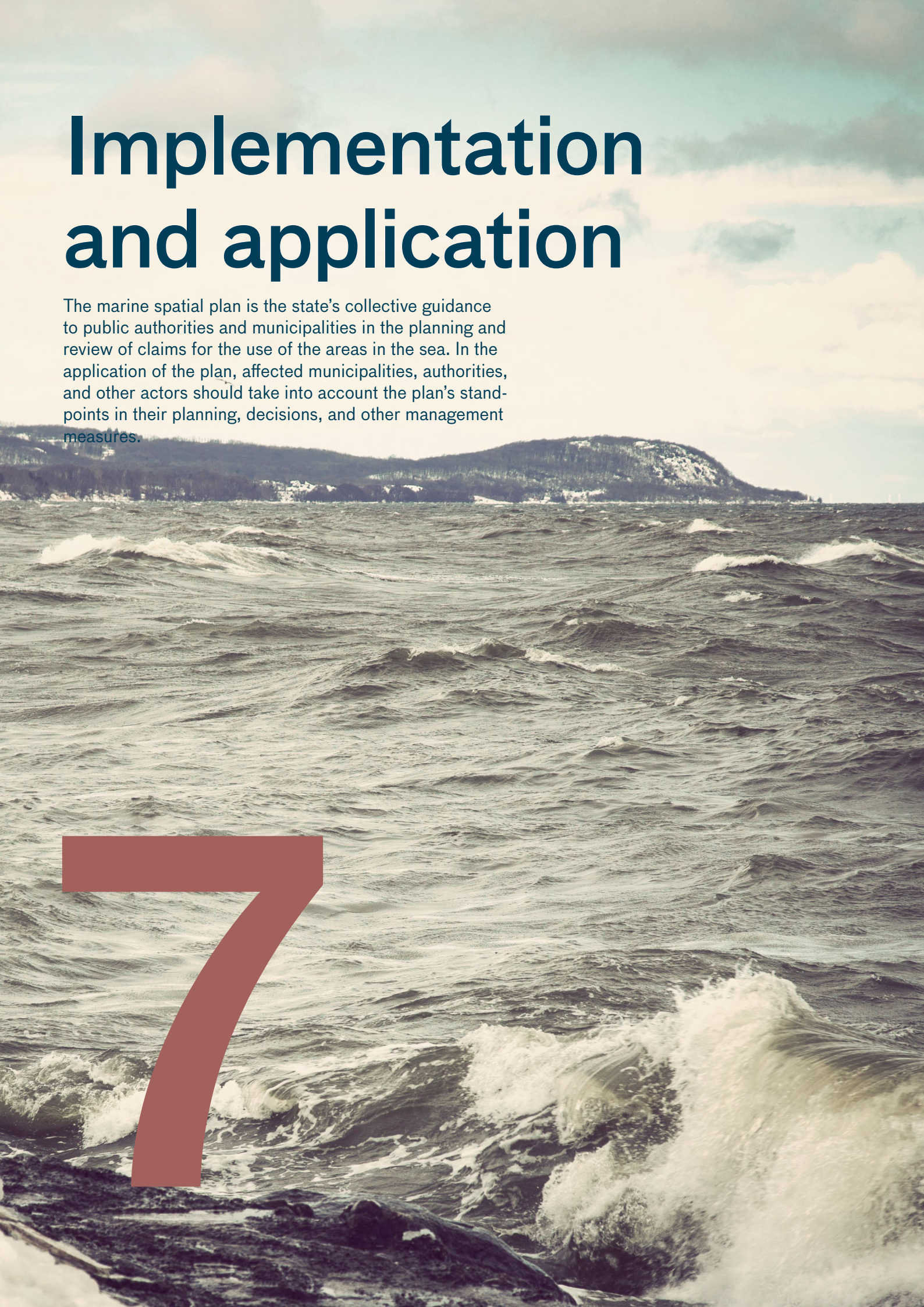
In order to strengthen the protection in marine protected areas, the Government has assigned SwAM the task of proposing fishing regulations in both new and already established protected areas. The objective is to preserve valuable environments. The agency will also investigate the effects of bottom trawling within protected areas and within the trawling boundary and will propose measures where necessary. A number of different regulations may be of interest, such as areas with a total closure on fisheries or prohibition of using certain fishing gear in these areas. A potential regulation can change both the actual patterns of fisheries and the planning prerequisites for the use commercial fisheries in the marine spatial plan. The agency will also review and modernise the regulations for coastal fisheries. The assignment will be reported to the Ministry of the Environment and Energy in 2018[82].

Read more about conditions in the marine spatial planning current status description, roadmap, the thematic report on commercial fisheries, and the report on ecosystem services from Swedish seas that you can find at www.havochvatten.se.

82 *Ministry of the Environment and Energy, 19/10/2017, Assignment regarding conservation values with regard to fishing in protected areas*

Implementation and application

The marine spatial plan is the state's collective guidance to public authorities and municipalities in the planning and review of claims for the use of the areas in the sea. In the application of the plan, affected municipalities, authorities, and other actors should take into account the plan's standpoints in their planning, decisions, and other management measures.



7

How the plan should be used

The marine spatial plan's guidance is directed at:

- **municipalities and regional planning bodies** that plan the use of the sea or areas affected by the sea
- **public authorities and municipalities** that plan, decide on and develop, or implement management measures that concern the sea
- **business operators** within maritime operations, by contributing predictability and by facilitating enterprise

The marine spatial plan constitutes the state's collective view of how the sea in a certain area should be used.

In order for the plan's objective of long-term sustainable development to be achieved, it is necessary in some cases that marine management and associated regulations be developed. This can, for example, involve measures in the form of regulations or other actions that facilitate coexistence between different interests in the sea. In terms of measures in commercial fisheries or shipping, agreements or decisions in the EU or the International Maritime Organization (IMO) are required in many cases.

Marine spatial plan's role in permit reviews

In various permit reviews and other matters according to the Environmental Code,[83] the marine spatial plans will be a guiding input. Each authority or municipality that applies the Environmental Code must accordingly 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, Chapters 3 and 4 of the Environmental Code must be applied. In the interpretation of what constitutes the most suitable use according to these provisions, the marine spatial plans will serve as guides.

The marine spatial plans will also serve as guiding input in permit reviews according to other laws, such as the Exclusive Economic Zone Act[84], the Continental Shelf Act, and the Establishment[85], Enlargement and Closure of Public Navigation Channels and Public Ports Act[86]. The provisions in Chapters 3 and 4 of the Environmental Code must also be applied in reviews in cases and matters under these laws.

83 *The Swedish Environmental Code (1998:808)*
84 *Lag (1992:1140) om Sveriges ekonomiska zon*
85 *Lag (1966:314) om kontinentalsockeln*
86 *Lag (1983:293) om inrättande, utvidgning och avlysning av allmän farled och allmän hamn*

The marine spatial plan's role in municipal comprehensive planning

According to the Planning and Building Act[87], the municipality must prepare a comprehensive plan for the entire municipal area, including the territorial sea. The national marine spatial plan is rooted in the Environmental Code and extends out to and includes the exclusive economic zone. The comprehensive plan and the marine spatial plan overlap in parts of the territorial sea. In the area where the 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 comprehensive plan is in effect.

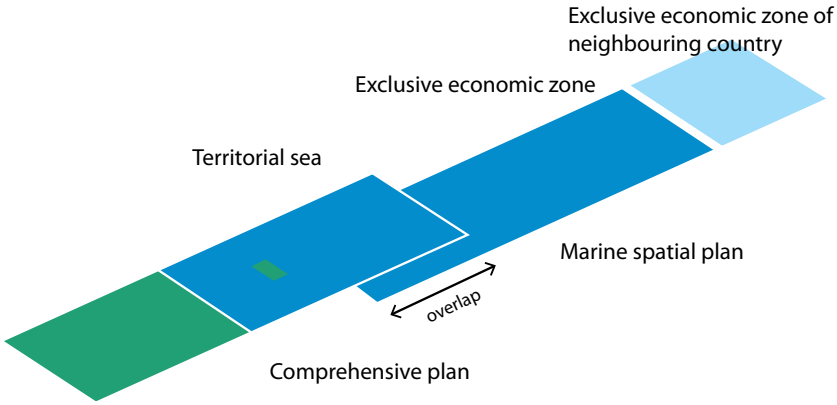


Figure 24. The municipality's comprehensive plan and the national marine spatial plan overlap in a part of the territorial sea. Both of the plans are in effect there.

Sweden has 65 coastal municipalities whose sea areas partly overlap with an upcoming marine spatial plan. In addition to these, around 15 municipalities have sea coasts but do not overlap any marine spatial plan.

Both the national marine spatial plan and the municipality's comprehensive plan must integrate economic policy and social and environmental objectives, but the marine spatial plan and the municipalities' comprehensive plan have different levels of detail and scale. The marine spatial plan's strategic level and rough delimitations for various interests can be specified in more detail in the municipal comprehensive plan. The marine spatial plan's rough scale might also mean that something that is pointed out in a comprehensive plan cannot be graphically depicted in the marine spatial plan.

The consultation on the marine spatial plan proposal is an opportunity for the municipality to call SwAM's attention to already made and possibly upcoming standpoints in the overlapping marine spatial planning area so that a common perception of the consequences of the differences in scale can develop during the consultation and review stages of the marine spatial planning.

87 Chapter 3 Section 1 of the *Planning and Building Act (2010:900)*

Status of the municipalities' planning of the sea

Today, few municipalities have adopted comprehensive plans that encompass the entire territorial sea and present well-conceived municipal standpoints. The reasons for this might be the sea's tradition of free use and the lack of properties in offshore waters. In 2016 and 2017, many coastal municipalities either began preparatory work for the planning of the marine area or began work on comprehensive planning according to the Planning and Building Act.

The national marine spatial planning has entailed a significant increase in municipal coastal and marine planning.

Guidance for municipal planning

The marine spatial plan should provide the guidance necessary to meet the requirements of good land and water use pursuant to Section 4 of the Marine Spatial Planning Ordinance[88]. The marine spatial plan is a guide in the municipal planning.

Coordination between the marine spatial plan and comprehensive plan and issues that have not yet been answered

Today, few municipalities have a spatial plan that encompasses the offshore areas. Currently applicable comprehensive plans can therefore to a marginal extent form the basis of the national marine spatial planning, and this is reflected in this consultation proposal on the marine spatial plan in which only a few municipal claims are presented. As the coastal municipalities gradually adopt plans over the marine areas, it will become apparent what municipal standpoints can suitably be reflected in upcoming marine spatial plans.

Another issue is the manner in which the marine spatial plan serves as a guide for the municipal planning:

- What standpoints can be made with the comprehensive plan's higher degree of detail without conflicting with the marine spatial plan?
- What will the collaborative process between municipalities, county administrative boards, and SwAM look like?

All three dialogue stages in the marine spatial planning work are intended, among other things, to answer these questions, and the municipalities can also participate in the process.

88 *Marine Spatial Planning Ordinance (2015:400)*

Follow-up of the plan

Once the marine spatial plans have been approved, SwAM is responsible for follow-up by continuously staying informed about developments in the affected areas. When necessary, or at least every eight years, SwAM must prepare and submit new marine spatial plan proposals.

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 in the process 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 SEA.

A control programme will therefore be prepared that describes how the follow-up will be performed and what parameters will be followed up. The control programme will be coordinated with other existing environmental follow-ups to ensure effective implementation of the programme.

Consequences

The consequences of the marine spatial plan are assessed from ecological, economic, and social perspectives. The work of assessing the consequences has been conducted in parallel with the planning and has been integrated into it. The consequences are also analysed in a separate strategic environmental assessment and a separate sustainability assessment.

8

Effects of the planning are assessed both continuously and for marine spatial plan proposals in the consultation and review phase.

- The on-going work uses specially ordered studies; reports; internal analyses; discussions with the national interest authorities and the county administrative boards; the results of dialogue with industries, municipalities, public authorities, trade associations, and neighbouring countries; and other documentation.

- For the marine spatial plan proposals in the consultation and review phase, sustainability and environmental impact are assessed by external consultants. Results and methods for the external assessments are described in separate documents.

Both sustainability assessment and strategic environmental assessment

The Marine Spatial Planning Ordinance places requirements on an strategic environmental assessment (SEA) being done for each marine spatial plan. The objective of the SEAs is to integrate environmental considerations into the marine spatial plans. By analysing what environmental impact different choices in the marine spatial plans might have, decisions can be made on different ways to reduce negative impacts and increase positive impacts. The so-called significant environmental impact can be analysed and described in a document that is called an environmental SEA-document or environmental report.

In addition to the SEAs for the marine spatial plans, sustainability assessments are done with a broader perspective. The objective of the sustainability assessments is to analyse the marine spatial plans' impact from economic, social, and environmental perspectives. Both the SEA and the sustainability assessment describe ecosystem services and how they are affected by the marine spatial plans. The sustainability assessment analyses the change in societal benefit that results from the impact on the ecosystem services. This contributes to a broad holistic assessment of how the plan relates to sustainable development. Questions such as "Are we headed in the right direction? What can we do better in the plan?" should be answered by both the SEA and the sustainability assessment. These answers can then be included in the revision of the plan prior to the next stage, the review stage.

Integrated impact assessment – a part of the planning

The impact assessments' results are fed back into the planning process. It is the feedback that makes it possible to take consideration of and to change draft plans based on the results provided by the impact assessments. This way, environmental, social, and economic aspects can be integrated into the planning.

A point of departure in the work of developing this consultation proposal has been the impact descriptions prepared for the drafts at an early phase and the comments received on both drafts of the marine spatial plans and

the impact descriptions during the dialogue in 2017.

In addition to this, more continuous assessments have been made of consequences of various planning alternatives. Among other things, in the course of the work SwAM prepared national thematic documents and special studies concerning specific planning issues and geographic areas. The documents and studies concern both the environmental impact and the impact on activities affected by the marine spatial plans, such as commercial fisheries, the establishment of wind power, and shipping. Documentation and studies were prepared by SwAM, collaborating authorities, and through contracts with external actors.

To be able to better plan in order to avoid a high environmental impact in sensitive areas, the planning tool *Symphony* was developed. With Symphony, the cumulative environmental impacts from various human activities and the cumulative burden on animal and plant life in the sea are assessed. The planning tool makes an integrated approach possible and means that the environmental impact for various planning alternatives can be assessed in a continuous manner.

The documentation prepared in the continuous assessment work was also used as one of several inputs for the SEA and the sustainability assess-

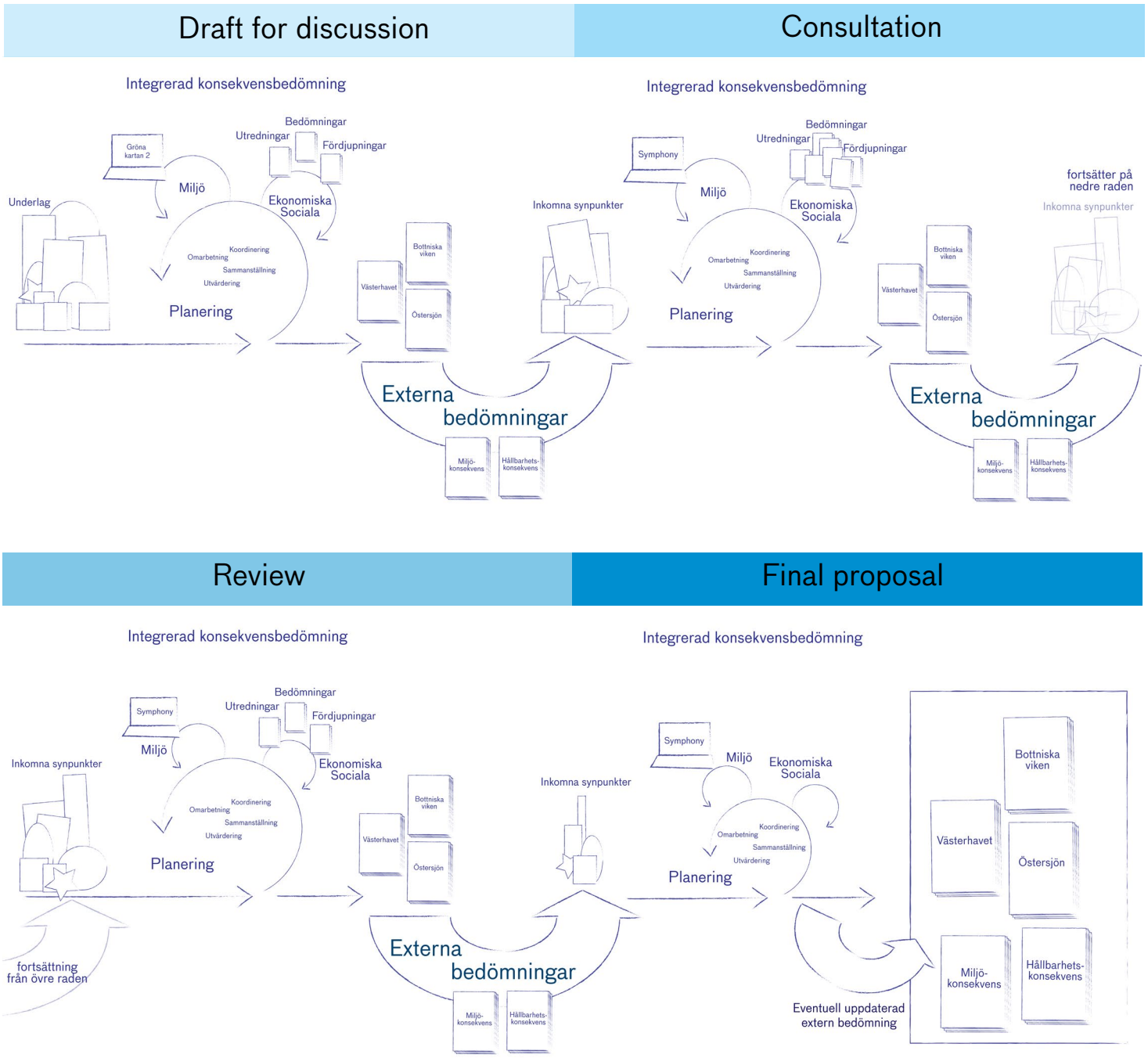
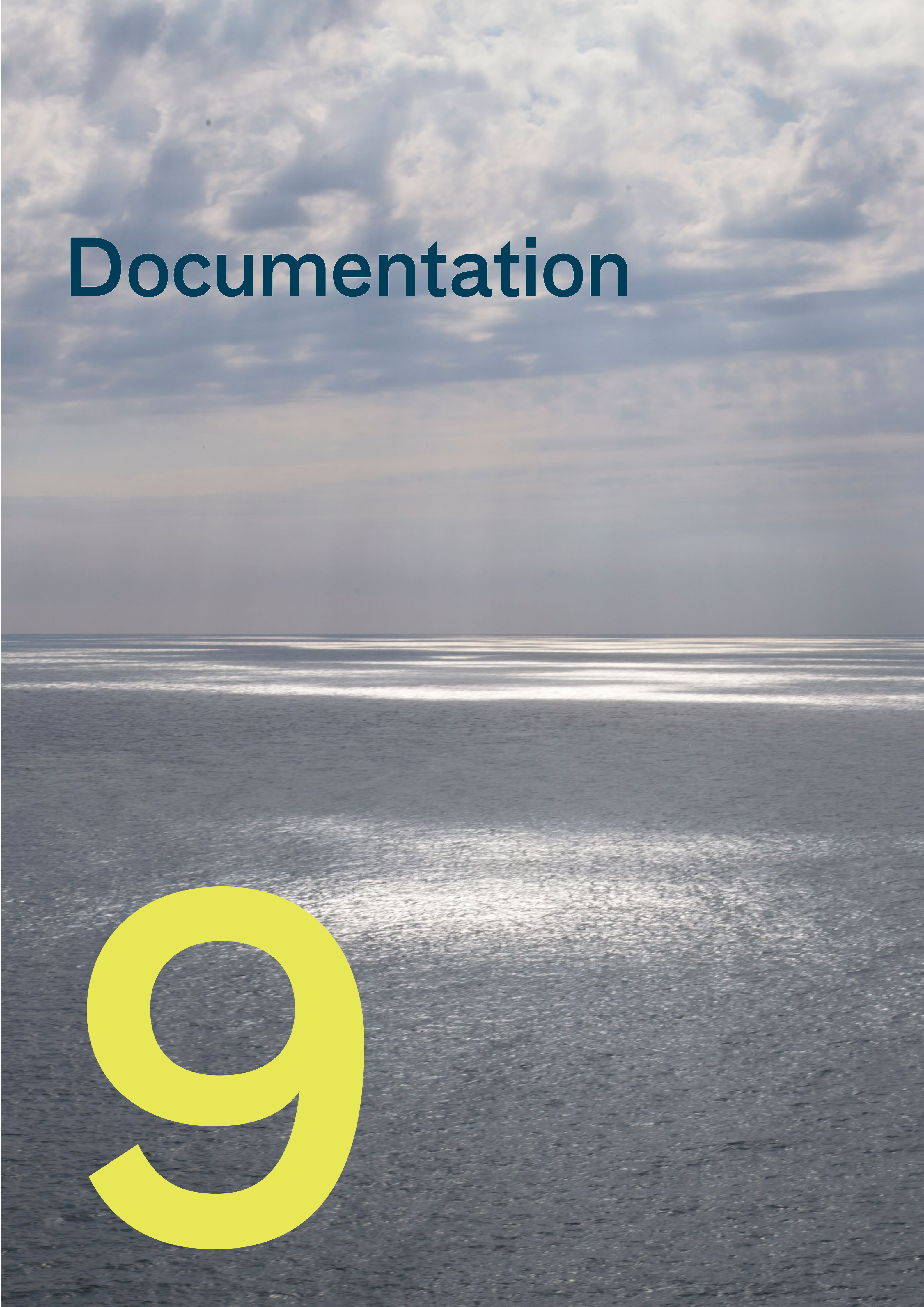


Figure 25. The work of analysing and assessing impacts is done in cycles that follow the stages in the planning.

Documentation



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Input for maps

Background maps: Natural Earth, Lantmäteriet's topographical online map and a selection of the Swedish map's municipalities (municipalities with a part in the marine spatial plan). Shipping outside of the marine spatial plan.

All maps were prepared by SwAM unless otherwise stated. The planning maps contain, besides a background map, layers for the uses of attractive living environments, sand extraction, shipping, and commercial fisheries, as well as uses divided by area (with map text). Further geographic information that is used in the maps is in layers for the marine spatial planning boundary and the marine area boundaries.

Map 5. National interests for the attractive living environments theme
National interest active outdoor recreation (Chapter 4 Section 2), National interests active outdoor recreation (Chapter 4 Section 2), National interest highly developed coast (Chapter 4 Section 4)

Map 6. National interest claim for the attractive living environments theme
National interest claim for cultural heritage conservation (Chapter 3 Section 6), National interest claim for outdoor recreation (Chapter 3 Section 6)

Map 7. Public interests and other conditions for the attractive living environments theme
Documentation: World Heritage site according to the World Heritage Convention (UNESCO), Sweden's coastal and archipelago landscape (RAÄ), Concentration of wrecks and sinking information from FMIS, compiled by the coastal county administrative boards (LST, RAÄ)

Map 8. National interest claims for the energy theme
National interest claims: Facilities for energy production, Wind power (Chapter 3 Section 8 Environmental Code)

Map 9. Public interests and other conditions for energy – wind power areas
Documentation, E: On-going projects, Wind power in municipal comprehensive plans, Additional areas identified in the marine spatial planning process.

Map 10. Public interests and other conditions for the energy theme – cables and pipelines
Documentation: Power cables, Planned new power cables

Map 11. Openly presented national interest claims in the sea for the defence theme
National interest claims for national defence: Marine training areas (Chapter 3 Section 9 Environmental Code)

Map 12. Openly presented national interest claims and areas of influence for the military part of national defence
National interest claims for national defence: Marine training areas (Chap-

ter 3 Section 9 Environmental Code), Influence areas: Prohibited areas for tall objects, Prohibited areas for wind power stations, Surrounding impact, MSA areas, Other influence areas, Areas with special need to be free from obstacles

Map 13. Public interests and conditions for sand extraction
Documentation, Sand extraction (SGU): Interest areas for extraction of sand (Chapter 3 Section 7 Environmental Code), Suitable areas for extraction of sand (Chapter 3, Section 7 Environmental Code)

Map 14. National interests and national interest claims for the nature theme
Natura 2000 areas SPA (NVV), Natura 2000 areas SCI (NVV), National interest claims nature conservation, National interest claims for commercial fisheries

Map 15. Public interests and other conditions for the nature theme – other marine protected areas
Documentation N: Other marine protected areas (Chapter 7 Environmental Code)

Map 16. Public interests and other conditions for the nature theme – climate refuges
Documentation n: Ringed seals climate refuge

Map 17. National interest claims for the transportation and communications theme
Ports - existing, Shipping - existing shipping lanes including buffer zones, Aviation - MSA areas

Map 18. Public interests and other conditions for the transportation and communications theme – routing systems
Documentation Routing systems (IMO): Traffic separation zone, Recommended route, Two-way lane. Documentation Shipping authorities: Expanded claims shipping

Map 19. Public interests and other conditions for the transportation and communications theme – data and telecommunication cables
Data and telecom cable (Telia), Data and telecom cable (PTS)

Map 20. National interest claims for the commercial fisheries theme
National interest claims for commercial fisheries (Chapter 3 Section 5 Environmental Code): Port, Catch area, Migration area

Map 21. Public interests and other conditions for the commercial fisheries theme – landing values
Landing values for 12 different fisheries 2003–2015

Map 22. Public interests and other conditions for the commercial fisheries theme – fishing regulations
Area closed to fishing, Trawler fishing area, Trawling boundary

Input for figures

Figures without reference to input documentation were prepared by the Swedish Agency for Marine and Water Management.

Figure 6. The sea's ecosystems.
Ministry of the Environment

Figure 14 Production expenses for wind power at sea (LCOE).
Bergman et al., 2017. *Sea-based wind power potential and costs – a report to the Swedish Energy Agency*.

Figure 15: Map image from the Green Map that shows aggregated nature values
Geological Survey of Sweden. *Green Map based on Symphony ecosystem components.* 20/11/2017. Unpublished.

Figure 16. Map image from Symphony that shows the cumulative environmental impact Swedish Agency for Marine and Water Management. Report 2018:1. *Symphony - Integrated planning support for national marine spatial planning based on an ecosystem approach*

Figure 17. Everything is interrelated from source to sea.
Granit et al., 2017. *Water Policy*

Figure 18. Internationally marine protected areas throughout Sweden and in neighbouring countries
According to OSPAR (OSPAR MPA), According to HELCOM (HELCOM MPA), Natura 2000, No-fishing zone for cod

Figure 19 Cross-border shipping
Concentration of ship movements (AIS) around Sweden and in neighbouring countries

Figure 21. Economic landing value of fishing with passive equipment in the Gulf of Bothnia during the period 2003–2015.
Swedish University of Agricultural Sciences. 2018. *Compilation and analysis of the spread of commercial fisheries*.

Figure 22. Economic landing value of pelagic fishing in the Gulf of Bothnia during the period 2003–2015.
Swedish University of Agricultural Sciences. 2018. *Compilation and analysis of the spread of commercial fisheries*.

Photographs

Chapter 1, Photographer Kat Singer. *Ship off of Visby*. Swedish Agency for Marine and Water Management image archive.

Chapter 2, Photographer Maja Kristin Nylander. *Cliffs in the archipelago,* Swedish Agency for Marine and Water Management image archive.

Chapter 4. Photographer Maja Kristin Nylander. View from Fårö over the Baltic Sea. Swedish Agency for Marine and Water Management image archive.

Chapter 5. Photographer Maja Kristin Nylander. *A boy who is out sailing, an optimist in the mist*. Swedish Agency for Marine and Water Management image archive.

Chapter 6. Photographer Natalie Greppi. Swedish Agency for Marine and Water Management image archive.

Chapter 7. Photographer Mats Svensson. *Hanöbukten from Baskemölle, Stenshuvud.* Swedish Agency for Marine and Water Management image archive.

Chapter 8. Photographer Maja Kristin Nylander. *Water*.
Swedish Agency for Marine and Water Management image archive.

Chapter 9. Photographer Maja Kristin Nylander. *Sun shining down on the sea*. Swedish Agency for Marine and Water Management image archive.

Photo collage, Chapter 3:
Photographer Kat Singer (*Cruise ship, Ducks in water, Stone beach),* Swedish Agency for Marine and Water Management image archive.

Photographer Mattias Sköld (*Shrimp trawler),* Swedish Agency for Marine and Water Management image archive.

Photographer Johannes Jansson, CC BY 2.5 Wikimedia commons (*Öresund Bridge),* Swedish Agency for Marine and Water Management image archive.

Illustrator Vilhelm von Wright, (*salmon),* Swedish Agency for Marine and Water Management image archive.

Photographer Maja Kristin Nylander (*Gulls, Sea, Oyster farm buoys, Sign Hanöbukten, Outhouse, Barn - bathing - dock.),* Swedish Agency for Marine and Water Management image archive.

Photographer Ingvar Lagenfelt (*Wind farm),* Swedish Agency for Marine and Water Management image archive.

Photographer Hangsna (*Juvenile sea eagle in the Ekeby wetlands)* /CC BY-SA 4.0 Wikimedia commons

Photographer Peter Appelros, (*Coastal surveillance radar)* /CC BY 3.0 Wikimedia commons

Swedish Agency for Marine and Water Management

Proposal on the

Marine Spatial Plan for the Gulf of Bothnia

This is the proposed Marine Spatial Plan for the Gulf of Bothnia that we are conducting consultations on. 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 plan provides guidance to national authorities, municipalities, and courts in future decisions, planning and permit reviews. Business operators can also find guidance in the plan.

The Swedish Agency for Marine and Water Management (SwAM) is now consulting with you and others to obtain strong and well-supported marine spatial plans. We would therefore like you to submit improvement suggestions and tell us about matters that we should know about. This consultation is under way from 15 February until 15 August 2018.

Swedish Agency for Marine and Water Management ref. no. 396-18.

Swedish Agency for Marine and Water Management
Postal address: Box 11 930, SE-404 39 Göteborg, Sweden