



RWE



**NEPTUNI WIND FARM
DOCUMENT/BASIS FOR
DELIMITATION CONSULTATION**

Malmö 14/05/2024

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Revision history

Revision	Date	Authors	Reviewer	Approved by
1.0	22/04/2024	Marwa El-Mahmadi Jacob Wester Natallia Rozum	Viktor Fihlman	Nicklas Gustavsson
2.0	03/05/2024	Marwa El-Mahmadi Jacob Wester Natallia Rozum	Viktor Fihlman	Nicklas Gustavsson
3.0	14/05/2024	Marwa El-Mahmadi Jacob Wester Natallia Rozum	Viktor Fihlman	Nicklas Gustavsson

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Information on processing of personal data	se.rwe.com/personlig-integritet-mark/

2. Background

2.1 About RWE

RWE Offshore Neptuni AB (hereinafter referred to as RWE or the company) intends to establish the Neptuni wind farm in the Baltic Sea, approximately 12 km northeast of Öland.

The RWE Group is the world's second largest operator of offshore wind farms. In the Nordic region, the RWE Group operates approximately 300 megawatts (MW) of wind power, with onshore and offshore wind farms in Sweden and Denmark. The Nordic development portfolio has a potential capacity of more than 10 gigawatts (GW). The RWE Group owns and operates Kårehamn, one of Sweden's two offshore wind farms in operation.

The RWE Group expands renewable electricity production to enable the electrification of society, contribute to the climate transition and strengthen the competitiveness of Swedish industry.

Electricity use in Sweden will double by 2040, largely due to the electrification of the industrial and transport sectors, which currently account for two-thirds of Sweden's total emissions (Svensk Vindenergi, 2021). Wind power can be built quickly and thus meet the increased demand for electricity when industry and transport are electrified. It also helps keep the price of electricity down. Each terawatt hour (TWh) of new electricity production from wind power in Sweden can reduce greenhouse gas emissions by around 600,000 tonnes. The RWE Group's goal is to reach net-zero emissions by 2040.

2.2 About the Neptuni wind farm

The Neptuni wind farm is planned for construction in the Baltic Sea, about 12 km northeast of Öland and about 26 km west of Gotland. The area for the wind farm covers approximately 231 km² and is located partly within Sweden's territorial waters, partly within the Swedish Economic Zone. The wind farm is planned for up to 110 turbines, with a total nameplate capacity of up to approximately 1600 MW and an annual production of 6.4 TWh of electricity. The facility also includes an internal cable network, measurement masts and up to three transformer and/or converter substations. More detailed information about the Neptuni wind farm is provided in the description of activities in chapter 4.

The electricity produced will be transmitted via high-voltage power lines to a connection point on land. The connection point is designated by the network operator and will be determined at a later stage.

3. Consultation and permit processes

The consultation covers the construction, operation and de-commissioning of the Neptuni wind farm with associated facilities, including the internal cable network, as well as the performance of surveys of the seabed. This consultation document is intended to relate to all permits applicable to the activities, see section 3.2.

For applicable permit applications, an environmental impact assessment (EIA) report must be prepared in accordance with the provisions of the Swedish Environmental Code. A specific environmental assessment must be carried out in order to obtain the right knowledge about the project, delimit the investigation work and the impact assessment to only include what is relevant, and investigate various alternative locations and designs for the planned activities. The specific environmental assessment also aims to obtain information on the conditions for the planned activities, as well as the effects of these. The information thus obtained constitutes a basis for decision-making in the planning and EIA process. This delimitation consultation is carried out as part of the specific environmental assessment, see section 3.1.

3.1 Consultation procedure

As planned activities pursuant to the Swedish Environmental Assessment Ordinance (2017:966) are presumed to entail significant environmental impact, delimitation consultation is carried out in accordance with chapter 6 of the Swedish Environmental Code. Therefore, no previous investigation consultation has been undertaken to determine whether any significant environmental impact is expected.

This document constitutes a basis for the delimitation consultation and contains information on the location, scope and design of the planned wind farm, identified interests and assets in the area, projected environmental impact and proposals regarding the content and format of the EIA. The consultation document has been prepared in accordance with section 8 of the Swedish Environmental Assessment Ordinance.

The consultation involves relevant authorities, affected parties and organisations, as well as the general public.

The consultation is advertised in local newspapers and in Post- och Inrikes Tidningar (the official government newspaper and gazette of Sweden). A list of proposed parties to be consulted can be found in chapter 12. It is planned to arrange a consultation meeting with Kalmar County Administrative Board in the spring/summer of 2024.

Opinions/comments on the formulation of the EIA and information on other matters should be sent by email to neptuni@ramboll.se or by post to RWE Offshore Neptuni AB, Box 388, SE-201 23 Malmö.

RWE gratefully accepts opinions/comments no later than 12 July 2024.

The opinions, comments, information and questions received during the consultation are important for RWE's work on the project and these, together with the results of in-depth studies and planned inventories, will form the basis for the further design of the project. Future permit applications with associated EIA will be formulated and delimited on the basis of the information that is received or emerges during the consultation process.

When the consultation process has been concluded, it will be described in a consultation report attached to the EIA. The consultation report will contain information on how the consultation was carried out and the opinions/comments received, along with an overview of how these have been taken into account in relation to the design of the project or the issues addressed in the EIA.

3.2 Applicable regulations and delimitation of the consultation

The activities in question require a number of different permits, as described in more detail below. The company's ambition is for permit reviews to be coordinated to the greatest extent possible and handled in the same EIA.

The wind farm area is located partly within Sweden's maritime territory and partly within the Swedish Economic Zone. Within Swedish territorial waters, the activities are subject to permit pursuant to chapters 9 and 11 of the Swedish Environmental Code for the construction, operation and de-commissioning of the wind farm with associated facilities and maritime activities. Within the Swedish Economic Zone, a permit is required for the construction and operation of commercial facilities and other establishments pursuant to section 5 of the Swedish Economic Zone Act (1992:1140).

The laying of submarine cables, the internal cable network which, among other things, connects the wind turbines, and any transformer and/or converter substations within the wind farm, are subject to permit pursuant to the Swedish Continental Shelf Act (1966:314), under which a permit is also required for exploration of the continental shelf. The company has obtained an exploration permit for the area, but further investigations, including drilling, will be needed prior to the detailed project design phase. This consultation document therefore also covers future investigations that are subject to permit under the Continental Shelf Act. A description of the surveys and investigations that may be relevant can be found in section 4.9.

There are a number of Natura 2000 sites along the mainland and the coasts of Öland and Gotland, with the nearest of these at a distance of approximately 25 km from the planned wind farm. If it is assessed that the planned activities entail a risk of significant impact on the environment in a Natura 2000 site, application will be made for a permit pursuant to chapter 7, section 28a of the Swedish Environmental Code. This consultation is carried out so that it can form the basis for such a review process.

In addition to the above-mentioned permits, other permits, dispensations or approvals may also be required.

This consultation document does not cover the installation of connection cables for the transmission of electricity from the wind farm to land, as the connection point will not be designated by the network operator until a later stage. Requisite permits for such connection will be reviewed in separate permit processes. Facilities, measures and activities linked to connection cables are described in this consultation document as follow-on activities.

If the planned activities are deemed capable of giving rise to transboundary impact, an Espoo consultation will take place in accordance with the Convention on Environmental Impact Assessment in a Transboundary Context (the Espoo Convention). An Espoo consultation is administered by the Swedish Environmental Protection Agency in a separate procedure.

4. Description of activities

4.1 Location

The planned Neptuni wind farm is located approximately 12 km northeast of Öland, approximately 26 km west of Gotland and approximately 36 km from the Swedish mainland. The wind farm area is located partly within Sweden’s territorial waters in the municipality of Borgholm, Kalmar County, and partly within the Swedish Economic Zone (see Figure 1). The area of the wind farm is approximately 231 km².

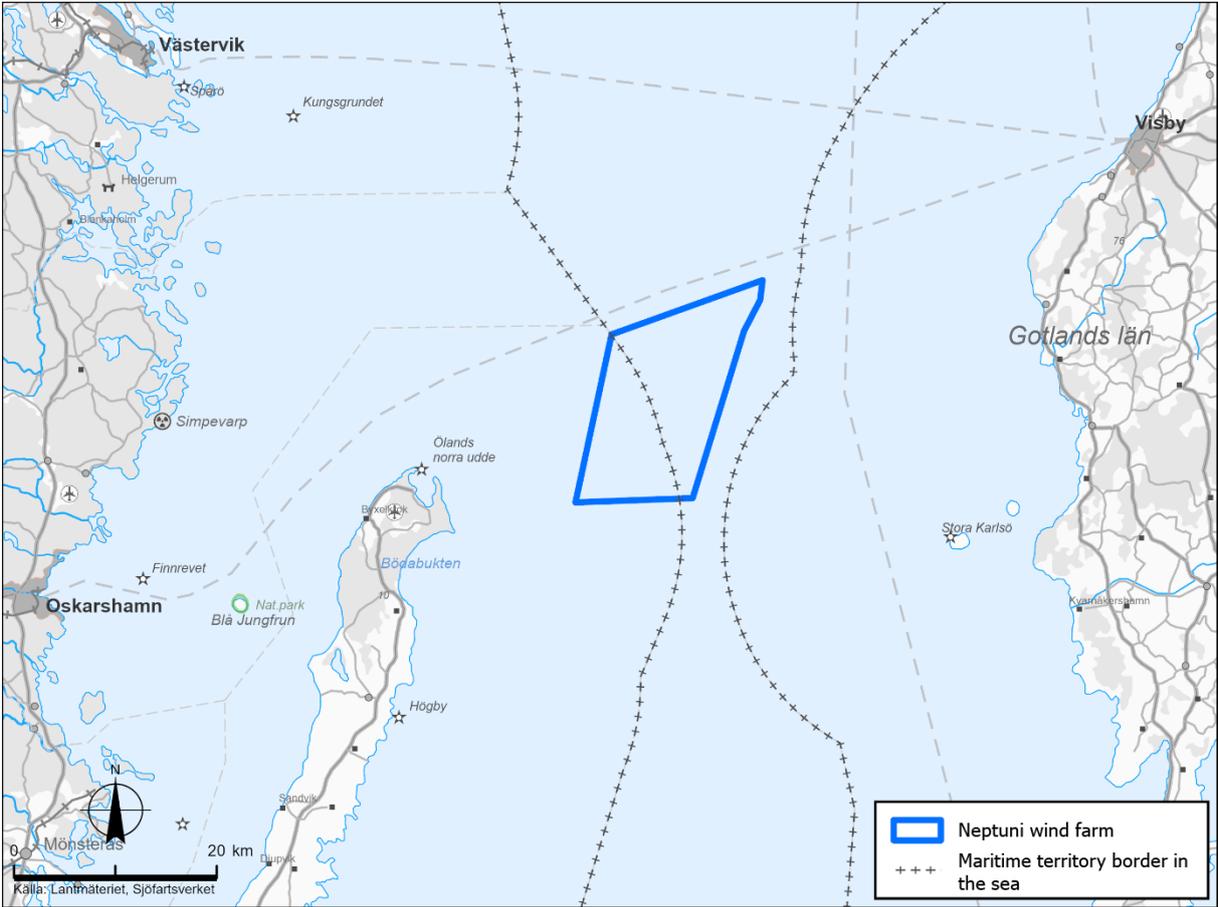


Figure 1. Location of the Neptuni wind farm.

4.2 Design and scope of the wind farm

The Neptuni wind farm will have a maximum nameplate capacity of up to approximately 1600 MW. The wind farm will comprise up to 110 wind turbines and up to three platforms for transformer and/or converter substations. For preliminary technical parameters, see Table 1. The wind farm's component parts are connected through the internal cable network. See Figure 2 for the wind farm's components.

The electricity that the wind farm produces will be transmitted via connection cables to a grid connection point on land for connection to the Swedish electricity grid. The connection cables are subject to separate assessment and are not included in this consultation.

Table 1. Preliminary technical parameters.

Parameters	
Nameplate capacity	Up to approx. 1600 MW
Area, approx.	231 km ²
Number of wind turbines, max.	110
Height of wind turbines (including rotor blades), max.	360 m
Platforms for transformer and/or converter substations, max.	3

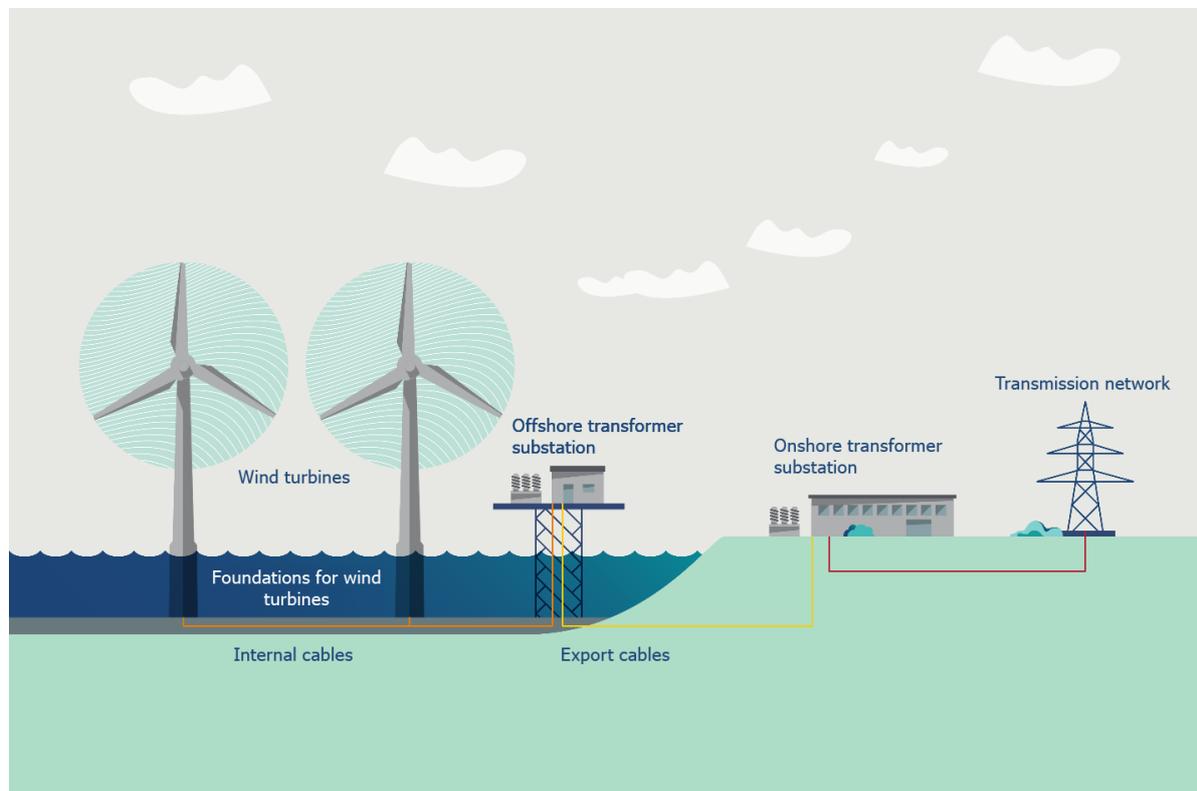


Figure 2. Conceptual illustration of a wind farm connected to an onshore transformer substation (illustration RWE).

Due to the rapid technological developments occurring in offshore wind power, the final choice of turbines and design of the wind farm has not yet been determined. This will be decided in connection with the detailed project design process for the wind farm and will be specified in more detail at a later stage. The final placement of individual wind turbines is determined based on parameters such as wind conditions, water depth, geology, environmental assets, optimisation of the route of the internal cable network and the size of the wind turbines. A preliminary layout is illustrated in Figure 3.

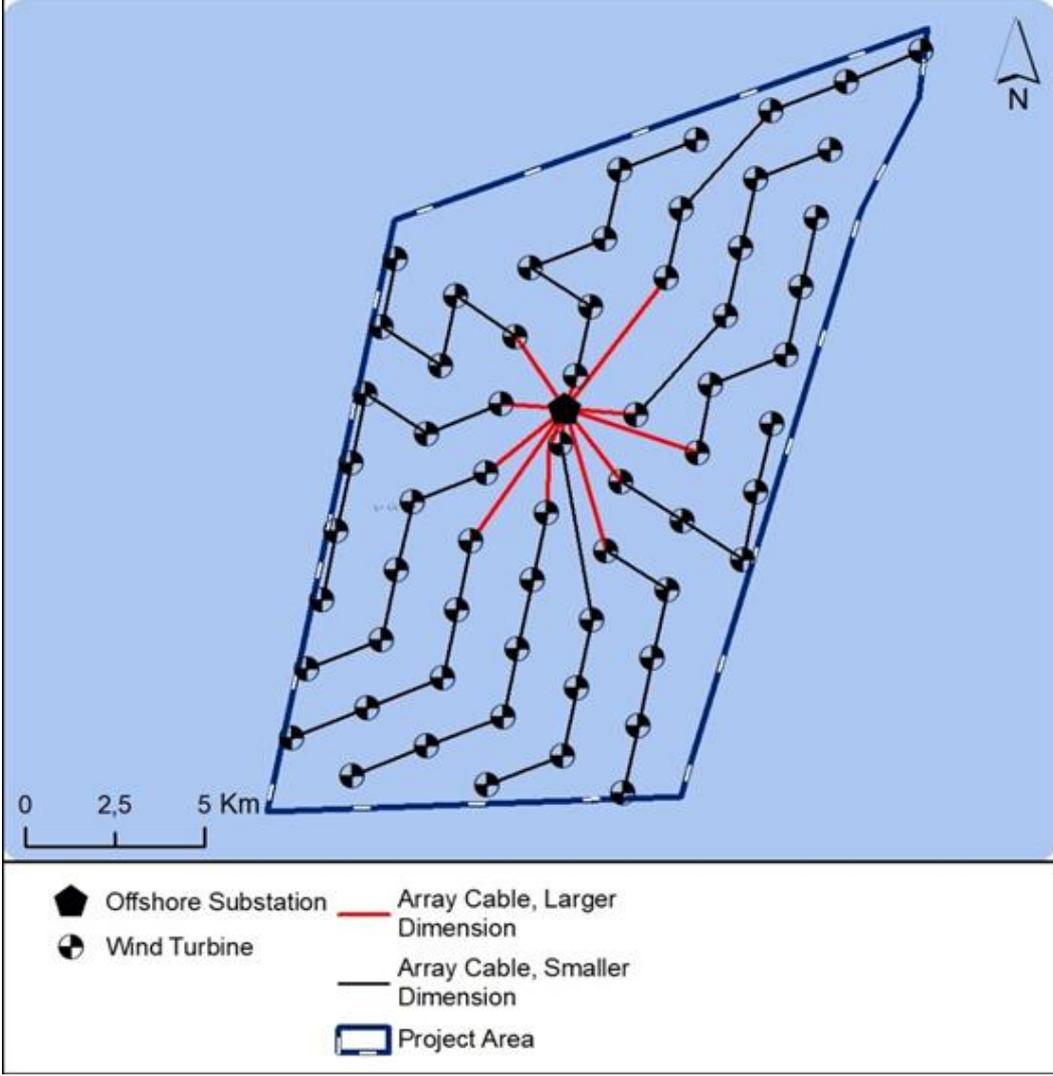


Figure 3. Example layout for the Neptuni wind farm with 25 MW turbines.

4.3 Wind turbines

A wind turbine consists of a tower, a nacelle and a rotor. The tower is anchored with a foundation. A schematic drawing of a wind turbine is shown in Figure 4. The rotor captures the wind's kinetic energy and transfers it to the generator that produces electricity. The generator is housed in the turbine's nacelle. For the Neptuni wind farm, the maximum height (total height) for each wind turbine will be 360 m above sea level, calculated from sea level to the highest point on the rotor blade when it is pointing upwards. The height between the lowest point of the rotor tip, when the rotor blade is pointing downwards, and sea level will be approximately 20-30 m.

The wind turbines will be equipped with obstruction lighting for identification and visibility from ships and aircraft. At the time of installation, the obstruction lighting will comply with current regulations specified by international, national and local authorities.

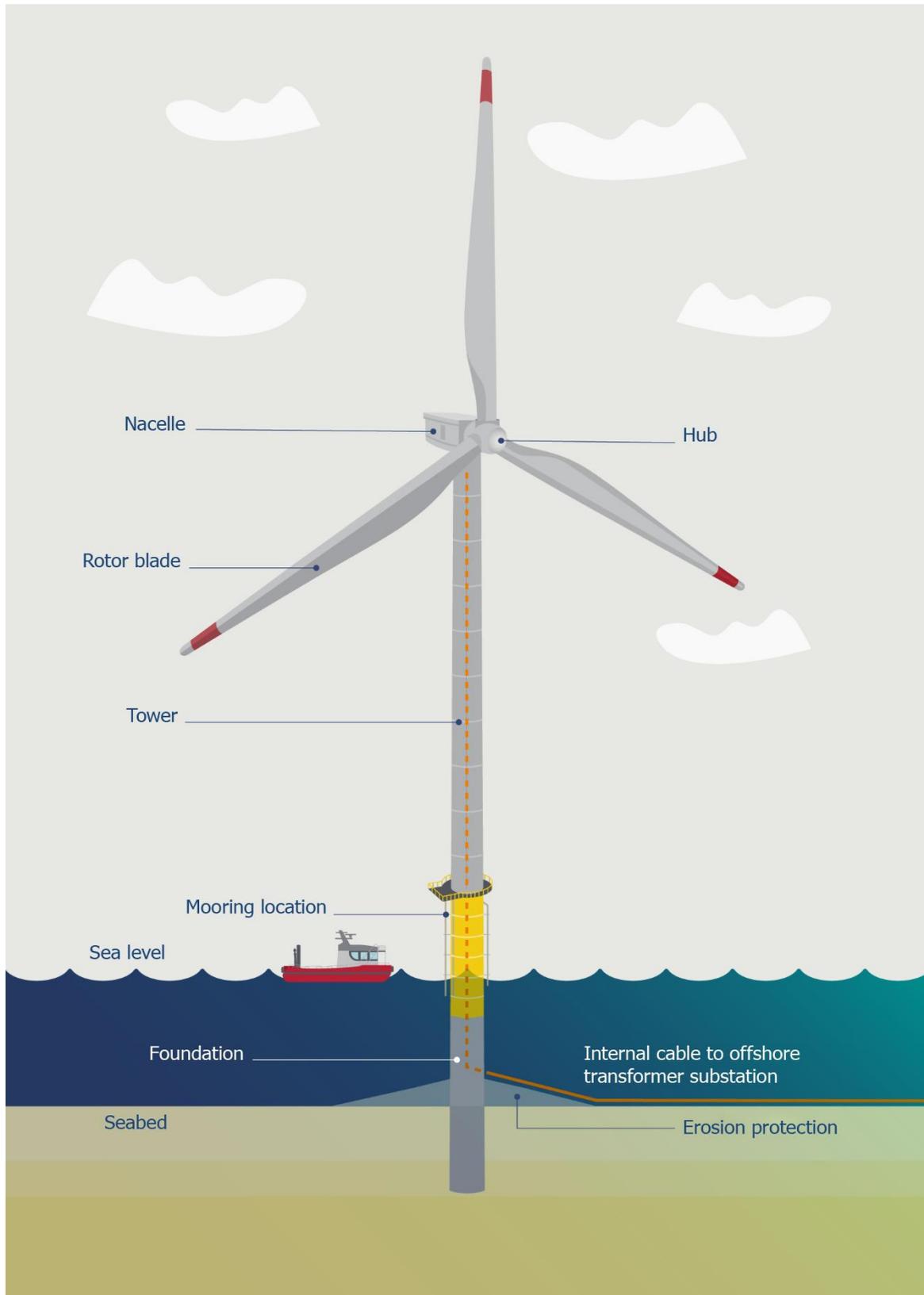


Figure 4. Schematic drawing of a wind turbine (illustration RWE).

4.4 Transformer and converter substations

The electricity is generated as alternating current (AC) in the wind turbines. In the transformer substation, the electricity generated in the wind turbines is transformed to a higher voltage level, from approximately 66-132 kV AC to approximately 220-275 kV AC. Other voltage levels may also be applicable.

A transformer substation usually consists of two main parts: a foundation and a top structure that houses the electrical power system and auxiliary systems, such as switchgear, transformers and backup power units, see Figure 5. Transformer substations are equipped with a platform for boarding and disembarking from ships and may also be equipped with a helicopter pad. Like the wind turbines, the transformer substations are anchored with foundations. The placement and design of the transformer substations will be determined during the later project planning process.

Converter substations are built in the event that transmission with high-voltage direct current is required. A converter substation has the same basic structure as a transformer station. In the converter substation, alternating current, which is generated at the turbines, is converted to direct current. Converter substations can be used in combination with transformer substations.

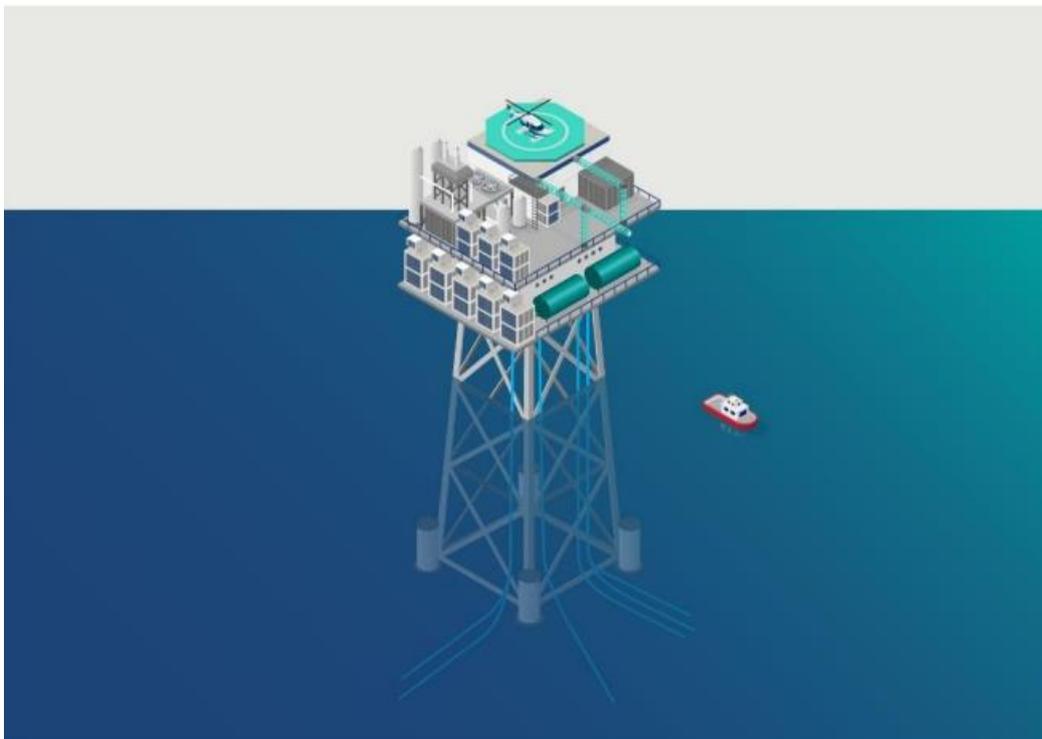


Figure 5. Illustration of a transformer substation. A converter substation has the same basic structure (illustration RWE).

4.5 Measurement masts and other measuring equipment

Measuring, monitoring and communication equipment may be installed to enable monitoring of the wind farm and weather conditions.

4.6 Foundations

Wind turbines, platforms for transformer and converter substations and measurement masts are anchored with foundations. Anchoring may be done with fixed foundations and floating foundations. Technologies for fixed and floating foundations that are alternatives for the Nep-tuni wind farm are described below. The final choice of foundations for wind turbines, platforms and measurement masts will be decided at a later stage.

Fixed foundations

There are four main types of fixed foundations used in the industry: gravity, monopile, tripod and jacket foundations, see **Error! Reference source not found.**. These are described below.

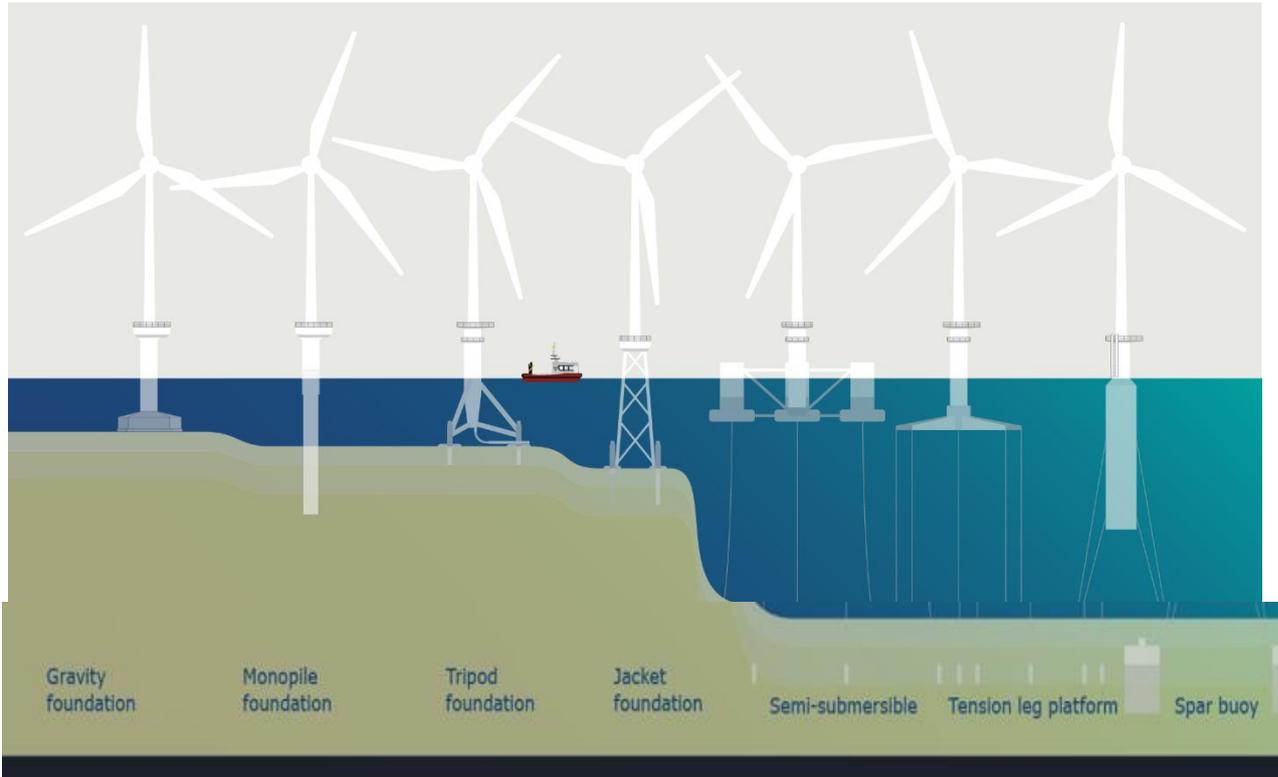


Figure 1. Fixed and floating foundations (illustration RWE).

Gravity foundations

Gravity foundations usually consist of heavy steel and concrete structures. The foundations vary in design but are considerably wider at the bottom (i.e. on the seabed) to provide support and stability to the structure.

Monopile foundations

Monopile foundations are the most common type of foundation used in offshore wind power. The foundation usually consists of a steel cylinder, which is usually driven down into the sediment by way of piling or vibratory piling, and a transition piece that connects the tower to the foundation.

Tripod foundations

A tripod foundation consists of an upper cylindrical part that joins the tower, and a lower tripod structure that distributes the force to the bottom. The tripod technology is stable and appropriate for use in relatively deep water.

Jacket foundations

Jacket foundations consist of a three-dimensional truss or framework structure with three or four legs. Anchoring of the foundations to the seabed is normally done with piles that are drilled or driven down to the desired depth by way of piling.

Floating foundations

Floating foundations enable the installation of wind farms in deeper water compared to fixed foundations. Suitable water depths range from approximately 60-800 m. A floating foundation consists of a floating structure that provides buoyancy and stability for the wind turbine and a mooring system that affixes the structure to the seabed. There are currently five main types of floating foundations: semi-submersible, barge foundation, tension leg platform, suspended counterweight and spar buoy, see **Error! Reference source not found.** More types of floating foundations are under development.

All types of floating foundations need to be anchored to the seabed. This is done by anchoring anchor lines/chains to the seabed. This can be done in different ways, e.g. via anchors, gravity foundations or different types of piles.

4.7 Erosion protection

Erosion protection is used to prevent the stability of the foundation from deteriorating as a result of hydrological and sedimentary processes, i.e. it stabilises the seabed and prevents erosion caused by the movement of water, such as waves and currents. The erosion protection is adapted to the conditions on site and the type of foundation used. The erosion protection normally consists of a layer of smaller stones and then a layer of gravel. Other types of erosion protection, in the form of various geomats with clay/sand, may also be put in place. The erosion protection can be adapted to benefit and promote the habitat for deep-sea species and organisms, for example through other substrates and structures.

4.8 Internal cable network

The electricity generated in the wind turbines is transmitted via the internal cable network to an offshore transformer and/or converter substation, or alternatively via connection cables from the wind turbines to a connection point on land that is to be determined at a later stage.

The cables usually consist of a copper or aluminium core surrounded by insulating material, as well as material to protect the cable from external damage. The voltage in the cables is expected to be between 66 and 132 kV, although other voltage levels may also be applicable.

To protect the cables within the wind farm, they are buried where possible and appropriate. Where it is not possible or appropriate to bury the cables, they are laid on the seabed and protected with stones, concrete mattresses or some other such form of protection.

Cables used for fixed foundations are static and are attached to the foundation. For floating foundations, dynamic cables are needed that are designed to withstand the strain of movements from the floating structure.

4.9 Planned activities

Preparatory surveys

Detailed geophysical and geotechnical surveys as well as environmental surveys are required for planning and implementation of the project. The purpose of the surveys is to obtain knowledge about the environment, geology and oceanography in the area. The results form the basis for the selection of foundations for the component parts of the wind farm, the layout of the internal cable network, the selection of the most suitable methods for the construction and installation of component parts and cables, and the final design of the wind farm.

The survey activities that may be applicable are described below. The final choice of survey methods will be made at a later stage and may deviate somewhat from the description provided below.

Geophysical surveys

Geophysical surveys are carried out to determine the bathymetry and properties of the seabed, water depth and soil stratigraphy, and to identify potentially hazardous objects on the seabed such as any UXO (unexploded ordnance).

Geophysical data is usually collected from ships moving along parallel transects across the wind farm area. Technologies that may be applicable include:

- 2D or 3D Ultra High Resolution Seismic (UHRS) including Sparker
- Sub Bottom Profiler (SBP)

- Sonar technology such as Side Scan Sonar (SSS) and Multi-beam Echo Sounder (MBES)

Geotechnical surveys

Geotechnical surveys are carried out to investigate the physical properties of the seabed. This knowledge is needed in the design and construction phase in relation to aspects such as foundations and cable anchoring. Technologies that may be applicable include:

- Test drilling. The diameter of the borehole is approximately 20 cm. Drilling takes place to a depth of approximately 100 m below the seabed.
- Vibrocore is used to determine material composition and soil layer sequences in sediment.
- Cone Penetration Test (CPT) is used to obtain information about the resistance and strength of the bottom material.

Surveys involving test drilling, vibrocore and CPT are preceded by scanning the seabed with a magnetometer to avoid collisions with objects.

Test drilling and CPT are normally carried out at planned turbine positions, as the data is needed for the design and selection of foundations.

Meteorological and oceanographic surveys

Site-specific knowledge of wind and wave characteristics is obtained through measurements from a buoy or measurement mast within the wind farm area. The measuring equipment records parameters such as wave heights, ocean currents and wind speeds.

Environmental surveys

Environmental surveys usually involve video filming with drop down video from a ship and/or ROV (remotely operated underwater vehicle), sediment sampling and bottom logging.

Construction

The construction phase involves installation of foundations, wind turbines and other infrastructure within the wind farm area such as cables and platforms for transformer and/or converter substations. The construction phase is preceded by preparatory work on the seabed. The construction of the wind farm normally takes place in stages. A preliminary time estimate for the construction phase is about 4 years.

During the installation, a safety zone is usually established around ongoing work to protect assembly, personnel and third parties. During the construction phase, materials and components for the wind turbines will be stored on land prior to assembly.

Foundations

Preparatory work on the seabed may be required, such as levelling of the seabed or removal of objects such as boulders, lost fishing equipment or anchors.

Piling is usually used to anchor monopile and jacket foundations. Drilling may be required to anchor the piles at locations where the foundations penetrate bedrock or sediment of a harder nature. For gravity foundations, which are normally stabilised using concrete weights, the seabed may need to be prepared by way of dredging to level the bottom surface. Once the fixed foundation is in place, erosion protection is installed as necessary.

For floating foundations, the wind turbines are generally assembled and installed on the foundations at the quayside or in protected water, before being towed out to the wind farm area. Once in place, the wind turbine and the floating foundation are attached to the previously installed mooring lines and cables.

Installation of foundations usually requires the use of different types of vessels, including vessels equipped with a crane, grappling device and other equipment to ensure correct positioning of the foundations. Support vessels, barges, tug boats, safety vessels and crew vessels may also be used during the installation.

Internal cable network

There are several methods of installing offshore cables. The cable laying is carried out by specially designed vessels, usually in one or two steps. A common procedure is for the cables to be laid on the seabed, after which the cables are buried or flushed down to a depth of about 1-3 metres in the seabed. An alternative procedure is to perform the activities (laying and burying the cables) simultaneously. Cables may also be anchored and stabilised on the seabed with stones, concrete mattresses or other such methods.

The laying of cables on the seabed is usually preceded by the clearing of any obstacles along the planned cable route. If floating foundations are used, the procedure not only involves cables on the seabed but also dynamic cables in the water mass between the foundations and the seabed.

Wind turbines and transformer and converter substations

Wind turbines are installed on foundations using installation vessels equipped with high-lift cranes. The procedure usually involves the use of one or more vessels equipped with support legs, known as jack-up vessels or semi-jack-up vessels. Pre-assembly of the wind turbine's components usually takes place on land.

When constructing platforms for transformer and converter substations, the foundation is installed first, and then the superstructure. When installing large transformer and converter substations, the superstructure may be transported to the site on a jack-up vessel or barge, after which the superstructure is mounted on foundations.

Operation

During the operational phase, inspection, maintenance and any necessary repairs take place on an ongoing basis within the wind farm. Operational and maintenance activities will take place around the clock, all year round. Wind turbines and offshore transformer and converter substations are unmanned during normal operation and are controlled remotely by trained personnel. Regular visits are required for inspection and maintenance. Transportation of personnel to and from the wind farm normally takes place by ship, and more rarely by helicopter.

De-commissioning

The expected useful life of offshore wind farms is about 45 years. When the wind farm has reached the end of its maximum useful life, it is de-commissioned. Wind turbines, foundations and any platforms for transformer and converter substations are dismantled, and the site of the foundations is restored to the necessary extent based on consultation with relevant authorities. The de-commissioning process will be carried out in accordance with accepted practice and based on applicable legislation at the time of de-commissioning. An overall description of the de-commissioning phase and its effects will be included in the EIA, based on current practice, technologies and methods.

4.10 Follow-on activities

The establishment of the Neptuni wind farm will entail other necessary activities, referred to in this consultation document as follow-on activities. An overall description of these is provided below.

Connection cables

The electricity generated in the wind farm is transmitted via connection cables to a connection point on land. The electricity is converted to mains voltage in substations and is then connected to the grid.

Connection cables designed for installation at sea are used to transport the electricity from the wind farm to shore, after which cables designed for installation on land are used to perform the transfer to the designated connection point.

Alternating current (HVAC) and direct current (HVDC) are both possible alternatives for electricity transmission. The installation of connection cables at sea is done using the same methods as described for the internal cable network.

Handling of dredged material

The extent of any dredged material, and how such material is to be handled, will be investigated at a later stage of the project and handled in accordance with applicable regulations.

4.11 Preliminary timetable

A preliminary overall timetable is set out in **Error! Reference source not found.**. Initially, site-specific surveys are planned, consultation is carried out and requisite permit applications are submitted. Project planning takes place to some extent at the same time as the permit process. When the necessary permits have been obtained, the detailed project planning usually begins, and design choices to optimise the wind farm are made. This is followed by construction of components, installation and commissioning. When the wind farm has reached the end of its useful life (after about 30-45 years), it is de-commissioned.

Table 1: Timetable

	YEAR																						
	0	1	2	3	4	5	6	7	8	9	10	11	12	-	-	-	-	47	48	49	50	51	
Surveys and permit process	5 years																						
Project planning for the wind farm		5 years																					
Construction of the wind farm					4 years																		
Wind farm in operation											30-45 years												
De-commissioning																						1.5 years	

5. Alternatives

5.1 Main alternative

The main alternative means that the wind farm is located and designed largely in accordance with the description in chapter 4. The fully built wind farm has a total nameplate capacity of up to approximately 1600 MW and consists of up to 110 wind turbines.

Impact, effects and consequences will be assessed for survey activities, construction, operation and de-commissioning of the Neptuni wind farm with associated facilities, including the internal cable network, and will be described in the EIA. A description of possible effects is provided for each environmental aspect in chapter 7.

5.2 Alternative location

RWE has carried out an investigation of possible locations for the planned Neptuni wind farm. The starting point has been the rules specified in the Swedish Environmental Code regarding choice of location for an activity or measure pursuant to chapter 2, section 6 of the

Environmental Code.

Alternative locations for the establishment of offshore wind farms in the southern Baltic Sea have been evaluated based on technical conditions, impact on protected areas and natural assets, and impact on other interests. Parameters taken into account include the size of the wind farm areas, sea depth, wind speed, onshore electricity connection and coexistence with nature conservation interests and other interests, such as shipping, defence interests and the fishing industry.

Based on available information about the area in question and technical conditions, RWE has identified the proposed location as suitable for the establishment of an offshore wind farm with associated cables. The location means that the Neptuni wind farm can supply the Swedish bidding zone SE3 with energy. The area has no overlapping national interests and has favourable wind conditions and sea depth for the establishment of a wind farm.

The chosen alternative and the reasons for the proposed location will be described in the future EIA, which will also include a description of alternative locations and any dismissed locations.

5.3 Alternative design

RWE examines the area's conditions and various technical solutions to arrive at the best design for the wind farm. Alternative design options will be described in the future EIA.

5.4 Zero alternative

The zero alternative means that the wind farm will not be built. Consequently, no environmental or other impact (positive or negative) will arise on account of the project. Furthermore, the zero alternative means that there will be no contribution from the planned activities to renewable electricity production in order to enable the electrification of society, contribute to the climate transition and strengthen the competitiveness of Swedish industry. The zero alternative will be described in the future EIA.

6. Planning situation

6.1 Marine plan

Sweden's marine plans shall, among other things, contribute to reaching the societal goal of 100% fossil-free electricity production by 2040. In general, the technical possibilities for use of wind farms in the Baltic Sea are good (Havs och Vattenmyndigheten, 2023).

According to the applicable marine plan, see Figure 6, the wind farm area is located within sub-area Ö226 with designation G (general use). This means that no particular type of use takes precedence.

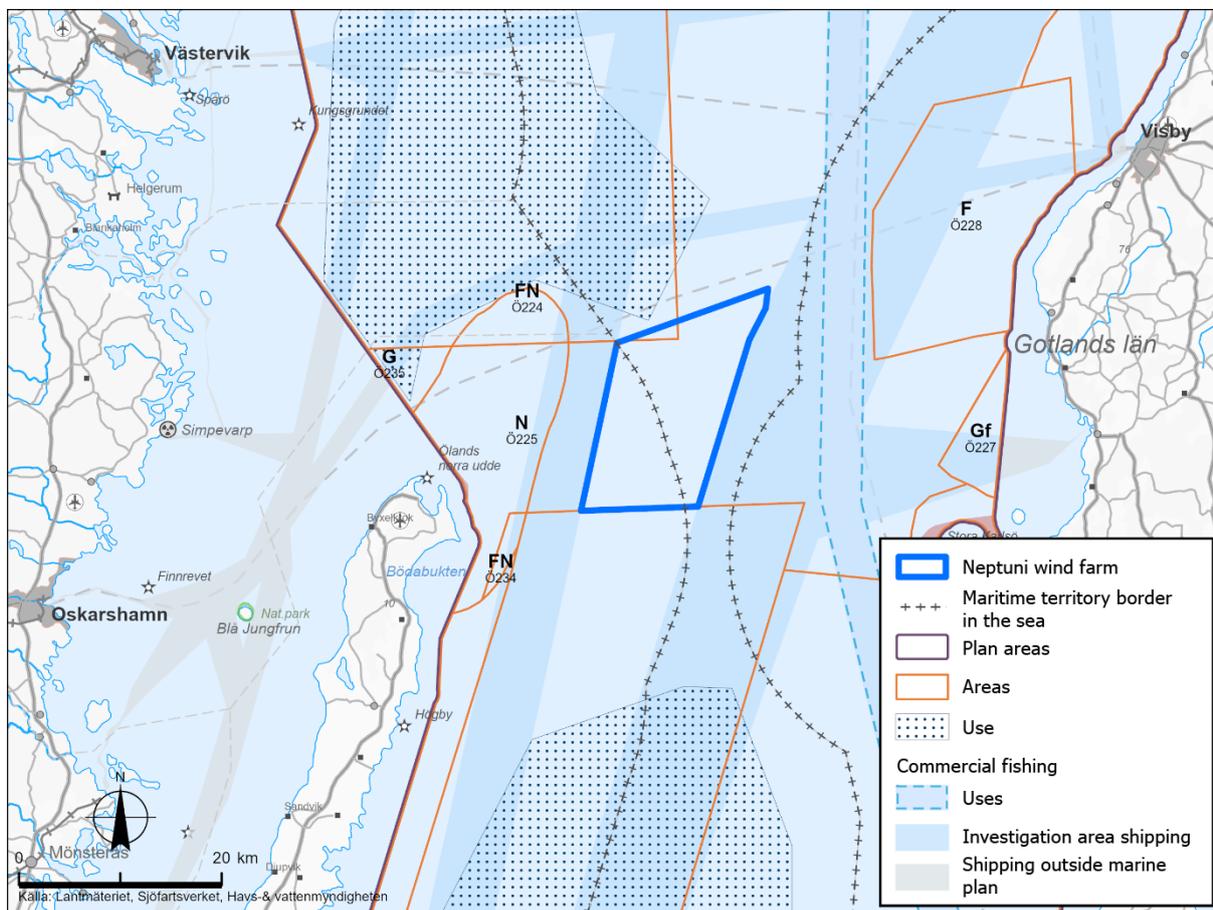


Figure 6. Applicable marine plan (Havs-och Vattenmyndigheten, 2022).

The Swedish Agency for Marine and Water Management presented a proposal for new marine plans in 2023 with proposals for new or changed areas for energy extraction (Havs och vattenmyndigheten, 2023). The aim is to enable further offshore electricity production in addition to the planning that exists in current marine plans.

In the proposal for new marine plans, the wind farm area is primarily located within subarea Ö277 (see Figure 7) with designation E(utr)fn. E(utr) means that the area is being investigated for energy extraction. Within the area, special consideration must be given to defence (f) and high natural assets (n).

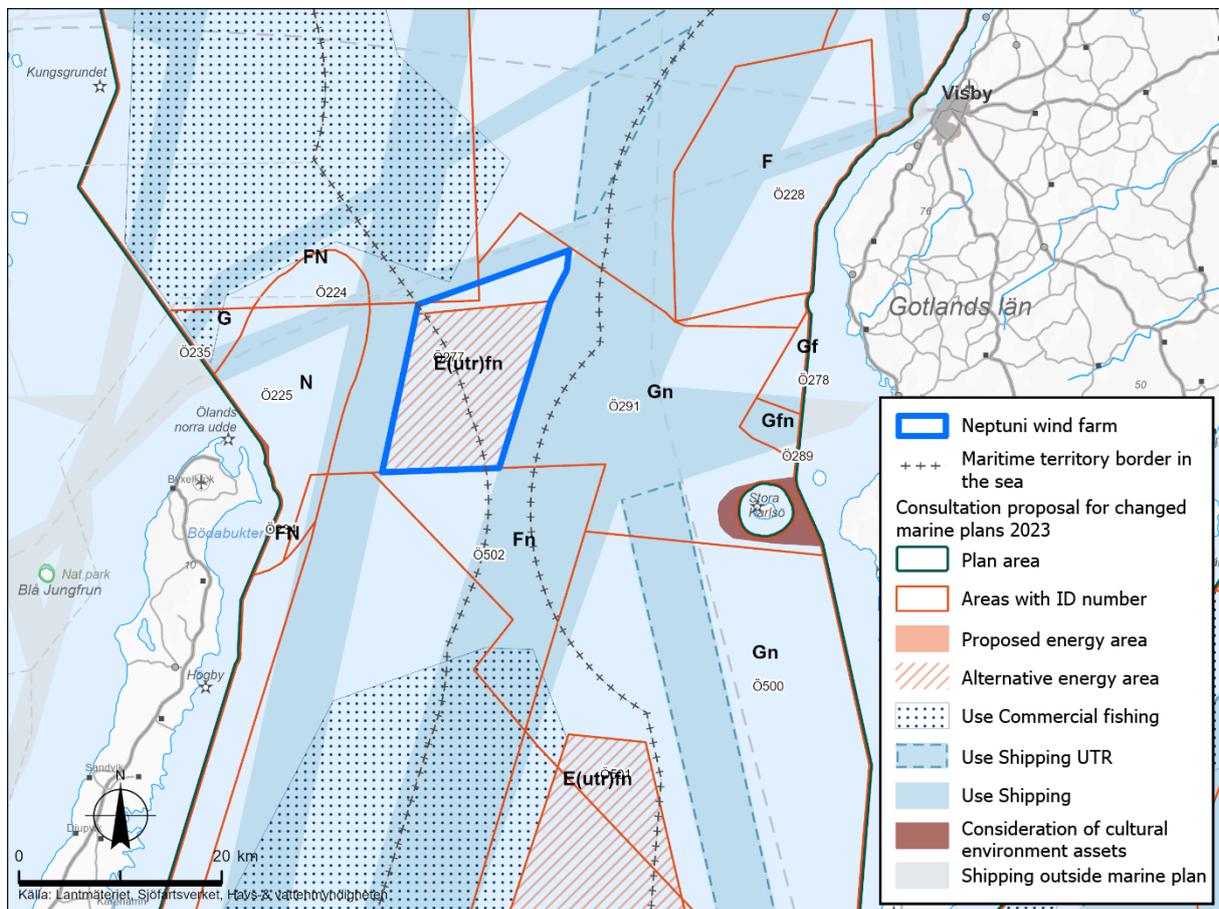


Figure 7. Proposal for marine plan (Swedish Agency for Marine and Water Management, 2023).

6.2 Master plan

The wind farm area is located partly within the municipality of Borgholm. See Figure 7 for the border of the maritime territory at sea. In the municipal comprehensive planning there is a wind power plan as a thematic supplement to the master plans shared by the municipalities of Borgholm and Mörbylånga. Borgholm Municipality is currently working on the development of a new master plan that will apply from 2040, where the wind power plan will be incorporated into the master plan. According to Borgholm Municipality’s master plan, no wind power establishments shall take place along the municipality’s western coastal stretch. It is stated that the sea outside the eastern coastline can only accommodate a few wind farm establishments of larger size. Furthermore, it is stated that the distance between the wind farms should be large enough so that they are not perceived as forming one large wind farm, and that the landscape between different establishments should be kept free of individual wind turbines (Miljö- och byggnadsförvaltningen Borgholms kommun, 2011).

7. Description of area and possible effects

The following sections describe baseline conditions and possible effects of the planned activities for various environmental aspects. For all aspects, the delimitation in the future EIA is described, i.e. if and how the aspect will be investigated and described in the EIA.

7.1 Depth conditions and hydrology

Baseline description

The depth within the area for the planned wind farm varies between approximately 20-110 m with an average depth of 68 m. The northwestern part of the wind farm area is shallower, and the eastern and southern parts are deeper (see Figure 8). Modelled salinity at the seabed on average over the year is 7.5 - 11 psu (HELCOM, 2024).

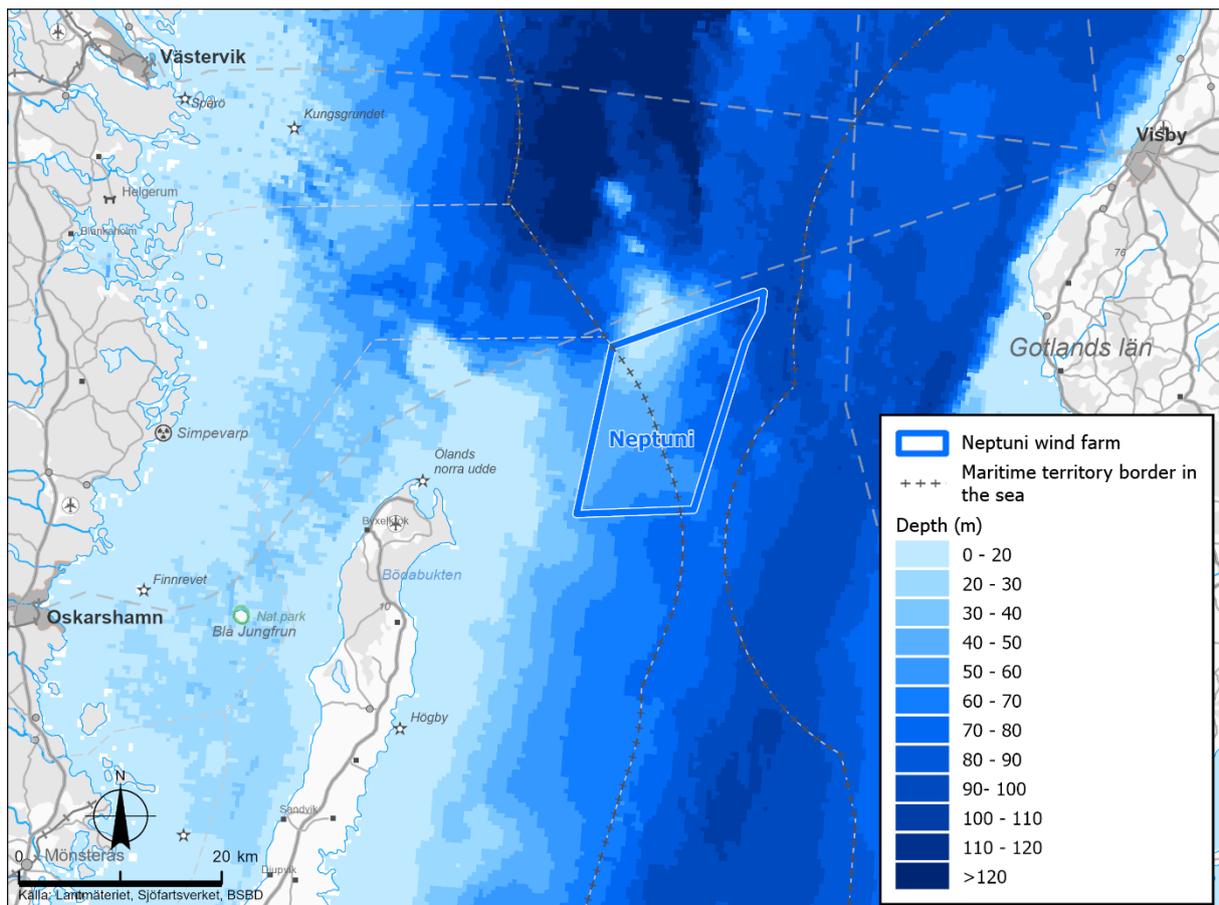


Figure 8. Bathymetry within the wind farm area and surrounding sea area.

The spread of oxygen-free seabed areas in the Baltic Sea is large. The sharp stratification resulting from the north-south gradient of salinity (halocline) in the Baltic Sea together with a large supply of nutrients from land over many years has caused the spread of oxygen depletion (Sveriges vattenmiljö, 2024).

During the spring, a distinct boundary between warmer and colder water (thermocline) appears. The thermocline has an important influence on the oxygen concentration, as oxygen dissolves better at lower temperatures. The most pronounced thermocline appears during the summer months.

The seabed conditions in the area consist to a small extent of oxygen-free seabed areas. (HELCOM, 2024). Data from HELCOM shows that the level of eutrophication is high (4 on a scale of 1-5) (HELCOM, 2024).

Possible effects

A possible covering of cables within the wind farm may create new seabed structures and affect the bathymetry, although only very locally.

A certain impact on ocean currents in the area cannot be ruled out based on the extraction of wind energy and the establishment of foundations and towers.

Delimitation

The impact on ocean currents during the operational phase will be investigated and assessed in the EIA.

7.2 Sediments and contaminants

Baseline description

The surface sediments within the wind farm area consist mainly of glacial clay with elements of moraine clay and till (SGU, 2024). The seabed within the wind farm area is expected to consist mostly of accumulation beds.

Surveys are planned to investigate the nature of the sediment, see section 4.9.

Inorganic and organic chemical contaminants mainly enter the Baltic Sea via atmospheric deposition and inland surface water. Many contaminants are hydrophobic, which means that they tend to be adsorbed onto particles and settle on the seabed. These contaminants accumulate in sediment on accumulation beds.

As the seabed within the wind farm area is probably dominated by accumulation beds, it is expected that contaminants could appear in the surface sediments. An environmental monitoring station (SE-10) is located in Karlsödjupet southeast of the wind farm area. The results from

environmental monitoring at this station indicate that environmental toxins occur in medium amounts in this area compared to other monitoring stations in the Baltic Sea (SGU, 2024). The contamination index (which is an overall assessment from a large amount of different harmful substances) is 4 (on a scale of 1-5) in the area between Öland and Gotland, as well as in the majority of the entire Baltic Sea (HELCOM, 2024).

Possible effects

The planned activities do not entail any direct emissions of environmentally hazardous substances into the surrounding area.

The construction work on the seabed may cause disturbance of sediment. Turbidity and sedimentation may have negative effects on bottom flora and fauna as well as fish through impaired foraging ability, clogging and/or covering of membranes. Sediment that contains contaminants could potentially entail negative effects on bottom flora and fauna as well as fish.

Delimitation

Impacts from suspended sediment, contaminants in sediment and sedimentation in connection with surveys and during the construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

7.3 Bottom flora and fauna

Baseline description

The depth within the wind farm area varies between approximately 20 - 110 m. A small proportion of the seabed in the wind farm area is located within the photic zone where the seabed is reached by sunlight and vegetated bottom areas may occur, see Figure 9.



Figure 9. Areas in the photic zone, HELCOM, 2017.

In Kalmar County, bottom fauna are monitored within the programs for regional and national environmental monitoring (NIRAS, 2022). None of the environmental monitoring stations are located within the wind farm area, but the general picture in the sea area, with polychaetes, molluscs and crustaceans as dominant groups of species on the marine sediment beds, can be expected to also apply to the wind farm area with the exception of oxygen-free or oxygen-depleted seabed areas. Environmental monitoring shows that the situation for animal life in the seabed areas along the coast of Kalmar County has deteriorated since measurements began in 1995 (NIRAS, 2022). The company plans to carry out surveys of bottom flora and fauna in the wind farm area.

The occurrence of oxygen-depleted and completely oxygen-free seabed areas is widespread in the Baltic Sea. The seabed within parts of the eastern part of the wind farm area is assessed as oxygen-depleted, and a minor part as completely oxygen-free, see Figure 10 (SMHI, 2020). Oxygen-depleted seabed areas can harbour bottom flora and fauna for shorter periods, while oxygen-free seabed areas have very limited multicellular life (Havet.nu, 2023). Oxygen concentrations below 3 ml/l become increasingly critical for fauna, as the development of oxygen-free

conditions and the release of harmful hydrogen sulphide formed under these conditions deteriorate the living conditions for larger benthic species (Sveriges vattenmiljö, 2024).

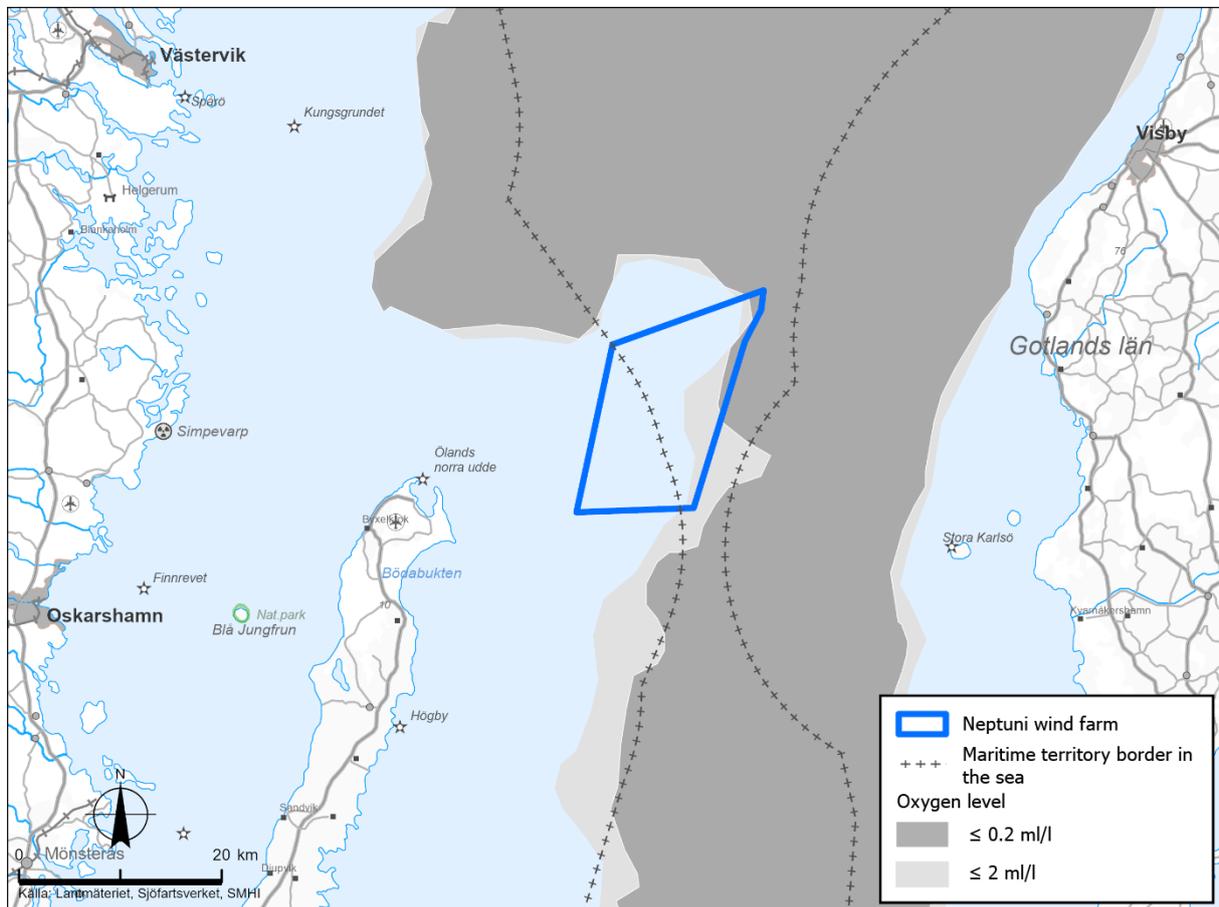


Figure 10. Oxygen levels in the seabed in and around the wind farm area, SMHI, October 2020.

Possible effects

The installation of foundations, cables and erosion protection may negatively affect local bottom fauna and flora communities through the effect of such activities on the seabed as well as through turbidity and sedimentation. Bottom flora is expected to occur within a small part of the wind farm area.

Bottom fauna occur only sparingly on oxygen-depleted or oxygen-free seabed areas, and no effects are expected to arise.

During the operational phase, foundations may create a local reef effect through the growth of organisms. In general, the growth is expected to be dominated by filter-feeding species such as blue mussels (Hammar, 2008).

Delimitation

Impacts on bottom flora and fauna in connection with surveys and during the construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

Modelling of sediment spreading and sediment deposition is carried out as a basis for the assessment of planned activities during the construction phase.

7.4 Fish

Baseline description

Species that may occur in the area are whitefish (*Coregonus maraena*), cod (*Gadus morhua*), trout (*Salmo trutta*), eelpout (*Zoarces viviparus*), turbot (*Scophthalmus maximus*), burbot (*Lota lota*), river lamprey (*Lampetra fluviatilis*), fourbeard rockling (*Enchelyopus cimbrius*), lumpfish (*Cyclopterus lumpus*), salmon (*Salmo salar*), herring (*Clupea harengus*), sprat (*Sprattus sprattus*) and flounder (*Platichthys flesus*) (HELCOM, 2024).

It is assessed that herring, sprat and flounder are present and spawn in the area (HELCOM, 2024). Spawning periods for herring vary greatly between populations, but in the Baltic Sea spawning predominantly takes place in spring. Spawning takes place in shallower water (0-10 m depth) over seabed areas of sand, stone or gravel. The eggs sink to the bottom and stick to plants and rocks. Young herring stay close to the coast (SLU Artdatabanken, 2024a). Potential spawning areas for herring are shown in Figure 11.

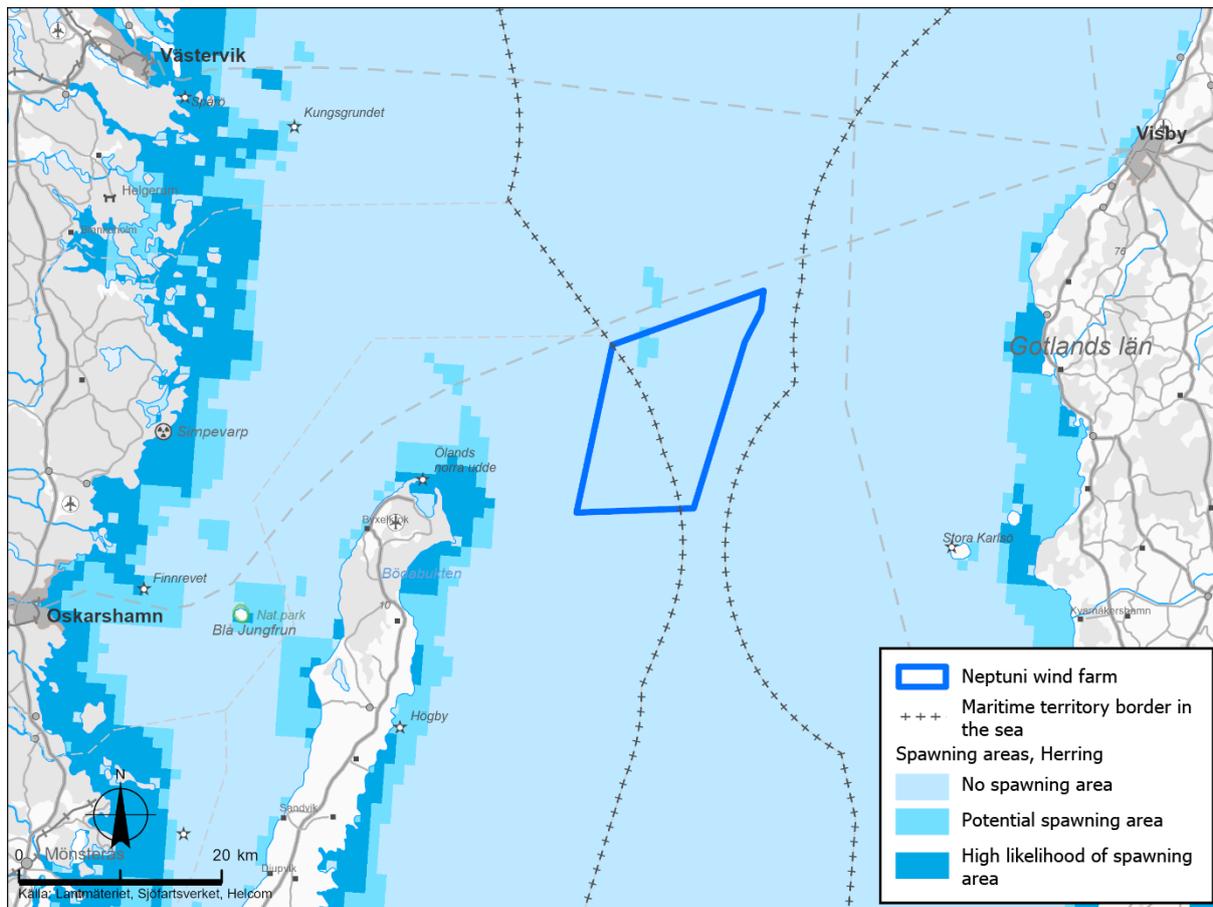


Figure 11. Potential/likely spawning areas for herring.

Sprat spawn during the period February–August in open water, from the surface down to a depth of 40 m. The spawning areas are located both out at sea and closer to the coast in the Baltic Proper. The eggs are pelagic and a salinity of at least 5–6 ‰ is required in order for them to float (SLU Artdatabanken, 2024b). Potential spawning areas for sprat are shown in Figure 12.

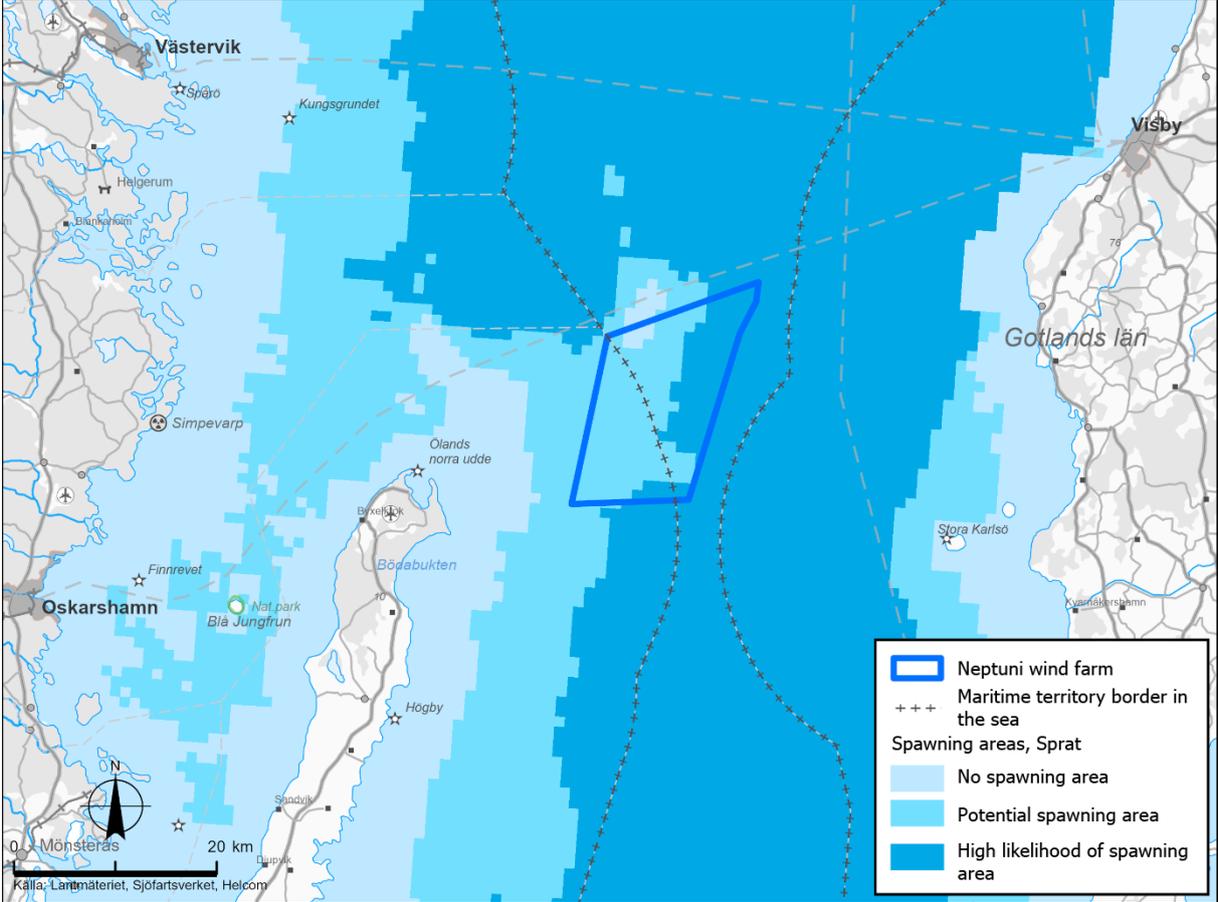


Figure 12. Potential/likely spawning areas for sprat.

The Baltic flounder spawns from March/April – June in the Baltic Sea and lays pelagic eggs in the southern Baltic Sea at a depth of 20-100 m. A salinity of at least 6 ‰ is required in order for them to float. However, adult individuals usually live in areas of considerably shallower, both soft and hard seabed (SLU Artdatabanken, 2024c). Potential spawning areas for Baltic flounder are

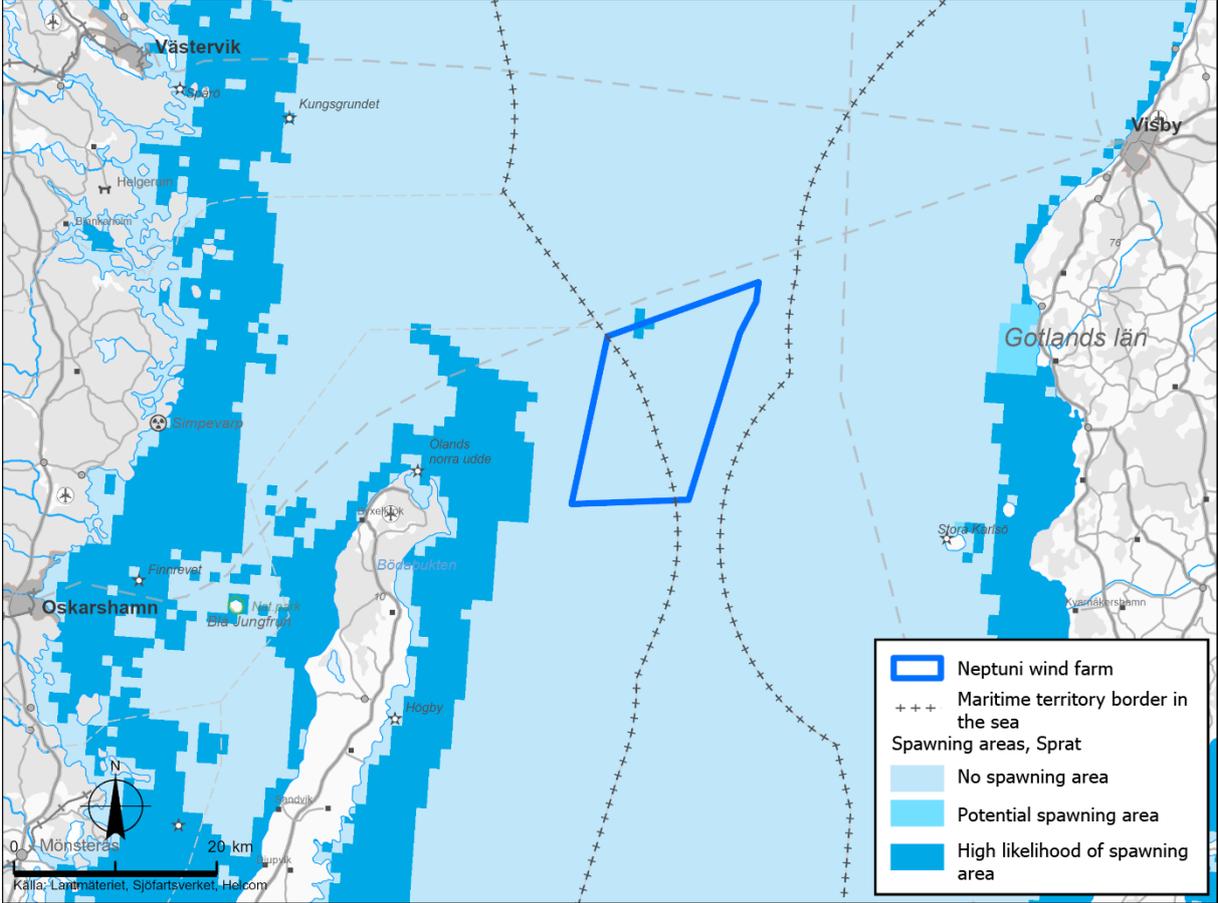


Figure 13. Potential/likely spawning areas for Baltic flounder.

shown in Figure 13.

Possible effects

Fish may potentially be affected by suspended sediment and sedimentation, electromagnetic fields and underwater noise (Öhman, 2023). Shadowing from the wind turbine’s tower and moving parts may potentially disturb fish in the immediate area. Research into the effects of shadowing is limited, but shadowing is not expected to constitute a major disturbance as fish generally do not avoid wind turbines in operation (Öhman, 2023).

Within the wind farm area, potential spawning for herring, sprat and Baltic flounder takes place to a very limited extent.

Loud underwater noise from piling work and certain survey activities may entail temporary or permanent hearing loss for fish that are close to the source. Fish eggs may also be damaged by high noise levels. The high noise levels generated during piling may also give rise to tissue damage or, in the worst case, mortality (Öhman, 2023). There is much to suggest that fish in the immediate vicinity of construction work leave the area when ships arrive and begin the initial steps of assembly, before piling begins. Technical solutions designed to reduce noise generation and to warn fish can also reduce the consequences of the noise (Öhman, 2023).

Suspended sediment may impair visibility and thereby impair foraging success for fish. Pelagic fish eggs may potentially be covered by suspended sediment and lose their buoyancy, and benthic eggs may be covered by sediment.

Fish can perceive electromagnetic fields and may therefore potentially be affected by the submarine cables that are laid on the seabed in connection with the construction of a wind farm. However, tests have shown that most of the species examined do not seem to be affected at all by the type of submarine cables found at offshore wind farms (Öhman, 2023). A 2016 study examined fish communities located at different distances from high-voltage submarine cables from a wind farm on the seabed. No difference could be seen between the communities that were close to the cable and those that were further away (E. S. Dunlop, 2016).

Delimitation

Impacts on fish during the survey, construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

7.5 Marine mammals

Baseline description

Four species of marine mammals regularly inhabit the Baltic Sea: ringed seal (*Pusa hispida*), harbour seal (*Phoca vitulina*), grey seal (*Halichoerus grypus*) and harbour porpoise (*Phocoena phocoena*).

Seals

Harbour seals and grey seals may occur in the wind farm area. Ringed seals are not expected to occur in the wind farm area as they are primarily found further north and are completely dependent on stable ice for their reproduction in areas where the females give birth to their young (SLU Artdatabanken, 2024c).

The harbour seal is deemed to be viable and can be found along the west coast and the south coast of Sweden, as well as in a limited area on southern Öland and the southern coast of Småland. In the southern part of the Kalmar Strait there is a local harbour seal population (the Baltic Sea population) which is genetically isolated and which is deemed to be vulnerable (VU)

according to the 2020 Swedish Red List (SLU Artdatabanken, 2024). The female harbour seal gives birth to one pup in June (SLU Artdatabanken, 2024).

The grey seal is deemed to be of least concern (LC) according to the 2020 Swedish Red List and can be observed along most of the coast of Sweden, but is more abundant in the areas around the Stockholm archipelago and Åland. In the Baltic Sea, the female grey seal gives birth to one pup during the period from late February to early March (SLU Artdatabanken, 2024).

Both the grey seal and harbour seal primarily inhabit coastal areas where there is access to larger areas with a shallow seabed, where they forage at depths of up to approximately 40–50 m. They mainly eat fish and to some extent crustaceans and shellfish. The mating season occurs shortly after a pup has been born, after the lactation period which lasts about 3–4 weeks.

Seals have well-developed hearing and hear best in the range from a few hundred hertz (Hz) to about 50 kHz, but have a hearing range up to about 75 kHz (Southall, 2019).

Porpoises

The harbour porpoise (*Phocoena phocoena*) occurs in the Baltic Sea, Kattegat and Skagerrak. As a result of the SAMBAH project (an international project to preserve the Baltic Sea harbour porpoise population), the abundance and distribution of harbour porpoises has become better known. Harbour porpoises occur in three distinct populations with limited genetic exchange: the Baltic population, the Belt Sea population and the North Sea population. The occurrence of harbour porpoises in the Baltic Sea concerns the viable Belt Sea population and the acutely threatened Baltic population, which is estimated to consist of only 500 individuals (SAMBAH 2016). It cannot be ruled out that harbour porpoises move through the wind farm area during parts of the year.

The Baltic population is present in higher densities in the areas around Hoburgs bank and Midsjöbankarna in comparison to other areas in the Baltic Sea during the months when calving and mating take place. Calving takes place during the period June–August.

Harbour porpoises have well-developed hearing and also use acoustic signals to locate prey and for communication. Harbour porpoises have a hearing range covering a wide frequency range between approximately 200 Hz–180 kHz. Harbour porpoises' hearing is most sensitive in the frequency range between about 10 kHz to about 160 kHz (Southall, 2019) and they emit clicking sounds at frequencies between 115 kHz and 130 kHz (SLU Artdatabanken, 2024).

Possible effects

Marine mammals have well-developed hearing and can hear over a wide frequency range, which makes them vulnerable to underwater noise. Underwater noise may cause behavioural changes as well as temporary or, in the worst case, permanent hearing damage. Effects from

underwater noise mainly arise during the construction phase, if foundations are laid by way of piling, and in connection with during certain seabed surveys.

Delimitation

Impacts on marine mammals during the survey, construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

7.6 Birds

Baseline description

The Baltic Sea is generally an important area for seabirds and migratory birds, and it is a winter location for a large number of wintering birds. Seabird populations are usually associated with shallow areas where they can forage in the water, for example on mussel reefs or sandbanks. In the Baltic Sea, Hoburgs bank and Midsjöbankarna are important wintering areas, in particular for long-tailed ducks and black guillemots, as well as for common guillemots and razorbills (Durinck, 1994).

Stora Karlsö, west of Gotland, is an important nesting site for seabirds. The island has been estimated to contain more than two-thirds of all nesting common guillemots in the Baltic Sea and about one-third of all nesting razorbills, as well as large colonies of common eider, great cormorant, lesser black-backed gull, European herring gull, Arctic tern and velvet scoter (Hentati-Sundberg & Olsson, 2022).

The sea area west of Gotland is used by auks, great cormorants and lesser black-backed gulls for foraging and for wintering (Ottvall, 2021) (Hentati-Sundberg & Olsson, 2022).

The assessment is that migrating birds could pass the wind farm area at different times of the year.

Protected areas, for which birds are designated, can be found on and along the west coast of Gotland and along the east coast of Öland, see sections 7.17 - 7.18.

Possible effects

Offshore wind farms may constitute a barrier or obstacle to foraging or migrating birds, depending on the location of the wind farms. Barrier effects could potentially result in altered migration patterns and displacement from foraging areas, and birds may also collide with wind turbines.

Different bird species show varying degrees of avoidance of offshore wind farms. Razorbills, common guillemots and Sandwich terns are examples of species where avoidance behaviour has been found to vary in extent (Rydell, Ottvall, Pettersson, & Green, 2017). Some species

exhibit both avoidance and attraction to roughly the same extent, including common eiders, black-legged kittiwakes, common terns and Arctic terns. A certain level of attraction is exhibited by the majority of terns and gulls, while strong attraction has been observed for great cormorants and common shags, likely due to the possibility of perching on foundations and improved food availability, due to artificial reef effects and a lack of commercial fishing within wind farms (Rydell, Ottvall, Pettersson, & Green, 2017).

Delimitation

Impacts on birds in connection with surveys and during the construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

7.7 Bats

Baseline description

Bats can use insect-dense areas as foraging areas far out to sea and pass sea areas during migration (Ahlén, 2007). How attractive the wind farm area is as a foraging area for bats is unclear. The location of the wind farm area, between the northern cape of Öland and the west coast of Gotland, means that the area may constitute a migration route for certain bat species.

Bats do not avoid wind turbines and may use them as a resting place and forage next to the wind turbines. From a number of observations at sea of passing bats, the most common flying heights for the small species are between close to 0 to about 10 m above sea level. The larger species often fly somewhat higher. Radar studies have shown that the large species mainly fly below 40 m above sea level, and there are only occasional examples of bats having been seen at higher altitudes (Ahlén, 2007).

Possible effects

During the operational phase, there is a risk of collision between bats and turbine blades. Bats are expected to occur in the sea environment above all in conditions with weak wind, although they may occur in the area even in stronger winds. The lower speed of the turbine blades in weaker winds may reduce the risk of collision.

Delimitation

Impacts on bats during the operational phase will be further investigated and assessed in the EIA.

7.8 Cultural environment and marine archaeology

Baseline description

There is a relatively large number of ship remains/wrecks in the area off the north-eastern coast of Öland. Within the wind farm area there is information about two shipwrecks, see Figure 14. These wrecks have not been confirmed in the field and are not the subject of any antiquarian assessment. Additional remains from shipwrecks may be found in the area.

There are no valuable identified cultural environments within the wind farm area. From the wind farm area it is 12 km to the nearest cultural environment area on the coast of Öland with cultural environment assets designated as being of national interest, namely the *northern cape of Öland*. The lighthouse *Långe Erik* is part of this cultural environment. The lighthouse is a listed building and a popular tourist destination.

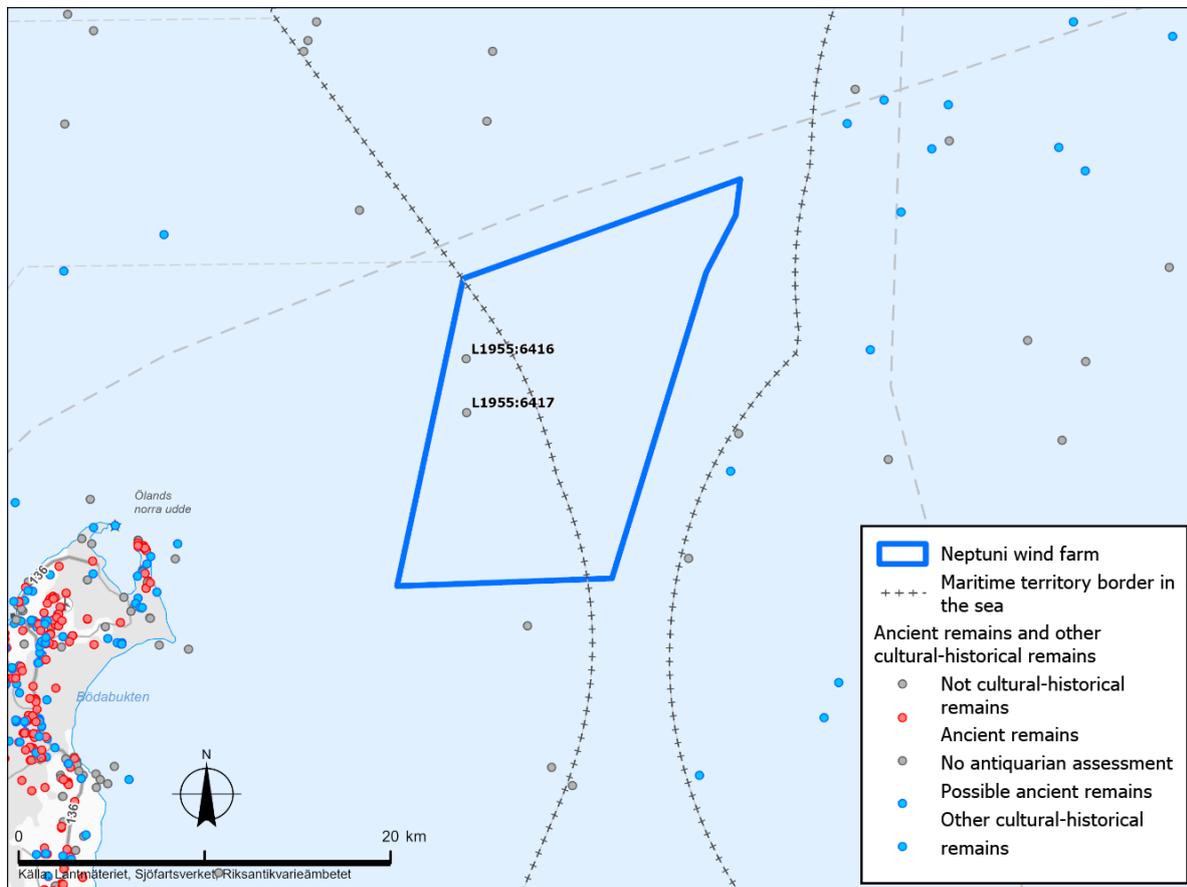


Figure 14. Marine remains in the wind farm area and surrounding sea area (Riksantikvarieämbetet, 2024).

Possible effects

The possible impact that may arise in relation to designated cultural environments and buildings in the vicinity of the wind farm area is visual, and will be assessed in the EIA from selected locations, see section 7.19 regarding landscape view.

Parts of the wind farm area have been surveyed using geophysical methods. Further surveys are planned prior to construction of the planned wind farm through which identification of known and unknown potential remains can be made.

Delimitation

Impacts on the cultural environment and marine archaeology during the survey, construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

7.9 Recreation and outdoor pursuits

Baseline description

The coasts of Öland and Gotland are popular destinations for recreation and outdoor pursuits. Along the coasts there are designated areas of national interest for active outdoor life and recreation, see section 7.17. The sea and coastal areas are important for recreation and nature and cultural experiences.

Recreational fishing is a popular activity on northern Öland and the coast of Gotland. Such fishing primarily takes place along the coasts (Havs- och vattenmyndigheten, 2022). Recreational boats move within and close to the wind farm area to a limited extent (EMODnet, 2024).

Possible effects

Assets relating to recreation and outdoor pursuits may be affected by noise from the construction and operation of the wind farm. The wind farm may constitute a physical obstacle to recreational fishing and recreational boats, see section 7.15 for information on shipping and sea lanes. The impact on the landscape view is described in section 7.19.

Delimitation

Impacts on recreation and outdoor pursuits in connection with surveys and during the construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

7.10 Human health

Baseline description

Noise and shadows from wind farms can potentially have a negative impact on people's health. The wind farm area is located approximately 12 km from the coast of Öland and approximately 26 km from the coast of Gotland. The nearest homes and buildings are located approximately 14 km from the wind farm area on the coast of Öland and consist of individual privately owned properties.

Possible effects

The noise from wind turbines during operation consists partly of mechanical noise from components such as the gearbox, and partly of aerodynamic noise from the passage of air over the blades. When granting permits for wind farms, the limit value of 40 dB(A) is used as a starting point and in accordance with the benchmark value for noise from wind power. The benchmark value relates to the noise level at residential buildings (Naturvårdsverket, 2020).

Shadows from the wind farm will not reach land, and thus no homes or buildings in general, as the wind farm is being built approximately 12 km from the nearest coast (Öland).

Delimitation

The impact on the surrounding area from airborne noise during the construction and operational phase will be investigated, and potential impacts on human health will be investigated and described in the EIA. Sound modelling is carried out as a basis for the impact assessment.

The effect of shadows will not be investigated in the EIA as no shadow-related impact will arise in relation to built environments and housing.

7.11 Commercial fishing

Baseline description

The wind farm area is located within subarea 27 according to the ICES (International Council for the Exploration of the Sea) geographical distribution. The economically most important species is sprat, which is fished using a pelagic trawl or demersal trawl, along with herring. European flounder, cod, salmon, turbot, plaice, common dab and whitefish are fished to a lesser extent (Fiskbarometern, 2023). The areas of national interest for commercial fishing are described in section 7.17.

Possible effects

In connection with surveys of the seabed and during construction work, areas may be closed to other maritime traffic for safety reasons. This may have an impact on commercial fishing temporarily and locally. During the operational phase, demersal trawling will not be able to be carried out in the area.

Delimitation

Impacts on commercial fishing in connection with surveys and during the construction, operational and de-commissioning phase will be investigated and assessed in the EIA.

7.12 Raw material extraction sites

Baseline description

Material extraction from the seabed may take place by extracting e.g. sand and gravel (Havs- och Vattenmyndigheten, 2022). In proposals for marine plans (Havs och vattenmyndigheten, 2023), possible material extraction sites have been identified. None of these coincide with or are close to the wind farm area.

Possible effects

Sites for material extraction from the seabed will not be affected by the planned wind farm.

Delimitation

Impacts on material extraction will not be investigated or assessed in the EIA.

7.13 Military areas

Baseline description

Sweden's total defence consists of military activities and civil activities. The Swedish Armed Forces have training areas at sea and in the coastal zone.

The planned wind farm overlaps to a small extent the Armed Forces' training area in the north-west and borders on a training area in the south, see Figure 15. There are also military areas along the northwest coast of Gotland (Havs- och vattenmyndigheten, 2022).

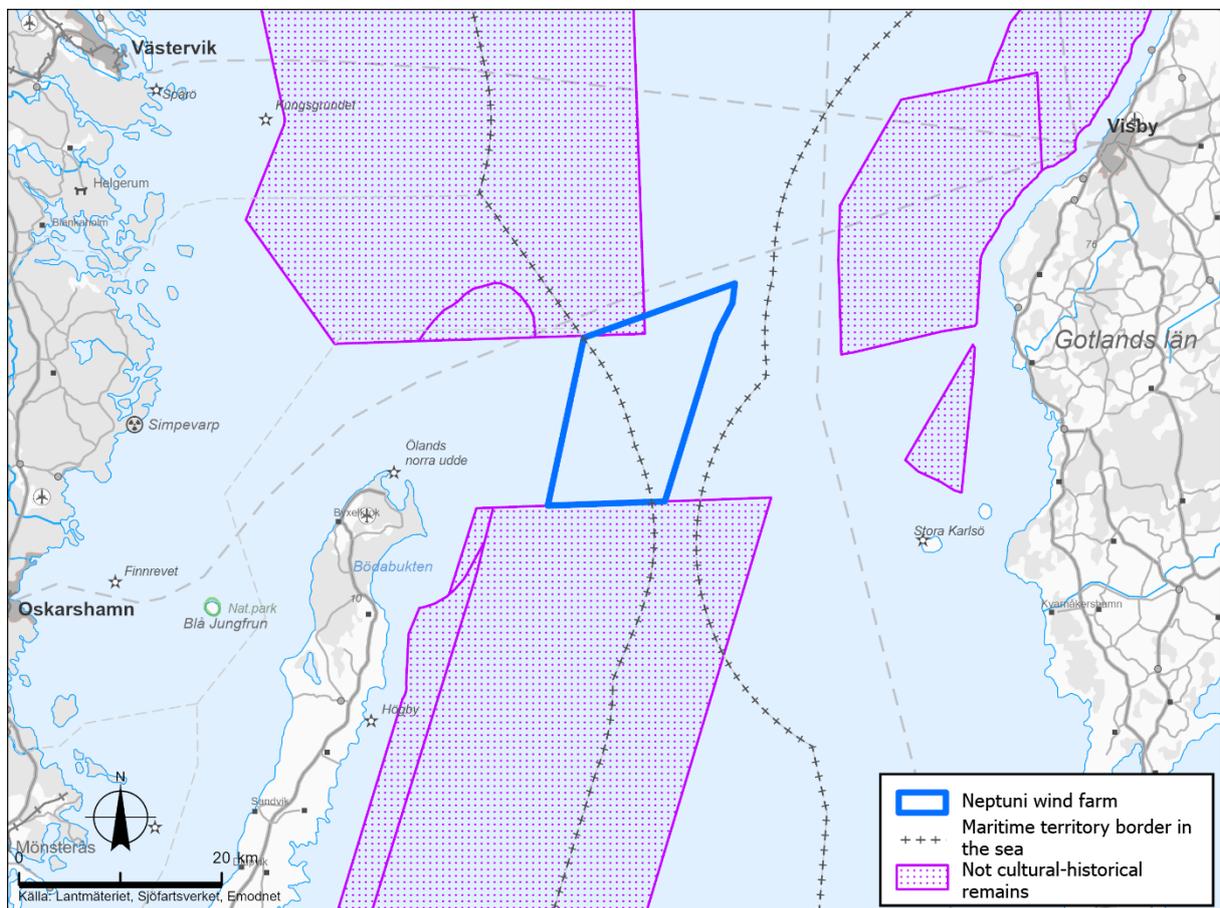


Figure 15. Military areas within and near the wind farm area.

Possible effects

The wind farm's component parts may constitute physical obstacles to military activities.

Delimitation

Impacts on military areas and activities in connection with surveys and during the construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

7.14 Infrastructure and other activities

Baseline description

The high-voltage power cable Gotland HVDC link 182 passes through the wind farm area. There is also another cable in operation approximately 13 km north of the wind farm area (HELCOM, 2023).

Global Connect is planning a new fibre cable north of the wind farm area (Global Connect, 2024) (Submarine Cable Map, 2024).

The Kårehamn wind farm, which is owned and operated by RWE, is located to the south of the planned wind farm area. Kårehamn consists of 16 wind turbines and was inaugurated in 2013.

Further south of the planned wind farm area, the Aurora offshore wind farm project is being investigated. In 2022, the company OX2 AB submitted an application for a Natura 2000 permit and an application for a permit under the Swedish Economic Zone Act and for a permit under the Continental Shelf Act to the government. The Natura 2000 permit was obtained in 2024.

About 30 km to the west of the planned wind farm area, development of the Simpevarp Havsvindpark project is taking place Figure 16 (Cloudberry Offshore Wind AB). During the spring of 2024, the project is carrying out consultation prior to application for permits pursuant to chapters 9 and 11 of the Swedish Environmental Code and a Natura 2000 permit pursuant to chapter 7, section 28a of the Environmental Code.

The Kultje project (Hexicon AB) is located approximately 18 km to the south of the planned wind farm area. This project is also carrying out consultation during the spring of 2024 prior to application for a permit pursuant to section 5 of the Swedish Economic Zone Act (1992:1140).

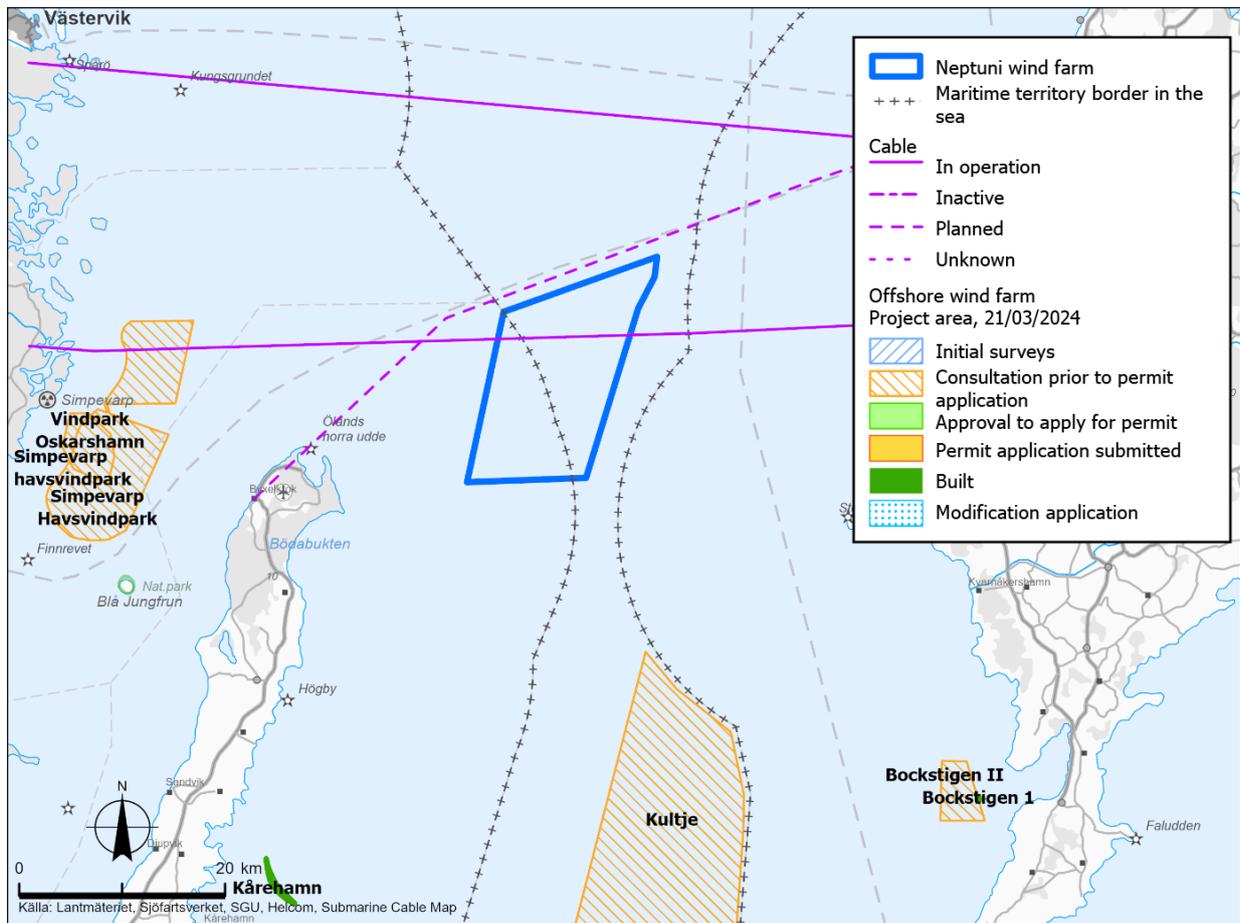


Figure 16. Infrastructure and other activities in the area.

Possible effects

The existing high-voltage power cable may need to be passed by the internal cable network.

Delimitation

Effects and impacts on infrastructure and other activities in connection with surveys and during the construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

7.15 Shipping and sea lanes

Baseline description

Within the wind farm area there are no designated sea lanes/maritime traffic routes on nautical charts. The wind farm area is surrounded by three main maritime traffic routes. A high-speed traffic route for the Gotland ferry that runs between Oskarshamn and Visby passes to the north of the wind farm area, see Figure 17. The maritime traffic routes *Ölands södra udde – Landsort* and *Ölands södra grund – Svenska Björn* are located to the east and west of the Neptuni wind farm.. These traffic routes are of national interest for shipping (see section 7.17).

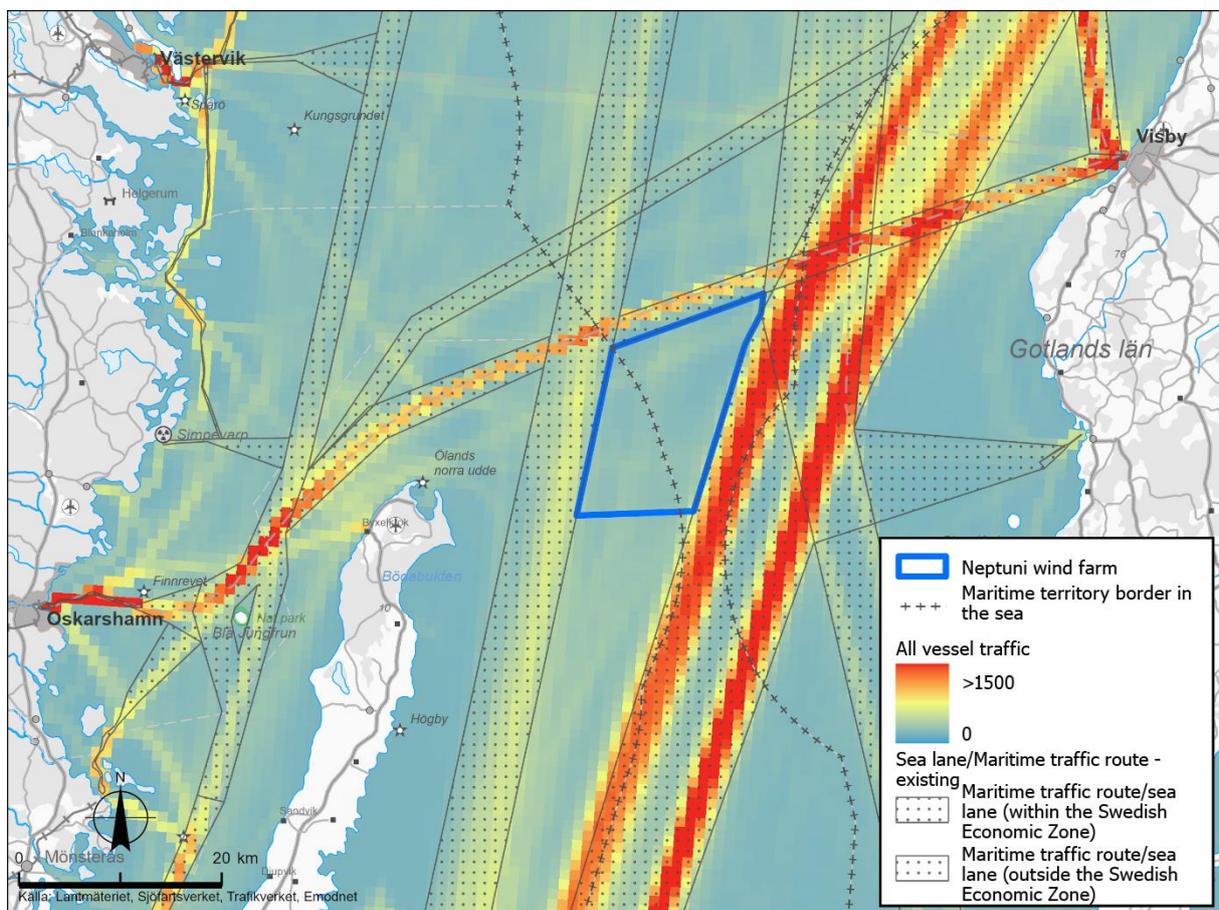


Figure 17. Vessel traffic in the area.

Possible effects

During construction, de-commissioning and ongoing survey activities, increased vessel traffic to the area may affect shipping in and near the wind farm area. A wind farm in operation may constitute a physical obstacle to larger vessels in the area, which may need to choose an alternative route around the wind farm.

Delimitation

Impacts on shipping and sea lanes in connection with surveys and during the construction, operational and de-commissioning phase will be investigated and assessed in the EIA.

A nautical risk analysis is planned for the purpose of investigating possible risks and obstacles that may arise and which potential risk-mitigating measures are appropriate to take. A HAZID (Hazard Identification) workshop is part of the nautical risk analysis.

7.16 Environmental monitoring stations

Baseline description

National and international environmental monitoring stations in the Baltic Sea monitor trends over time in relation to various physical, chemical and biological parameters (Havs- och vatten myndigheten, 2018). There are no environmental monitoring stations for contaminants and ecological parameters within or in close proximity to the planned wind farm, see Figure 18. The

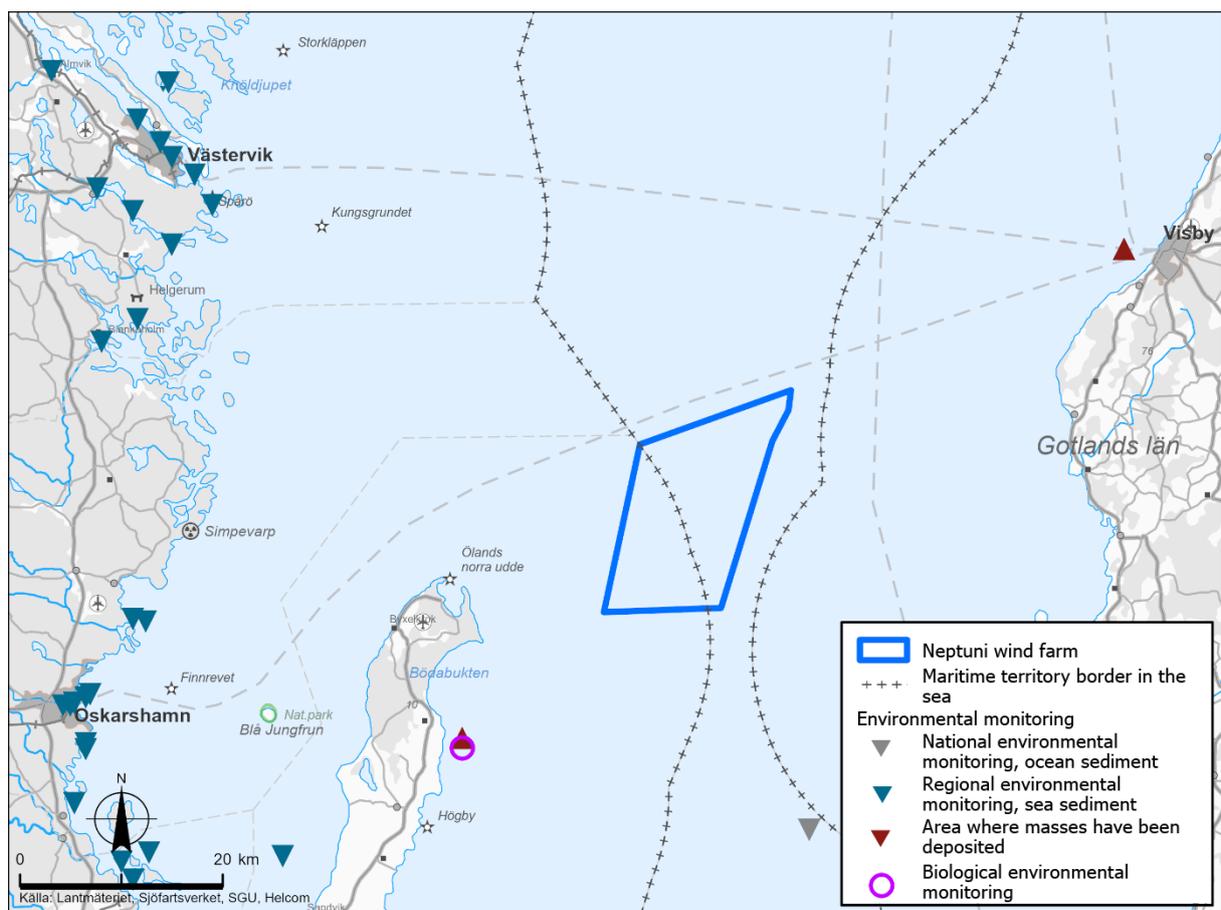


Figure 18. Environmental monitoring stations.

nearest environmental monitoring station is located between Öland and Gotland, approximately 18 km southeast of the wind farm area.

Possible effects

Due to the long distance to the nearest environmental monitoring station (16 km), the assessment is that no effects will arise.

Delimitation

Impacts on environmental monitoring stations will not be further investigated and assessed in the EIA.

7.17 National interests and area protection

This section describes the baseline, possible effects and delimitation in the future EIA with regard to areas of national interest pursuant to chapters 3–4. of the Swedish Environmental Code and protected areas pursuant to chapter 7 of the Environmental Code. The wind farm area does not overlap with any area of national interest or any protected area.

The description covers areas of national interest and protected areas located adjacent to the wind farm area that may be at risk of being affected.

National interest: energy production (wind energy)

According to chapter 3, section 8 of the Swedish Environmental Code, land and water areas of national interest for facilities for energy production and energy distribution must be protected against measures that could significantly hinder the creation or use of the facilities. Areas of national interest for energy production are identified by the Swedish Energy Agency.

Baseline description

The wind farm area does not overlap with any area of national interest for energy production (wind energy), see Figure 20. The nearest area of national interest for wind energy (ObjID_614) is located approximately 35 km to the west of the wind farm area (Energimyndigheten, 2013; Energimyndigheten, 2023).

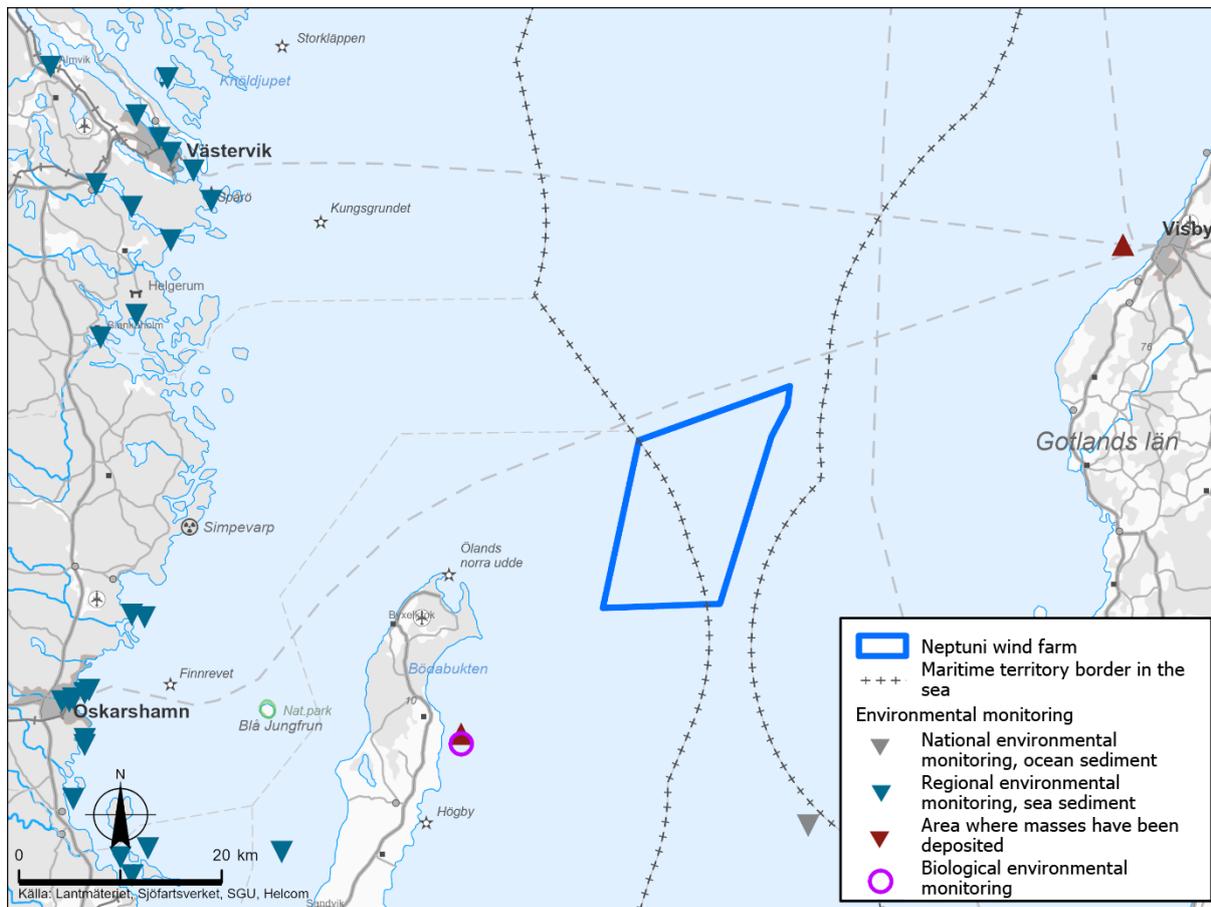


Figure 19. Areas of national interest for wind energy (The Swedish Energy Agency 2023).

Possible effects

Due to the long distance between the planned Neptuni wind farm and identified areas of national interest for offshore wind energy, the planned wind farm is not expected to affect areas of national interest for wind energy.

Delimitation

Effects and impacts on areas of national interest for wind energy will not be investigated in the EIA.

National interest: commercial fishing

Areas of national interest for commercial fishing are regulated in chapter 3, section 5 of the Swedish Environmental Code and are identified by the Swedish Agency for Marine and Water Management. Claims of national interest relate to areas at sea or in lakes or rivers that include important fishing areas, migration routes or spawning and rearing areas for commercially important species of fish or crustaceans. These areas, which are of importance for commercial fishing or for aquaculture, must be protected against measures that could significantly hinder the operation of business activities. An important prerequisite for being able to conduct fishing

within a sea area is access to ports/harbours that can provide service to the fishing vessels, as well as landing opportunities. The most important home and/or landing ports within each sea area are also considered to be of national interest for commercial fishing (Havs- och vattenmyndigheten, 2022; Boverket, 2020).

Baseline description

Figure 21 shows areas of national interest for commercial fishing. Located about 1 km north-west of the wind farm area is the area of national interest *Västervik Utsjöområde*. About 17 km south of the wind farm area is the area of national interest *Östra Öland*. Byxelkrok, Kårehamn (Öland) and Visby are the harbours/ports of national interest for commercial fishing that are closest to the Neptuni wind farm.

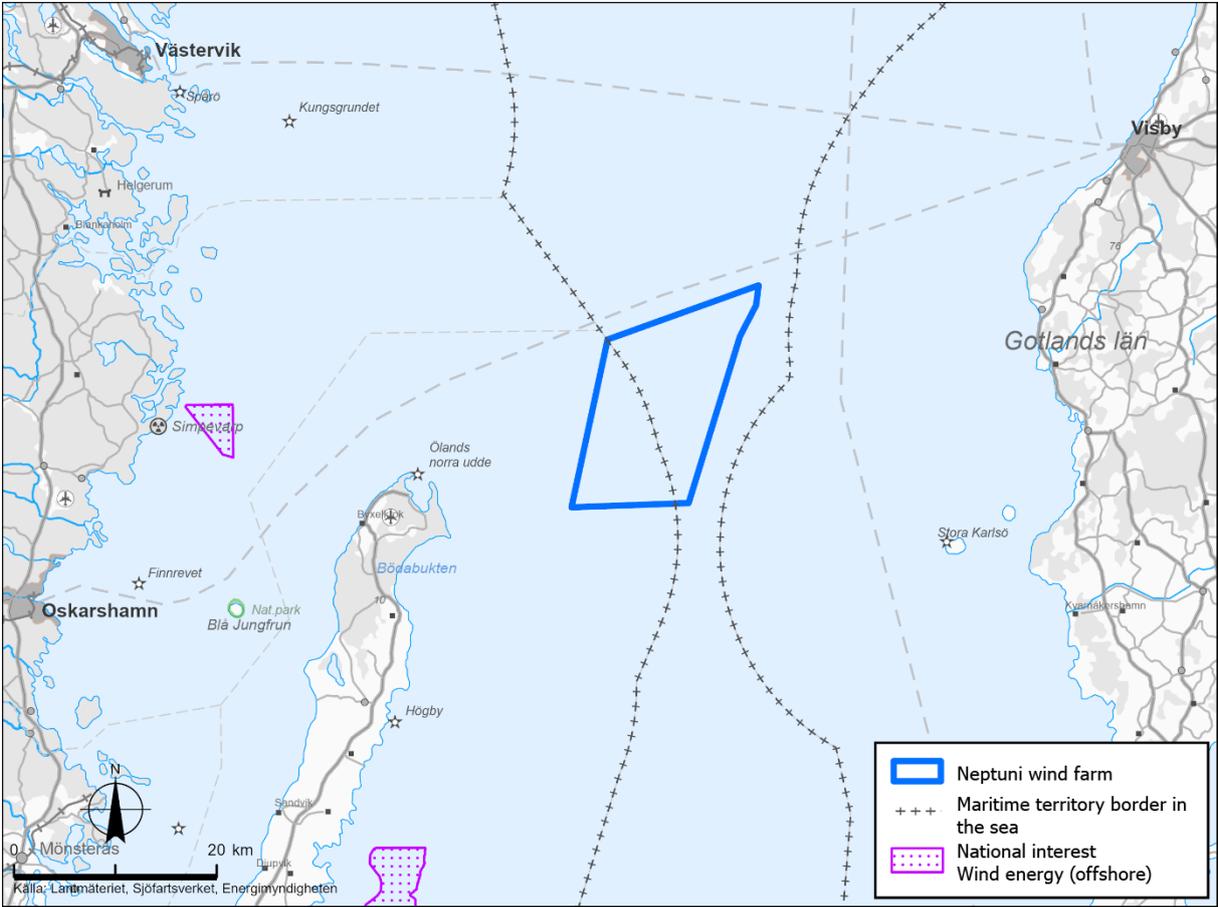


Figure 20. Areas of national interest for commercial fishing (County Administrative Board WebbGIS, 2021).

Possible effects

Construction activities may give rise to suspended sediment, sedimentation and underwater noise. Vessel traffic in the area may increase during the construction phase. No long-term effects on areas of national interest for commercial fishing are expected to arise as a result of surveys, construction work, operation or de-commissioning of the Neptuni wind farm.

Delimitation

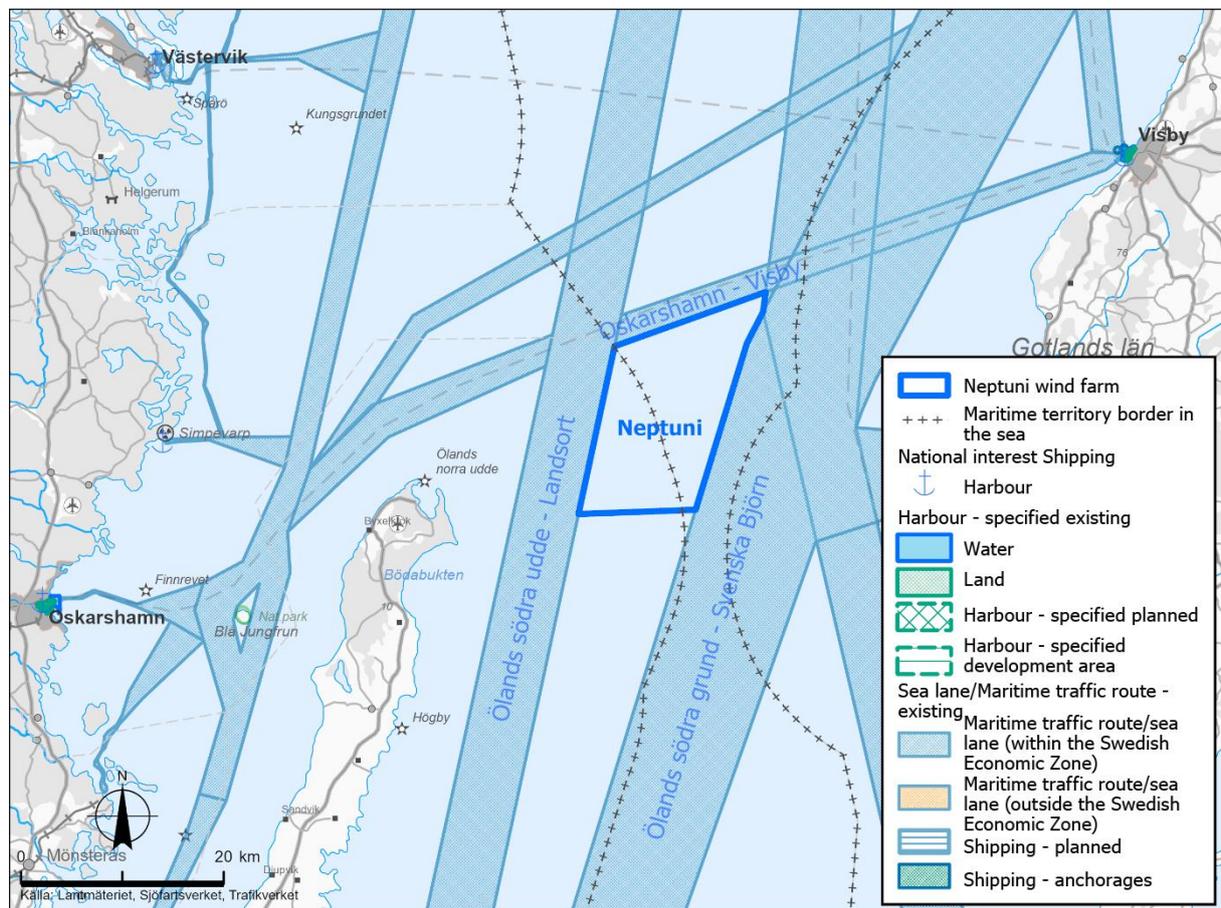
Potential impacts on areas of national interest for commercial fishing during the survey, construction, operational and de-commissioning phase will be investigated and assessed in the EIA.

National interest: shipping

The Swedish Transport Administration identifies the ports/harbours and maritime traffic routes/sea lanes, as well as areas in general, which provide such special functions for the maritime transport system that they are of national interest for transport facilities pursuant to chapter 3, section 8 of the Swedish Environmental Code (Sjöfartsverket, 2001).

Baseline description

Figure 22 shows maritime traffic routes of national interest for shipping in the sea area where the Neptuni wind farm is located. The wind farm area is situated adjacent to several maritime traffic routes: Ölands södra udde – Landsort to the west, Oskarshamn – Visby to the north, and



Ölands södra grund – Svenska Björn to the east.

Figure 21. Areas of national interest for shipping.

Possible effects

In connection with surveys and during the construction phase, activities are conducted next to areas with high-intensity vessel traffic. Passages of sea lanes and the establishment of temporary safety zones around project-related vessels may potentially affect shipping in areas of national interest, and there may be an impact on areas of national interest for shipping during the operational phase.

Delimitation

Potential impacts on areas of national interest for shipping in connection with surveys and during the construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

National interest: total defence

The Swedish Armed Forces are responsible for identifying areas of national interest for total defence military facilities (Försvarmakten, 2023). Areas of national interest for total defence and military interests are found on coasts and at sea in the form of areas for training activities and signals intelligence. Ports/harbours and sea lanes are also important resources. Some interests are subject to secrecy. RWE's ambition is to conduct a dialogue with the Swedish Armed Forces.

Baseline description

Within the national interest for total defence there are stopping areas for high objects, areas with an increased need for freedom from obstruction, areas with set permitted heights (MSA areas), areas of influence for weather radar and naval training areas. There are three known areas of national interest for total defence in close proximity to the wind farm, see Figure 23.

To the northwest of the wind farm area is the naval training area *Valdemarsvik, Oskarshamn, Västervik, Borgholm*. To the south of the wind farm area is the area *Mörbylånga, Borgholm, Gotland*. The northeast corner of the wind farm area is located within the MSA area for *Visby Airport*.

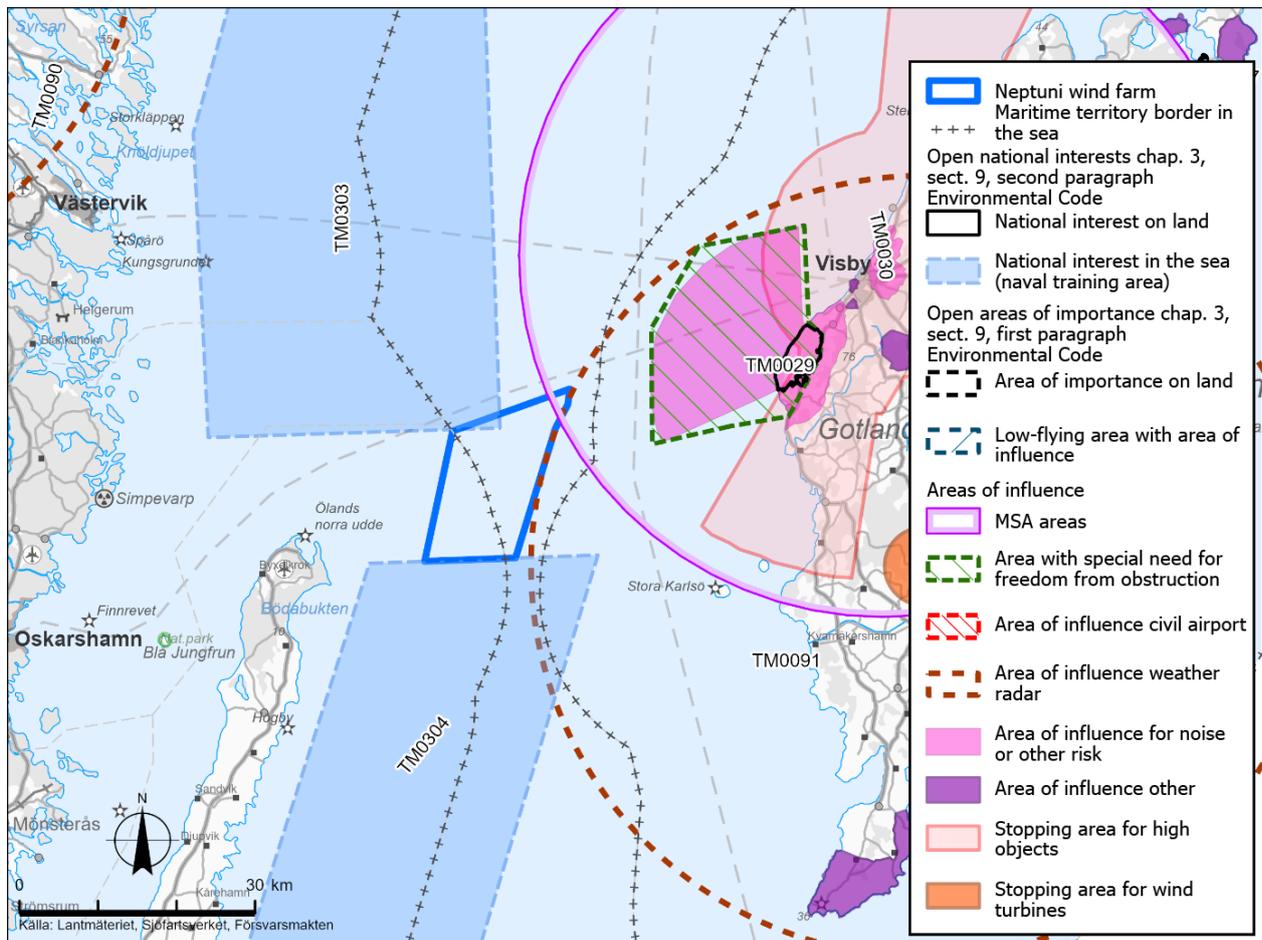


Figure 22. National interest and areas of influence for total defence with MSA areas and naval training areas at sea.

Possible effects

Construction work will be carried out next to areas of national interest for total defence. The establishment of temporary safety zones around the project vessels and increased vessel traffic during the construction work may potentially disrupt military exercises. The company's ambition is to conduct a dialogue with the Swedish Armed Forces.

Delimitation

Potential impacts on areas of national interest for total defence in connection with surveys and during the construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

National interest: outdoor recreation

Areas with good conditions for people to spend time in and experience nature and cultural landscapes may be identified as areas of national interest for outdoor recreation pursuant to chapter 3, section 6 of the Swedish Environmental Code. It is the responsibility of the Swedish Environmental Protection Agency and the Swedish Agency for Marine and Water Management to

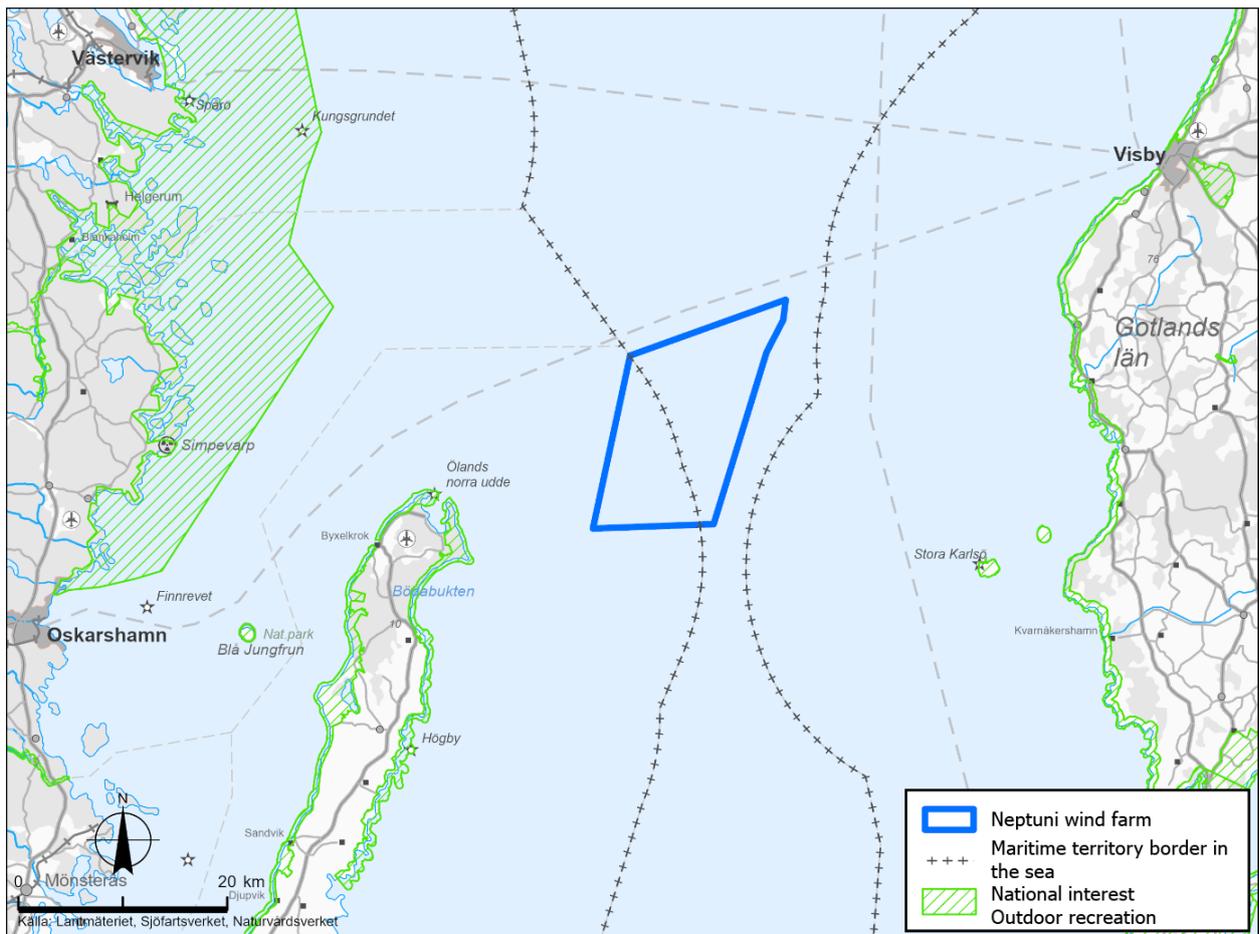


Figure 23. Areas of national interest for outdoor recreation in the vicinity of the wind farm area.

assess which areas are of national interest for outdoor recreation.

Baseline description

The wind farm does not overlap with any area of national interest for outdoor recreation. The closest area of national interest is *Norra Ölands kuster* along the eastern side of Öland and about 12 km from the wind farm area, see Figure 23. It consists of a very open cultural landscape with open grazing and mowing fields along the coast. The area is used, among other things, for hiking, mountain biking and horse riding. The landscape view is appealing and there are many opportunities for views out over the open sea (Länsstyrelsen Kalmar Län, 2005). There is also a designated area of national interest for outdoor recreation along the coast of

Gotland (FI 03 Storsudret) which is located about 26 km from the Neptuni wind farm (Länsstyrelsen Gotlands Län, 2014).

Possible effects

Activities that would damage an area of national interest for outdoor recreation are development activities within or in the immediate vicinity of the area in the form of infrastructure facilities as well as facilities that would entail disturbing noise or light, a changed landscape view or other effects that could negatively impact the experience of the area.

Delimitation

Potential impacts on areas of national interest for outdoor recreation in connection with surveys and during the construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

National interest: active outdoor recreation

Areas of national interest for tourism and active outdoor recreation are regulated in chapter 4, section 2 of the Swedish Environmental Code. Within these areas, the interests of tourism and outdoor recreation, primarily active outdoor recreation, must be given particular consideration when assessing the permissibility of development companies or other interventions in the environment. Active outdoor recreation refers to outdoor recreational activities that can be practiced with the support of the everyman's right of the freedom to roam. The Swedish Environmental Protection Agency and the Swedish Agency for Marine and Water Management are also responsible for identifying areas of national interest for active outdoor recreation.

Baseline description

Öland is designated as an area of national interest for active outdoor recreation. The part of the wind farm area that is located within Sweden's territorial waters overlaps with an area of national interest for active outdoor recreation – *Öland*. The wind farm area is also close to the area of national interest *Gotland*, see Figure 24.

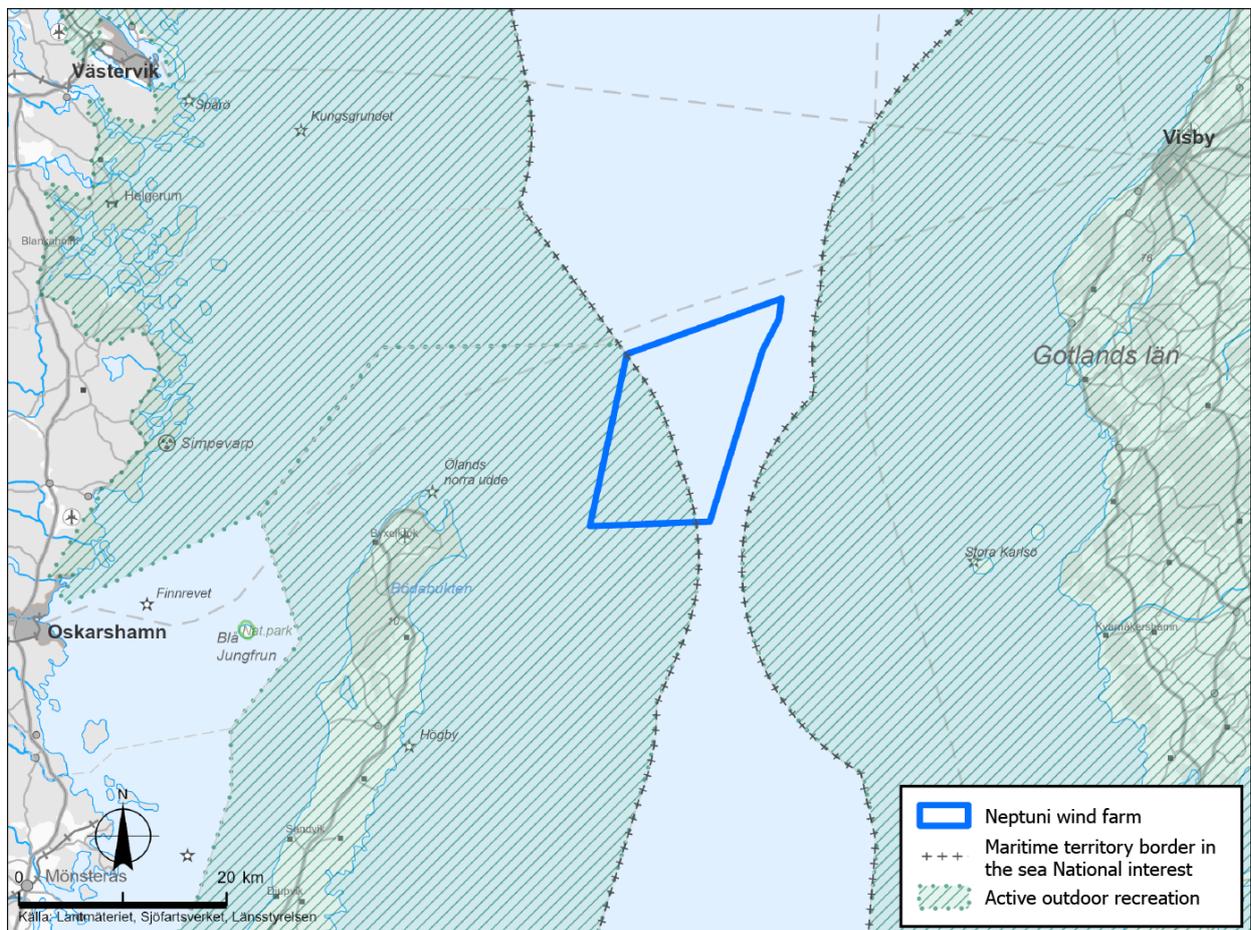


Figure 24. Areas of national interest for active outdoor recreation.

Possible effects

Potential effects consist of physical intrusion and visual impact. Survey activities, construction and de-commissioning of the wind farm may entail an increase in vessel traffic. Recreational boats and sailboats may have to change their route as a result of the establishment of the wind farm.

Delimitation

Potential impacts on areas of national interest for active outdoor recreation in connection with surveys and during the construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

National interest: unbroken and highly exploited coast

Areas of national interest for unbroken and highly exploited coast, according to chapter 4, section 3 and chapter 4, section 4 of the Swedish Environmental Code, are areas that are subject to special regulations due to their unique natural and cultural assets. Coastal and archipelago areas that are covered by unbroken coast have great conservation value and must be protected against the establishment of facilities that disturb the environment. National interest for highly exploited coast protects areas with valuable natural and cultural assets from exploitation. These areas are identified by the Swedish Agency for Marine and Water Management.

Baseline description

A large area that includes Öland and its coast, the Småland archipelago–Simpevarp and Öland, is designated as being of national interest for unbroken coast. The distance to the wind farm area is approximately 6 km. There are areas of national interest for highly exploited coast along the coast of Gotland and in the coastal area Bröms–Simpevarp approximately 26 km and 28

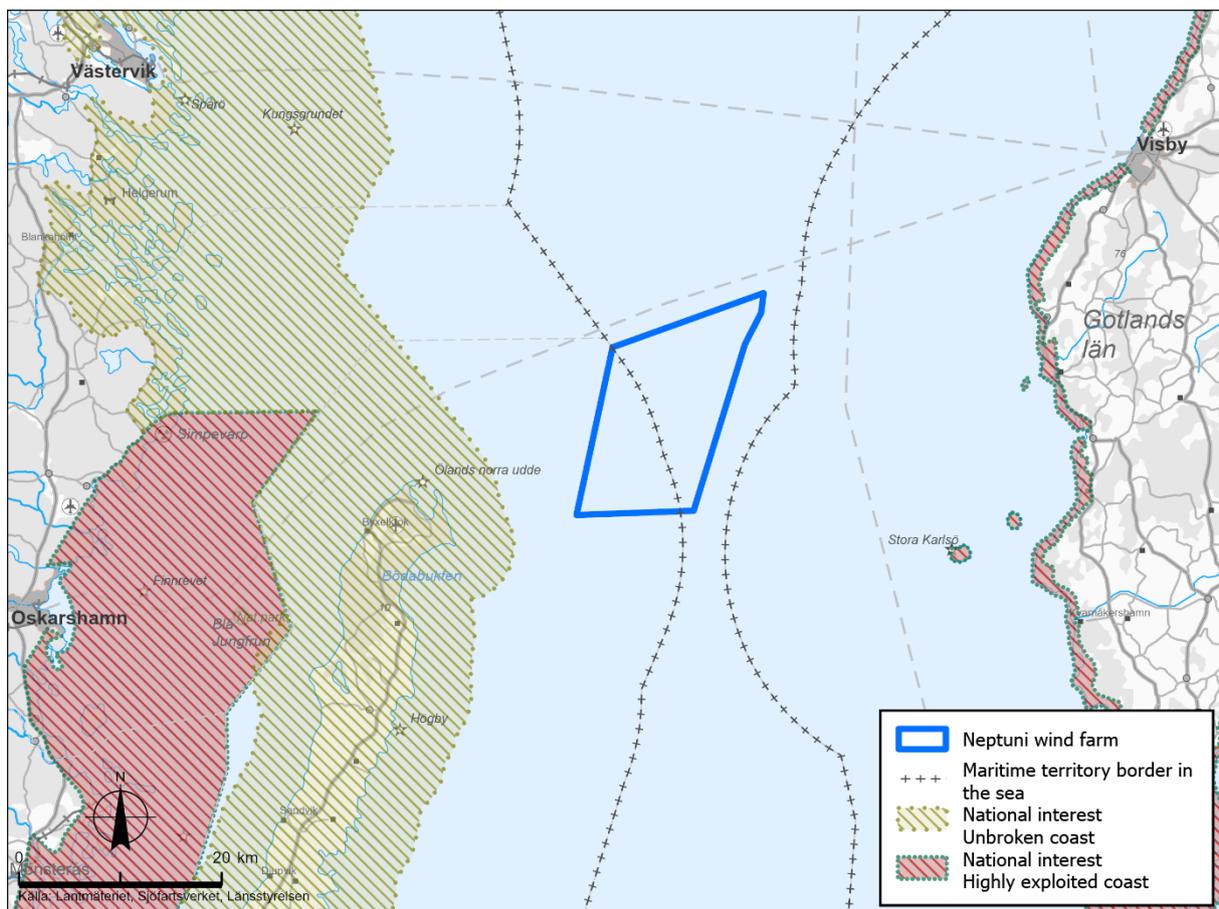


Figure 25. Areas of national interest for unbroken and highly exploited coast.

km from the wind farm area, see Figure 25.

Possible effects

No effects are predicted for areas of national interest for unbroken coast and highly exploited coast, as no physical intrusion will occur that would prevent public access to these areas and worsen the conditions for area protection.

Delimitation

Impacts on areas of national interest for unbroken and highly exploited coast will not be further investigated and assessed in the EIA.

National interest: nature conservation

Areas of national interest for nature conservation represent the main features of Swedish nature and are the most valuable areas from a national perspective. The Swedish Environmental Protection Agency is responsible for reporting areas deemed to be of national interest for nature conservation pursuant to chapter 3, section 6 of the Swedish Environmental Code (Naturvårdsverket, 2005). Areas that are of national interest for nature conservation must be protected against measures that could significantly damage the natural environment. Significant damage in this context refers to damage to assets in the natural environment that are of importance from a general point of view and that cannot be recreated or replaced if they are destroyed.

Baseline description

The closest area of national interest for nature conservation is *the water area around the northern cape of Öland*, approximately 5 km from the wind farm area, see Figure 26.

This area of national interest has a great richness of species and is valuable for, among other things, algae and as a resting and wintering area for e.g. the long-tailed duck, the velvet scoter and the red-breasted merganser. Shallows in the area are valuable spawning areas for herring and flounder.

The closest area of national interest for nature conservation on the coast of Gotland, *Karlsöarna med Ekstakusten*, is located about 26 km from the wind farm area. Assets that form the basis for the designation of national interest are bird fauna and protected landscape/sea area. *Karlsöarna* also constitutes a Natura 2000 site, see the description in section 7.18.

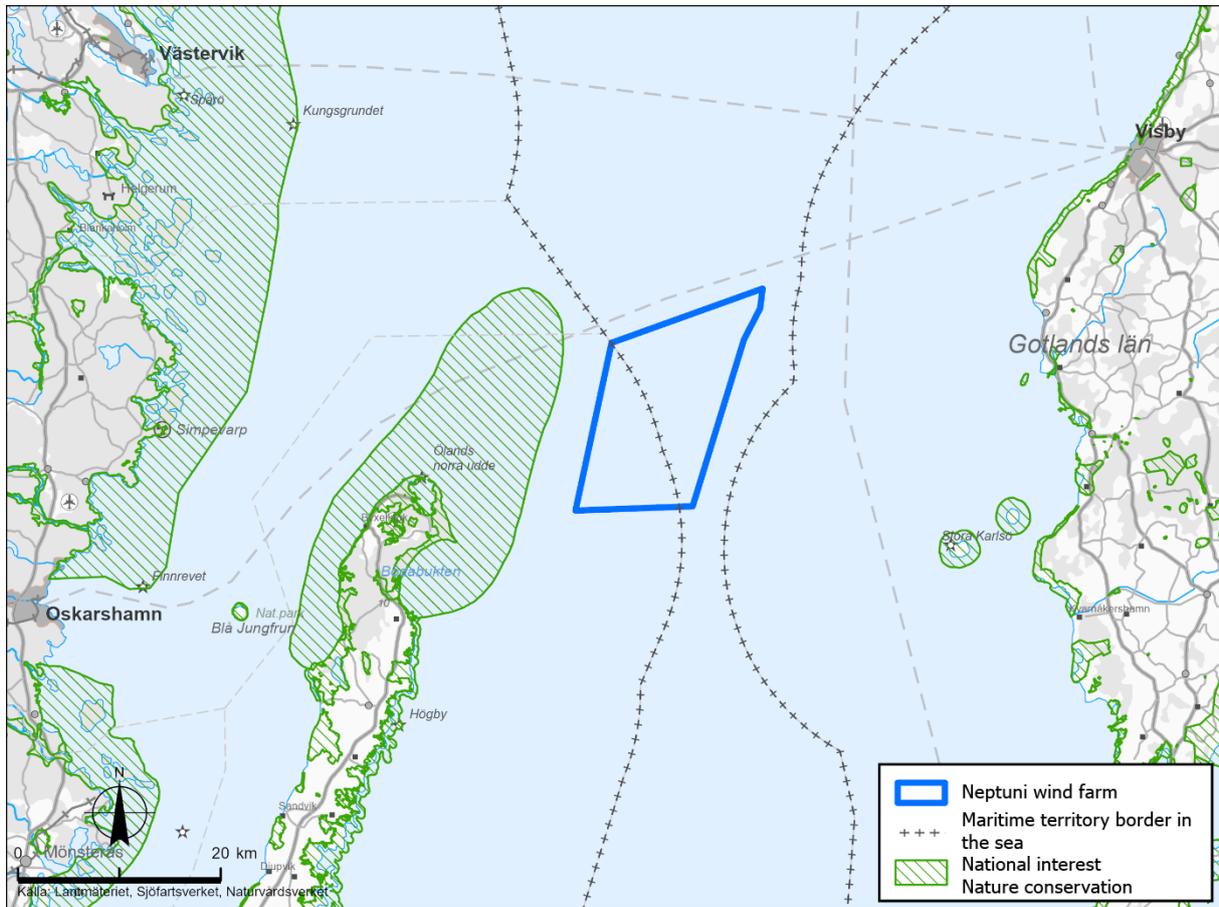


Figure 26. Areas of national interest for nature conservation.

Possible effects

Effects that may arise during the construction phase primarily consist of disturbances through increased traffic intensity and airborne noise. During the operational phase, the wind farm may constitute a potential barrier to the spread of certain species.

Delimitation

Potential impacts on areas of national interest for nature conservation in connection with surveys and during the construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

National interest: cultural environment assets

National interests for cultural environment assets, pursuant to chapter 3, section 6 of the Swedish Environmental Code, must, through their content, reflect the stages, course of events or activities that are of importance for Sweden's cultural, political, social, religious and technological development. Areas of national interest are considered as comprehensive environments and can be linked not only to material places and buildings, but also to intangible cultural environments such as traditions, language and social customs linked to a place. The Swedish

National Heritage Board is responsible for identifying areas of national interest for cultural environment assets.

There are no national interests for cultural environment assets within the wind farm area. The wind farm may be visible from the areas of national interest on Öland and Gotland. A brief description of these areas of national interest is provided below.

Baseline description

The distance to the area of national interest *Ölands norra udde [H38]* is approximately 12 km, see Figure 27. It is a transport environment from the 19th and 20th centuries that developed around the natural harbour in Grankullavik. The expression of national interest consists of ancient remains around Grankullavik with burial fields and cairns from the Iron Age, and medieval gun emplacements with clear visual connections to the bay and the Baltic Sea. The lighthouse *Långe Erik*, with associated lighthouse environment from the 19th and 20th centuries, is also part of the expression of national interest (Riksantikvarieämbetet, 2017).

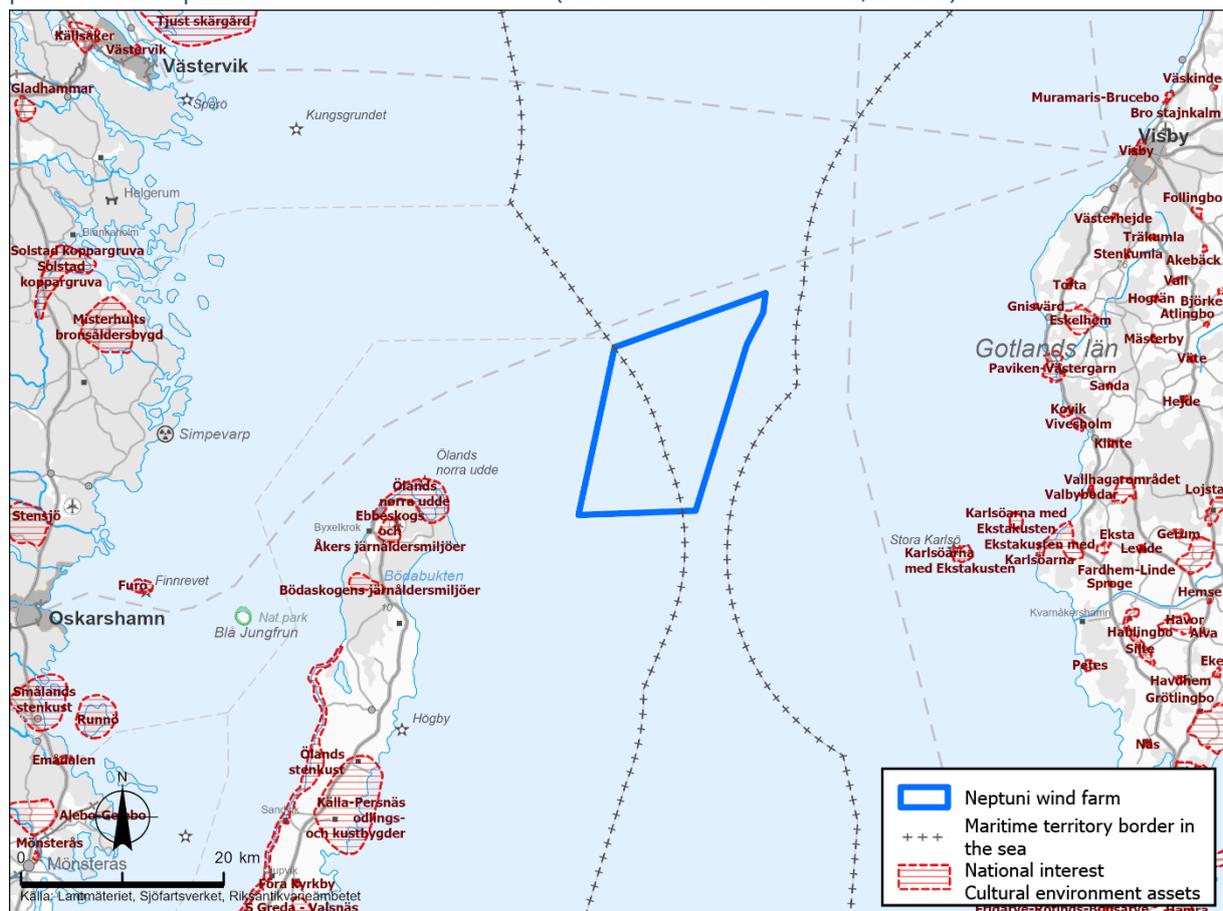


Figure 27. Areas of national interest for cultural environment assets.

Karlsöarna med Ekstakusten [I26] is located 25 km from the wind farm area. The area consists of a coastal and archipelago landscape with long settlement continuity. The expression of

national interest includes the flat coastal stretch along Ekstakusten and the fishing villages of Kronvald and Djupvik with post-and-plank boathouses and sheds (Riksantikvarieämbetet, 2024).

There is also an area of national interest for cultural environment assets on the coast of Gotland, *Paviken–Västergarn* [I23], approximately 30 km from the wind farm area. The expression of the area reflects a trading post from the Viking Age. Part of the national interest is the openness to the coast and the visual connection between Paviken to the east towards the isthmus and the protected headland (Riksantikvarieämbetet, 2024).

In addition to these, there are *Gotland fishing villages* [I60] along the coast of Gotland that have been designated as being of national interest for cultural environment assets. These are fishing villages in the Gotland tradition, often with roots in prehistoric harbour locations. The nearest fishing village from the wind farm area is located in Kovik, about 30 km from the wind farm area (Riksantikvarieämbetet, 2024).

On the mainland, the majority of cultural environments can be found along the eastern coast. Those that may be relevant to highlight are areas of national interest where the wind farm can potentially be seen from land. Given that the coast of Öland obscures most of them, it is primarily *Tjust archipelago* [H93], situated 50 km from the wind farm area, that is relevant to highlight. It is an archipelago landscape with cultural environments identified for their settlements, often of a medieval character, in the vicinity of fishing villages along the islands. The expression of national interest also consists of the boathouse that is characteristic of Tjust archipelago, with an oversized gable roof and lying at an angle to the shore, located on a stone box out in the water and with a jetty to the boathouse (Riksantikvarieämbetet, 2017).

Possible effects

The wind farm may be visible from Öland, Gotland and the mainland during the operational phase. There are no physical encroachments on areas of national interest for cultural environment assets.

Delimitation

Since the areas of national interest for cultural environment assets along the coast have extremely valuable assets, potential impacts on the landscape view will be investigated in the EIA. The visual context is primarily linked to the area of national interest *Ölands norra udde* [H38] and the area of national interest *Paviken–Västergarn* [I23] where visual contexts have been identified as part of the expression of national interest.

Nature reserves

Baseline description

There are no nature reserves in close proximity to the wind farm area. Nature reserves can be found along the mainland coast and along the northern cape of Öland and the eastern coast of

Gotland, see Figure 28. These consist of *Misterhult archipelago* on the mainland, *Bödakusten östra*, *Trollskogen* and *Vargeslätten* on Öland, and the islands *Stora Karlsö*, *Lilla Karlsö* and *Västergarns utholme* to the west of Gotland. The aforementioned nature reserves also constitute Natura 2000 sites (see section 7.18).

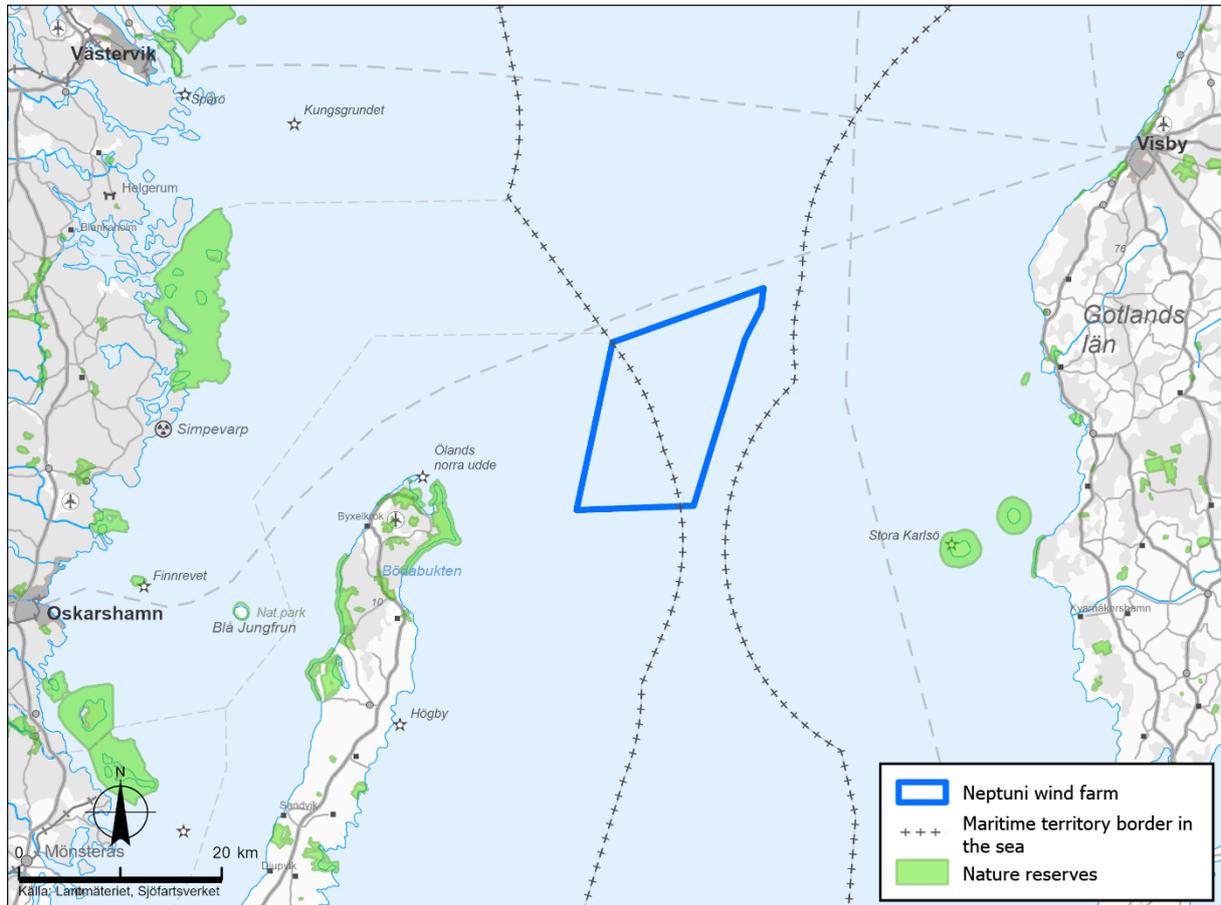


Figure 28. Nature reserves.

Possible effects

Effects that may arise during the construction phase primarily consist of disturbances through increased traffic intensity and airborne noise. During the operational phase, the wind farm may constitute a potential barrier to the spread of certain species.

Delimitation

Effects and impacts on nature reserves during the construction, operational and de-commissioning phase will be described and assessed in the EIA.

7.18 Natura 2000 sites

Natura 2000 is a network of protected areas in the EU. Natura 2000 sites are established to protect natural areas that are considered particularly worthy of protection from a European perspective. Natura 2000 sites may be designated as a protected area according to the EU Habitats Directive (SCI) and according to the EU Birds Directive (SPA).

There are no Natura 2000 sites within or in close proximity to the wind farm area. There are a number of Natura 2000 sites along the west coast of Gotland, the coast of Öland and along the mainland coast (see Figure 30). The Natura 2000 sites located closest to the wind farm area are shown in Table 2 and described below. Table 3 shows identified species and types of nature according to the Habitats Directive and the Birds Directive for each Natura 2000 site.

Baseline description

On the coast of Gotland, with the closest at a distance of 25 km from the wind farm area, there are several Natura 2000 sites, see Figure 29. The nearest Natura 2000 sites (areas within a distance of about 35 km from the wind farm area) are *Stora Karlsö* (SE0340023), *Lilla Karlsö* (SE0340025), *Västergarns utholme* (SE0340100), *Gannarreviken* (SE0340149) and *Ugnen* (SE0340018).

Stora Karlsö is one of the world's oldest nature protection areas and is located approximately 25 km from the wind farm area. The area has valuable geological, cultural-historical and biological assets. The island, with its characteristic limestone cliffs and wide grasslands, is an important location for breeding birds such as the common guillemot and the razorbill. *Stora Karlsö* partly consists of alvar lands, which is an unusual type of nature found on Gotland and Öland and in a few other places in Sweden. The island is home to a large number of red-listed species (Länsstyrelsen Gotlands Län, 2018).

Lilla Karlsö, located about 30 km from the wind farm area, is known, like *Stora Karlsö*, for its rich birdlife, and a large proportion of common guillemots and razorbills nest on the island. The island has great botanical assets and is characterised by high limestone cliffs and open grasslands. The special alvar lands can also be found on this island (Länsstyrelsen Gotlands Län, 2018).

The island of *Västergarns utholme*, located about 30 km from the wind farm area, is made up of loose soil layers consisting mainly of gravel and sand. The shore slopes steeply towards the sea, and the vegetation consists of herbaceous drylands. The island has a rich birdlife, and the species that nest here include the common shelduck, eider, common curlew and northern lapwing (Länsstyrelsen Gotlands Län, 2018).

Gannarreviken, located about 33 km from the wind farm area, consists of grazed grasslands and a rich flora and fauna associated with these and with wetlands and riparian environments.

A rich bird fauna can also be found here, and the area is an important nesting and resting place for a large number of species (Länsstyrelsen Gotlands Län, 2016).

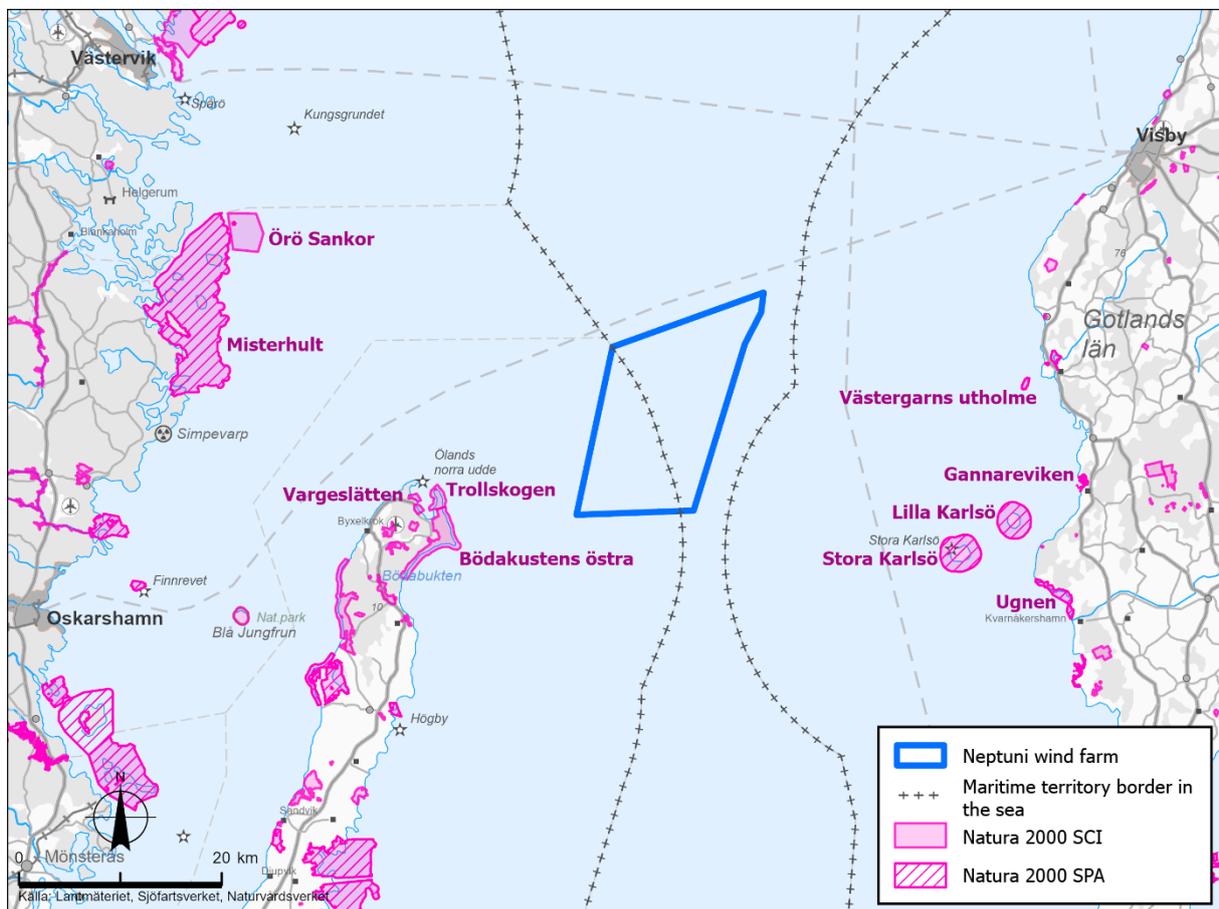


Figure 29: Natura 2000 sites

Ugnen, located about 35 km from the wind farm area, consists of sprawling grazing lands and other grasslands with rich flora and fauna. Wetlands and riparian environments can also be found here. It is an important location for birds, with nesting and resting areas for a large number of species that live in shallow sea areas and open coastal meadows (Länsstyrelsen Gotlands län, 2011).

Along the north coast of Öland, with the closest at a distance of about 12 km from the wind farm area, there are several Natura 2000 sites that have been designated pursuant to the Habitats Directive. The closest Natura 2000 sites are *Bökakustens Östra* (SE0330121), *Trollskogen* (SE0330122) and *Vargeslätten* (SE0330154).

Bökakustens Östra, located about 12 km from the wind farm area, consists of gravel and sand areas in northeastern Öland. The area consists largely of young forest and of sand dunes and

flying sand fields devoid of vegetation. Some pine forest can be found growing further in from the shore. The water area consists of sandbanks and shallow beds. The area has, among other things, been identified as a spawning area for herring and flounder (Länsstyrelsen Kalmar Län, 2016).

Trollskogen, located about 13 km from the wind farm area, is an area that has very valuable forest with partial natural forest character. The area is rich in lichens and fungi. The marine environment next to *Trollskogen* is of high value with shallow areas that form spawning and rearing areas for fish around the whole of northern Öland. The coastal area is also an important resting and wintering place for seabirds (Länsstyrelsen Kalmar Län, 2016).

The *Vargeslätten* Natura 2000 site was previously called Nabbelund and is situated on northern Öland. The area consists of wetlands, coastal meadows, swamp forests and fir-tree forests. On the northern shore there are coastal meadows and marshes of special character. The land is regularly flooded by seawater, which contributes to the growth of seashore species such as sea rush, brookweed and seaside plantain together with various marsh plants (Länsstyrelsen Kalmar län, 2016).

The closest Natura 2000 sites along the mainland coast are located about 36 km to the west of the wind farm area and consist of *Misterhult* (SE0330049) and *Örö Sankor* (SE0330159).

Misterhult, according to the conservation plan (Länsstyrelsen Kamlar Län, 2016), is made up of a very valuable and mosaic habitat complex with marine environments such as lagoons, large bays and straits and reefs. The land areas are made up of a large number of islands with nesting birds such as eiders, greylag geese, velvet scoters, oystercatchers, black-headed gulls and ruddy turnstones. The marine environment has vegetated beds that are important spawning and rearing grounds for herring, whitefish, perch and pike.

Örö Sankor (SE0330159), situated just to the east of the Natura 2000 site *Misterhult*, consists mainly of water and a smaller proportion of small islands, islets and reefs that are largely devoid of vegetation. *Örö Sankor* is a regular resting place for grey seals (Länsstyrelsen Kalmar Län, 2016).

Table 2: Natura 2000 sites.

Natura 2000 site	Area protection	Designated types of nature and species pursuant to the Habitats Directive and Birds Directive
SE0340023 Stora Karlsö	SPA, SCI	1170 - Reefs 1220 - Stony banks 1230 - Vegetated sea cliffs 6210 - Grasslands on calcareous substrates 6280 - Alvar 6410 - Moist meadows 8210 - Calcareous rocky slopes 8240 - Limestone pavements 8310 - Caves

Natura 2000 site	Area protection	Designated types of nature and species pursuant to the Habitats Directive and Birds Directive
		9020 - Northern deciduous forest 9180 - Deciduous forest on steep slopes 1014 - Narrow-mouthed whorl snail, <i>Vertigo angustior</i> 1952 - Gotland corydalis, <i>Corydalis gotlandica</i> A045 - Barnacle goose, <i>Branta leucopsis</i> A194 - Arctic tern, <i>Sterna paradisaea</i> A307 - Barred warbler, <i>Sylvia nisoria</i> A338 - Red-backed shrike, <i>Lanius collurio</i> Other species that have formed the basis for the designation: A391 - Great cormorant, <i>Phalacrocorax carbo sinensis</i>
SE0340025 Lilla Karlsö	SPA, SCI	1170 - Reefs 1220 - Stony banks 1230 - Vegetated sea cliffs 6210 - Grasslands on calcareous substrates 6410 - Moist meadows 8210 - Calcareous rocky slopes 8240 - Limestone pavements 8310 - Caves 8330 - Sea caves 1364 - Grey seal, <i>Halichoerus grypus</i> 1952 - Gotland corydalis, <i>Corydalis gotlandica</i> A045 - Barnacle goose, <i>Branta leucopsis</i> A103 - Peregrine falcon, <i>Falco peregrinus</i> A193 - Common tern, <i>Sterna hirundo</i> Other species that have formed the basis for the designation: A391 - Great cormorant, <i>Phalacrocorax carbo sinensis</i>
SE0340100 Väster-garns utholme	SPA, SCI	1220 - Stony banks 1640 - Baltic sandy beaches 2130 - Grey dunes 6210 - Grasslands on calcareous substrates 6410 - Moist meadows A045 - Barnacle goose, <i>Branta leucopsis</i> A190 - Caspian tern, <i>Sterna caspia</i> A191 - Sandwich tern, <i>Sterna sandvicensis</i> A193 - Common tern, <i>Sterna hirundo</i> A194 - Arctic tern, <i>Sterna paradisaea</i> A195 - Little tern, <i>Sterna albifrons</i> (new name <i>Sternula albifrons</i>) Other species that have formed the basis for the designation: A391 - Great cormorant, <i>Phalacrocorax carbo sinensis</i> A046 - Brant, <i>Branta bernicla</i>
SE0340149 Gannar-veviken	SPA, SCI	1170 - Reefs 1220 - Stony banks 1630 - Baltic coastal meadows 6210 - Grasslands on calcareous substrates 9010 - Taiga 9070 - Wooded pastures A045 - Barnacle goose, <i>Branta leucopsis</i> A132 - Pied avocet, <i>Recurvirostra avosetta</i> A193 - Common tern, <i>Sterna hirundo</i> A194 - Arctic tern, <i>Sterna paradisaea</i> A195 - Little tern, <i>Sterna albifrons</i> (new name <i>Sternula albifrons</i>)

Natura 2000 site	Area protection	Designated types of nature and species pursuant to the Habitats Directive and Birds Directive
SE0340018 Ugnen	SPA, SCI	1140 - Mudflats and sandflats not covered by seawater at low tide 1220 - Stony banks 1310 - Salicornia and other annuals colonising mud and sand 1630 - Baltic coastal meadows 1640 - Baltic sandy beaches 2130 - Grey dunes 3150 - Natural eutrophic lakes 6210 - Grasslands on calcareous substrates 6410 - Moist meadows 9010 - Taiga 9070 - Wooded pastures A037 - Tundra swan, <i>Cygnus columbianus bewickii</i> A038 - Whooper swan, <i>Cygnus cygnus</i> A045 - Barnacle goose, <i>Branta leucopsis</i> A132 - Pied avocet, <i>Recurvirostra avosetta</i> A193 - Common tern, <i>Sterna hirundo</i> A194 - Arctic tern, <i>Sterna paradisaea</i> A195 - Little tern, <i>Sterna albifrons</i> (new name <i>Sternula albifrons</i>)
SE0330121 Bödakustens Östra	SCI	1170 - Reefs 1220 - Stony banks 2110 - Shifting dunes 2120 - White dunes 2130 - Grey dunes 2180 - Wooded dunes 9010 - Taiga
SE0330122 Trollskogen	SCI	1160 - Large shallow inlets and bays 1170 - Reefs 1220 - Stony banks 1630 - Baltic coastal meadows 1640 - Baltic sandy beaches 6210 - Grasslands on calcareous substrates 9070 - Wooded pastures
SE0330154 Vargeslätten (formerly Nabbelund)	SCI	1160 - Large shallow inlets and bays 1630 - Baltic coastal meadows 6410 - Moist meadows 7210 - Calcareous fens 7230 - Alkaline fens 9070 - Wooded pastures 9080 - Deciduous swamp woods
SE0330049 Misterhult	SPA, SCI	1150 - Lagoons 1160 - Large shallow inlets and bays 1170 - Reefs 1620 - Baltic islets and small islands 6510 - Lowland hay meadows 6530 - Wooded meadows 7140 - Transition mires and quaking bogs 8230 - Siliceous rock with pioneer vegetation 9010 - Taiga 9070 - Wooded pastures 9160 - Oak forests rich with nutrients 9190 - Oak forests devoid of nutrients 91D0 - Bog woodland 1083 - European stag beetle, <i>Lucanus cervus</i> 1084 - Hermit beetle, <i>Osmoderma eremita</i>

Natura 2000 site	Area protection	Designated types of nature and species pursuant to the Habitats Directive and Birds Directive
		A094 - Osprey, <i>Pandion haliaetus</i> A190 - Caspian tern, <i>Sterna caspia</i> A193 - Common tern, <i>Sterna hirundo</i> A194 - Arctic tern, <i>Sterna paradisaea</i> A236 - Black woodpecker, <i>Dryocopus martius</i>
SE0330159 Öro Sankor	SCI	1170 - Reefs 1620 - Baltic islets and small islands 1364 - Grey seal, <i>Halichoerus grypus</i>

Explanation of terms

SPA – Area classified by government decision as a special protection area in accordance with the EU Birds Directive.

SCI – Area that, in the biogeographical region or regions to which it belongs, significantly contributes to maintaining or restoring a favourable conservation status for any of the habitats in Annex 1 of the EU Habitats Directive or any of the species in Annex 2 of the same directive. Areas that significantly contribute to coherent Natura 2000 sites and the maintenance of biological diversity.

Possible effects

During construction, operation, de-commissioning and in connection with certain surveys, underwater noise may arise that may affect fish and marine mammals. The assessment is that turbidity and sediment spreading that may arise in connection with work on the seabed will not reach the Natura 2000 sites. The distance to the nearest Natura 2000 site, *Bödakusten Östra*, is approximately 12 km.

For foraging and migrating birds, offshore wind farms may entail a risk of barrier effects and collision risks. Offshore wind farms may also entail a risk of birds being displaced from foraging and wintering areas. See section 7.6 on birds.

Delimitation

Impacts on Natura 2000 sites and on the protected interests in connection with surveys and during the construction, operational and de-commissioning phase will be further investigated and assessed in the EIA.

7.19 Landscape view

The proximity of the proposed wind farm to areas with valuable recreational, natural and cultural-historical assets warrants an investigation of possible effects on the landscape view. The wind farm will be visible from the coastal areas of Öland and Gotland and from the mainland. How great the visual impact will be depends, among other things, on the landscape's existing character, scale and existing infrastructure in the area.

To investigate from which locations the wind farm may be visible, a ZTV (zones of theoretical visibility) analysis is carried out. The landscape view will be investigated and assessed based on a photo montage that visualises how the wind farm might look from land. The photo points are selected based partly on valuable recreational, natural and cultural environment assets, and partly on the ZTV analysis. In addition to the photo montage, animations are also carried out at night to assess how obstruction lighting may affect the landscape view in the area.

Possible effects

The wind farm may be visible from areas up to approximately 50 km from the wind farm area depending on sight and weather conditions.

Delimitation

The wind farm may be visible from parts of the coast of Gotland and Öland and from the mainland. Impacts on the landscape view will be described and investigated in the future EIA.

7.20 Aviation

The wind farm is located approximately 43 km southwest of Visby Airport, which is owned and operated by Swedavia. All airports are surrounded by an MSA (Minimum Sector Altitude) area consisting of a circle with a radius of 55 km from the airport's radio beacon (Luftfartsverket, 2024). The MSA area constitutes an area within which there are set heights for the highest permitted objects that may be added in the area. The northeastern part of the Neptuni wind farm is located within the MSA area for Visby Airport, see Figure 30.

Possible effects

The construction of wind turbines within the MSA area may potentially affect flight procedures for Visby Airport.

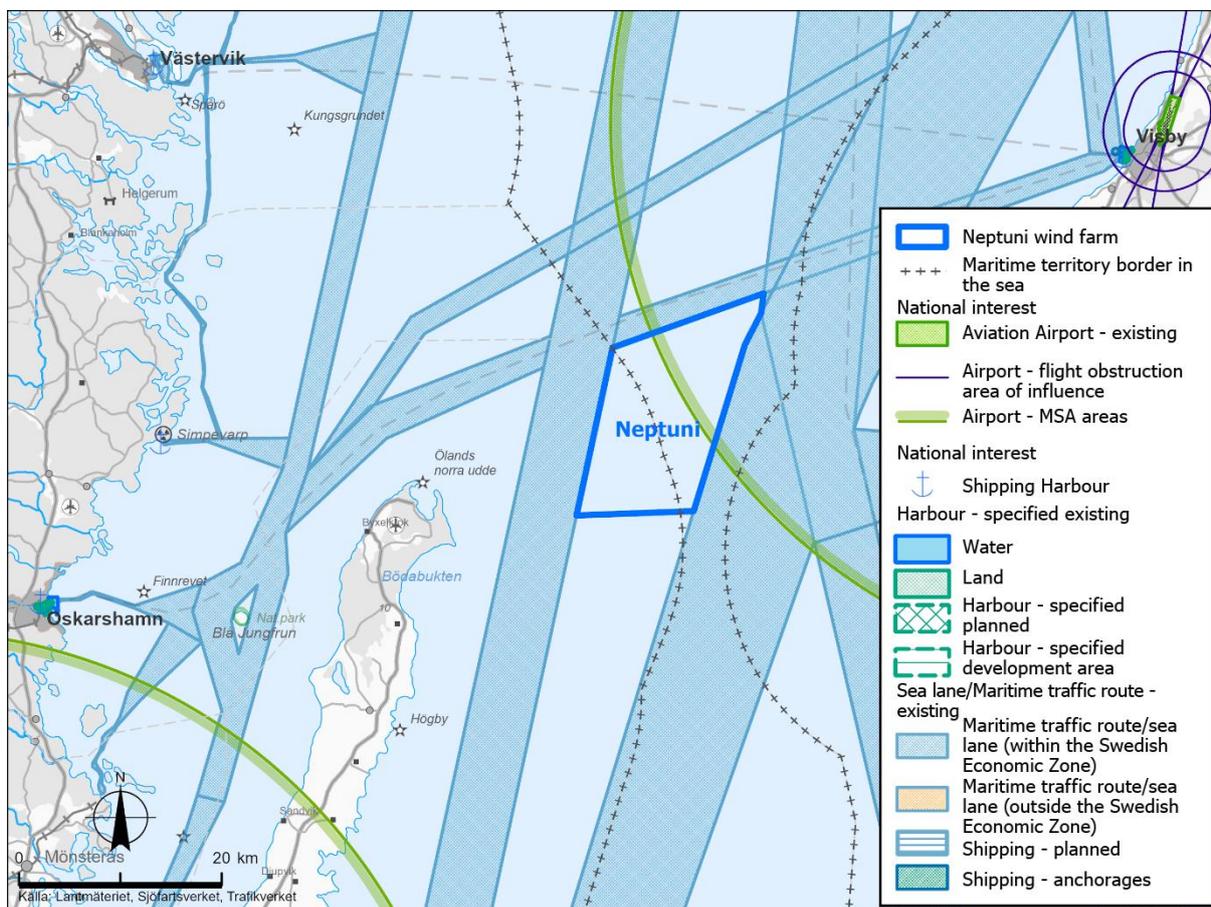


Figure 30 Airports and MSA areas.

Delimitation

Effects and impacts on aviation during the operational phase will be investigated and described in the future EIA. A flight obstruction analysis is planned for the purpose of investigating possible risks and as a basis for assessment.

7.21 Marine Environment Directive and Water Framework Directive

Marine Environment Directive

The Marine Environment Directive is the EU's common framework for the marine environment and aims to achieve or maintain a good environmental status in the seas of Europe. Marine areas from the coast to the outermost limit of the Swedish Economic Zone are covered by the directive.

The Marine Environment Directive is implemented in Swedish law through chapter 5 of the Swedish Environmental Code, the Swedish Marine Environment Ordinance (2010:1341) and the Code of Statutes of the Swedish Agency for Marine and Water Management (HVMFS 2012:18).

There are 11 descriptors in Annex 2 to HVMFS 2012:18 which include both receptors and environmental effects and are used to assess human impact on the marine ecosystems. Of these descriptors, the following are deemed relevant to investigate in relation to the wind farm in the future EIA:

- Descriptor 1, Preservation of biodiversity
- Descriptor 4, Marine food webs
- Descriptor 6, Seabed integrity
- Descriptor 7, Hydrographical conditions
- Descriptor 11, Energy including underwater noise

Water Framework Directive

The EU's Water Framework Directive specifies what EU countries must achieve as a minimum in terms of water quality and access to water. The Water Framework Directive is implemented in Swedish law, among other things, through chapter 5 of the Swedish Environmental Code and the Swedish Water Management Ordinance (2004:660). The provisions apply to groundwater and surface water (lakes, waterways, coastal waters and seawater). In order to maintain good environmental status, environmental quality standards (EQS) are used as governing legal instruments that describe the environmental goals for the body of water and when the goals must be achieved.

The wind farm area is located within *Part of the West Gotland Sea's ocean waters* (WA73889608). The body of water in question only has requirements regarding chemical status. The chemical status is good except for the widespread elevated levels of mercury and PBDE (polybrominated diphenyl ethers). These two environmental toxins are found in fish in elevated levels in almost all Swedish surface waters as a result of transboundary atmospheric deposition (VISS, 2024).

To the west of the wind farm area is the body of water *Kalmarsund's ocean waters* (WA60004545). The ecological status is classified as *Moderate* due to eutrophication and impacts from surrounding water. As the status in Sweden's coastal waters is dependent on international agreements being followed regarding a reduced nutrient load to the oceans, this body of water therefore has an exception with a deadline of 2039 to achieve EQS. The chemical status is good except for the widespread elevated levels of mercury and PBDE.

The wind farm's potential effects on EQS will be investigated and described in the future EIA.

7.22 Risks and safety

Risks arise during survey activities, construction, operation and de-commissioning of wind farms. Risks that may arise include risks relating to shipping, oil spills and emissions from the wind farm in connection with breakdowns. Risks relating to objects on the seabed, for example UXO (mines and unexploded ordnance) may also arise.

In order to identify possible risks that may arise in relation to shipping and navigational risks, a nautical risk analysis will be carried out. The risk analysis includes a traffic analysis, a risk analysis for third-party vessels during the construction and de-commissioning phase and a risk analysis for third-party vessels during the operational phase.

Prior to the construction phase, the seabed will be examined with a magnetometer to avoid possible collisions with UXO.

8. Cumulative effects

Cumulative effects may occur when several environmental effects interact. It could have to do with environmental effects that arise due to the interaction between several different activities or measures that may affect the environment within the wind farm area or in its surroundings. Relevant activities that are ongoing or for which a permit has been granted in the sea area in question will be included in the assessment. With regard to other wind farms, it is the assessment of RWE that the Kårehamn and Aurora wind farms (see section 7.14) are the wind farms that currently can and should be taken into account when assessing cumulative effects. Projects which at the time of the environmental assessment are in the consultation phase, or where the application has been submitted, will not be taken into account in relation to cumulative effects.

Potential cumulative effects from other ongoing activities, such as shipping and cables, will also be taken into account. Cumulative effects will be investigated and assessed in the future EIA.

9. Transboundary impact

Transboundary impact refers to impact that extends across national borders. The effects of planned activities during the construction, operational and de-commissioning phase mainly arise within the area of operation. Some effects, such as the spread of suspended sediment and sedimentation, underwater noise, airborne noise, the physical presence of the wind turbines which may potentially affect shipping, commercial fishing, radar, telecommunications and radio communication, air traffic and entail a visual impact, will expose the area outside the area of operation. Based on the location of the wind farm, no transboundary impact is expected to arise. This will be further investigated and assessed in the EIA.

10. Surveys and investigations

As a basis for the EIA, it is planned to carry out the following surveys and investigations:

Technical surveys

- Geophysical and geotechnical surveys of the seabed
- Sediment sampling

Field surveys

- Seabed survey of benthic flora and fauna
- Inventory of birds

Investigations

- Nautical risk analysis
- Investigation of commercial fishing
- Landscape impact and visualisation, including photo montage
- Flight obstruction analysis
- Investigation of bats
- Investigation of marine mammals
- Investigation of fish

Modelling activities

- Modelling of suspended sediment
- Modelling of spread of underwater noise
- Modelling of spread of airborne noise

11. Scope of Environmental Impact Assessment

In chapter 6, sections 35-36 of the Swedish Environmental Code it is stated what an EIA must include. The information to be included in an EIA must be of a scope and level of detail that is reasonable in the light of current knowledge and assessment methods and is necessary to provide an overall assessment of the significant environmental effects that the activity or measure is likely to entail (chapter 6, section 37 of the Swedish Environmental Code).

As a proposal and in summary, the EIA report/documentation will include the following:

1. Non-technical summary
2. Introduction
3. Background and purpose
 - The permit process
 - Consultation carried out
 - Reporting of alternatives
4. Method and delimitation
 - Assessment of effects and impacts
 - Delimitation
 - Uncertainties
5. Consultation
6. Planned operation
 - Location
 - Technical aspects including internal cable network
 - Surveys
 - Construction
 - Operation and maintenance
 - De-commissioning
7. Description of area, planning situation and protected areas
8. Baseline description, environmental impact and mitigation measures
 - Bathymetry
 - Water quality and hydrography
 - Sediments and other marine geological conditions
 - Bottom flora and fauna
 - Fish
 - Marine mammals
 - Birds
 - Bats
 - Landscape view
 - Human health, including airborne noise
 - Cultural environment
 - National interests and protected areas
 - Recreation and outdoor pursuits

- Commercial fishing
 - Shipping
 - Aviation
 - Environmental monitoring stations
 - Existing infrastructure
 - Military interests
9. Natura 2000
 10. De-commissioning
 11. Risk assessment in relation to shipping
 12. Cumulative effects
 13. Transboundary impact
 14. Follow-on activities
 15. Overall assessment
 16. Follow-up and monitoring
 17. Qualifications of EIA authors
 18. Bibliography

12. Parties for consultation

RWE proposes that the following parties should be included in the consultation process:

Authorities

Kalmar County Administrative Board
Gotland County Administrative Board
Swedish Agency for Marine and Water Management
Swedish Environmental Protection Agency
Swedish Armed Forces
National Defence Radio Establishment
Swedish Defence Research Agency (FOI)
Swedish Transport Agency
Swedish Transport Administration
Swedish Maritime Administration
Swedish Coastguard
Swedish Civil Aviation Administration
Swedish Energy Agency
Swedish Energy Markets Inspectorate
Swedish Civil Contingencies Agency
Swedish National Heritage Board
Svenska kraftnät
Swedish Board of Agriculture
Department of Aquatic Resources at the Swedish University of Agricultural Sciences (SLU)
ArtDatabanken (SLU)
Swedish Post and Telecom Authority
Swedish National Board of Housing, Building and Planning
Legal, Financial and Administrative Services Agency
Geological Survey of Sweden (SGU)
Swedish Geotechnical Institute (SGI)
SMHI
Swedish Institute for the Marine Environment
Swedish Museum of Natural History
Emergency Services Region Gotland

Municipalities and municipal bodies

Region Gotland
Borgholm Municipality
Oskarshamn Municipality
Västervik Municipality
Kalmar County Coastal Water Committee
Öland Water Council

Sveriges Fiskares Producentorganisation (SFPO)
Swedish Pelagic Federation Producer Organisation (SPFPO)
Ports of Sweden
Swedish Society for Nature Conservation
World Wide Fund for Nature (WWF)
Greenpeace Sweden
Kalmar Ornithological Society
Gotland Ornithological Society
Öland Ornithological Society
BirdLife Sweden
Swedish Anglers Association
Linnaeus University
Gotland Marine Environment Association
Northwest Gotland Water Council
Sandhamns Strand Sällskap
Swedish Sailing Association
Swedish Sea Rescue Society
Swedish Confederation of Transport Enterprises
Oskarshamn Ornithological Association
Sveriges Fiskares Producentorganisation (SFPO)
Sveriges Torskfiskares Producentorganisation
Swedish Pelagic Federation (SPF)
Swedish Shipowners' Association
Blått Centrum Gotland

Business operators

Cloudberry Offshore Wind AB
OX2 AB
Hexicon AB
Global Connect
Böda Sand Beach Resort
Visby Airport
Aida Cruises
Destination Gotland
Ports of Gotland
MSC Cruises
Polferries
Smyril Line
TUI Cruises

Organisations and associations

Swedish Shipowners' Association
Havs- och kustfiskarnas producentorganisation (HKPO)

Ports of Öland

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