CONSULTATION DOCUMENT FOR DELIMITATION CONSULTATION

CONSULTATION DOCUMENT PRIOR TO APPLICATION FOR LICENCE IN ACCORDANCE WITH CHAPTER 7(28 A) OF THE ENVIRONMENTAL CODE (NATURA 2000 LICENCE)

WIND FARM, CABLES, ETC. AT SÖDRA MIDSJÖBANKEN

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Summary

This document constitutes RWE Renewables Sweden AB’s documentation for delimitation consultation in accordance with Chapter 6(9) of the Environmental Code concerning the forthcoming application for a licence in accordance with Chapter 7(28 a) of the Environmental Code (Natura 2000 licence) for a planned wind farm with transformer stations and cables at Södra Midsjöbanken.

The investigation site for wind farm and cable corridor is shown in Figure 1.

Queries addressed in the consultation document and examined further in a forthcoming environmental impact assessment (EIA) relate to impact, effects and consequences for the Natura 2000 area as a whole, and also for the habitats and species covered by the Species and Habitats Directive, namely sublittoral sandbanks (1110) and reefs (1170), and the species harbour porpoise, long-tailed duck, common eider and black guillemot. Both direct/indirect and cumulative effects are taken into consideration.

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1 Administrative information

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2 Introduction

2.1 Background and purpose

RWE Renewables Sweden AB, formerly E.ON Wind Sweden AB (hereinafter RWE), began in 2006 to explore the options for establishing a major offshore wind farm in southern Sweden, as it was apparent that the electricity deficit would increase in the future.

Södra Midsjöbanken, Norra Midsjöbanken and Hoburgs Bank in the Baltic Sea were initially indicated as potential areas for offshore wind power. Following investigations, the company concluded that the opportunities for environmental assets and wind power to coexist were greatest at Södra Midsjöbanken.

In 2007, the company applied for and received a survey licence in accordance with the Swedish Continental Shelf Act (1966:314) (KSL), which included bed sampling, peak pressure sounding and drilling at Södra Midsjöbanken. Between Södra Midsjöbanken and the mainland, the licence covered penetrating echo sounding and extraction of bed samples. The licence was valid from 15 March 2007 to 15 March 2012 and was used between February and April 2011.

An extension to the validity of the survey licence up to and including 2018 was applied for and granted on 13 March 2012. The need for an extension was justified by the anticipated need for supplementary surveys for a wind farm at Södra Midsjöbanken in accordance with a currently dormant licence application.

On 17 February 2012, the company submitted an application for a licence in accordance with the Swedish Economic Zone Act (1992:1140) (SEZ) in order to construct and run a wind farm at Södra Midsjöbanken, and also in accordance with the Continental Shelf Act (1966:314) to lay and maintain underwater cables for heavy current and perform the requisite surveys in the continental shelf given the laying of power lines and the erection of permanent installations.

In December 2016, the authorities designated a sea area of more than 10,500 km^2 in area in the Baltic Sea as a Special Protection Area (SPA) in accordance with the Birds Directive. In December 2017, the same area was designated as a Site of Community Importance (SCI) in accordance with the Species and Habitats Directive. The marine area includes the offshore banks Hoburgs Bank, Norra Midsjöbanken and parts of Södra Midsjöbanken as well as parts of Öland's southern bed, which is a smaller offshore bank (Naturvårdsverket, utan årtal).

The government, via the Ministry of the Environment, stated in an official communication dated 14 March 2019 that RWE's application for a licence in accordance with the Swedish Economic Zone Act (1992:1140) (SEZ) to erect an offshore wind farm at Södra Midsjöbanken in the southern Baltic Sea had to be supplemented with a licence in accordance with Chapter 7(28 a) of the Environmental Code (EC) (i.e. a Natura 2000 licence).

Prior to the application for a licence in accordance with Chapter 7(28 a) of the EC, RWE is now consulting on the delimitation and contents of the forthcoming environmental impact assessment (known as a delimitation consultation in accordance with Chapter 6(9) of the EC). This document is a consultation document. No survey consultation in accordance with Chapter 6(23) of the EC will be performed because a specific environmental assessment must always be performed for an enterprise that is to be examined for a licence in accordance with Chapter 7(28 a) of the Environmental Code.

Prior to applying for a Natura 2000 licence, RWE is examining the option of potentially adjusting the location of the wind farm within an extended investigation site with a view to minimising the impact on natural assets in the area; see Figure 1. This means that a number of investigations and services are being performed between 2019 and 2020 (see also chapter 9). Surveys of seabed conditions are included in survey packages in accordance with the Continental Shelf Act, for which RWE has applied for licences:

- Survey licence 1, including geophysical (bathymetry measurement), geotechnical (bed sampling) and environmental surveys and inventory of undetonated objects.
- Survey licence 2, including geotechnical surveys (test drilling in a small number of locations, plus peak pressure sounding and vibrocore sampling survey).

The surveys above involve such limited impact on the environment within the Natura 2000 site that they do not involve requirements for a Natura 2000 licence.

The extended investigation site is situated partly within the Natura 2000 site that encompasses Hoburgs Bank and the Midsjö Banks (SE 0330308): see Figure 1 and Figure 2.

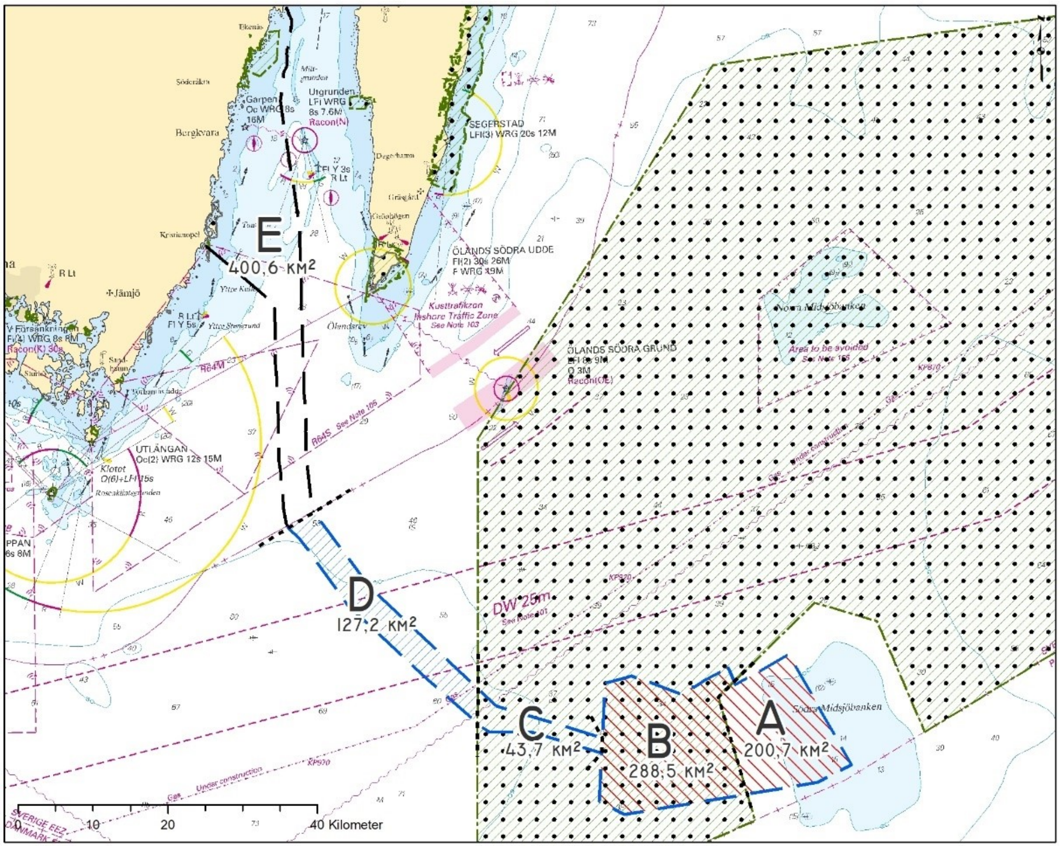


Figure 1 Investigation site for wind farm and cable corridor. The investigation site for a wind farm outside the Natura 2000 site (area A), investigation site for a wind farm within the Natura 2000 site (area B), investigation site for export cable within the Natura 2000 site (area C), investigation site for export cable outside the Natura 2000 site within the Swedish economic zone (area D) and investigation site for export cable within Swedish territorial waters (area E).

The investigation site for the wind farm is made up of areas A and B in Figure 1 (red-hatched area) and covers an area of approximately 490 km^2. Alternative locations for the wind farm are being investigated within this area. The wind farm itself will take up an area of approximately 200 km^2, which is less than half of the investigation site for the wind farm, and will be sited within this in its entirety. Depending on the final position of the wind farm, area B may also be of relevance for the decommissioning of export cables. The export cables will then continue through areas C, D and E in Figure 1 and be connected to the Swedish mainland.

The results from geotechnical and geophysical surveys of seabed conditions and foundation criteria within the investigation site, plus surveys of the area's natural assets that are performed prior to submission of the Natura 2000 application, will govern which wind farm locations are viable and appropriate within the investigation site.

2.2 Scope of the Natura 2000 licence

The forthcoming application for a Natura 2000 licence is intended to include the following:

- Survey activities
- Construction of the wind farm
- Laying of export cables
- Activities during the operating phase
- Decommissioning activities

On the preliminary level, it is thought that a Natura 2000 licence will be required for activities that are to take place within areas A, B and C in Figure 1. Within areas D and E, it is thought that there will be no activities that could potentially impact on the environment at the adjacent Natura 2000 site.

2.3 Restrictions

This consultation document for delimitation consultation constitutes part of the specific environmental assessment to be performed owing to the licence in accordance with Chapter 7(28 a) of the Environmental Code (known as a Natura 2000 licence) that is to be applied for in respect of the planned wind farm.

In the specific environmental assessment, the emphasis is on the Natura 2000 site Hoburgs Bank and the Midsjö Banks (SE 0330308) and its designated habitat types (reefs and sublittoral sandbanks) and typical species for each habitat type, plus designated species (long-tailed duck, black guillemot, common eider and harbour porpoise).

The delimitation consultation must act to ensure that the environmental impact assessment is of the scope and degree of detail necessary for the forthcoming licence review in accordance with Chapter 7(28 a) of the Environmental Code. Other environmental aspects that are not examined on the basis of the Natura 2000 provisions will be dealt with in a different stage of the process via the specific environmental assessment belonging to the licence application in accordance with the Swedish Economic Zone Act (1992:1140) and the Continental Shelf Act (1966:314) and are therefore not included in this consultation document.

3 General design of the wind farm and export cables

The planned wind farm will include up to around 120 turbines, each with an output of between 10 and 20 MW, transformer and converter stations and a number of meteorological towers (see Table 1). The electricity will be transmitted via two export cables to onshore stations in southern Sweden. It is estimated that the wind farm will produce between 6 and 8 TWh of electricity each year.

Table 1 Facts on the wind farm and export cables.

Attribute	**Dimension/quantity**
Wind farm height above sea level	≤ 295 m including rotor blades
Number of wind turbines	Up to approx. 120
Turbine housing height above sea level	Approx. 165 m
Rotor diameter	Approx. 270 m
Wind farm area	Approximately 200 km^2
Distance from land	Approx. 70 km (Öland)
Distance between individual turbines	Approx. 1400–2500 m (determined by wind direction)
Output per turbine	10–20 MW
Total installed output	Max. 1600 MW
Annual electricity production	6–8 TWh
Cables within the farm – alternating current	Max 210 km
Corridor for export cables within the Natura 2000 site	Approx. 15–40 km (length of corridor dependent on wind farm position)
Certain other facilities such as meteorological towers and platforms for transformer stations etc. will be needed.	

4 Location of the enterprise

The investigation site for the wind farm is located on and at Södra Midsjöbanken, which is a ground area situated in the middle of the south-east Baltic Sea, approximately 70 km south-east of the southern tip of Öland and approximately 90 km north-west of the northernmost coast of Poland (see Figure 2). The depth within the investigation site for the planned wind farm varies between approximately 15 and 35 metres. The depths within the investigation site for the cable corridor are greater and go down to approximately 60 metres (see Figure 3).

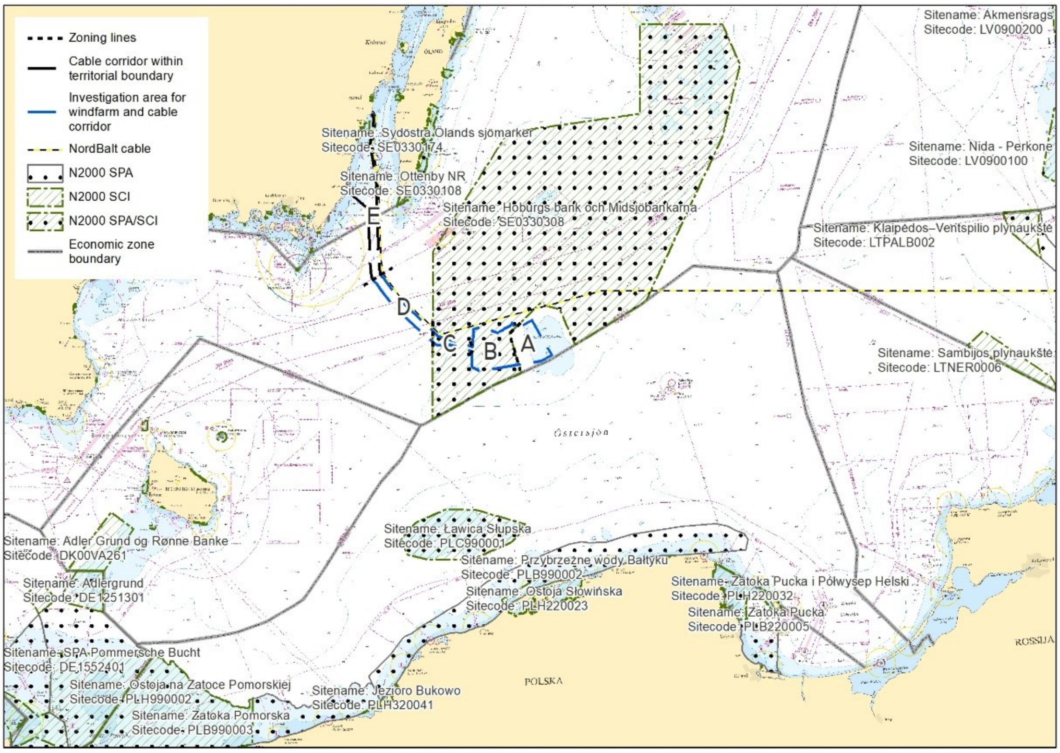


Figure 2 The green hatched areas make up the Natura 2000 site. Parts of the investigation site for the planned wind farm (areas A and B) and cable corridor (areas C–E) are located within the Natura 2000 site Hoburgs Bank and the Midsjö Banks.

The following factors have been taken into account during RWE's evaluation of an appropriate area for establishment of an offshore wind farm:

- Good wind conditions
- Limited distance to the power grid
- Sufficiently large area with limited water depth and favourable foundation conditions
- Calm wave climate and calm current conditions
- Sufficiently far away from the coast to limit visual impact and other disruptions for the general public
- Conflicts with other interests

Of the total area of the investigation site (including the area for the cable corridor), 332 km^2 is situated within the Natura 2000 site Hoburgs Bank and the Midsjö Banks (area B+C in Figure 1). The total area of the Natura 2000 site is just over 10,500 km^2. The extent to which the wind farm will be situated within the boundaries of the Natura 2000 site is dependent on its final location.

The cable corridor will link the farm site with the Swedish coast in the south-eastern part of Småland. Parts of the cable corridor are situated within the Natura 2000 site (area C in Figure 1).

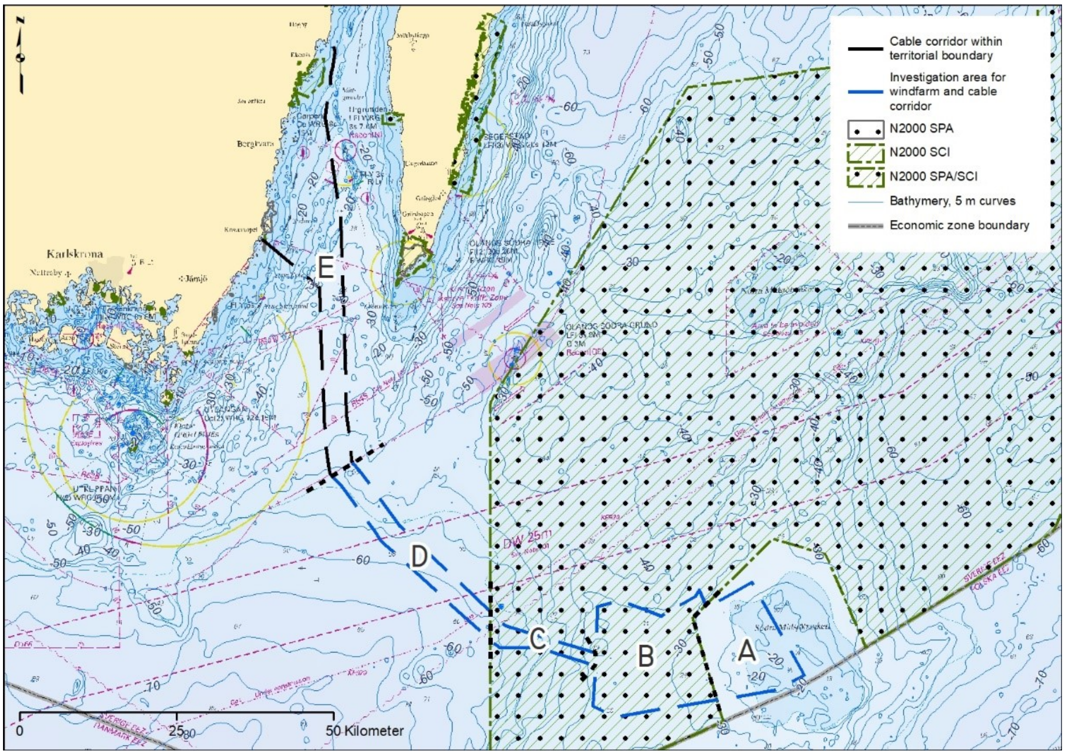


Figure 3 The depth of the sea in and around the investigation site for the wind farm and export cables. The depth within the investigation site for the planned wind farm as a whole (areas A and B) varies between approximately 15 and 35 metres. The depth at the investigation site for the wind farm outside the Natura 2000 site (at Södra Midsjöbanken, area A) varies between approximately 15 and 30 metres. The depth at the investigation site for the wind farm within the Natura 2000 site (area B) varies between 30 and 35 metres. The depth within the investigation site for the cable corridor (areas C and D) varies between approximately 35 and 60 metres.

4.1 Alternative locations

In *Havsplaner för Bottniska viken, the Baltic Sea and Västerhavet, Förslag till regeringen 2019-12-16* (Havs- och vattenmyndigheten, 2019a), Södra Midsjöbanken is indicated as an investigation site for energy recovery with regard to nature and defence interests. The two offshore banks Hoburgs Bank and Norra Midsjöbanken are prioritised for natural environment interests.

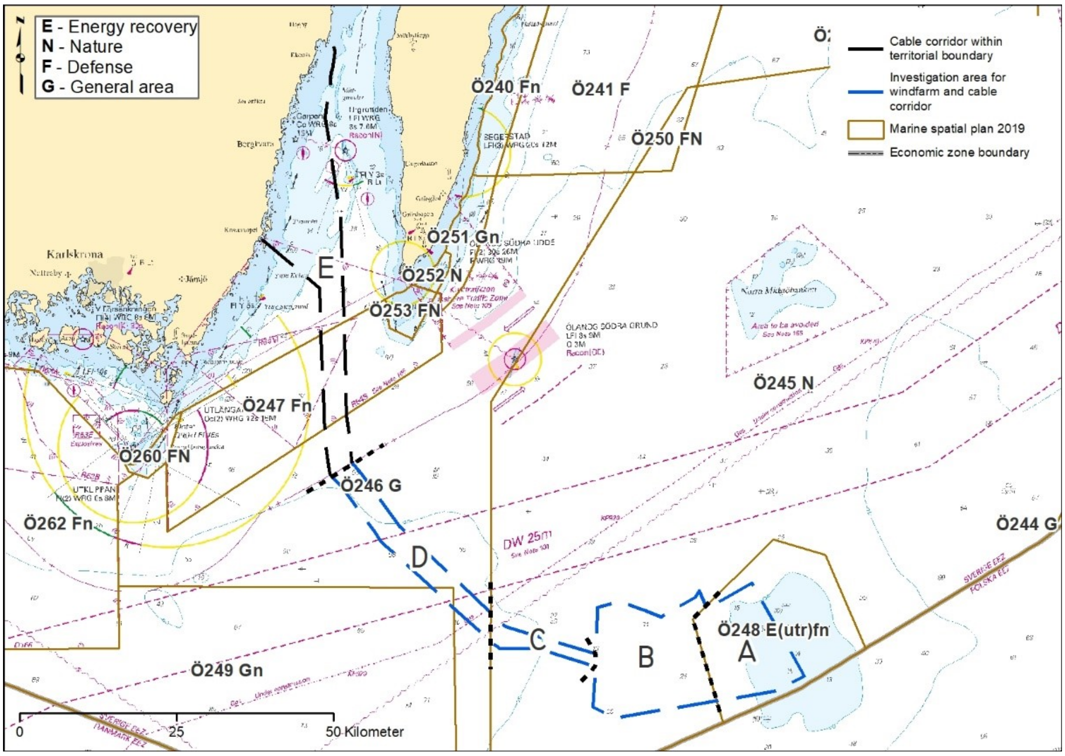


Figure 4 The investigation site and designated areas in the Swedish Agency for Marine and Water Management's proposal for s maritime plan dated December 2019 (Havs- och vattenmyndigheten, 2019a). Parts of the investigation site for the wind farm (area A) coincide with area Ö248. Letter combination 'E(utr)fn' means that the site is a designated investigation site for energy recovery, where special attention must be paid to outstanding natural assets and total defence interests.

In a consultation response relating to RWE's licence application according to the Swedish Economic Zone Act (1992:1140) and the Continental Shelf Act (1966:314), objections have been submitted from authorities, etc. against a location within the actual Södra Midsjöbanken offshore bank, stating that this location could have a potential impact on the adjacent Natura 2000 site's designated habitats and species.

RWE has therefore chosen to extend the investigation site for the wind farm to also include deeper offshore areas, primarily west of Södra Midsjöbanken (see Figure 1). Alternative locations for the wind farm within the investigation site for the wind farm, which is made up of areas A and B in Figure 1, are being investigated. This means that the wind farm may be located entirely or partly within the boundaries of the Natura 2000 site. Assessments by experts and referral bodies indicate that such a location could be preferable with regard to the wintering bird life at the Natura 2000 site, particularly long-tailed duck, which head for the actual offshore ground at depths of less than approximately 20–30 metres.

Potential locations within the investigation site, plus the alternative finally selected, will be described in a forthcoming environmental impact assessment (EIA). Alternative locations elsewhere for the wind farm will be discussed in the EIA.

4.2 The zero alternative

If RWE fails to obtain a licence according to Chapter 7(28 a) (Natura 2000 licence) and the wind farm is therefore not constructed, prevailing conditions within the investigation site will continue to develop in the manner that is to be expected given the current situation. The Natura 2000 species will frequent the site to a similar extent to the present day, and with natural dynamics.

The consequences of the zero alternative will be expanded upon in the forthcoming environmental impact assessment.

5 Description of activities

The application for a Natura 2000 licence will include construction, operation and decommissioning of a wind farm and associated export cables. This application will also include survey activities in the form of seismic and geotechnical surveys of the seabed. The survey activities are described in section 5.1.

The wind farm will include up to approximately 120 wind turbines and platforms for transformer stations and converter stations, meteorological towers and an internal cable network. These system elements, as well as the alternative foundations for foundation work and construction methods that may be of relevance, are described in section 5.2. Section 5.3 describes the laying of export cables.

Activities and measures of relevance during the operating phase and decommissioning phase are described in section 5.4 and section 5.5.

Planned survey methods, a type or types of foundation and foundation laying technique, technique for decommissioning of cables, etc. will be described in greater detail in the forthcoming environmental impact assessment.

Finally, a preliminary implementation schedule is presented in section 5.6.

5.1 Surveys

As a basis for the design of the wind farm and cable laying, data from seismic and geotechnical surveys is needed within the area for the wind farm and cable that will be covered by the Natura 2000 application.

However, RWE is working to be able to use existing seismic data produced at an earlier stage through SGU. It may be necessary to perform new seismic surveys if such data is unavailable or of insufficient quality.

Typical survey methods are described in general terms in section 5.1.1 and section 5.1.2 and expanded upon in the forthcoming environmental impact assessment. Besides these survey methods, geophysical surveys using echo sounding technology such as bathymetry measurement may be of relevance. (Bathymetry is included in one of the survey licences applied for by RWE in the winter/spring of 2020 and was not found to require a Natura 2000 licence. Further bathymetry measurements may be needed when RWE has decided upon a final area for the wind farm and cable.)

5.1.1 Seismic surveys

Seismic surveys are performed with a view to obtaining information on depth to rock, the occurrence of soil types, sediment layers, fissure zones in rock, etc. The knowledge base constitutes a starting point for selection of drilling equipment, dimensioning of wind turbine foundations and optimisation of wind farm design, for example, as well as for the placement of foundations on the basis of local geographical differences in seabed composition.

Various methods are used for seismic measurements. One thing they have in common is that they generate sonic pulses that are potentially very powerful. During a survey, sonic pulses are transmitted towards the seabed and then reflected and captured by a receiving system (see the illustration in Figure 5). The surveys are performed from a ship.

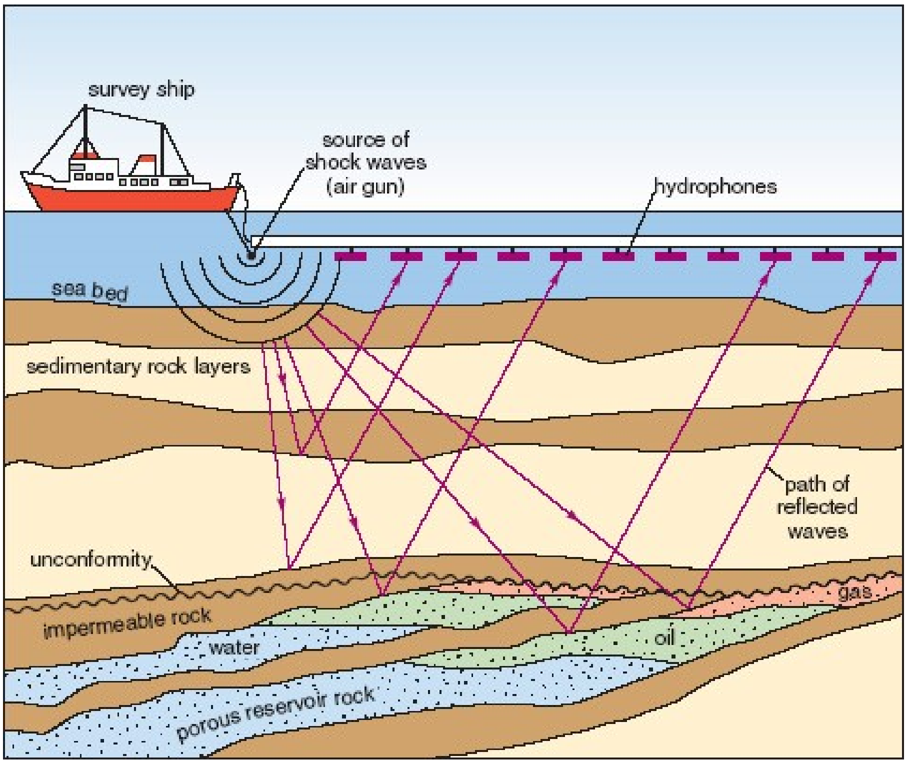


Figure 5 Illustration of a seismic survey. (Image source: http://openlearn.open.ac.uk/mod/resource/view.php?id=172129)

5.1.2 Geotechnical investigations

Drilling is normally performed at all turbine positions prior to the laying of foundations[1]. Further drilling may be required if, for example, a turbine position needs to be adjusted on account of local seabed conditions. Drilling takes place from a work platform that is moved between drilling positions by a tug. (Drilling at a *small number* of positions is included in one of the survey licences ('Survey licence 2') applied for by RWE in the winter/spring of 2020 and, on consultation prior to the application, has been found not to require a Natura 2000 licence as a consequence of the limited scope.)

The noise generated during drilling is classified as a continuous (not impulsive) noise.

Geotechnical field surveys may also be needed using the vibrocore sampling and peak pressure sounding (CPT) techniques. The information obtained from vibrocore sampling

[1] Turbine position = position of the wind turbine

provides important data prior to laying cables. The information obtained from peak pressure sounding provides important data for the selection of foundation types.

Vibrocore technology is used to extract sediment samples by vibrating a tube down into the seabed from a ship. This results in cylindrical sediment samples that retain their layer sequences. Peak pressure sounding (CPT) is used to survey the structure of the seabed and the firmness of looser soil layers. Both international and Swedish standards are available for CPT.

Vibrocore sampling and CPT give rise to either loud, impulsive loud noises or turbidity of seabed sediments and significant sediment spreading.

These survey methods in themselves involve no risk of significant impact on the environment at the Natura 2000 site (and are included in the preparatory surveys in 'Survey licence 2', which are intended to be implemented in 2020 and which were not found during consultation prior to application to require a Natura 2000 licence).

5.2 Construction of the wind farm

5.2.1 Laying foundations – possible foundation types

The foundation types that typically constitute potential alternatives for foundations for offshore wind turbines are (see the references to letters a–e in Figure 6):

- concrete gravity foundations (a)

- monopiles, dropped steel piles (b)

- suction bucket foundations (c)

- tripods (pile group) made up of three steel piles (d)

- framework placed on three or four steel piles (e)

A combination of foundations within the wind farm may be one solution.

An investigation is in progress to find out which foundation technology is most appropriate.

The option of using floating foundations – i.e. structures that are held in position by means of cables anchored to the seabed – has been dismissed as an unrealistic option because these are primarily appropriate for large depths, from 50 metres and more (BOEM, 2017; Energimyndigheten, 2017). The depth within the investigation site for the wind farm varies between approximately 15 and 35 metres.

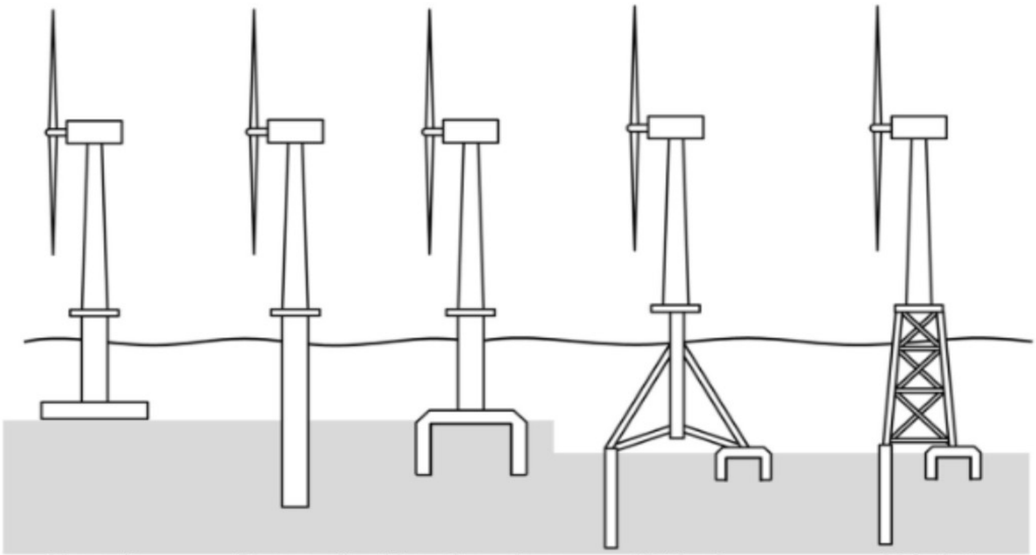


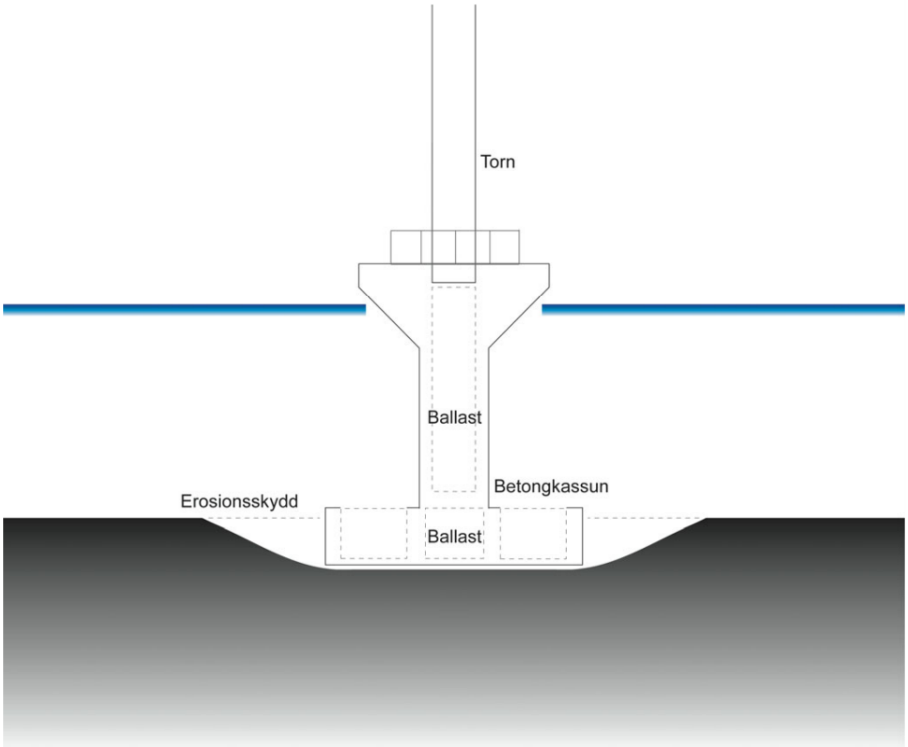
Figure 6 Foundations that typically constitute possible options for foundations for offshore wind turbines: a) gravity foundation, b) monopile, c) suction bucket foundation, d) tripod and e) framework (figur 3 i Oh et al., 2018).

Gravity foundations

Gravity foundations are made up of large concrete structures that hold the wind turbine in an upright position on account of their size and weight. Figure 7 presents a basic diagram showing the design of the gravity foundation. Cavity foundations are used, for example, at RWE's existing Kårehamn wind farm, off the island of Öland.

Laying gravity foundations requires a level seabed and is often advantageous in the case of soil types with sufficient load-bearing capacity and where the water depth is limited. Before the foundations are laid, the surface of the seabed may need to be pretreated by means of dredging and construction of a base bed (such as crushed rock). The concrete caisson is then lowered to the seabed and filled with ballast. Erosion protection (made up of gravel and rock, for example) is placed adjacent to the foundation to prevent water movements undermining the anchoring (Hammar, Andersson och Rosenberg, 2008). The towers and turbines are then fitted.

The towers and turbines will be dismantled when the wind farm has been decommissioned. The foundations will be emptied of ballast and lifted from the seabed before being transported to the mainland for recycling. All or parts of the gravity foundations may also be left in situ when the wind farm has been decommissioned if this is deemed more appropriate from a natural environment standpoint.



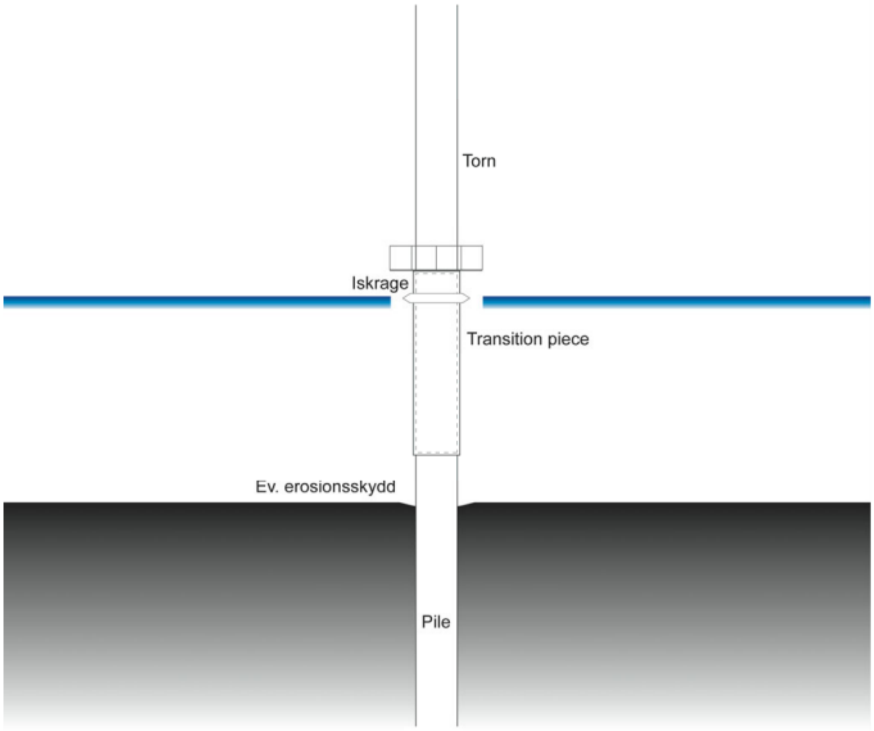
SV	EN
Torn	Tower
Ballast	Ballast
Erosionsskydd	Erosion protection
Ballast	Ballast
Betongkassun	Concrete caisson

Figure 7 Basic diagram showing a concrete gravity foundation. Not to scale. (Figure 1 in Hammar, Andersson och Rosenberg, 2008).

Monopile

Monopiles are made up of two parts: the steel pile (the 'monopile'), which is drilled or driven deep down into the seabed; and a transition piece that is mounted on the top of the pile (see the basic diagram in Figure 8). Laying steel monopiles is a tried and tested technique for offshore wind farms and is used, for example, for RWE's Arkona wind farm situated south-west of Rönne, between Sweden and Rügen in Germany.

No seabed preparation, excavation or other preparatory work is normally required for laying monopile foundations, except for removal of any boulders and equivalent. Erosion protection may need to be constructed adjacent to the foundations, but there is less need for this than with gravity foundations (Hammar, Andersson och Rosenberg, 2008).



SV	EN
Iskrage	Ice collar
Ev. erosionsskydd	Erosion protection (where applicable)
Torn	Tower
Transition piece	Transition piece
Pile	Pile

Figure 8 Basic diagram of a monopile. Not to scale. (Figure 3 in (Hammar, Andersson och Rosenberg, 2008).

Piled foundation

The traditional technique for constructing offshore wind turbines is to use what is known as pile-driving for underwater piling (Andersson *m.fl.*, 2016). Piling is carried out using a pile-driver driven by hydraulics or a diesel motor, whereby the foundations are driven down into the seabed. This method generates the loudest noise levels.

Development work is in progress on alternative methods involving less impact on the sound environment that can replace traditional pile-driving technology. The drive–drill–drive method involves piling the foundations until a certain amount of resistance is encountered. Piling is then stopped and a drill is lowered inside the monopile, which drills to a slightly smaller diameter than that monopile. Piling is then resumed after having drilled through the harder layer.

Other examples of more recent techniques that are being developed include what are known as blue piling and vibro-piling, both of which generate less noise during piling than traditional pile-driving. In the case of blue piling, a column of water inside a container is used as a pile-driver. The column of water is accelerated by means of gas combustion, which introduces an initial impact on the pile while the column of water is raised at the same time. The second impact comes when the column of water returns to its previous position. Fibro piling involves vibrating the pile down into the seabed rather than pile-driving it (Andersson *m.fl.*, 2016). This technique can be used in combination with traditional pile-driving, requiring fewer impacts per pile.

When the wind farm is decommissioned, the monopile foundation will be sawn off a couple of metres beneath the surface of the seabed. Parts of the foundation under the seabed may therefore be left in situ.

Tripod and framework

A tripod is a group of piles consisting of three piles connected by means of a prefabricated steel structure, or else a concrete structure cast in situ (see the basic diagram in Figure 9). The foundations are narrower but have more legs on which to ‘stand’, unlike the classic foundation (‘monopile’), which is made up of just one pile.

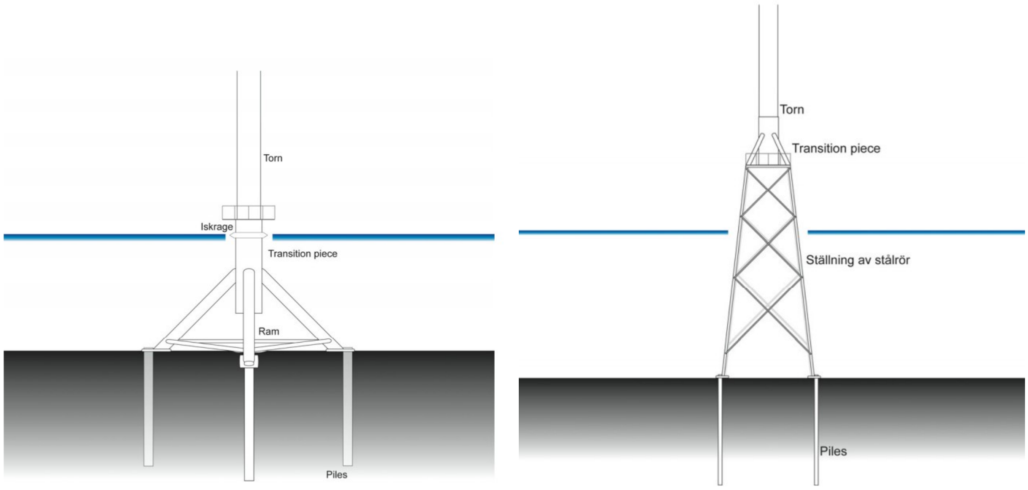
Framework foundations are made up of the network structure made up of steel tubing (see Figure 9). Like tripods, these are secured to the seabed by means of three or four piles. Framework structures are frequently used in the oil and gas industry.

Tripod foundations and foundations based on a framework structure are appropriate for deeper waters, compared with gravity foundations and monopiles (Hammar, Andersson och Rosenberg, 2008).

Since the piles used for tripod and framework foundations are narrower than monopiles, less impact strength is required during pile-driving and there is less noise at source compared with monopiles. Furthermore, there is a smaller area transmitting the noise out into the water. Less time is required for pile-driving in total, however, because tripod and framework foundations have three or four pile legs that have to be anchored to the seabed.

As stated for monopiles, no seabed preparation, excavation or other preparatory work is normally required for laying piled foundations, except for removal of any boulders and equivalent. Compared with monopiles, larger amounts of erosion protection may be needed when laying foundations using tripods and framework structures on account of the many ‘legs’.

When the wind farm is decommissioned, the pile legs of the foundation will be sawn off beneath the seabed. The remaining parts of the pile legs beneath the seabed will be left in situ.



SV	EN
Torn	Tower
Iskrage	Ice collar
Transition piece	Transition piece
Ram	Frame
Tom	Empty
Transition piece	Transition piece
Ställning av stålrör	Positioning of steel tubes
Piles	Piles

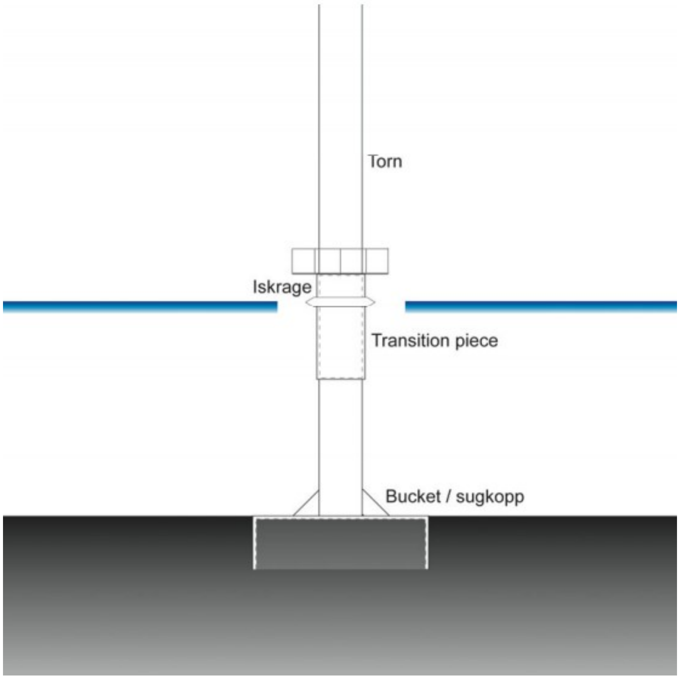
Figure 9 Basic diagram showing a tripod (left) and framework (right). Not to scale. (Figures 4 and 5 in (Hammar, Andersson och Rosenberg, 2008).

Suction bucket

Suction bucket is a foundation laying technique that is being developed and is illustrated in Figure 10. This foundation laying method is most appropriate on homogeneous sandy beds and is less appropriate for seabeds with rocky elements.

During the construction stage, the foundations are transported to the site by ship and lowered to the seabed. The foundation, which is made up of a hollow caisson, is then anchored in position on the seabed means of negative pressure. This negative pressure is created by extracting the water from the water-filled space so that the structure sinks down into the sediment and is held there. The towers and turbines are then fitted.

The towers and turbines will be dismantled when the wind farm is decommissioned. The foundation in its entirety can then be removed (BOEM, 2017).



SV	EN
Torn	Tower
Iskrage	Ice collar
Transition piece	Transition piece
Bucket/sugkopp	Bucket/suction cup

Figure 10 Basic diagram of a suction bucket foundation. Not to scale (Figure 6 in (Hammar, Andersson och Rosenberg, 2008).

General environmental impact – foundations

- **Utilisation of seabed area**: Gravity foundations and suction bucket foundations take up the most space. Monopile and tripod/framework structures take up less space.
- **Noise from construction activities:** Driving of monopile foundations makes the loudest noise, and the noise is inherently impulsive. Tripods and frameworks involve less noise. Alternative piling techniques may involve both less noise and less impulse noise. Gravity foundations and suction bucket foundations typically involve no impulse noise.

- **Turbidity and sediment spreading** may occur during any dredging for gravity foundations and drilling. The extent of any turbidity and sediment spreading is dependent on the composition of the seabed material.

5.2.2 Wind turbines

Installation of up to approximately 120 wind turbines is planned on the wind farm site. The highest point of the wind turbines – including the rotor – will be up to 295 metres above the surface of the sea. See the basic diagram in Figure 11.

Towers, turbines and rotor blades will probably be mounted on the foundations out at sea on account of the size of the wind turbines. The construction elements will then be transported by boat to the wind farm site. Towers and turbines will be installed on the foundations using a crane ship, jack-up ship or similar.

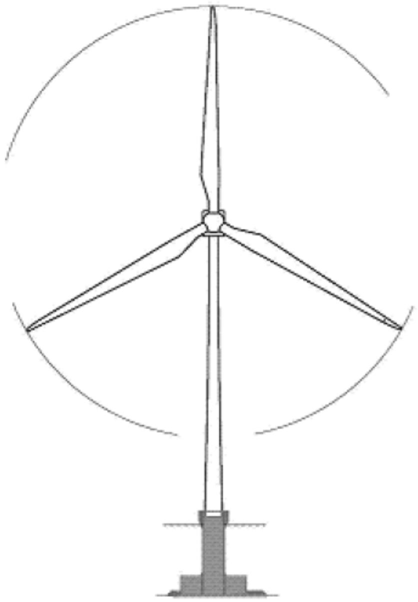


Figure 11 Wind turbine, basic diagram. The wind turbine is made up of a foundation, a tower with turbine housing and a rotor.

5.2.3 Other facilities

Besides the wind turbines themselves, meteorological towers and platforms for transformer stations and any converter stations will also be constructed on the wind farm site.

Transformer stations collect together the electricity produced by the wind turbines and transform its voltage. Converter stations (HVDC – High Voltage Direct Current – stations) convert alternating current generated by the wind farm to a high-voltage direct current, which has lower energy losses when transmitted over long distances.

One of the platforms may be equipped with a helicopter pad and accommodation module for personnel who are to operate and maintain the wind turbines and transformers.

5.2.4 Construction of an internal cable network

Cables connecting the individual wind turbines are referred to as the internal cable network. The length of the internal cable network is shown in Table 1. The cables will be laid by means of jetting or ploughing/excavation to a depth of approximately 1 to 2 metres beneath the seabed in order to protect them from external influences and damage caused by fishing equipment, anchors and ice. Alternatively, if the seabed conditions do not allow excavation, smaller stone fractions can be used to anchor the cable in position. Methods and assessment of general environmental impact are the same as for export cables and are described in section 5.3.

A method will be selected when the location of the wind farm has been established on the basis of information on seabed conditions within the site in question.

5.3 Laying of export cables

Two export cables (probably direct current cables) will be laid from the wind farm to the mainland of Sweden. The cables will be laid at a depth of approximately 1 to 2 metres down into the seabed sediment in order to protect them from external influences and damage caused by fishing equipment and anchors, for example. The cables will be ploughed/excavated or jetted into position. Alternatively, if the seabed conditions do not allow excavation, they will be anchored on the seabed using rocks. The methods and general environmental impact are described below.

Cables are laid in or on the seabed from special cable ships, and this work will not necessarily generate loud noise levels, depending on the technique used (CEDA, 2011).

Jetting

Jetting of cables is possible in areas where the near-surface sediments are made up of sand. Jetting involves expelling water through a number of nozzles at high pressure and ‘fluidising’ the material at the seabed (water and seabed material are mixed). Jetting takes place beneath the cable and down to a specified depth. The cable sinks down through the mix of water and seabed material on account of its own weight. A ditch will be formed during the jetting operation. The size of this is dependent on what material the seabed is made up of, thereby determining how soft the seabed is. A relatively narrow ditch can be created by adjusting the pressure of the water in the nozzles even when the seabed is very soft. The ditch is filled automatically over time as currents in the water refill the channel.

The extent of turbidity and the spread of sediments from the seabed are dependent on the composition of the seabed material. A seabed with a lot of clay causes more turbidity than a coarse-grained sandy seabed. The seabed is only affected temporarily and within a limited area when jetting cables. In theory, seabed work may also cause minor releases of nutrients and contaminants in the form of particulates from the sediment.

Ploughing/excavation

If the seabed sediments are hard, a channel in which the cable is placed is ploughed or dug. These methods are tried and tested on land and have also been developed for conditions at sea.

The method involves temporarily disturbing the seabed within a limited area. The turbidity of the water and the spread of sediments in connection with this work are very limited.

Anchoring on the seabed

If the cable is to be anchored on top of the seabed, it is submerged from the ship together with some form of anchoring material (such as rock).

The method involves temporarily disturbing the seabed within a limited area.

5.4 The operating phase

The system elements of the wind farm will be inspected and maintained regularly during the operating phase. The large number of wind turbines and other items of equipment means that inspection of the wind farm will be ongoing continuously throughout its entire service life. The personnel who will be responsible for this may be accommodated in an accommodation section on one of the platforms, in a separate accommodation module or on a ship. Personnel will be transported to and from the area by ship or possibly by helicopter.

It is thought that the following elements will be of potential significance to the environment within the Natura 2000 site during the operating phase:

- shipping operations linked with operation and maintenance
- helicopter operations, where applicable
- underwater noise and vibration from the wind turbines, where applicable
- risk of habitat loss due to use of the surface of the seabed for foundations and cables. Foundations of gravity and suction bucket type take up the most space.
- new structures in the marine environment (foundations and any erosion protection) form substrates for growth of organisms (the reef effect)

5.5 Decommissioning

The final phase of the project, after the service life of the wind farms, involves decommissioning the wind farm. Any underground parts of foundations are normally left in place, possibly after filling any cavities. Parts of foundations on the seabed may possibly be left in place if this is deemed more appropriate with natural environmental assets in mind. It is also conceivable that foundations will be left in place in their entirety and used for a new set of wind turbines.

Cables can be either collected or left in place to be reused by a new generation of wind turbines constructed on the site, for example.

It is thought that the relevant elements of potential significance to the environment within the Natura 2000 site during the decommissioning phase will be as follows:

- Shipping and helicopter operations when removing the wind turbines. The towers, turbines and rotor blades, including all other equipment such as transformer stations, will be dismantled and transported back to land.
- Noise linked with the removal of foundations. If steel foundations have been used for the foundation work, these will be cut off just beneath the seabed and transported back to land. If concrete gravity foundations have been used, these will be emptied of ballast and transported back to land.
- Spreading of sediment when taking up cables, where applicable.

It may be noted that decommissioning will take place along way into the future, and some development of the technology that could be applied during the decommissioning phase can be expected. The environmental impact assessment will provide general information on the decommissioning phase.

5.6 Planned implementation time

Surveys: approx. 1–2 years

Construction of the wind farm: approx. 2–3 years

Operation: 30 years or more

Decommissioning: approx. 1–2 years

The planned implementation time is preliminary and may be altered for practical reasons.

6 Criteria on site

This section focuses on the criteria within and in the area surrounding investigation sites A–C in Figure 1. The criteria within and in the area surrounding investigation sites D and E in Figure 1 are described only in general terms because planned operations within areas D and E are not deemed to involve any impact on the nearby Natura 2000 site.

6.1 The Natura 2000 site Hoburgs Bank and the Midsjö Banks

The investigation site is located partly within the Natura 2000 site Hoburgs Bank and the Midsjö Banks (SE0330308) (see areas B and C in Figure 2).

The government decided on 14 December 2016 that Hoburgs Bank and the Midsjö Banks would be proposed to the EU Commission as a new Natura 2000 site in accordance with both the Species and Habitats Directive and the Bird Directive (SPA/SCI). This decision meant that the existing Natura 2000 sites Hoburgs Bank and Norra Midsjöbanken were extended to form a cohesive area covering 10,512 km^2.

The Natura 2000 site is in a central location in the Baltic Proper and includes the sea areas around the actual offshore banks Hoburgs Bank, Norra Midsjöbanken and parts of Södra Midsjöbanken. (However, most of Södra Midsjöbanken is not included in the Natura 2000 site.) It also includes parts of Öland's southern bed, which is a minor offshore bank. The offshore banks are made up of a mosaic of shallow sandbanks and reefs. The site also includes deep areas with sedimentation beds located between the banks (Naturvårdsverket, utan årtal). The banks are important feeding and nursery grounds for fish and sea birds, and together they constitute the most important wintering area in the Baltic Sea for long-tailed duck, as well as the core area for the Baltic population of harbour porpoise (Naturvårdsverket, utan årtal).

The Natura 2000 site has been designated with regard to the wintering of the bird species long-tailed duck (species code A064) and black guillemot (species code A202), resting common eider (species code A063), and also taking into account the significance of the area for harbour porpoise (species code 1351) with a certain amount of seasonal variation (see Table 2). The site also includes two habitats worthy of protection: reefs (habitat code 1170) and sublittoral sandbanks (habitat code 1110) (see Table 3). Species and habitats worthy of protection are described in greater detail in sections 6.1.2 - 6.1.7.

Table 2 Habitats according to the Species and Habitats Directive, the conservation of which is included in the purpose of the site.

Area code	Designation	Total area (ha)	Habitat (code)	Area (ha)	Description
SE 0330308	Hoburgs Bank and the Midsjö Banks	1,051,111.3	1110	220000	Sublittoral sandbanks
			1170	20000	Reefs

Table 3 Species according to the Species and Habitats Directive and the Birds Directive, the conservation of which is included in the purpose of the site.

Area code	Designation	Species code	Species
SE 0330308	Hoburgs Bank and the Midsjö Banks	1351	Harbour porpoise (*Phocoena phocoena*)
		A064	Long-tailed duck (*Clangula hyemalis*) wintering
		A063	Common eider (*Somateria mollissima*) resting
		A202	Black guillemot (*Cepphus grylle*) wintering

6.1.1 Conservation plan

There is currently no conservation plan for the Natura 2000 site Hoburgs Bank and the Midsjö Banks (SE 0330308).

There is a conservation plan dating back to 2005 that was produced for what was then the Natura 2000 site Hoburgs Bank (SE 0340144) (Länsstyrelsen Gotland, 2005). The conservation plan – which is no longer valid due to the fact that the Natura 2000 site has been replaced by and will be included in the new Natura 2000 site Hoburgs Bank and the Midsjö Banks (SE 0330308) – states that the site was protected with regard to the habitats sublittoral sandbanks and reefs, and also for the species long-tailed duck, common eider and black guillemot.

The identified threats for the former Natura 2000 site Hoburgs Bank (SE 0340144) were the same for both the habitats and the species worthy of protection; these are listed in Table 4.

Table 4 Identified threats from the conservation plan for the former Natura 2000 site Hoburgs Bank (SE 0340144).

Threat no.	Threat profile	Abbreviated explanation
1	Intervention	No physical encroachments that may alter habitats or processes of significance to habitat assets are permitted in the area.
2	Eutrophication	Eutrophication is threatening to appreciably alter the ecosystems in the Baltic Sea and therefore also in the area.
3	Trawl damage	Trawl fishing involves a risk of dragging and moving boulders on the seabed, leading to physical damage to the habitat in the area.
4	Fishing	There is no legislation limiting the removal of fish at Hoburgs Bank.
5	By-catches	Fishing in the area means that there is a major risk of by-catches of sea birds.
6	Introduction of new plants and animals	Bringing foreign species into the Baltic Sea deliberately or accidentally may cause significant damage to existing ecosystems.
7	Disappearance of host species/prey	If long-tailed duck numbers decline or if the species disappears from Hoburgs Bank, this will potentially have a major impact on the ecosystem. Since long-tailed duck consume large quantities of blue mussels, major reductions in the number of long-tailed duck may appreciably alter the Hoburgs Bank ecosystem.
8	Oil leaks	If an oil leak were to occur at Hoburgs Bank in winter, there is a major risk of killing hundreds of thousands of wintering birds. If the oil sinks, there is also a risk of serious damage to habitats.
9	Disruption from sea lanes	Regular traffic on sea lanes passing the east part of Hoburgs Bank cause physical erosion of the seabed environment at the shallow parts of the bank and threaten to disturb the birds while they search for food. There is a major risk of the water being contaminated by a ship emitting pollutants or oil.
10	Environmental toxins	Society's enormous use of chemicals poses a threat to the Baltic Sea environment and therefore also within this area.

6.1.2 Harbour porpoise

Harbour porpoise from the Belt Sea population and the Baltic population are present in the area. The Baltic population of harbour porpoise is estimated to include approximately 500 individuals and is deemed to be Critically Endangered (CR) according to the 2020 National Red List. This species receives protection via the EU's Species and Habitats Directive, annexes II and IV, and is a protected species.

The SAMBAH project (SAMBAH stands 'Static Acoustic Monitoring of the Baltic Sea Harbour Porpoise'), which ran between 2010 and 2015 and involved all EU countries surrounding the Baltic Sea, aimed to increase awareness of the status of the harbour porpoise in the Baltic Sea, with the objective of preserving the harbour porpoise population in the Baltic Sea (SAMBAH, 2016). The results of the project show that between May and October, most of the Baltic population can be found in the area south of Gotland and east of Öland, around Norra Midsjöbanken and Södra Midsjöbanken, plus Hoburgs Bank (Figure 12). The results indicate that this area is used for calving and mating and is crucial to the continued survival of the population (Carlström och Carlén, 2016). In Swedish waters, harbour porpoise mate between July and August (SLU, utan årtal).

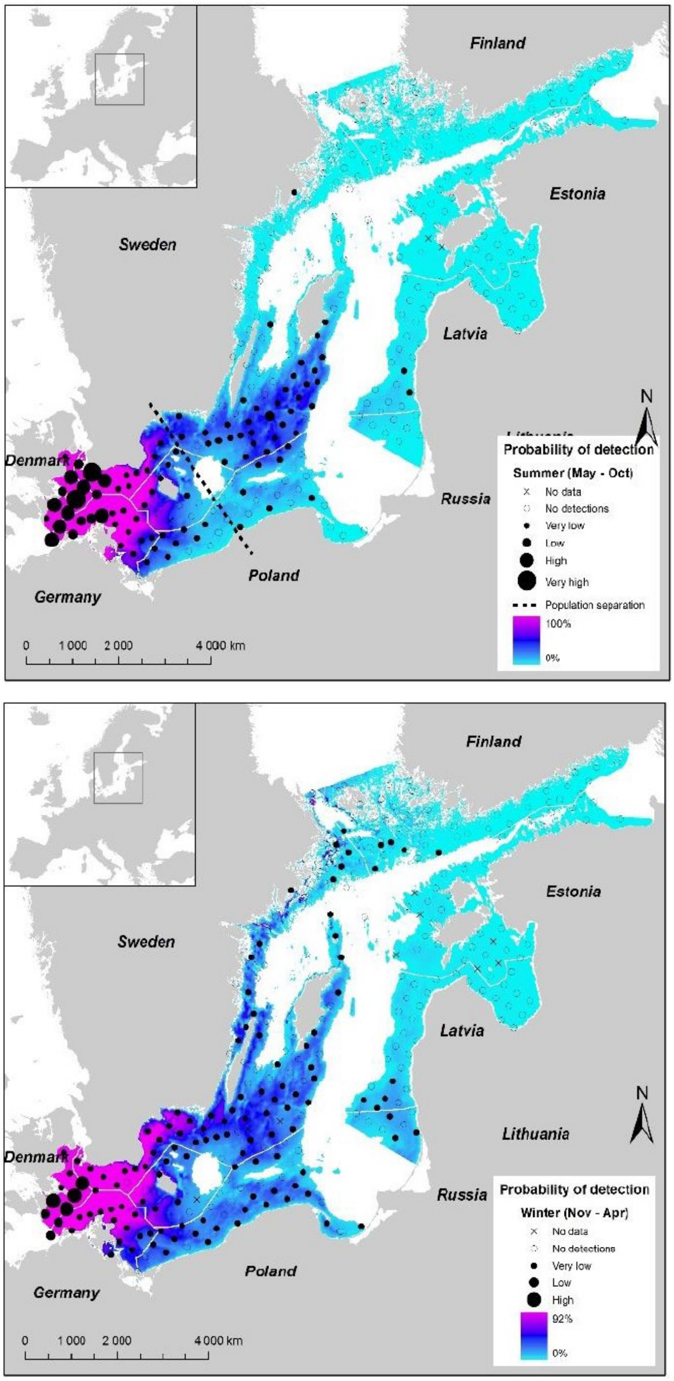


Figure 12 Harbour porpoise numbers in the Baltic Sea between May and October (top) and November and April (bottom). The figures are taken from the final report for the SAMBAH project, page 6 (SAMBAH, 2016).

Harbour porpoise use acoustic signals to locate their prey (primarily oily fish such as herring, sprat, smaller cods and hagfish) and for communication with conspecifics. Good, sensitive hearing is therefore important for the lives of harbour porpoise. The hearing range of the harbour porpoise covers the frequencies 0.20–180 kHz as a minimum (Southall *m.fl.*, 2007). They emit high-frequency clicking noises at frequencies between 115 kHz and 130 kHz (SLU, utan årtal).

Harbour porpoise are sensitive to underwater noise. In particular, activities that generate loud sonic pulses may be harmful to harbour porpoise.

A 2016 report compiled by Vindval[2] presented an extensive review of the state of scientific knowledge on harbour porpoise and how they are affected by underwater noise. The report describes how the noise level at which harbour porpoise voice indicate that they are being disturbed by impulsive noises (sudden loud noises) is 140 dB re 1 μPa^{2}s SEL_{single} [3](Andersson *m.fl.*, 2016). In general, harbour porpoise react to this noise by demonstrating avoidance behaviour. In the case of impulsive underwater noises above 164 dB re 1 μPa^{2}s SEL_{single}, there is a risk of temporary hearing damage to harbour porpoise, and above 179 dB re 1 μPa^{2}s SEL_{single} there is a risk of them suffering permanent hearing damage (Andersson *m.fl.*, 2016).

According to Southall *m.fl.*, (2019a), in respect of impulsive underwater noises, there is a risk of temporary hearing damage to harbour porpoise at an exposure level of 140 dB re. 1 μPa^{2}s (SEL, weighted value) when the exposure level is weighted in order to take into account the hearing range of harbour porpoise, and that 196 dB re. 1 μPa (Peak SPL[4], unweighted value). Permanent hearing damage may be caused at a noise exposure level of 155 dB re. 1 μPa^{2}s (SEL, weighted value), or 202 dB re. 1 μPa (Peak SPL, unweighted value). In the case of weighted values, the threshold value is weighted with regard to high frequencies, which harbour porpoise perceive best.

6.1.3 Long-tailed duck

Population development and status
Most of the individuals in the Northern European/Western Siberian population of long-tailed duck spend the winter in the Baltic Sea. The Gulf of Riga and the Irbe Strait, the Gulf of Pomerania and offshore banks such as Hoburgs Bank, Norra Midsjöbanken, Södra Midsjöbanken and Slupsk bank are important areas for wintering and resting (see Figure 13). Large numbers of long-tailed duck also spend the winter along the East Coast of Gotland. Long-tailed duck in smaller densities are found along other parts of the coastal areas in the Baltic Sea. Along the coast of Sweden, long-tailed duck can be found in the area from Falsterbo in the south to Finngrunden in Gävle Bay in the north (see Figure 14, samt Nilsson, 2016).

[2] Vindval is a research programme looking at the impact of wind power on humans, nature and the environment. This programme is a partnership between the Swedish Energy Agency and the Swedish Environmental Protection Agency.
[3] SEL_{single} stands for Sound Exposure Level, indicated as a single pulse.
[4] Peak SPL stands for Peak Sound Pressure Level.

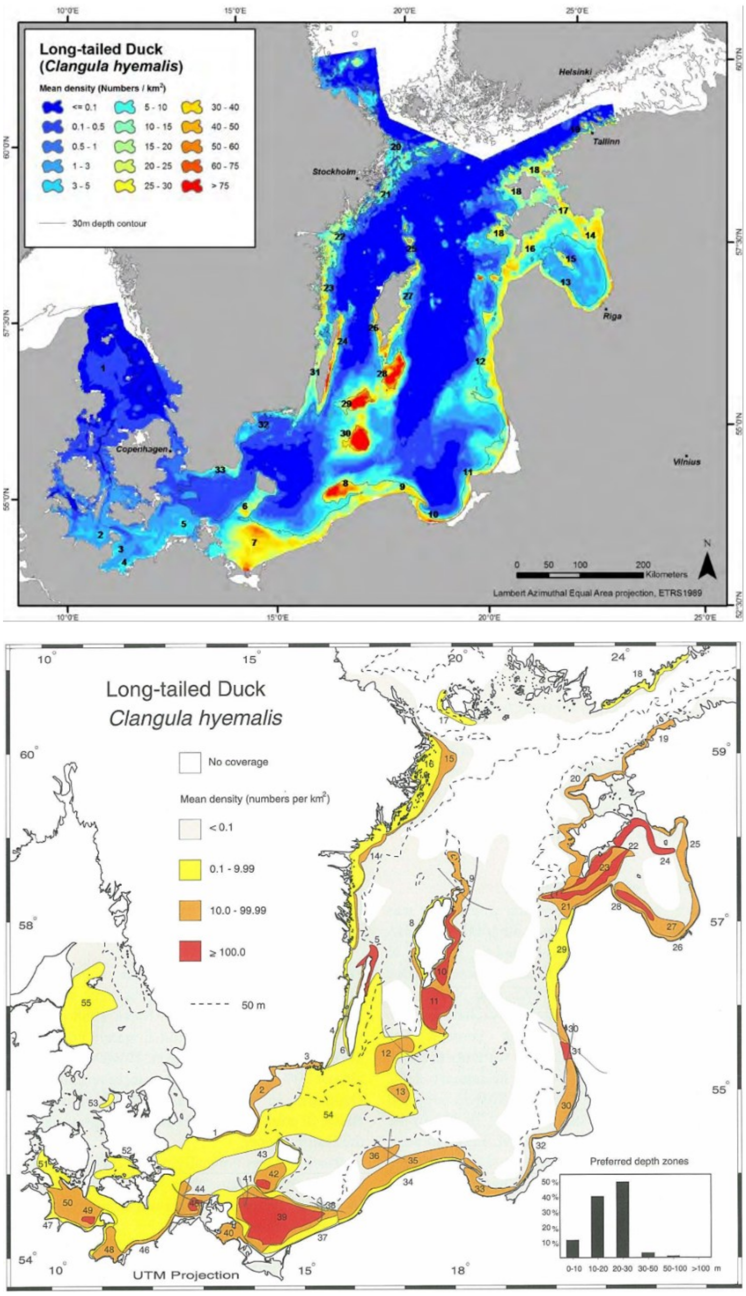


Figure 13 Comparison of long-tailed duck wintering areas between 2007 and 2009 (top) (Skov *m.fl.*, 2011) *and 1992 and 1994 (bottom)* (Durinck *m.fl.*, 1994). *Red areas indicate the highest densities.*

Inventories of numbers of wintering long-tailed duck have been compiled since the 1970s, and in three major, comprehensive, international inventory is in the Baltic Sea region for 1992–1993, 2007–2009 and 2016. The wintering long-tailed duck population in the Baltic Sea is estimated to have declined from over 4 million individuals to just under 1.5 million between 1992/1993 and 2009 (see Table 5) (Skov *m.fl.*, 2011; Nilsson, 2016). In Swedish waters, the number of wintering long-tailed duck has declined from 1.4 million in the 1992/1993 inventories to 436,000 individuals in 2009. At the time of the latest Baltic Sea inventory in 2016, the long-tailed duck population in Swedish waters was estimated at approximately 370,000 individuals. As things stand at present, it is unclear whether the difference between 2009 and 2016 (436,000 and 370,000 individuals respectively) indicates a further population decline or is due to the fact that long-tailed duck have altered their winter distribution (Nilsson, 2016). The downward trend in numbers of wintering long-tailed duck is also observed at Norra Midsjöbanken and Södra Midsjöbanken (see Table 6).

Preliminary data from bird inventories carried out using aircraft and boats under the auspices of RWE within the investigation site in question in February 2020 indicates a large number (approximately 76,000) of long-tailed duck observed at Södra Midsjöbanken. The last time so many long-tailed duck were observed during an inventory at Södra Midsjöbanken was in 2010 (see Table 6).

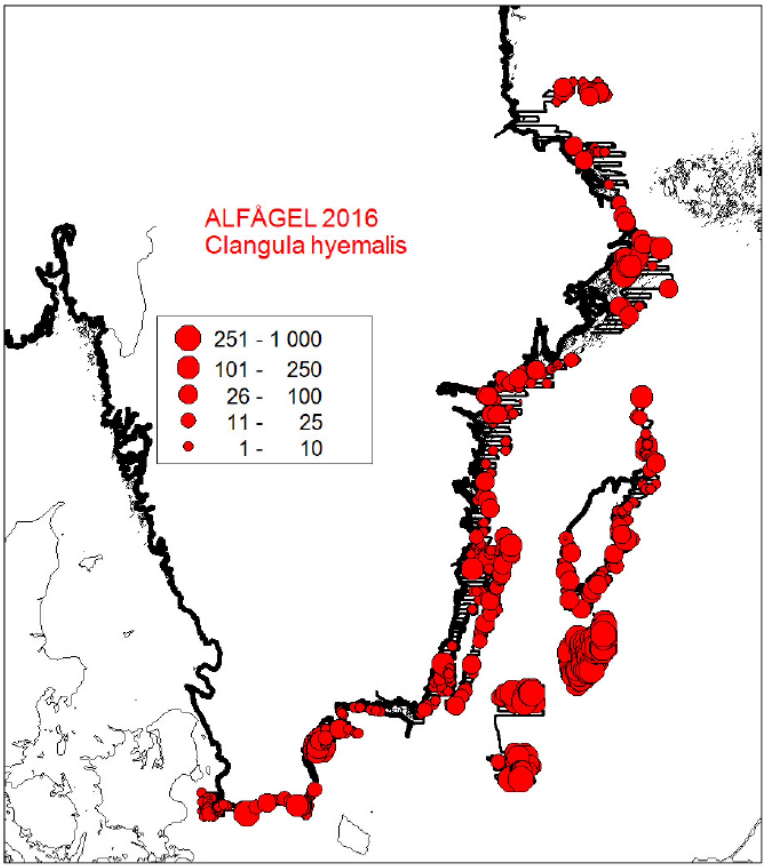
Table 5 Estimated number of wintering long-tailed duck in the Baltic Sea (table from (Nilsson, 2016).

Area	1970-74	1992-93	2007	2009	2010	2011	2016
Falsterbo + S Öresund		500		1600	2800	1200	900
Scania south coast	10000	800		1700		2000	4300
Scania southeast		200		100		300	400
Hanö Bight	25000	17000	23000	17000		7100	7200
Blekinge archipelago	1600	1100	300	100		100	200
Kalmarsund		12000	23000	11000	11500	2500	5800
Öland east coast	40000	10000	19000	26000		39000	9100
Ölands northern banks	60000	30000	11000	5000	7200	22400	3500
Midsjö banks		81000		213000	206000	85000	87200
Hoburgs bank		925000		90000	426000	280000	173000
Gotland east coast	400000	270000		11000	15100	15700	11800
Gotska sandön + northern banks	20000	10000			13500	14500	3900
Gotlands west coast)		23000		2000		2000	6700
Kalmar archipelago (N Kalmarsund)	10000	12000		14000	2700	Ice	1600
Österg archipelago	1000	3500		8800	3200	Ice	6100
Sörml. archiepalo	4000	4000		4100	12000	Ice	2400
Stockholm archipelago	24000	18000		26100		Ice	37000
Uppland Northern coast				3700		Ice	2600
Gävle Bight				600		Ice	5800
Total		1418100		435800	700000	471800	369500

SV	EN
Area	Area
Falsterbo + S Öresund	Falsterbo + S Öresund
Scania south coast	Scania south coast
Scania southeast	Scania south-east
Hanö Bight	Hanö Bight
Blekinge archipelago	Blekinge archipelago
Kalmarsund	Kalmarsund
Öland east coast	Öland east coast
Ölands northern banks	Öland's northern banks
Midsjö banks	Midsjö banks
Hoburgs bank	Hoburgs Bank
Gotland east coast	Gotland east coast
Gotska sandön + northern banks	Gotska sandön + northern banks
Gotlands west coast)	Gotland's west coast
Kalmar archipelago (N Kalmarsund)	Kalmar archipelago (N Kalmarsund)
Österg archipelago	Österg archipelago
Sörml. archiepalo	Sörml. archipelago
Stockholm archipelago	Stockholm archipelago
Uppland Northern coast	Uppland Northern coast
Gävle Bight	Gävle Bight
Total	Total

Table 6 Estimated number of wintering long-tailed duck at the Midsjö Banks, based on air inventories between 2009 and 2016 (from (Nilsson, 2016).

Numbers of long-tailed duck per inventory date	09-03-03	10-03-16	11-03-07	11-03-29	11-04-20	16-02-24
Norra Midsjöbanken	76000	74000	63000	37000	67000	56700
Södra Midsjöbanken	137000	132000	22000	7500	16500	34500
Total for the Midsjö Banks	213000	206000	85000	44500	83500	91200



SV	EN
ALFÅGEL 2016	**LONG-TAILED DUCK 2016**
Clangula hyemalis	**Clangula hyemalis**

Figure 14 The distribution of long-tailed duck along the coast of Sweden in 2016. Long-tailed duck occur from Falsterbo in the south to Finngrunden in Gävle Bay in the north (figure from (Nilsson, 2016)*, page 165).*

The reasons for the decline in population are not entirely understood, but they are probably ascribed to a combination of factors. By-catches during fishing, oil pollution, hunting and a reduction in the quality of areas in which the birds search for food are considered likely causes (Hearn, Harrison och Cranswick, 2015; Nilsson, 2016). In Swedish waters, the greater population decline has been seen in the area east of Gotland and at Hoburgs Bank (see Figure 13), which according to Nilsson (2016) provides a strong indication that diffuse oil spills east of Gotland may be an important explanatory factor.

Given the strong decline since 1992/1993, the wintering populations of long-tailed duck is classified as Endangered (EN) in the National Red List (2020). It is also classified as Endangered (EN) in the HELCOM Red List (HELCOM, 2013).

6.1.4 Black guillemot

Population development and status

The black guillemot belongs to the auk family and is a marine species with a northerly and almost circumpolar[5] distribution. In Sweden, black guillemot nest solely along the coasts, and almost without exception on island (Länsstyrelsen Gotland, 2005). The species *Cepphus. g. grylle* is endemic in the Baltic Sea. The eastern Atlantic species *C. g. arcticus* nests along the west coast (Larsson och Skov, 2005).

The most important prey species in the Baltic Sea is the benthic fish eelpout (*Zoarces viviparus*). Black guillemot also eat crustaceans and mussels on the offshore banks (Larsson and Skov, 2005) and can dive to seabeds 10–30 metres deep. Inventories performed between 1987 and 2001 indicate high black guillemot densities in areas with depths of between 12 and 20 metres at Norra Midsjöbanken (Larsson och Skov, 2005). The choice of food means that black guillemot are more a coastal-bound species than common guillemot and razorbill, which live primarily on pelagic fish.

The Baltic population of black guillemot spends the winter in the southern and central parts of the Baltic Sea (see Figure 11). According to (Durinck *m.fl.*, 1994), black guillemot our more coastal-bound than other auks. Adult individuals are more likely to spend the winter in ice-free waters nearer to their nesting areas, while young birds remain further out. The birds are forced to move to ice-free areas during cold winters with widespread ice; and at that time the offshore banks are important wintering sites.

The Baltic population of black guillemot has been estimated at just under 20,000 nesting pairs, with a declining population trend (Larsson, 2016) (see also Figure 10). The primary threats are predation from mink, oil spills, by-catches in fishing nets and changes in the composition of fish stocks. Black guillemot are protected according to Article 4 of the Species Protection Regulation (2007:845) and are classified as Near Threatened (NT) in the National Red List (2020).

[5] Circumpolar = the species has a more or less continuous distribution area around the North Pole.

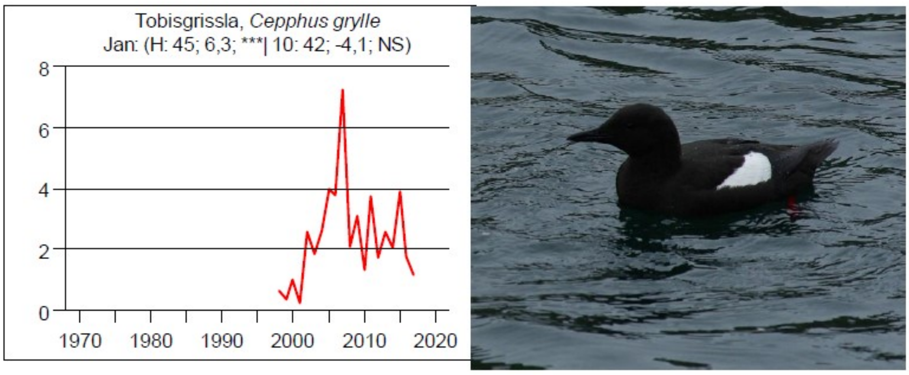


Figure 15 Results for the 2016/2017 Swedish sea bird inventory for black guillemot (from (Haas och Nilsson, 2017).

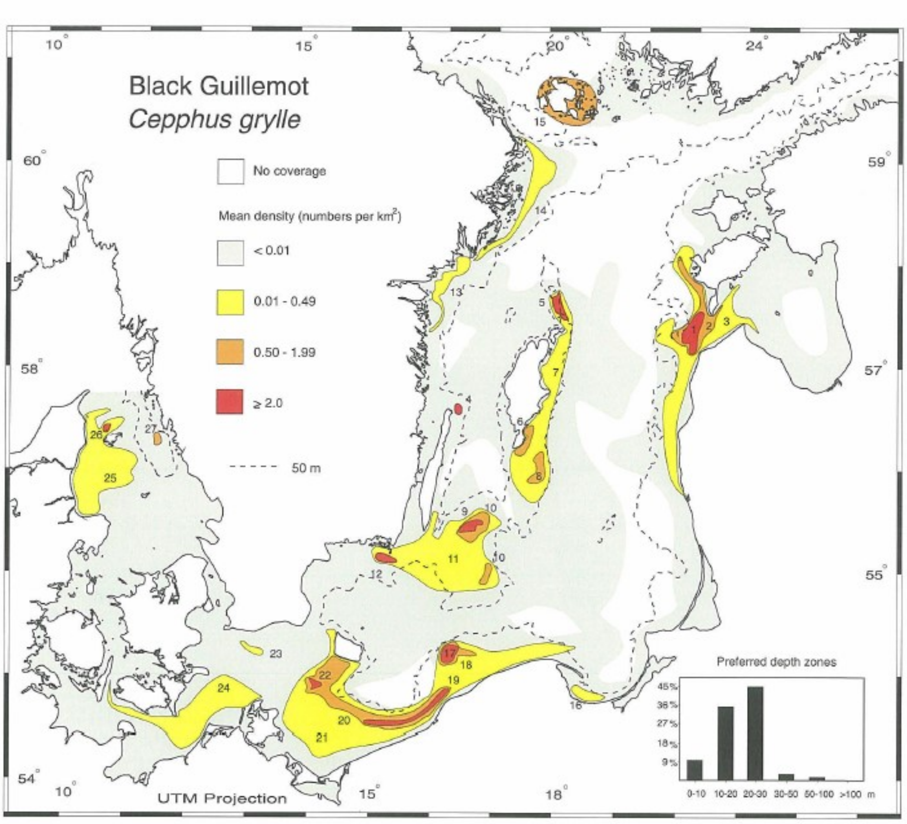


Figure 16 Figure from (Durinck m.fl., 1994). The most important wintering areas for the Baltic population of black guillemot (based on the results from inventories between 1988 and 1993). The histogram shows the proportion of birds observed at different depths during the inventories. The most important wintering areas are the area from Rönne, south of Bornholm, and eastwards towards Slupsk bank and the Gulf of Pomerania, the Irbe Strait, the Midsjö Banks and the area east of Gotland, including Hoburgs Bank.

6.1.5 Common eider

Like the long-tailed duck, the common eider lives largely on blue mussels, but the relative importance of Södra Midsjöbanken as a wintering area is significantly lower.

Common eider nest in various locations in northern Europe, eastern Siberia, along the Arctic coasts of North America and in Greenland. Common eider are extremely coastal-bound, and in Sweden they nest along all our coasts and in all archipelago areas. Common eider moved to their nesting areas early spring, primarily during a concentrated period in early April (SLU, utan årtal).

They moved to their wintering areas between September and November. Most common eider in Sweden spend the winter in the relatively shallow areas in Danish waters, primarily around the islands and along the east coast of Jutland. Slightly smaller numbers can be found in the southern Baltic Sea, on the west coast of Sweden and in the Wadden Sea (SLU, utan årtal).

Common eider mainly eat mussels, especially blue mussels, which they collect at depths of up to 20 m (SLU, utan årtal).

Numbers of common eider increased up to the mid-1990s, but this trend has reversed since. There has been an approximately 50% decline in the Baltic Sea area over the last decade, and a change in the population structure has taken place, with a major decline in the number of females. This indicates that numbers may decline in the next few years. In 2012, the Swedish common eider population was estimated at 150,000. The strong decline in the population means that it is classified as Endangered (EN) in the 2020 Red List (SLU, utan årtal).

6.1.6 Sublittoral sandbanks

According to the definition in the Habitats Directive, sublittoral sandbanks (habitat code 1110) are banks that are permanently covered by seawater. They are normally situated in relatively shallow waters. The European Commission indicates that the sea depth over a sandbank is rarely more than 20 metres (European Commission DG-ENV, 2013). The Swedish Environmental Protection Agency’s interpretation of the EU definition indicates a maximum depth of approximately 30 metres beneath the surface of the sea (Naturvårdsverket, 2011).

These banks are primarily made up of sandy sediments, but other grain sizes may occur. The banks differ topographically from the surrounding seabed areas and may be free of vegetation or covered by seaweed and/or macroalgae. The banks further away from the coast have good water exchange and frequently act as refuges for marine species that have been pushed away from more coastal areas. The bottoms of these banks offer habitats for both soft and hard bottom species.

Typical species for the sandbanks habitat (in the marine Baltic region) include, according to (Näslund *m.fl.*, 2019), the vascular plants *Ruppia maritima*, *Ruppia spiralis*, *Stuckenia filiformis*, *Stuckenia pectinata*, *Zannichellia major*, *Zannichellia palustris*, *Zostera marina*, the crown algae *Chara aspera*, *Chara baltica*, *Chara canescens*, *Chara globularis*, *Chara* *tomentosa*, *Tolypella nidifica*, the brown alga *Chorda filum* and the green alga (*Monostroma balticum*).

Habitats with little or no macrophyte vegetation were found in earlier inventories within the original area for the wind farm in the shallower parts of Södra Midsjöbanken (performed in 2011 prior to the application for a licence according to the Swedish Economic Zone Act (1992:1140)). The macrophytes found were red algae.

Typical bird species include wintering populations of long-tailed duck (*Clangula hyemalis*), and more sparse wintering black-throated loon (*Gavia arctica*), red-throated loon (*Gavia stellata*), velvet scoter (*Melanitta fusca*), common scoter (*Melanitta nigra*) and common eider (*Somateria mollissima*).

Typical bony fishes are eel (*Anguilla anguilla*), herring (*Clupea harengus*), lumpfish (*Cyclopterus lumpus*), cod (*Gadus morhua*), perch (*Perca fluviatilis*), flounder (*Platichthys flesus*), plaice (*Pleuronectes platessa*), common goby (*Pomatoschistus microps*), sand goby (*Pomatoschistus minutus*), turbot (*Scophthalmus maximus*), sprat (*Sprattus sprattus*), sea stickleback (*Spinachia spinachia*) and eelpout (*Zoarces viviparus*). Other typical species include the echinoderm *Psammechinus miliaris* and the crustaceans *Crangon crangon*, *Palaemon adspersus*, *Palaemon elegans* and *Saduria entomon*.

6.1.7 **Reefs**

Reefs (habitat code 1170) are biogenic and/or geological formations of hard substrate occurring on hard or soft bottoms. Reefs are topographically separated in that they rise above the seabed in littoral and sublittoral zones. The reef environment is frequently characterised by zoning of benthic communities of algae and animal species, including concretions (hard, compact mineral clumps), incrustations and coral formations.

Biogenic reefs are a subtype of the Natura 2000 habitat 1170 reefs. Biogenic reefs occur in locations where the physical structure of the bottom is made up primarily of live sessile organisms such as blue mussels (*Mytilus edulis*). Blue mussels can form carpet-like structures (mussel banks) even on soft bottoms that are exposed to currents (Naturvårdsverket, 2012). These mussel banks are often home to a rich variety of both soft and hard bottom species. Mussel banks our part of the reefs habitat, if they have a coverage level in excess of 10% (Lonnstad, 2011).

Reefs are delimited to the surrounding seabed where reef formation makes the transition by more than 50% in soft bottom areas and/or where biogenic formations account for less than 10% of the coverage.

6.2 Södra Midsjöbanken (outside the Natura 2000 site)

The topographic formation, the Södra Midsjöbanken itself, at depths of <approximately 30 m, does not form part of the Natura 2000 site designated by the government but nevertheless needs to be handled with its link with the ecology of the entire area in mind (area A, Figure 1).

Södra Midsjöbanken is of major importance for the conservation assets indicated within the Natura 2000 site Hoburgs Bank and the Midsjö Banks (see section 6.1). For example, like at other offshore banks *within* the Natura 2000 site, this is where the highest concentrations of long-tailed duck can be found in winter thanks to the rich supplies of blue mussels at the banks.

Offshore banks such as Södra Midsjöbanken are characterised by cleaner, clearer waters than the shallows close to the coast. The water closer to the coast is affected more extensively by sediments, nutrients faults and chemical contamination from mainland water run-off.

Södra Midsjöbanken is a shallow area surrounded by deeper waters. Sea birds in the shallow areas are generally made up of what are known as erosion bottoms. High current velocities generally prevail at shallow bottoms. Fine-grained material deposited there temporarily will therefore be whirled back up in the water and transported on to greater depths and what are known as accumulation bottoms, where the current conditions are calm enough to allow fine sediment to accumulate permanently. Erosion bottoms are therefore made up primarily of coarse-grained materials such as sand, gravel and rocks. Accumulation bottoms are made up of finer-grained sediments and are therefore also known as soft bottoms. The sea areas west of the shallow parts of Södra Midsjöbanken are deeper offshore areas with what are known as accumulation bottoms.

Geophysical and geotechnical surveys indicate that the uppermost layer of the seabed at Södra Midsjöbanken is made up primarily of sand, gravel and smaller rock fractions. There are elements of rocks and larger boulders within certain areas. SGU's marine geology map also indicates that there is glacial clay in the area.

Södra Midsjöbanken was classified as a sublittoral sandbank (code 1110) in the 2006 offshore inventory (Naturvårdsverket, 2006).

6.3 Other general and individual interests

6.3.1 National interests according to chapter 3 of the Environmental Code

The investigation site for the wind farm is designated as being of national interest as a wind farm site according to Chapter 3(8) of the Environmental Code (Figure 17). East of the investigation site for the export cables is an area of national interest for professional fishing according to Chapter 3(5) of the Environmental Code.

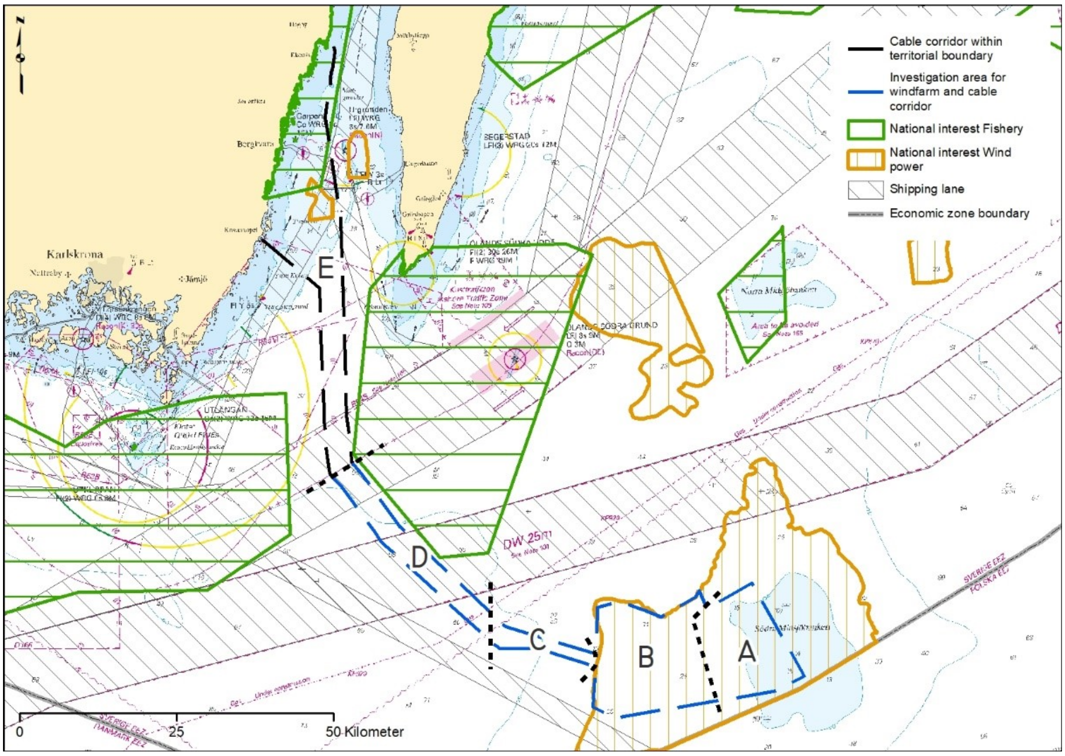


Figure 17 Investigation site and areas designated as being of national interest for fishing and energy production. Sea lanes are also shown.

6.3.2 **Maritime traffic**

A sea lane for large ships passes north of the investigation site for the wind farm, at a distance of approximately 8 km at its closest point. This sea lane crosses the investigation site for the export cable. According to the Swedish Maritime Administration's reporting system for AIS information, approximately 42,000 ships passed between Öland and Södra Midsjöbanken in 2015. Extensive shipping activities also take place south of Södra Midsjöbanken.

6.3.3 **Proposed maritime plan**

Södra Midsjöbanken constitutes an investigation site for energy recovery, in particular taking into account total defence and nature, in the proposed maritime plan dated 16 December 2019 (Havs- och vattenmyndigheten, 2019a, se Figur 4). Planned activities are in line with the proposed maritime plan.

6.3.4 **Individual interests**

Fishing boats use the waters both to and from and within the investigation site. Pleasure boats also use the area to a certain extent. Angling around Södra Midsjöbanken takes place only to a very limited extent on account of the great distance from the mainland and Öland.

7 Anticipated environmental impact

This consultation document describes the anticipated environmental impact in general terms for planned survey activities and the construction, operating and decommissioning phases. The anticipated environmental impact is described for the Natura 2000 site as a whole and for the species and habitats there. The impact, effects and consequences will be developed in the environmental impact assessment.

7.1 Impact on the Natura 2000 site in its entirety

The impact on the Natura 2000 site in its entirety is largely dependent on the point within the investigation site where the wind farm is sited. In general, and regardless of location, planned surveys and construction work will involve a certain impact as a consequence of increased human activity within a small part of the very large Natura 2000 site. The decommissioning phase will also involve increased human activity in the area. The survey, construction and decommissioning phases are relatively short compared with the operating phase. During the operating phase, human activity in the area around the wind farm will actually decrease as a consequence of potential restrictions for other shipping activities.

The protected bird species are linked mainly with the offshore Södra Midsjöbanken (outside the Natura 2000 site). Depending on the location of the wind farms, the wintering population of the protected long-tailed duck (*Clangula hyemalis*, species code A064), common eider (*Somateria mollissima*, species code A063) and black guillemot (*Cepphus grylle*, species code A202) will be impacted to varying extents, or not at all. The latter two species are concentrated at Södra Midsjöbanken for wintering to a lesser extent than long-tailed duck.

Harbour porpoise (*Phocoena phocoena*, species code 1351) are not expected to be adversely impacted by the wind farm during the operating phase, regardless of its location. Any impact will instead be linked with activities during the survey, construction and decommissioning phases, where survey methods and work elements that can generate (particularly impulsive) loud noise risk disturbing harbour porpoise. The present assessment is that the final location of the wind farm within the investigation site is of little significance to the risk of impact on harbour porpoise.

7.2 Harbour porpoise

7.2.1 Surveys

Noise

Harbour porpoise (*Phocoena phocoena*, species code 1351) are particularly sensitive to loud impulsive noises. If it is necessary to perform survey activities generating loud impulsive noises within the frequency range audible to harbour porpoise, RWE will take precautions to minimise adverse impact on harbour porpoise.

When submitting an application for a survey licence for drilling, etc. ('Survey licence 2') in the spring of 2020, RWE allowed external experts to survey noise from drilling, vibrocore sampling and peak pressure sounding (CPT). The results indicated very limited noise impact that will probably involve no consequences other than a risk of influencing behaviour at a distance of approximately 500 metres from the survey point in question.

The drilling points will be distributed over a wide area and be far apart from one another. Not all drilling will be performed at the same time.

Turbidity

Some turbidity may occur during drilling, originating primarily from the return of crushed rock and stone particles (drill cuttings). These particles are primarily expected to sediment adjacent to the drilling position, resulting in insignificant turbidity.

Vibrocore sampling and peak pressure sounding do not result in distribution of sediments or turbidity to any significant extent.

7.2.2 Construction phase

Noise

Noise from construction work may be generated to varying extents depending on the foundation laying method selected. Pile-driving is the noisiest foundation laying method. If pile-driving is used, RWE will take precautions to minimise adverse impact on harbour porpoise.

Two principles for precautions to minimise impact from underwater noise during piling – primary and secondary – are primarily applied. The primary precautions involve reducing noise emissions at source by selecting a method and type of pile-driver that generates less noise during actual piling work.

The secondary precautions include measures that can be implemented to reduce impact on harbour porpoise, for example. One such precaution involves gradually increasing the impact force during piling work so that the animals have the opportunity to avoid the area. Another secondary precaution is to screen off the noise during construction work. What are known as bubble curtains and Hydro Sound Dampers (HSD) are examples of common noise attenuation systems. The noise attenuation methods can be used individually or in combination (Andersson *m.fl.*, 2016).

A bubble curtain is formed by forcing compressed air out through a perforated pipe along the bottom around the piling site. The bubbles attenuate the spread of the noise from piling. A greater effect can be achieved by creating more bubble curtains around the piling site in question. Hydro Sound Dampers are air-filled rubber or plastic balloons that are secured to a net and placed around piles during piling in order to attenuate the distribution of noise (Andersson *m.fl.*, 2016).

The primary and/or secondary precautions can be supplemented with tools and methods for further reduction of the risk of exposing harbour porpoise to the impact of loud underwater noises. For example, acoustic scarers can be used to remove harbour porpoise from the local area where they may come to physical harm. However, the use of acoustics scarers has been questioned, and hence their potential use will be investigated initially.

Using gravity foundations and suction bucket foundations as expected to have a marginal impact on the sound environment.

Turbidity

Work on the seabed may agitate bottom sediment and cause turbidity to varying extents depending on the location of the wind farm and the foundation laying technique used. Turbidity per se is expected to be of minor significance to harbour porpoise, who hunt by means of echolocation and are thus not affected by impaired visibility, but it may reduce the availability of fish locally and temporarily in that fish will move away from the area. Fish may also temporarily avoid the area local to construction activities as a response to noisy activities.

7.2.3 Operating phase

No operations or activities that are expected to adversely impact harbour porpoise will take place during the operating phase.

There are a number of studies indicating that harbour porpoise can coexist with operational wind farms (Tougaard *m.fl.*, 2006; Scheidat *m.fl.*, 2011; Tougaard och Carstensen, 2011). The best hearing for harbour porpoise is far above the frequency range for noise generated by operational wind turbines. High frequencies are attenuated quickly and disappear into the background noise. When operating noise from offshore wind turbines in Denmark and Sweden was measured, operating noise within frequencies audible to harbour porpoise was detected only within a radius of 20–70 metres from the foundation (Carlström och Carlén, 2016).

The conclusion that harbour porpoise are able to coexist with offshore wind farms during the operating phase is supported by the Swedish Agency for Marine and Water Management (HaV), which indicates in a statement on proposed maritime plans for the Gulf of Bothnia, the Baltic Sea and North Sea and impact assessments (Havs- och vattenmyndigheten, 2019b) that ‘the relatively extensive knowledge on how wind power affects marine life, including harbour porpoise, supports the opinion that energy recovery at Södra Midsjöbanken would involve no harm provided that the construction and dismantling work is provided with effective restrictions, which is a process that must take place via the Environmental Code review. The requirements for caution are supported by the fact that the plan indicates that special consideration must be paid to the outstanding natural assets in the area’.

7.2.4 Decommissioning phase

During decommissioning work, noise may be generated if monopile or tripod/framework foundations need to be sawn off or vibrated up from the seabed. Noisy decommissioning work may cause a temporary reduction in the presence of harbour porpoise in the local area.

Work on the seabed during the decommissioning phase may agitate bottom sediment and cause temporary turbidity; see the description and assessment for the construction phase.

7.3 Long-tailed duck

7.3.1 Surveys

Long-tailed duck primarily use the shallow area of Södra Midsjöbanken in the winter months. Long-tailed duck arrive in the Baltic Sea area between October and December and return to their nesting areas from March onwards. There is little risk of disturbing wintering long-tailed duck as attempts will be made to avoid the winter period for survey activities if possible on account of poor weather conditions. If survey activities nevertheless need to take place in winter, loud noises and ships passing close by may temporarily scare away flocks of long-tailed duck from a resting place or an area where they search for food. The long-tailed duck are expected to return when the ship leaves the area.

7.3.2 Construction phase

Long-tailed duck may be affected by the construction work for the wind farm to varying extents depending on its final location within the investigation site.

Long-tailed duck may be disturbed if construction work takes place on and in the vicinity of the shallow Södra Midsjöbanken area in winter. The impact here will originate primarily from the increase in shipping and the presence of construction ships, which may scare birds and cause noise. The long-tailed duck are expected to relocate from the local area at that time and head mainly for other parts of Södra Midsjöbanken. Activities throughout the construction period will not take place at the same time throughout the entire site.

Construction work on the seabed may cause turbidity, the extent of which will be dependent on the location within the investigation site where the wind farm is positioned. Long-tailed duck search for food by sight and so could be affected by temporary visibility impairments. Accumulation bottoms are expected to result in greater turbidity than erosion bottoms. Sediment distribution modelling performed within the scope of the project at an earlier stage indicates that any construction activities at Södra Midsjöbanken itself are not expected to cause turbidity or sediment distribution of any significance.

Impact is expected only to be local and to pass quickly, regardless of the location within the investigation site within which the wind farm is positioned.

7.3.3 Operating phase

Long-tailed duck may be affected to varying extents depending on the wind farm's final location within the investigation site.

Experiences from Danish wind farms indicate that long-tailed duck largely avoid offshore wind farms. Long-tailed duck spend the winter at the offshore banks on account of the rich food resources there (mainly blue mussels). Locating the wind farm off the shallow Södra Midsjöbanken area is therefore expected to affect long-tailed duck to a lesser extent than locating it in the actual shallow area.

The risk of collisions between long-tailed duck and wind turbines is deemed to be low regardless of location because long-tailed duck largely avoid offshore wind farms (Krijgsveld, 2014, Rydell et al 2017).

7.3.4 Decommissioning phase

Work during the decommissioning phase that may be of significance to long-tailed duck is expected to be similar to the work done during the construction phase and involve similar temporary effects and consequences for long-tailed duck; see the construction phase.

7.4 Black guillemot

7.4.1 Examination

Black guillemot occurring within the investigation site may be temporarily scared away by ships passing close by and any loud noises during survey activities.

7.4.2 Construction phase

Black guillemot search for food at Södra Midsjöbanken, but the species is tied to the shallow areas to a lesser extent on account of the fact that the birds also live on fish.

Black guillemot present within the wind farm area will be affected by construction activities to a certain extent.

It is unlikely that construction activities will take place simultaneously throughout the entire wind farm site (regardless of location within the investigation site). It is therefore thought that black guillemot will not be affected to any appreciable extent during the construction period regardless of the location of the wind farm within the investigation site.

7.4.3 Operating phase

Black guillemot may be affected to varying extents during the operating phase depending on the wind farm's final location within the investigation site.

The auk varieties razorbill (*Alca torda*) and common guillemot (*Uria aalge*) have been shown to avoid offshore wind farms (Petersen *m.fl.*, 2006). Hence there are fears that black guillemot may demonstrate similar avoidance behaviour. The effect may vary depending on the location of the wind farm.

The risk of black guillemot colliding with wind turbines is deemed to be low because auks have been shown to avoid wind turbines (Krijgsveld, 2014; Rydell *m.fl.*, 2017).

7.4.4 Decommissioning phase

Work during the decommissioning phase that may be of significance to black guillemot is expected to be similar to the work done during the construction phase, with similar temporary consequences; see the description for the construction phase.

7.5 Common eider

7.5.1 Surveys

Common eider occurring within the investigation site may be scared away from the local area temporarily on account of passing ships and any loud noises in connection with survey activities.

7.5.2 Construction phase

Common eider occurring within the wind farm area will be affected to some extent by the construction activities.

It is unlikely that construction activities will take place simultaneously throughout the entire wind farm site (regardless of location within the investigation site). It is therefore thought that common eider will not be affected to any appreciable extent during the construction period regardless of the location of the wind farm within the investigation site.

7.5.3 Operating phase

Common eider are expected to be affected to a minor extent during the operating phase. Available knowledge indicates that common eider do not avoid offshore wind farms (Petersen *m.fl.*, 2013).

7.5.4 Decommissioning phase

Work during the decommissioning phase that may be of significance to common eider is expected to be similar to the work done during the construction phase, with similar temporary effects and consequences for common eider; see the description for the construction phase.

7.6 Sublittoral sandbanks

The sandbanks habitat may be affected to varying degrees or not at all depending on the location of the wind farm within the investigation site.

If the sublittoral sandbanks habitat will be affected by the positioning of the wind farm/cables or by any other impact (sediment distribution), the environmental impact assessment will include an account of the species typical to the habitat and assessed conservation status during and after establishment of the wind farm.

7.6.1 Surveys

The surveys that may affect the seabed are drilling, vibrocore sampling and peak pressure sounding (CPT). Certain sample points may possibly be supplemented with grab sampling in order to take random samples of the occurrence of benthic flora and fauna. Even if they are performed at around a hundred points, they can influence only a very small proportion of the seabed and the impact on the habitat can only be insignificant.

7.6.2 Construction phase

Construction work on the seabed involves using the surface of the seabed, which may lead to sediment distribution. The extent of this will be dependent on the location of the wind farm and the choice of foundations.

7.6.3 Operating phase

Any impact during the operating phase will be due primarily to the location of the wind farm, but the choice of foundation type may also involve certain differences.

The seabed will be used for laying a cable network and foundations. Gravity foundations and suction bucket foundations will take up more seabed surface area than steel structures such as monopiles and tripods.

7.6.4 Decommissioning phase

The impact during the decommissioning phase will be similar to the impact during the construction phase.

Decommissioning may involve a certain amount of sediment distribution.

The choice of foundation type will be of significance to the decommissioning phase. Leaving certain structures in place, such as underground parts of monopiles, may be necessary. Gravity foundations may also be left in place if this is deemed advantageous in respect of the natural environment.

7.7 Reefs

The reefs habitat may be affected to varying degrees or not at all depending on the location of the wind farm within the investigation site.

If the reefs habitat will be affected by the positioning of the wind farm/cables or by any other impact (sediment distribution), the environmental impact assessment will include an account of the species typical to the habitat and assessed conservation status during and after establishment of the wind farm.

7.7.1 Surveys

The surveys that may affect the seabed are drilling, vibrocore sampling and peak pressure sounding (CPT). Certain sample points may possibly be supplemented with grab sampling in order to take random samples of the occurrence of benthic flora and fauna. Even if they are performed at around a hundred points, they can influence only a very small proportion of the seabed and the impact on the habitat can only be insignificant.

7.7.2 Construction phase

Construction work on the seabed involves using the surface of the seabed, which may lead to sediment distribution. The extent of this will be dependent on the location of the wind farm and the choice of foundations.

7.7.3 Operating phase

Any impact during the operating phase will be due primarily to the location of the wind farm, but the choice of foundation type may also involve certain differences.

The seabed will be used for laying a cable network and foundations. Gravity foundations and suction bucket foundations will take up more seabed surface area than steel structures such as monopiles and tripods.

It is likely that the foundations may constitute substrates for growth of organisms, primarily blue mussels.

7.7.4 Decommissioning phase

The impact during the decommissioning phase will be similar to the impact during the construction phase.

Decommissioning may involve a certain amount of sediment distribution.

The choice of foundation type will be of significance to the decommissioning phase. Leaving certain structures in place, such as underground parts of monopiles, may be necessary. Gravity foundations may also be left in place if this is deemed advantageous in respect of the natural environment.

7.8 Other environmental impact

7.8.1 Accidents

Accidents during the survey, construction, operating and decommissioning phases may result in environmentally harmful emissions to water.

According to a risk and safety analysis compiled in 2011 prior to the original licence application according to SEZ and KSL, the primary risks identified involve collisions between ships and between ships and the facility.

Machinery used on platforms will run on diesel and/or petrol supplied via hydraulic pumps. Preventive action will be taken to prevent any leaks escaping into free water. All vessels containing petroleum products must be placed in sealed troughs accommodating the volume of the largest vessel plus 10% of the total volume of the vessels placed in the trough. The aim of this is to prevent products escaping into free water in the event of a leak.

If any product leaks out, contingency plans – including equipment and materials (such as absorption products, floating barriers and so forth) – must be in place in order to restrict further spread.

8 Cumulative effects

Cumulative effects are effects that could occur as a consequence of effects from other projects or activities interacting with effects from the project in question. Cumulative effects could lead to effects in various activities with acceptable consequences individually potentially having unacceptable adverse consequences collectively.

There are a number of wind farm projects at various planning phases immediately south of Södra Midsjöbanken, in the Polish economic zone. There are further wind farm plans another approximately 50 km to the south, immediately north of Slupsk bank, another designated Natura 2000 site. Nearby wind farm projects at various planning phases are described in Figure 18 (detail) and Figure 19 (summary).

An area of interest for gravel extraction has also been identified in the Polish part of Södra Midsjöbanken; the area in the Polish part of the bank that has been exempted from wind farm plans in Figure 18.

At the Natura 2000 site north of Södra Midsjöbanken, there are also ongoing operations such as the NordBalt cable transmitting electricity between Sweden and the Baltic states and the Nord Stream gas pipe transporting gas from Russia to Germany. Both NordBalt and Nord Stream have been expanded, while RWE’s current wind farm expansion has been undergoing planning (after 2010). Extensive commercial shipping is also taking place using sea lanes passing through the Natura 2000 site north of Södra Midsjöbanken and also outside the Natura 2000 site south of Södra Midsjöbanken. Professional fishing is taking place throughout the entire investigation site; see Figure 17.

Information on both known ongoing activities and future planned projects is needed in order to assess cumulative effects. Future planned products are associated with uncertainty depending on the outcome of various planning and licensing processes and subsequent scheduling of construction work and operating periods. Cumulative effects will be assessed as part of future EIA work on the basis of available information and own assessments on these issues.

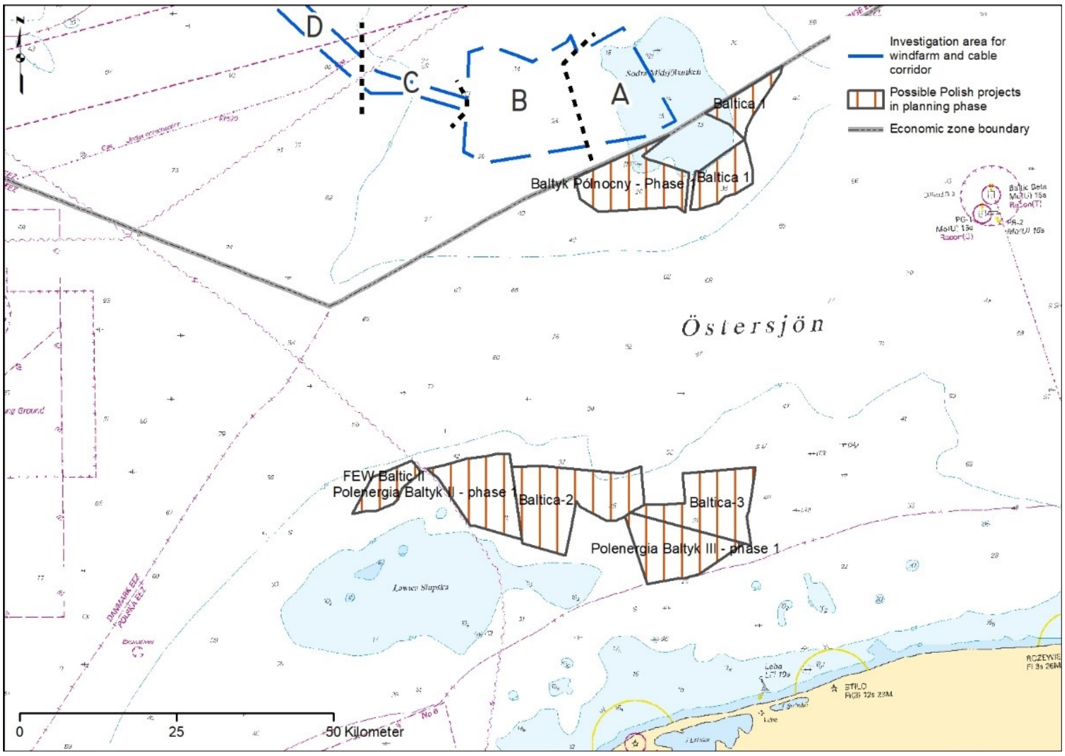


Figure 18 Nearby wind farm projects at various planning phases.

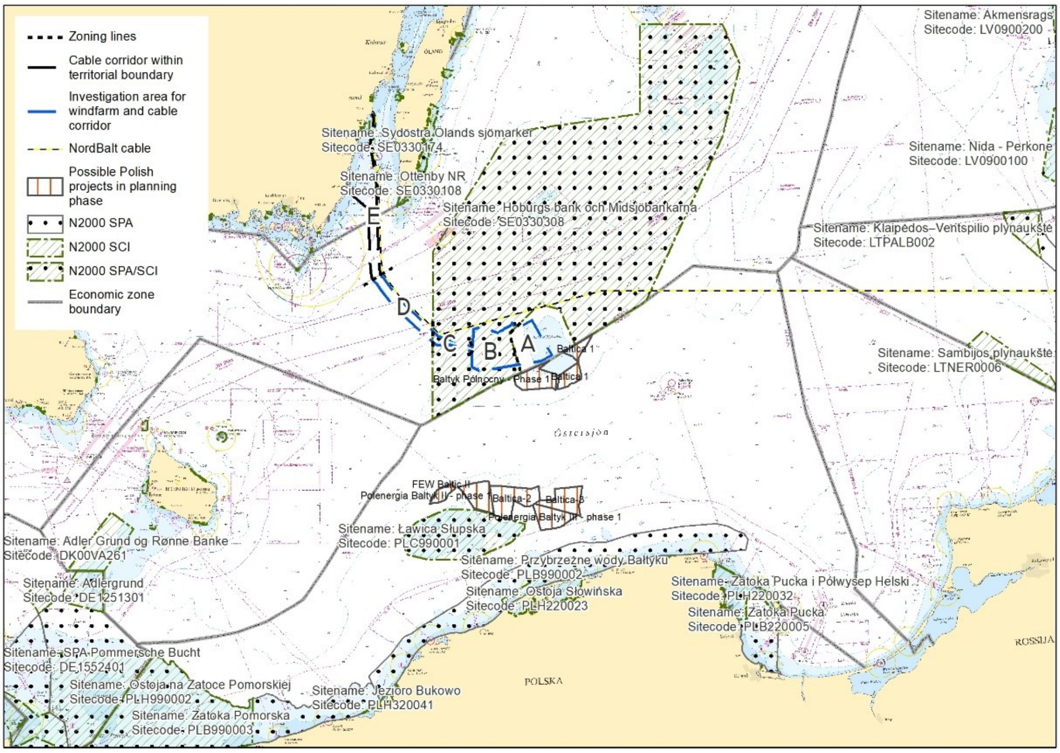


Figure 19 Nearby wind farm projects at various planning phases.

9 Data surveys

The application for a Natura 2000 licence and associated environmental impact assessment will be based on results from data surveys such as:

- Noise survey
- Bird inventory (flight inventories, boat inventory, etc.)
- Fish (relating to fish as food for harbour porpoise and birds)
- Inventory of the presence of harbour porpoise within the investigation site for the wind farm
- Inventory of benthic vegetation and benthic fauna

10 Scope of the consultation[6]

The intention is to conduct consultation with consultation bodies other than those that have obvious responsibility for and knowledge of Natura 2000 issues. This is because the precise location of the wind farm and export cables will not have been decided upon at the consultation phase. It is therefore important for RWE to obtain opinions on location in particular during consultation prior to the Natura 2000 application.

The intention is to conduct consultation with the following consultation bodies.

- Kalmar County Administrative Board
- Gotland County Administrative Board (which shares responsibility for the Natura 2000 site with Kalmar County Administrative Board)
- Swedish Agency for Marine and Water Management
- Swedish Environmental Protection Agency
- Swedish Armed Forces
- Swedish Museum of Natural History
- Swedish Coast Guard
- Swedish Maritime Administration
- Swedish Civil Aviation Administration
- Geological Survey of Sweden (SGU)
- Swedish Transport Agency
- Swedish National Heritage Board

[6] Please note that chapter 10 refers to the national consultation process in Sweden.

- Swedish Energy Agency
- Kjell Larsson, Kalmar Maritime Academy, Linnaeus University
- Birdlife Sverige
- Coalition Clean Baltic
- World Wide Fund for Nature (WWF)
- Swedish Society for Nature Conservation

11 Scope of the environmental impact assessment (EIA)

On a preliminary level, it is proposed that the environmental impact assessment should include the following:

- A non-technical summary
- Administrative information
- An introduction (background and purpose, plus restrictions)
- Assessment criteria
- Design of the wind farm and export cables
- Location of the enterprise
- Alternative locations and zero alternative
- Description of activities
- Criteria on site
- Environmental effects and consequences
- Cumulative effects
- Overall assessment
- Consultation report
- Bibliography
- Report on technical knowledge contributing to the EIA

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