Nord Stream
The new gas supply route for Europe

Chapter 10

Natura 2000

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10 Natura 2000

10.1 Introduction

Nord Stream has recognised the importance of the EU Natura 2000 network in the design and development of its Project. The Project has carried out a thorough analysis of potential impacts that might result from the construction, commissioning, decommissioning and operation of the Nord Stream pipeline on Natura 2000 areas.

The Natura 2000 network has been established under both EU and Member State legislation. Therefore, each of the national application documents prepared by Nord Stream, with the exception of the application documents for the Russian Federation, includes an impact analysis for all Natura 2000 areas that could be affected by the Nord Stream Project in each country. The assessment of potential impacts focuses on the extent to which the Project could have any likely significant effects on the designation criteria and the conservation objectives of the sites.

Nord Stream considers it to be important to provide information pertaining to potentially affected Natura 2000 areas within this Espoo Report since it has been an integral part of the Project's ongoing design and development. The results of the Natura 2000 impact assessments carried out for the national application documents are summarized in this chapter. This chapter does not aim to provide complete Natura 2000 impact assessments as these are presented in the national application documents.

10.2 Natura 2000 areas

The European Commission Directive on the Conservation of Wild Birds (The Birds Directive, 79/409/EEC) and the Directive on the Conservation of Natural Habitats and Wild Flora and Fauna (The Habitats Directive, 92/43/EEC) establish the legislative framework for Natura 2000 areas, i.e. for monitoring "the existence, the conditions and the changes of the natural habitats throughout Europe" in order to prevent "causes for the decrease of biodiversity".

The objective of the Habitats Directive is to promote biodiversity by requiring Member States to take measures to maintain or restore the favourable conservation status of natural habitats and wild species. The objective of the Birds Directive is to implement special measures to maintain the favourable conservation status of wild birds throughout Europe.

The eight EU Member States around the Baltic Sea have come a long way in implementing the two Natura 2000 directives. To meet the objectives of the two directives, the Member States

have designated Sites of Conservation Interest (SCIs) and Special Protection Areas (SPAs) in coastal as well as in offshore waters. Habitats in the context of the directives are understood to be ”terrestrial or aquatic areas distinguished by geographical, abiotic and biotic features, whether natural or semi-natural”. The habitats listed in Annex I and the rare and vulnerable species listed in Annex II of the Habitats Directive as well as the rare and vulnerable bird species listed in Annex I of the Birds Directive (and the regularly occurring concentrations of migratory birds) are to be protected by means of the Natura 2000 network.

The conservation status of a natural habitat is defined in Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora as the sum of the influences acting on a natural habitat and its characteristic species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its characteristic species. The conservation status of a natural habitat is "favourable" when:

- Its natural range and areas it covers within that range are stable or increasing
- The specific structure and functions necessary for its long-term maintenance exist and are likely to continue for the foreseeable future
- The conservation status of its characteristic species is favourable

The conservation status of a species is "favourable" when:

- Population dynamics data indicate that the species is maintaining itself on a long-term basis as a viable component of its natural habitats
- The natural range of the species is not being reduced nor is it likely to be reduced for the foreseeable future
- There is, and probably will continue to be, a sufficiently large habitat to maintain its population on a long-term basis

The purpose of the Natura 2000 network is to maintain the habitats and species to "favourable conservation status" in their natural range.

The three types of areas and sites that form the Natura 2000 network are as follows:

- **Special Protection Areas (SPAs):** areas conserving bird species listed in Annex I of the Birds Directive as well as migratory birds
- **Special Areas of Conservation (SACs):** areas conserving habitat types and animal and plant species listed under the Habitats Directive

- **Site of community interest (SCI):** areas that can contribute to conservation or restore a habitat to favourable status

Figure 10.1 below provides an overview of Natura 2000 sites along the route of the Nord Stream Project.

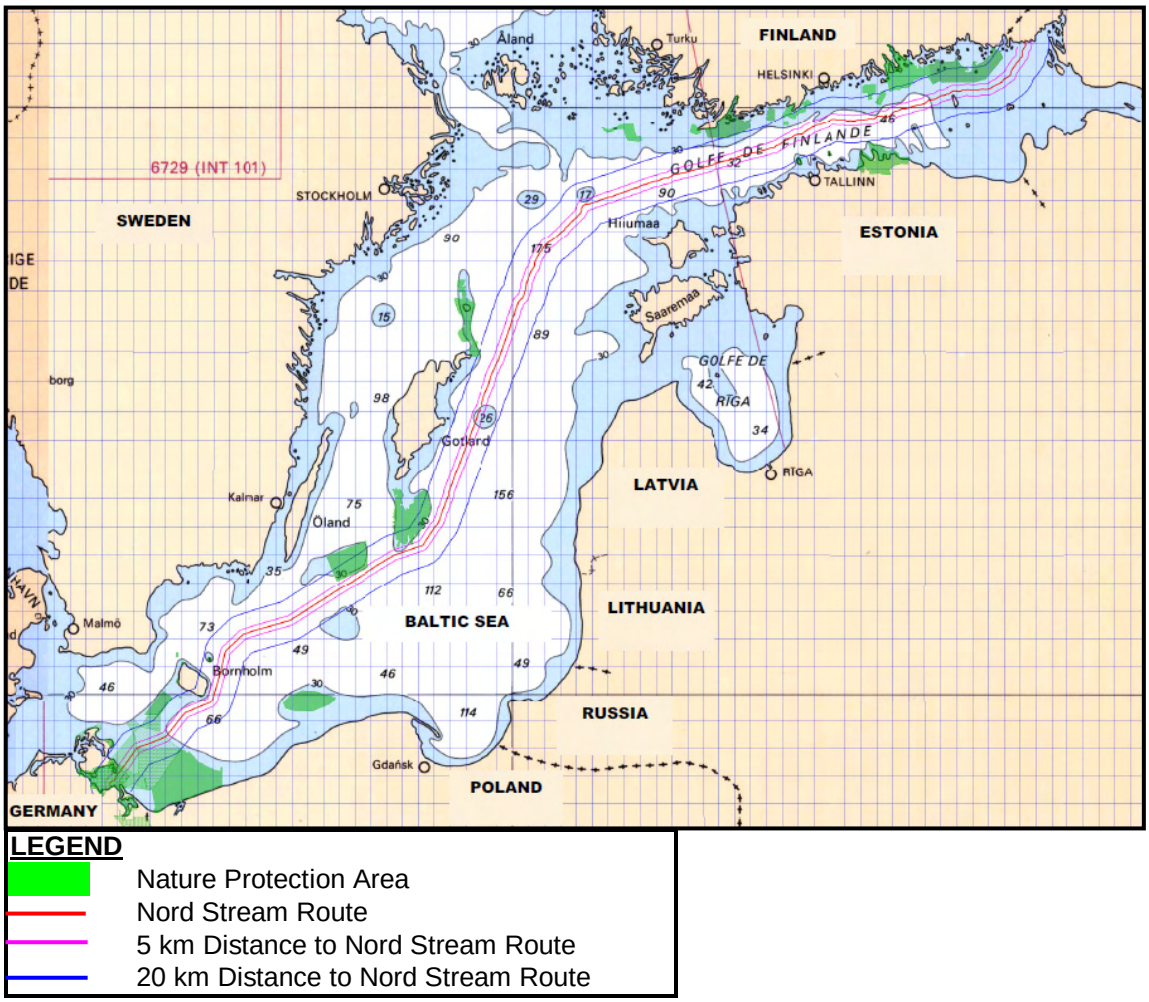

Figure 10.1 Map of all Natura Sites along the Pipeline Route

10.3 Natura 2000 Requirements

10.3.1 Natura 2000 Requirements in Finland

The Habitats Directive and the Birds Directive have been implemented in Finland by the Nature Conservation Act 1096/1996. The European Union's Natura 2000 network in Finland consists of 1) bird sanctuaries according to the Birds Directive; and 2) sites considered to be of Community interest in accordance with the provisions of the Habitats Directive.

According to section 65(1) of the Finnish Nature Conservation Act, if a project or plan, either individually or in combination with other projects and plans, is likely to have significant adverse effect on the ecological value of a site included in, or proposed by the Council of State for inclusion in, the Natura 2000 network, the project's developer is required to conduct an appropriate assessment of its impact. The same requirement also applies to any project or plan outside the site which is likely to have a significantly harmful impact on the site. The assessment can be carried out as part of the EIA procedure.

No authority may grant a permit for a project if the assessment procedure indicates that the project or plan would have a significant adverse impact on the particular ecological value or conservation objective of the area. A permit can, however, be granted if the Council of State decides that a given project must, in the absence of alternative solutions, be carried out for imperative reasons of overriding public interest. Where a site hosts a priority natural habitat type or a priority species of the Habitats Directive, a further precondition for granting a permit is that a reason relating to human health or public safety, or to beneficial consequences of primary importance for the environment, or any other imperative reason of overriding public interest demands that a permit is granted. In the latter case, an opinion must be requested from the European Commission.

10.3.2 Natura 2000 Requirements in Sweden

The Habitats Directive and the Birds Directive have been implemented in Sweden through chapter 7 of the Environmental Code. In principle, the Environmental Code is only applicable within Swedish territory, i.e. not in the exclusive economic zone or on the continental shelf where the pipelines are being laid out. However, in the preparatory work of both the Environmental Code and the Exclusive Economic Zone Act (which applies to activities etc, in that zone), it is evident that the regulations in the code regarding the Natura 2000 areas also apply to activities outside of Sweden (i.e. in the exclusive economic zone) that could have an impact on such an area.

According to the Environmental Code, a permit is required for activities and operations that could have a significant impact on a Natura 2000 area (see chapter 7, paragraph 28a of the Environmental Code).

In case there is a risk of significant impact, a permit may only be issued if the activities do not significantly harm the particular environment that is protected through the Natura 2000 network or if the activities are not detrimental to the protection and conservation of specific species protected through the network.

10.3.3 Natura 2000 Requirements in Denmark

In Denmark, the Habitats Directive and the Birds Directive have been implemented in a number of different acts and executive orders covering different areas and different activities.

As regards the implementation of the Nord Stream Project on the Danish continental shelf, the above mentioned directives have been implemented in Section 4a of the Danish Continental Shelf Act.(1)

An assessment of the consequences of the project needs to be elaborated if the installation may have significant impacts on a Natura 2000 area. Only if the evaluation concludes that the project does not harm the area or is of overriding public interest and no alternative solution is available may a permit for the project be issued.

10.3.4 Natura 2000 Requirements in Germany

In Germany, the Habitats Directive and the Birds Directive are implemented at both federal and state levels.

According to Sections 34 and 35 German Federal Nature Conservation Act which implements the EU Directives, plans and projects which may lead to significant effects on a protected area are subject to an assessment of its implications for the sites. The focus of the assessment is, whether a project is compatible with the specific site's conservation objectives. If the result of the assessment is negative (the plan or project has significant effects on the protected area and its conservation objectives), the project or plan cannot receive a permit. In spite of a negative assessment the project can be approved if the project must nevertheless be carried out for imperative reasons of overriding public interests, and additionally no alternative solutions are available.

(1) Denmark. Consolidated Act No. 1101 of 11 November 2005 on the Continental Shelf.

In Mecklenburg-Western Pomerania Section 18 of the Nature Conservation Act Mecklenburg-Western Pomerania (*Landesnaturschutzgesetz*) contains a corresponding system to the federal one. The selection of protected areas is regulated in Section 28.

10.4 Selection Criteria for the Assessment of Potential Impacts on Natura 2000 areas

Prior to carrying out the assessment of potential impacts on Natura 2000 sites, it is important to establish clear criteria on which to base the assessment. For this purpose, a detailed impact scoping exercise has been carried out in each country to determine the geographic scope of potential Project impacts, resulting in a corridor on both sides of the pipelines where impacts are likely to occur. The relationship between the corridor and areas belonging to the Natura 2000 network establishes which Natura 2000 areas should be investigated for potential impacts. In addition, the areas to be assessed have been identified based on the specific characteristics of each site and its conservation objectives and discussions with the relevant national authorities.

The following geographic definition of Natura 2000 areas to be investigated has been defined by the Project as general guidance. This has been supplemented by the requirements established within national legislation and the guidance and discussions with the national authorities which have refined the scope of the assessments.

- Natura 2000 areas within 5 kilometres of the pipelines are included as potential **direct impact areas**

- Natura 2000 areas within 20 kilometres of the pipelines are included as potential **indirect impact areas**. This distance is a conservative measure of the impact zone and is primarily based on the spreading of noise, which can still be detected by marine mammals in this range but is not expected to have any further impact

In carrying out the assessment of potentially significant effects on individual sites designation criteria and conservation objectives, the Project has also ensured that the specific requirements of the key species/habitats present and the factors affecting conservation status have been addressed even if this, as for example maybe the case or the feeding requirements of some species, has required assessment beyond the 20 kilometre corridor.

Specific aspects of the approaches adopted in Denmark, Finland, Germany and Sweden are discussed below.

Based on the identification of potentially affected Natura 2000 areas, a detailed assessment of each site in the framework of its designation criteria and conservation objectives has been carried out. The methodologies adopted, the analyses carried out and results of these

assessments are presented in detail in the respective national application documents which are available on the Project Website.

10.5 Summary of the assessment of potentially affected Natura 2000 areas in Finland

10.5.1 Introduction

In this section we summarise the assessment work on Natura 2000 areas in Finland. This work has been carried out in the context of the preparation of the application documentation in Finland.

10.5.2 Basis of the Assessment of Impacts

The assessment of potential impacts on Natura 2000 areas has been carried out by considering the various Project activities during construction and operation and how the Project might interact with the protected areas.

The impacts on protected areas have been conducted using the methodology defined and suggested for carrying out a “preliminary Natura 2000 assessment”, as described in the Finnish Environment Institutes guidelines “Biodiversity impact assessment in regional planning, environmental impact assessment and Natura 2000 assessment”. The basis for selecting this methodology was that no protected area is crossed by the pipeline and the measured distance between the impact source (i.e. the pipelines and rock placement areas along the pipelines’ route) and the protected areas (10 kilometres) is large.

The approach of the assessment has been to evaluate whether the Nord Stream Project is likely to have **significant adverse effect on the value of a protected area** or not.

Table 10.1 identifies potential impacts as an interaction between the planned activities and the impact target. The impacts are divided into impacts during construction and operation.

Table 10.1 Potential Impacts from planned activities and impact receptors

Impact target	Project phase	Impact	Activity
Protected areas	Construction	Suspension of sediments, nutrients and contaminants and re-sedimentation of released sediments (including effects on the food chain)	Munitions clearance Rock placement Dredging Ploughing Offshore pipelaying Hyperbaric tie-in Anchor handling
		Noise and visual disturbance from increased vessel movement	Munitions clearance Rock placement Dredging Ploughing Pipe supply Offshore pipelaying Hyperbaric tie-in Anchor handling
	Operation	Noise from gas flowing	Pipe on seabed and gas flowing
		Disturbance from supply traffic and rock placement	Monitoring and surveying Restriction zone Maintenance rock placement as required

The potential interference of planned Project activities with protected areas has principally been investigated with regard to suspension and re-sedimentation of sediments from construction activities. In addition, the possible interference of noise impacts on protected areas has also been assessed. Other types of impacts have also been considered (e.g. gas emissions, light pollution etc) but their potential to impact on Natura 2000 sites has been assessed as being **insignificant**.

For Natura 2000 areas, the project developer is required to conduct an Appropriate Assessment in accordance with the Nature Protection Decree No.65 if an adverse effect is considered as being potentially likely to occur that would affect its conservation objectives.

The assessment has been carried out by fulfilling the following tasks: describing identified impacts, assessing the significance of the impacts, generating proposals for mitigation

measures (if an impact has been assessed as likely to occur), undertaking a comparative study of alternatives and summarising the impacts.

Actual field investigations inside the areas themselves have not been seen as necessary. A “preliminary Natura assessment” is usually carried out using existing source material.

The following baseline information has been used in the assessment:

- Natura 2000 standard information sheets
- Map information
- Information on EU Habitat Directive and Bird Directive species and habitats that have been identified as grounds for designation of Natura 2000 areas
- Results from field surveys conducted by Nord Stream AG (i.e., habitat mapping outside Natura 2000 areas)
- Modelling data on sediment spreading

In this assessment, mainly underwater habitats have been regarded as possible impact targets with respect to impacts from sediment spreading. For example sandbanks and reefs are found in most of the Natura 2000 areas and are known to be sensitive to eutrophication and contamination. They can be impacted if turbidity rises to significant concentrations over a long period.

Birds and mammals have been regarded as possible impact targets of disturbance from constructions works even when they are migrating outside the protected areas.

The following criteria defined by the European Commission have been considered in the assessment:

- Reduction of the extent of the Natura 2000 site. The result is given as a percentage of the habitat loss from the whole Natura 2000 area
- The significance of the fragmentation of the area; its duration and reversibility compared to the baseline situation
- The significance of the disturbance: duration and reversibility and location of the source in relation to the protected area
- Density of population; the duration of the reversibility of a change caused by the project

- The indicators of change of water quality; the relative change of the water chemical parameters

The two first criteria have been excluded from the assessment since the pipelines do not cross any protected area. The assessment of impacts on protected areas is to a large extent based on the results of the assessment of impacts on the seabed and water quality.

10.5.3 Potentially Affected Natura 2000 areas

Initially, the scope of the assessment covered all sites within a 20 kilometre corridor around the route of the pipelines. As a result of consultations with the relevant authorities 9 Finnish Natura 2000 sites were included in the initial assessment of potential impacts because of their relative proximity (10 - 50 kilometres) to the proposed pipeline route. The sites cover 287,808 hectares, representing 5.9 per cent of the area covered by Finnish Natura 2000 sites. All Åland Natura 2000 areas are located more than 50 kilometres away from the pipeline and have therefore been excluded from the assessment. A detailed map for Natura 2000 areas is presented in **Atlas Map PA-2-F**.

Based on their relative proximity to the pipelines' route six sites have been assessed in greater detail. These are presented in the **Table 10.2**.

Table 10.2 Potentially Affected Natura 2000 Sites

Name	Official number	Type of conser-vation areas (SPA, SAC, SCI)	Conservation objectives	Distance to pipelines (km)
Eastern Gulf of Finland archipelago and water areas	FI 0408001	SPA, SCI	Includes important underwater habitats such as Sandbanks slightly covered by sea water (1110), Reefs (1170), and Coastal lagoons (1150). Important nesting area for archipelago birds. Hosts large communities of lesser Black-backed gull (*L. fuscus*), Common tern (*S. hirundo*) and Arctic tern (*S. paradisaea*). Includes important underwater ridge formations and spawning areas of herring (*C. harengus*), and known grey seal haul-outs	23 (Finland) 6.8 (Russia)
Marine protection areas in the Pernaja Bay and Pernaja Archipelago	FI 0100078	SPA, SCI	Contains Annex I priority habitat types for example, Narrow inlets (1650), Refs (1170) and Coastal lagoons (1150). Hosts very abundant birdlife. Important resting areas for birds (i.e., Aspskär). The Caspian tern. There are also known grey seal haul-outs (An Annex II species). The whole Natura 2000 area is proposed to be a part of the Ramsar wetland protection network (type B).	15
Söderskär and Långören archipelago	FI 0100077	SPA, SCI	Contains the Annex I priority habitat types; Sandbanks slightly covered by water (1110) and Reefs (1170). Designated sanctuary for grey seal (A Habitat Directive Annex II species).	10

Name	Official number	Type of conser-vation areas (SPA, SAC, SCI)	Conservation objectives	Distance to pipelines (km)
			Hosts numerous seasonal breeding birds and also an important resting area for birds. Proposed to be a part of the BSPA and Ramsar networks.	
Kirkkonummi Archipelago	FI 0100026	SPA, SCI	Contains the priority habitat types Sandbanks slightly covered by sea water (1110), Reefs (1170) and Coastal lagoons (1150). Important terrestrial and underwater habitats and bird species. Very diverse bird species, many breeding in the area.	15
Kallbådan islet and water area	FI 0100089	SCI	Contains Annex I priority habitat type Baltic Seas islets and islands (1620) Established to protect the grey seal (an Annex II species), and hosts a seal sanctuary.	11
Inkoo Archipelago	FI 0100017	SPA, SCI	Important nesting and resting place for birds. Breeding birdspecies include Caspian Tern, Black Guillemot, Lesser Black-backed Gull, Turnstone and numerous Arctic and Common Terns. Gray seals are also visiting this area. Contains old spruce forest with old pines and birches. A lot of daceyed trees, important for insects.	21
Tammisaari and Hanko Archipelago and Pohjanpitäjänlahti marine protected area	FI 0100005	SPA, SCI	Contains Annex I priority habitat types. Narrow inlets (1650), Reefs (1170) and Coastal lagoons (1150) and Large shallow inlets and bays (1160)	19

Name	Official number	Type of conser-vation areas (SPA, SAC, SCI)	Conservation objectives	Distance to pipelines (km)
			that are important nesting and resting places for birds. The grey seal, a Habitats Directive Annex II species is also found here.	
Tulliniemi Bird Protected Area	FI 0100006	SPA, SCI	Includes important underwater habitats such as sandbanks slightly covered by sea water and reefs. Very important for nesting sea birds. Passage area for migrating birds. Contains different types of dunes.	30
The Archipelago Sea	FI0200090	SPA, SCI	Includes 46 different habitat types according to the Habitats Directive (mostly land based), of which 15 are prioritised as specially protected habitat types. Important for terrestrial and for underwater habitats such as coastal lagoons and reefs. Important for a great variety of bilds and for both grey and ringed seals.	30

These habitats are nowadays affected by eutrophication and contamination and can be impacted if the turbidity rises to significant concentrations for over a long period. It is known that the biotic zones and therefore sensitive areas of the reef structures (sensitive to i.e. eutrophication, contamination) is limited to areas less than 5 - 6 metres deep, but this depth can be higher in the western Gulf of Finland up to 5 - 10 metres. The sandbanks are limited to a maximum of 20 metres depth, but this becomes much shallower when moving towards the eastern Gulf of Finland.

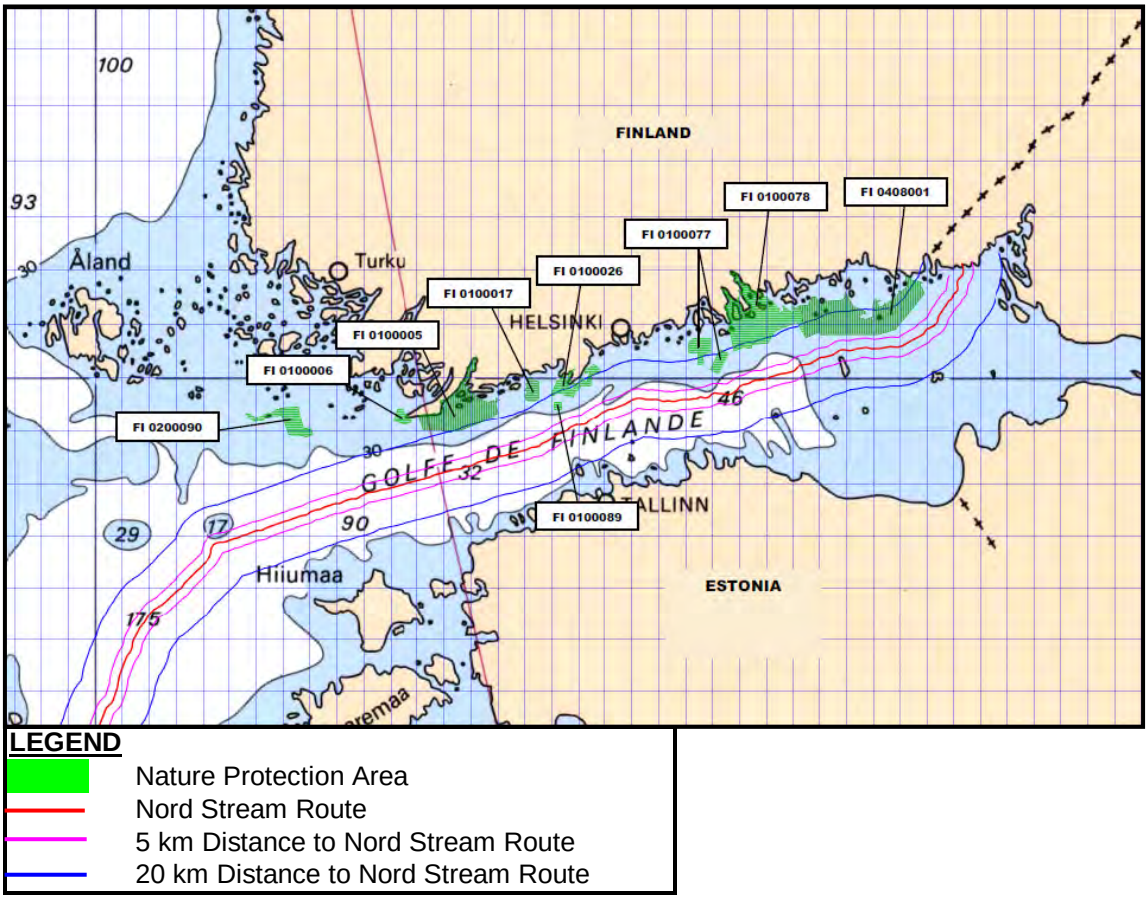

Figure 10.2 The Finnish Natura 2000 areas in the Gulf of Finland

The closest Natura 2000 area to the pipelines' route in Finland is the "Söderskär and Långören Archipelago", which is situated within 10 kilometres of the pipelines. However, the Eastern Gulf of Finland Archipelago and Water Areas Natura area is within 6.8 km of the pipelines' route when the Russian sector is considered.

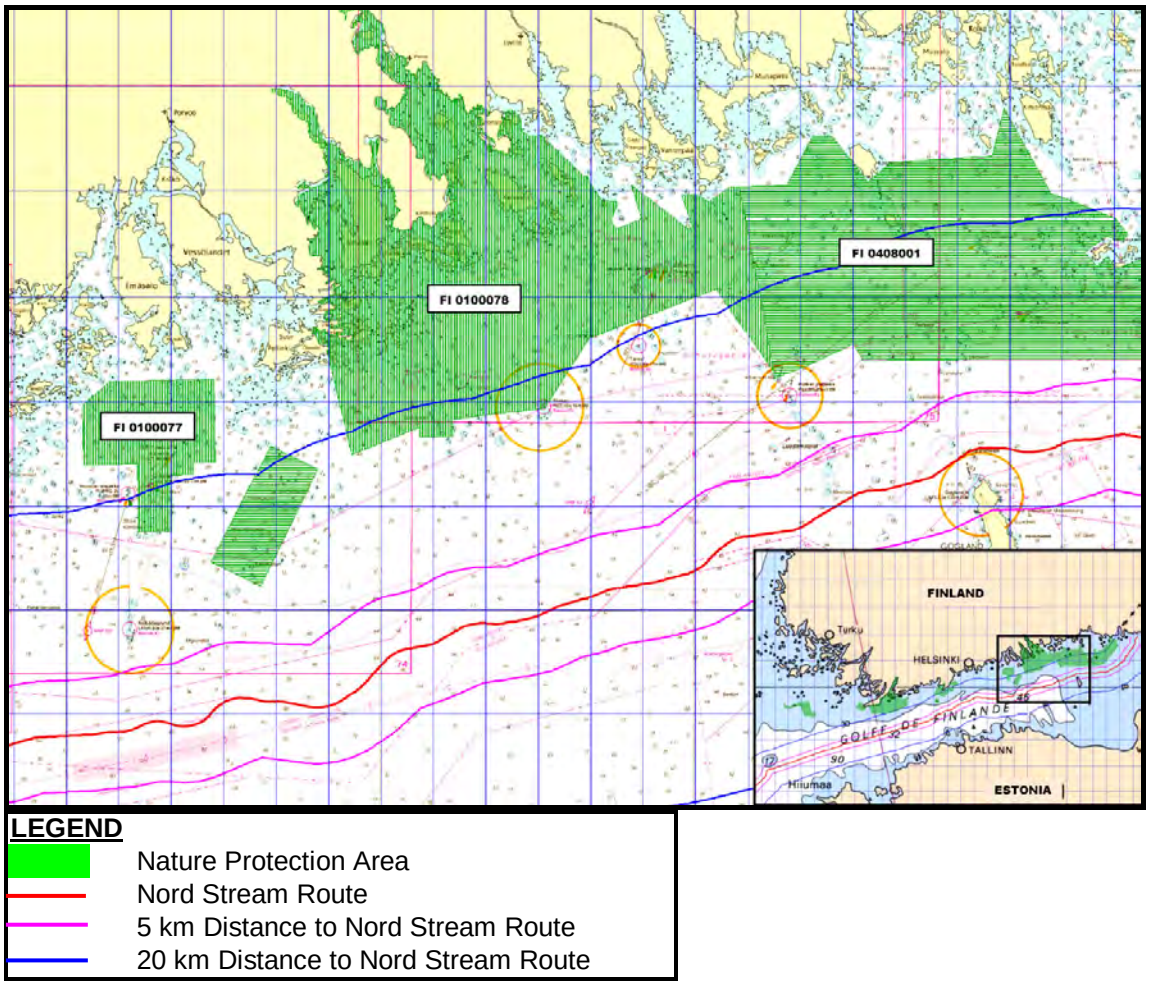

Figure 10.3 The Natura 2000 areas closest to the pipeline route, Söderskär and Långören and identified potential offshore Natura 2000 areas

Other habitats according to the Habitats Directive as i.e. “Coastal lagoons” have not been considered since they are considered being located at a considerable distance from the pipeline. For the same reason terrestrial habitats have also not been considered in the assessment.

Each of the sites considered for assessment because of potential effects from the Nord Stream Project is discussed below.

Eastern Gulf of Finland archipelago and water areas (FI 0408001, SPA, SCI)

This Natura 2000 area is almost 100,000 hectares in extent and contains a cluster of islands, basins and underwater ridges. The site is located mainly in the outer archipelago and sea area within the municipalities of Hamina, Kotka, Pyhtää and Virolahti. The shortest distance to the pipeline corridor is about 23 kilometres in Finland and 6.8 kilometres in Russia.

The Natura 2000 area includes important underwater habitats such as Sandbanks slightly covered by water (1110), Reefs (1170), and Coastal lagoons (1150). The site is an important nesting area for archipelago birds and hosts large communities of lesser Black-backed gull (*L. fuscus*), Common tern (*S. hirundo*) and Arctic tern (*S. paradisaea*). The area also includes important underwater ridge formations and spawning areas of herring (*C. harengus*). There are also known grey seal haul-outs

The core of the Natura 2000 area consists of the Eastern Gulf of Finland National Park. It is proposed that the Natura 2000 area will be included in the Marine and Coastal Baltic Sea Protection Areas Network as a BSPA site.

Marine protection areas in the Pernaja Bay and the Pernaja Archipelago (FI 0100078, SPA, SCI)

This Natura 2000 area extends from Pikkupernajanlahti Bay located near the town of Porvoo to the border of the Uusimaa Regional Centre's operational area. The shortest distance to the pipeline corridor is about 15 kilometres.

The Natura 2000 area includes important underwater habitats such as Narrow inlets (1650), Reefs (1170) and Coastal lagoons (1150) as listed in Annex I of the Habitats Directive. The inner bays within the Natura 2000 area host very abundant birdlife, mostly typical wetland communities. More than 20 species of protected birds are found in this area. In the archipelago, some islands function as important resting areas for birds (i.e., Aspskär). The area is important for the protection of the Caspian tern (*S.Caspia)*. Additionally, there are some known grey seal haul-outs.

The whole Natura 2000 area is proposed for inclusion as part of the Ramsar wetland protection network.

Söderskär and Långören archipelago (FI 0100077, SPA, SCI)

This Natura 2000 area extends to approximately 18,000 hectares and is located in the outer archipelago near the town of Porvoo. The shortest distance to the pipeline corridor is about 10 kilometres.

The Natura 2000 area includes important underwater habitats such as Sandbanks slightly covered by sea water (1110) and Reefs (1170) (both priority habitats listed in Annex I of the Habitats Directive). The outer archipelago hosts numerous seasonal breeding birds and is at the same time also an important resting area for birds.

The area is proposed for inclusion as part of the BSPA network. The Langören area is also proposed for inclusion as a part of the Ramsar network.

Kirkkonummi Archipelago (FI 0100026, SPA, SCI)

The area extends to over approximately 1,750 hectares and covers the coast of the municipality of Kirkkonummi. Its western parts extend from Sommarn in Inkoo almost to Espoo in the east. The site includes all of the islands within the area and some water areas that are defined separately. The shortest distance to the pipeline corridor is about 15 kilometres.

The archipelago and coastal areas are relevant for conservation of important habitat types and bird species. The Natura 2000 area includes the inner, middle and outer archipelago and includes important underwater habitats listed in Annex I of the Habitats Directive Sandbanks slightly covered by sea water (1110); Reefs (1170); Coastal lagoons (1150). The site hosts very diverse protected bird species, many of them breeding within the area.

Kallbådan islet and water area (FI 0100089, SCI)

This Natura 2000 area, extends for approximately 1,500 hectares and is located in the open sea south-west of Cape Porkkala, with roughly half of this area extending from Territorial Waters into the Finnish Exclusive Economic Zone. The shortest distance to the pipeline corridor is about 11 kilometres.

The Natura 2000 area was primarily established to protect the grey seal, and it hosts a seal sanctuary. The area also contains the Annex I habitat type "Baltic Sea islets and islands" (1620).

Inkoo archipelago (FI 0100017, SCI)

This Natura 2000 area has a size of 203 hectares and it is located in the outer archipelago of the municipality of Inkoo. There is only one water area included in the Inkoo Natura 2000 area, the water area in the Timmerö protected area (68 hectares). The shortest distance to the pipeline corridor is about 21 km.

The Inkoo archipelago Natura 2000 area is important nesting and resting place for birds. Breeding birdspecies include Caspian Tern, Black Guillemot, Lesser Black-backed Gull, Turnstone and numerous Arctic and Common Terns.

Gray seals are also visiting this area, although usually only single seals are observed near Hästen island.

Most of the islands and skerries are stony and treeless. There is one exception, Stora Fagerö, which is larger wooded island with sandy beaches, ridges and ancient seashore banks. Forests consist of old spruce forest with old pines and birches. There is also a lot daceyed trees, important for many insects.

Tammisaari and Hanko Archipelago and Pohjanpitäjänlahti marine protected area FI 0100005, SPA, SCI)

This marine Natura 2000 area, extends over approximately 53,000 hectares and includes the following areas; Pohjanpitäjänlahti Bay, the Tammisaari Archipelago and southern Hanko Bay. The shortest distance to the pipeline corridor is about 19 kilometres.

The Natura 2000 area includes important underwater habitats such as Large shallow inlets and bays (1160), Reefs (1170), Coastal lagoons (1150) and Narrow inlets (1650) (as listed in Annex I of the Habitats Directive). It holds many semi-enclosed lakes and shallow bays that are important nesting and resting places for birds. More than 25 protected bird species are included in its conservation objectives. The Grey Seal is also found here.

Tulliniemi Bird Protected Area (FI 0100006, SPA, SCI)

The rather small Tulliniemi Natura 2000 area has a size of approximately 2,600 hectares and is part of the western Salpausselkä lateral moraine. Part of the lateral moraine is located below sea level. The shortest distance to the pipeline corridor is about 30 km.

The Natura 2000 area includes important underwater habitats such as sandbanks slightl covered by sea water and reefs. The archipelago is very important for nesting sea birds. Because of its geographical location, Tulliniemi is one of the most important passage areas for migrating birds and thus also an important area for research. The area also contains different types of dunes.

The Natura 2000 area includes the Tulliniemi nature conservation area.

The Archipelago Sea (FI0200090, SPA, SCI)

The Archipelago Sea Natura 2000 area, in the south-western Finland, is rather a large area, approximately 50,000 hectares. Some 88% of the area is water area. The majority of the area is situated in the outer archipelago zone. The shortest distance to the pipeline corridor is about 30 km.

The Natura 2000 area includes 46 different habitat types according to the Habitats Directive (mostly land based), of which 15 are prioritised as specially protected habitat types. The area is not only important for terrestrial, but also for underwater habitats such as coastal lagoons and reefs. The Archipelago Sea Natura 2000 area is important for a great variety of bilds and also for both grey and ringed seals. The majority of the Natura 2000 area is included in the Archipelago Sea National Park.

The Archipelago Sea constitutes the centre of the Archipelago Sea Biosphere area, which UNESCO founded in 1994 in order to support and improve research on sustainable development.

10.5.4 Potential Impacts on Habitats and Species

From the assessment carried out it appears that **no significant negative impacts** are expected to occur in Finnish Natura 2000 areas. Potential impacts on the feeding areas of protected species of diving birds are unlikely in the area of the pipeline due to the depth of water surrounding the pipeline and the availability of other feeding areas. The same is true for marine mammals.

Impacts during construction

Suspension of sediments and re-sedimentation of released sediments

Construction activities, such as munitions clearance, rock placement, offshore pipe-laying and anchor-handling can lead to release of sediments to re-sedimentation of released sediments.

None of the activities will occur in the territorial water area where all the existing protected areas are located. Since the closest protected area is located at a distance of 6.8 kilometres (Eastern Gulf of Finland Archipelago and Water Areas) it can be stated that sediment spreading will not reach any existing protected area and therefore **no impact** on any protected area with respect to suspension of sediments or a designated habitat type is foreseen.

Consequently, the assessment has primarily focused on impacts on birds and mammals (seals) migrating outside the Natura 2000 areas. Possible **negative** and **indirect** impacts related to their feeding conditions have therefore been assessed with respect to increased levels of the water turbidity, which may **directly** disturb their feeding activities.

For orientation birds mainly use their vision. This means that more turbid water might reduce the feeding success of diving seabirds. Generally, a suspended matter concentrations of > 15 mg/l is regarded as problematic for the eyesight of diving sea birds. 15 mg/l suspended solids means approximately 2 metres visibility.

It has not been possible to estimate accurately the numbers of diving birds, however, (no reports or observations are published). The main populations of birds are likely to be located inside the Natura 2000 areas in Territorial Waters. It has therefore been assumed that the known diving depths for feeding birds are crucial when assessing potential impacts on birds dwelling or feeding outside the Natura 2000 areas. In areas, where sediment is predicted to spread, the depths are in general greater than the so called maximum diving depths of birds. Also sediment spreading will occur close to the seabed.

Where construction works are carried out in deep water (~> 60 metres) there will be **no impacts** on birds from dispersed sediment because the birds are expected not to dive to these depths. The pipeline runs at depths of more than 60 metres for 95 per cent of its route in Finland. The significance of the impact is therefore assessed to be **low**, because the depths at which the pipelines will be located are of low value for feeding birds.

5 per cent of the pipeline however runs almost solely at depths between 50 – 60 metres and at its shallowest 43 metres in the so called Kalbådagrund area. Here the Natura 2000 areas Långören and Söderskär and Pernajanlahti bay are located at a distance of ~ 10 kilometres from the pipeline.

Impacts on mammals (seals) have been assessed with respect to sediment suspension in detail and it is expected that there will only be a very few or no seals in the vicinity of the construction area and hence **no impacts** are expected. The rise in turbidity is **not** considered a **significant** impact, since the impact will be very limited.

Potential impacts from rock placement

The pre-lay works (starting in March 2009) will take in total approximately 3 months for the north-west pipeline and approximately 6 months for the south-east pipeline and the post-lay works approximately 11 months and 13 months. For the north-west pipeline each rock placement location will be constructed at a different time and require work for between 1 - 4 days. There are planned to be approximately 5 – 10 rock placement sites comprising all laying-phases for the shallower parts (40 – 60 metres) of the Kalbådagrund area regardless of which route alternative is selected. Therefore, the possible impacts are considered to be **local** and very **short-term**.

Model calculations of rock placement show that a suspended matter concentration > 1 mg/l occurs no more than at a maximum of 1 - 2 kilometres away from the areas where the work is carried out and will usually last less than 12 hours. At some locations close to the source concentrations > 1 mg/l can last for up to 72 hours. Clearly higher concentrations may occur in the direct vicinity of the source close to the sea bottom. According to estimates, concentrations > 10 mg/l will not be exceeded at any point for more than 20 hours; the background concentration during calm weather is below 4 mg/l. An average background level of 3,6 mg/l has been measured in the Söderskär, Pentarn, Isosaari, Matalakari areas which are situated close to or inside many of the existing Natura 2000 areas in the archipelago area.

Even if it is known that some important bird species have the ability to dive deeper e.g. Black-throated Diver and therefore could potentially to be present in the shallower (> 40 metres) Kalbådgrund area it is assessed that the impacts on birds in Natura 2000 areas will be **minor** or probably **negligible.** This conclusion is based on the fact that the suspension is very **short-term**, lasting less than a day, the importance is **low** due to the low value of the feeding areas (depth mainly > 60 metres and many areas possess low levels of benthic fauna) along the

pipeline route and concentrations of suspended sediments (**locally)** rarely rise above the 10 mg/l level for more than 20 hours at any point.

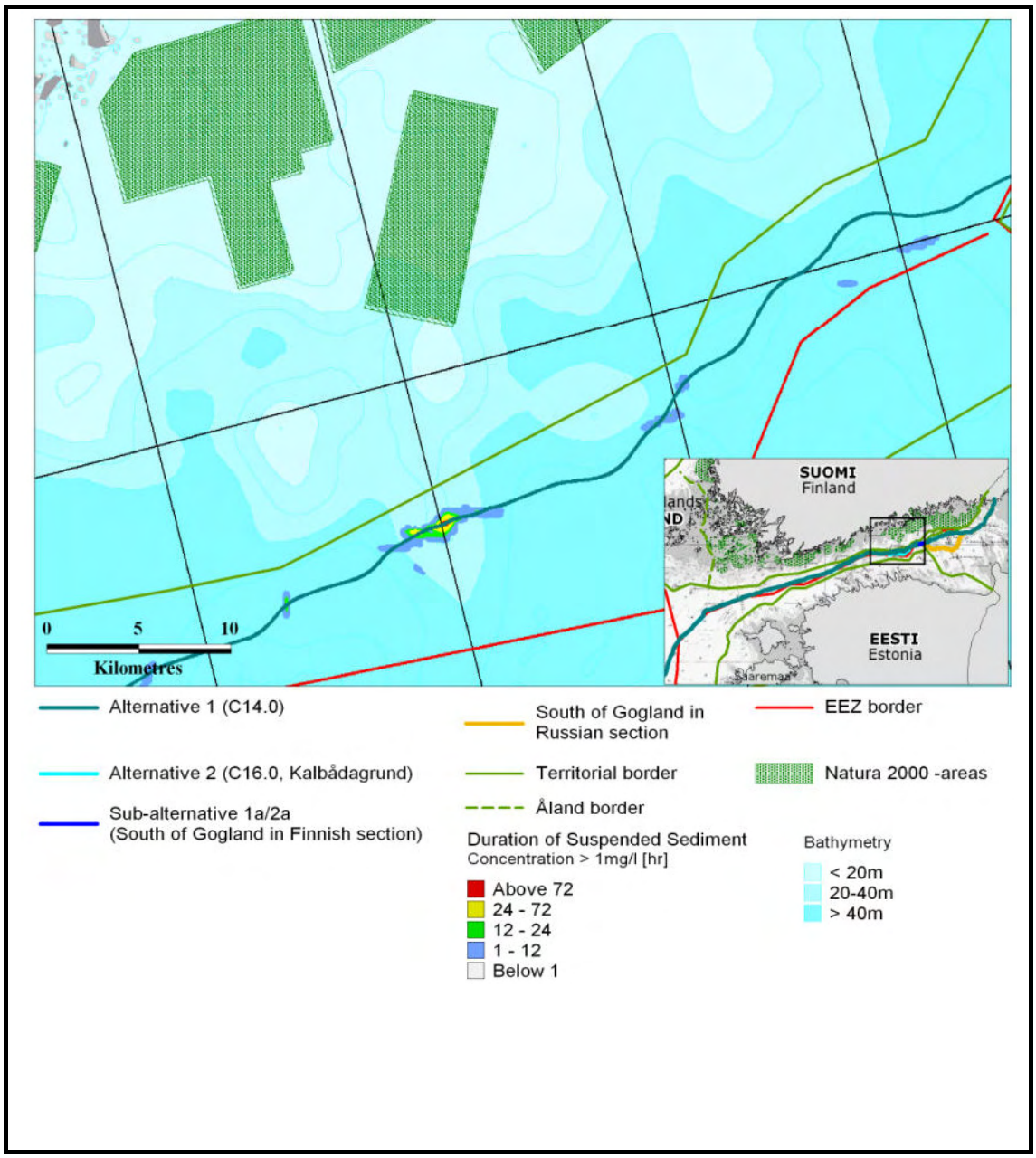

Figure 10.4 **Modelling results for suspension of sediments during rock placement activities along the north-west pipeline route in the Kalbådagrund area: The Söderskär and Långören Natura 2000 area is approximately 10 kilometres from the pipeline route. The modelling was carried out for normal weather conditions, which is the likely situation during construction. No activities are planned to take place during rough weather conditions. See Atlas Maps MO-12 and MO-13 for more modelling results.**

Potential impacts from anchor handling and offshore pipelaying

The construction of the pipeline will take approximately 6 months for each pipeline. The pipeline will be built at a rate of 2 - 3 kilometres per day. The effect on sediments from lowering of the pipelines onto the seabed is considered negligible and has been assessed to cause no greater impacts than rock placement activities. These activities will be carried out at a different time than the seabed intervention works. The impacts from anchor handling are assessed to be **local**, close to the seabed. The increase in turbidity has been assessed to be negligible and of short duration**,** as the rise in concentrations will last for only some hours to days. It is assessed therefore that the impacts will be **negligible**.

Potential impacts from munitions clearance

As a result of munitions clearance sediment and contaminants will be suspended in the water column which will cause a temporary increase in the turbidity in the water column. The area over which the suspended sediment will spread is directly dependent on the height over which sediments are suspended, the settling velocity of the sediments and local currents.

Most mines are located at a depth of approximately 70 metres. In rough weather, sediment particles get transported up to the water surface; clay particles may settle up to ~ 20 kilometres from their source. Under similar conditions fine sand will settle within approximately 1 kilometre from the point of detonation. It is therefore assessed that the level of suspended sediments from munitions clearance will be far less than from rock placement. Therefore, **no impacts** are expected from munitions clearance with respect to suspension of sediments.

Potential impacts on the food chain

Possible impacts on the food chain due to spreading of contaminants could have an effect on birds and seals in protected areas. The concentrations of contaminants will be elevated for only a **short** duration and only close to the seabed. Because the source of sediment suspension is in near-bottom areas contaminants concentrations are highest close to the seabed. It is assessed that impacts through the food chain on birds and mammals are highly dependent on organisms further down the food chain. Plankton is regarded as an important link in the chain. It has been assessed that the release of contaminants will be very small and no impacts are foreseen with respect to plankton. It has also been assessed that there will be **no impacts** on birds or mammals in Natura 2000 areas with respect to contaminants spreading during the construction phase and potential effects on the food chain.

Noise and visual disturbance

Munitions clearance, rock placement, offshore pipe-laying, pipe supply, hyperbaric tie-in and anchor-handling will all create noise. The primary source of noise will be the supply vessels travelling to and from the pipe-laying vessel and the tugboats moving the anchors of the lay barge.

Most noise and visual disturbance during the construction phase will occur in the outer areas of the Finnish EEZ. The magnitude of the noise levels and visual disturbance has been assessed to be similar to that of the existing background traffic. The extent of the impact is **local** and its duration is **short** as the construction areas are moving (e.g. the pipelaying barge will move 2-3 kilometres/day) and therefore impacts will be limited to the area near the pipeline. An exception to this is munitions clearance, which causes higher noise levels near blasting disposal areas.

Supply vessel traffic from Hanko and Kotka will amount to two or three vessels per day; therefore, it is assessed that the noise levels and visual disturbance from these vessels will not significantly alter the local background levels along the shipping lanes. Underwater noise from construction will not exceed the background noise in the protected areas. Overall, impacts from noise and visual disturbance will not exceed the background levels of noise or cause more visual disturbance than normal in the protected areas.

It is assessed that there will be **no impacts** in any of the protected areas due to noise and visual disturbance during the construction phase.

Seals and birds are sensitive to nearby noise and visual disturbance. For seabirds the alert distance is usually a few kilometres. A study has shown that sea birds react to fast going vessels at up to about 860 metres, but other references mention flight distances for Shelduck and Common Eider of 2 kilometres or more.

Impacts of noise and visual disturbance on birds and seals outside the protection areas are estimated to be **local** and of **short** duration. Although it is not exactly known where their offshore feeding areas (no reports or observations are published), it is expected that those areas likely to be affected by Project activities are less important than shallower areas (less than 30 metres deep) near the coast. Most seabird species which are feeding on mainly benthic fauna, can find food more easily near shore. Fish eating species are hunting for shoals of fish and feeding areas change as fish move.

If blasting is used for munitions clearance, it could potentially cause injuries or death to any seals that are close to the explosion. Safe distances to munitions clearance depend on the charge weight: the maximum safe range is 2 kilometres. Seals close to munitions clearance or construction areas can be scared away and in that way impact can be minimised.

If seals or birds are found near pipeline construction vessels, they will probably just change their feeding areas and avoid disturbance. Impacts of noise and visual disturbance on birds and seals outside protected areas are estimated to be local and of short duration. **No significant impacts** on bird or seal populations are expected.

Impacts during operation

Noise from gas flowing in pipelines

During the operations phase, gas flowing in the pipelines will emit underwater noise. Noise is **local** but **permanent**. According to research carried out for the Project, the noise level within the Finnish EEZ will be between 56 and 90 dB re 1 µPa within 10 metres of the pipelines. The noise level is so low that it will have no impact on protected areas in the Finnish EEZ. Beyond 10 metres from the pipelines, the noise level will be equivalent to the normal background noise.

Disturbance from supply-vessel traffic and rock placement

Monitoring and surveying and maintenance rock placement will create noise and visual disturbance. The impact of these activities on protected areas will depend on the magnitude (extent and duration) of the noise and visual disturbance and the sensitivity of the protected area.

Most of the disturbance caused by supply-vessel traffic and rock placement activities is **local** and the duration is **short**. Disturbance will not extend to protected areas. Disturbance from supply-vessel traffic using the shipping lanes will not significantly exceed background levels. There will not be direct negative impacts to breeding colonies, and birds feeding outside protected areas will probably just fly to other nearby feeding areas.

The impact from underwater noise due to rock placement has been assessed to be **short-term, reversible** and **local** (the duration of the works is approximately one to four days per site). It is assessed that disturbance from supply traffic and rock placement will have **no impacts** within any of the protected areas. Impacts on birds and seals outside protected areas are estimated to be **local** and of **short** duration and much less than the impacts during construction. **No significant impacts** on these populations are expected.

Suspension of sediments, nutrients, contaminants and re-sedimentation of released sediments

Munitions clearance, rock placement, offshore pipelaying, hyperbaric tie-in and anchor handling lead to dispersal of sediments, nutrients, contaminants and to re-sedimentation of released sediments. The effect will depend on the magnitude of the impact and if suspended matter or sedimentation will occur inside these Natura 2000 areas or affect them. If suspended sediment and sedimentation would occur inside a Natura 2000 area, the impacts will depend on, in what

degree, designated habitats and/or threatened species (according to the EC directives) will be affected.

Model calculations show that suspended sediments, nutrients, contaminants and re-sedimentation of released sediments will only have potential impacts within 2 kilometres of the pipeline areas and **no impacts** reach any Natura 2000 area at any point.

It is assessed that there will be **no impact** due to suspension of sediments, nutrients, contaminants and re-sedimentation of released sediments inside any of the Natura 2000 areas.

Noise and visual disturbance from increased vessel movement

Munitions clearance, rock placement, offshore pipelaying, pipe supply, hyperbaric tie-in and anchor handling will create noise and visual disturbance. The impacts to Natura 2000 areas will depend on the magnitude of the impact and in what degree designated habitats and/or threatened species (according to the EEC directives) will be affected.

Noise and visual disturbance during the construction will be located mostly in the outer sea and mostly the noise levels and visual disturbance are assessed to be of similar magnitudes as from the background traffic. Supply vessel traffic from Hanko and Kotka will be 2-3 vessels per day and it is assessed that these noise levels and visual disturbance have no change in the local background levels along the shipping lanes. Underwater noise from construction is assessed not to exceed the background noise inside the protected areas (see **Section 9.4**: impacts on physical and chemical environment). Impacts from noise and visual disturbance will not exceed the background levels in the Natura 2000 areas.

It is assessed that there will be **no impacts** due to noise and visual disturbance during the construction inside any of the Natura 2000 areas.

It is not expected that there will be any negative accumulative effects together with any other planned projects in the Nord Stream Project area.

10.5.5 Summary of Impacts on Natura 2000 areas in Finland

Table 10.3 Impacts on Protected areas

Impact	Intensity of effect	Scale of effect	Duration of effect	Overall significance of impact
Sediment spreading and sedimentation	Not Significant	Local 3-4 kilometres	Short-term Days (2-3)	Not Significant
Noise during construction and operation	Not Significant	Local 2-3 kilometres	Short-term Days (1-2)	Not Significant
Physical (1) disturbance during construction	Not Significant	Local 1-2 kilometres	Short-term Days (1-2)	Not Significant
Transboundary and cumulative impacts on protected areas	Not Significant	-	-	Not Significant

10.6 Summary of the assessment of potentially affected Natura 2000 areas in Sweden

10.6.1 Introduction

This section summarizes the results of the assessment of potential impacts from the Nord Stream Project on Natura 2000 areas in Sweden.

Nord Stream's potential impacts on Natura 2000 areas in Sweden have been discussed at meetings and consultations with e.g. the Swedish Environmental Protection Agency, Gotland University, Swedish Fishermen's Federation and the County Administrative Boards of Gotland,

(1) Physical disturbance relates to the potential disturbance of birds, mammals and fish which causes them to move (temporarily in most cases) or to modify their behaviour.

Kalmar and Blekinge in the context of the overall preparation of the application documentation in Sweden.

10.6.2 Basis of the Assessment of Impacts

The potential threats to the habitats and species in the Natura 2000 areas, such as increased sedimentation, noise and physical disturbance during construction and operation, have been identified in order to assess the potential impacts from the construction, pre-commissioning and operation of Nord Stream.

The area of influence and the severity of the potential impacts have been assessed and consequences for the designated Natura 2000 areas have been addressed for the Nord Stream route. The assessment adopted a 20 kilometre corridor along the pipelines' route for its initial assessment. This has been refined as a result of consultation with relevant authorities and stakeholders (see **Section 10.6.1**).

10.6.3 Potentially Affected Natura 2000 areas

Three Natura 2000 sites in Sweden have been identified as having potential impacts from the Nord Stream Project and thus requiring a more detailed assessment. These are shown in **Figure 10.5** and described below.

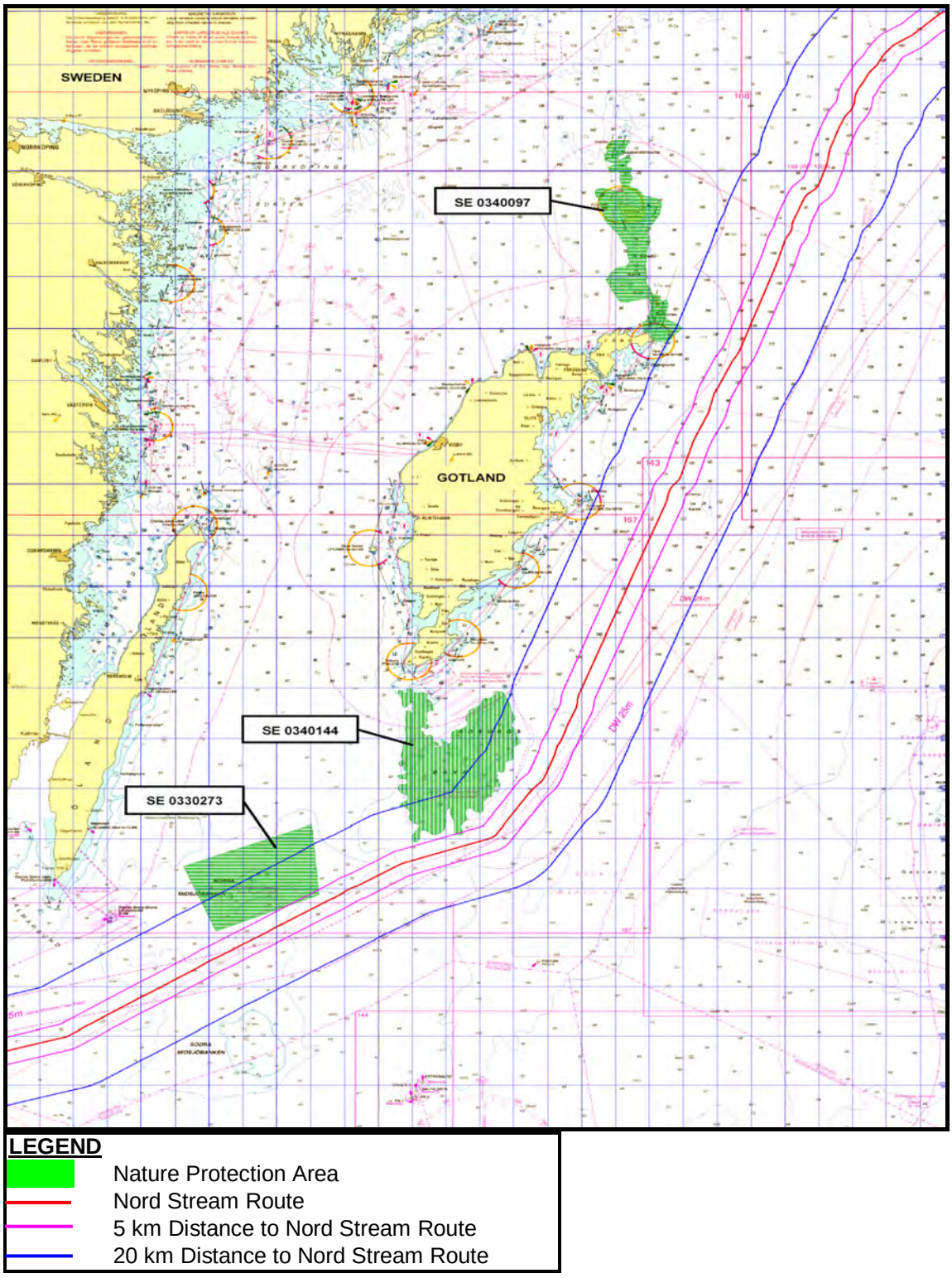

Figure 10.5 Natura 2000 areas along the pipeline route in the Swedish EEZ

Table 10.4 Natura 2000 sites in Sweden closer than 20 kilometres to the pipelines

Name	Official number	Type of conservation areas (SPA, SAC, SCI)	Conservation objectives	Distance to pipelines
Gotska Sandön - Salvorev	SE0340097	SCI	Sandbanks and reefs (Code 1110, 1170)*. Grey seal (*H. grypus*).	18 km
Hoburgs bank	SE0340144	SCI, SPA	Sandbanks and reefs (Code 1110, 1170). The bird species Common eider (*S. mollissima*), Long-tailed duck (*C. hyemalis*) and Black guillemot (*C. grylle*)	4 km
Norra Midsjö Bank	SE0330273	SCI, SPA	Sandbanks and reefs (Code 1110, 1170). The bird species Long-tailed duck (*C. hyemalis*) and Black guillemot (*C. grylle*)	3.2 km

* Also designated for several habitats and one species on land, according to the Habitats Directive.

Kopparstenarna/Gotska Sandön/Salvorev (SE0340097 SCI)

Gotska Sandön is a national park. Together with Kopparstenarna and Salvorev, it forms a Natura 2000 area north of Fårö Island. Gotska Sandön is located on a sunken ridge made of moraine, gravel and sand stretching from Klint Bank east of Gotland via Salvorev northeast of Fårö Island to Kopparstenarna 20 kilometres northeast of Salvorev. Kopparstenarna and Salvorev make up a marine reserve, and the border of the Natura 2000 area and the marine reserve are the same. It is located 18 kilometres from the pipeline corridor.

The Salvorev area is made up of sublittoral sandbanks measuring approximately 56,000 hectares. The area is designated for the Habitats Directives types Sandbanks (1110) and Reefs (1170).

Grey seal (*H. grypus*) an Annex II species is under the Habitats Directive are found here. The area also has a large population of Blue Mussel (M.edulis). The area is a breeding area for turbot (*P. maxima*). Many seabirds stay in the area for shorter or longer periods. Salvorev and Gotland's eastern coast are the most important Swedish bird areas in the Baltic Sea after Hoburgs Bank. Long-tailed duck (*C. hyemalis*) is the overwhelmingly dominant species in wintertime, with approximately 250,000 ducks wintering here. The Sandwich tern (*S.*

sandvicensis) and the Baltic gull (*L fuscus)* are present in the Salvorev area, and are listed as Bird Directive Annex I and Annex II species respectively.

Hoburgs Bank (SE 0340144 SCI, SPA)

Hoburgs Bank is shallow sea area, of which the northern part is situated only five nautical miles south of Gotland. Large parts of the area are at depths of approximately 35 m. The bank consists partly of bedrock, but there are also large areas comprised of sublittoral sandbanks and reefs. Annex I habitats found in this area include "Sandbanks" (1110) and "Reefs" (1170). It is located 4 kilometres from the pipeline corridor.

Hoburgs Bank has a unique substrate composition, with wave-induced glaciofluvial deposits(1), that is very rarely found elsewhere on Earth. The seafloor at this wave-exposed site is characterised by stones, rocks and extensive areas with sand on bedrock. Large algaes can be found down to a depth of 25 m. The most widely distributed animal is the blue mussel (*M. edulis*). Foraging of the Long-tailed duck (*C. hyemalis*) seems to have a major effect on the blue mussel population.

Annex II species of the Birds Directive found in this area include the Long-tailed duck (*C. hyemalis*) and the Common eider (S*. Mollissima).* Black Guillemot (*C. Grylle)* known to winter on the banks is protected by HELCOM.

Norra Midsjö Bank (SE0330273 SCI, SPA)

Norra Midsjöbanken is situated to the east of the southern end of Öland. It is a vast bank, partly consisting of a moraine ridge on bedrock. It is of interest in terms of both Annex I and Annex II of the Habitat Directive. The area contains two Annex I habitats "Sandbanks" (1110) and "Reefs" (1170). It is some 98,403 hectares in extent. It is located 3.2 kilometres from the pipeline corridor.

Norra Midsjöbanken is a spawning area for turbot (*P. maxima*) and herring (*C. harengus*). A large population of blue mussels (*M. edulis*) makes the area important for birds. It is of global interest for black guillemot (*C. grylle*) and is an important wintering area for long-tailed duck (*C. hyemalis)*.

(1) Glaciofluvial deposits consist of coarse- to medium-grained sand and gravel, poorly to well-sorted and bedded, with numerous cobbles, boulders and lenses of till.

10.6.4 Potential Impacts on Habitats and Species

Impacts during Construction

Suspension of sediments and re-sedimentation of released sediments

Seabed intervention works, i.e., trenching and rock placement, will lead to mechanical impacts on the sea bottom and changes to the water column in terms of levels of suspended sediment. This can affect organisms, such as fish species, that are food resources of seabirds. Avoidance of areas by fish could lead to changes in feeding conditions for seabirds. On the other hand, seabed intervention works may result in increased food resources because of increased suspended material that includes infauna species.

Both Norra Midsjöbanken and Hoburgs Bank are designated bird protection areas due to the presence of Long-tailed duck and Black guillemot which are diving species of seabirds. Hoburgs Bank is also a designated bird protection area due to the presence of common eider, also a diving seabird. Generally, a concentration of 15 mg/l or more sediment is regarded as being problematic for the visibility of diving seabirds.

Where seabed intervention works are carried out in deep water (~ >60 metres), there will be **no effects** on birds from dispersed sediment because the birds do not dive to these depths and sediment spread is mainly limited to 10 metres above the seabed. Model calculations show that suspended matter in the water column and sedimentation will not reach areas inside the Natura 2000 areas of Norra Midsjöbanken (3,2 kilometres from the pipelines) and Hoburgs Bank (4 kilometres from the pipelines) nor the Gotska Sandön and Salvorev area (18 kilometres from the pipelines).

An analysis of the density profile of long-tailed ducks in relation to the pipeline route has been carried out. Black guillemots were not included in the analysis because a larger data sample than what is available was needed. However, because the highest densities of Black guillemots are found at 12-20 metres depth, the highest densities of black guillemots are likely to be found even further away from the pipeline route than Long-tailed ducks. Common eider are most commonly found close to the coast, and so far away from the pipelines.

The pipelines to the east of Hoburgs Bank are in waters deeper than 50 metres, coinciding with the location of the international shipping lane, an area that is generally unsuitable for long-tailed ducks. Although peak densities are some distance from the route alignment (around 2 - 45 kilometres), the exact location of these peaks may vary in response to the distribution of available food supply.

Modelling has shown that a sediment concentration of more than 10 mg/l is only exceeded in close vicinity (<1 kilometre) to the areas where the seabed intervention works are carried out,

and then only for up to approximately one day. Sedimentation from seabed intervention works has also been modelled and the results show that sedimentation is quite insignificant.

Even though the main densities of the birds are likely to be located inside the Natura 2000 area of Norra Midsjöbanken and Hoburgs Bank, they are not restricted to these areas and birds may also be encountered outside these areas. In relation to sediment spreading and sedimentation the scale and intensity of effects on birds will be **minor**, the geographical extent of any effects will be **local** and the duration of the effects will be **short-term**. As these effects occur outside the designated Natura 2000 areas it is assessed that sediment plumes and sedimentation from seabed intervention works will have **no overall significant impact** on birds within Norra Midsjöbanken and Hoburgs Bank. Birds are likely to fly away from the sites of intervention works and return after the operation has moved on. These banks are particularly important in the winter for the long-tailed duck and black guillemot, and any disturbances during this period as a result of construction will affect these birds. However disturbance from construction during the summer months may also impact young immature guillemots which are known to feed on the offshore banks.

Norra Midsjöbanken and Hoburgs Bank are also designated as protected areas due to the presence of reefs and sandbanks. Because sedimentation inside these areas has been modelled to be zero or close to zero, it is assessed that there will be no impact on the designated habitat types. Sediment spreading from anchor-handling in connection with pipe-laying will not reach the Natura 2000 area of Norra Midsjöbanken and Hoburgs Bank and **no impacts** are expected.

Gotska Sandön-Salvorev is designated due to the presence of reefs and sandbanks. The Natura 2000-area is at considerable distance (18 kilometres) from the pipeline route and there will be no sedimentation inside the area. Thus, there will be **no impact** on the designated habitat types.

Noise

Noise levels from the pipe-laying vessel and the supply vessels will be similar to noise from other vessels sailing in the Baltic. As the pipeline route is located close to existing shipping lanes, the impact of noise from pipe-laying is assessed to be **negligible** inside the protected areas. Modelling of noise levels around the lay vessel shows that noise will have no impact inside the Natura 2000 areas.

Underwater noise from vessels carrying out seabed interventions has been assessed as not exceeding the levels of background noise inside the protected areas. Birds encountered outside the area are likely to fly away from sites of intervention works and approaching ships and return after the operation has moved on or the approaching ship has passed.

The scale and intensity of effects is assessed to be **minor**, the geographical extent of the effects to be **local** and the duration of the effects to be **short-term**. As these effects occur outside the designated Natura 2000 areas it is assessed that noise will have **no overall significant impact** on birds.

Physical Disturbance

Physical disturbances from the lay vessel, support vessels and vessels used during seabed intervention works are not assessed to have any significant impacts on the environment. Disturbance and flight reactions of bird species in response to slow-moving vessels in general is recorded to be up to a distance of around 1,000 metres. Birds are likely to fly away from sites of intervention works and approaching ships and return after the operation has moved on or the approaching ship has passed. The scale and intensity of the effects in proximity to the pipelines will be **minor**, the geographical extent will be **local** and the duration will be **short-term**. As these effects occur within a distance of approximately 1-2 kilometres around the pipeline route it is assessed that physical disturbances during construction will have **no overall significant impact** on birds in the Natura 2000 areas.

Impacts during Operation

Noise

Noise from gas flowing in the pipeline or from maintenance and survey work will have **no impact** on Natura 2000 areas.

Physical and visual disturbance

Monitoring and surveying, maintenance, rock placement and the restriction zone around these activities will cause physical and visual disturbance. However, the disturbance will not exceed current background levels at any of the Natura 2000 areas. There will be **no impacts** on Natura 2000 areas.

10.6.5 Summary of Impacts on Natura 2000 areas in Sweden

Table 10.5 Summary of Impacts on Natura 2000 areas in Sweden

Natura 2000 area Impact	Norra Midsjöbanken	Hoburgs Bank	Gotska Sandön - Salvorev	Likely significance of impact
Sediment spreading and sedimentation	Not Significant	Not Significant	Not Significant	Not Significant
Noise during construction and operation	Not Significant	Not Significant	Not Significant	Not Significant
Physical disturbance during construction	Not Significant	Not Significant	Not Significant	Not Significant
Transboundary and cumulative impacts on protected areas	Not Significant	Not Significant	Not Significant	Not Significant

10.7 Summary of the assessment of potentially affected Natura 2000 areas in Denmark

10.7.1 Introduction

Nord Stream's potential impacts on Natura 2000 areas in Denmark have been discussed at a meeting with the nature protection authorities on the 3rd March 2008 in the context of the overall preparation for the application documentation in Denmark. A map of the offshore and coastal habitats and bird protection areas was produced for the Bornholm area as basis for further assessment. The areas examined are all in the EEZ and territorial waters around Bornholm.

10.7.2 Basis of the Assessment of Impacts

The potential impacts on habitats and species in Natura 2000 areas, arising from activities such as increased sedimentation, noise during construction or physical disturbance during construction have been used in order to assess potential impacts from the construction, pre-commissioning and operation of Nord Stream.

The area of influence and the severity of the potential impacts have been assessed and consequences for the designated Natura 2000 areas have been addressed for the Nord Stream route. The initial assessment of potentially affected Natura 2000 areas was based on the identification of sites within a 20 kilometre corridor along the route of the pipelines. This has subsequently been refined in discussion with the relevant authorities.

10.7.3 Potentially Affected Natura 2000 areas

The Natura 2000 areas in Denmark identified as requiring a more detailed assessment of potential impacts are described in greater detail below.

The Danish Ministry of Environment proposed a new Natura 2000 area at Adlergrund and Rönne Banke to the west of Bornholm in October 2008. This area is included in the assessment.

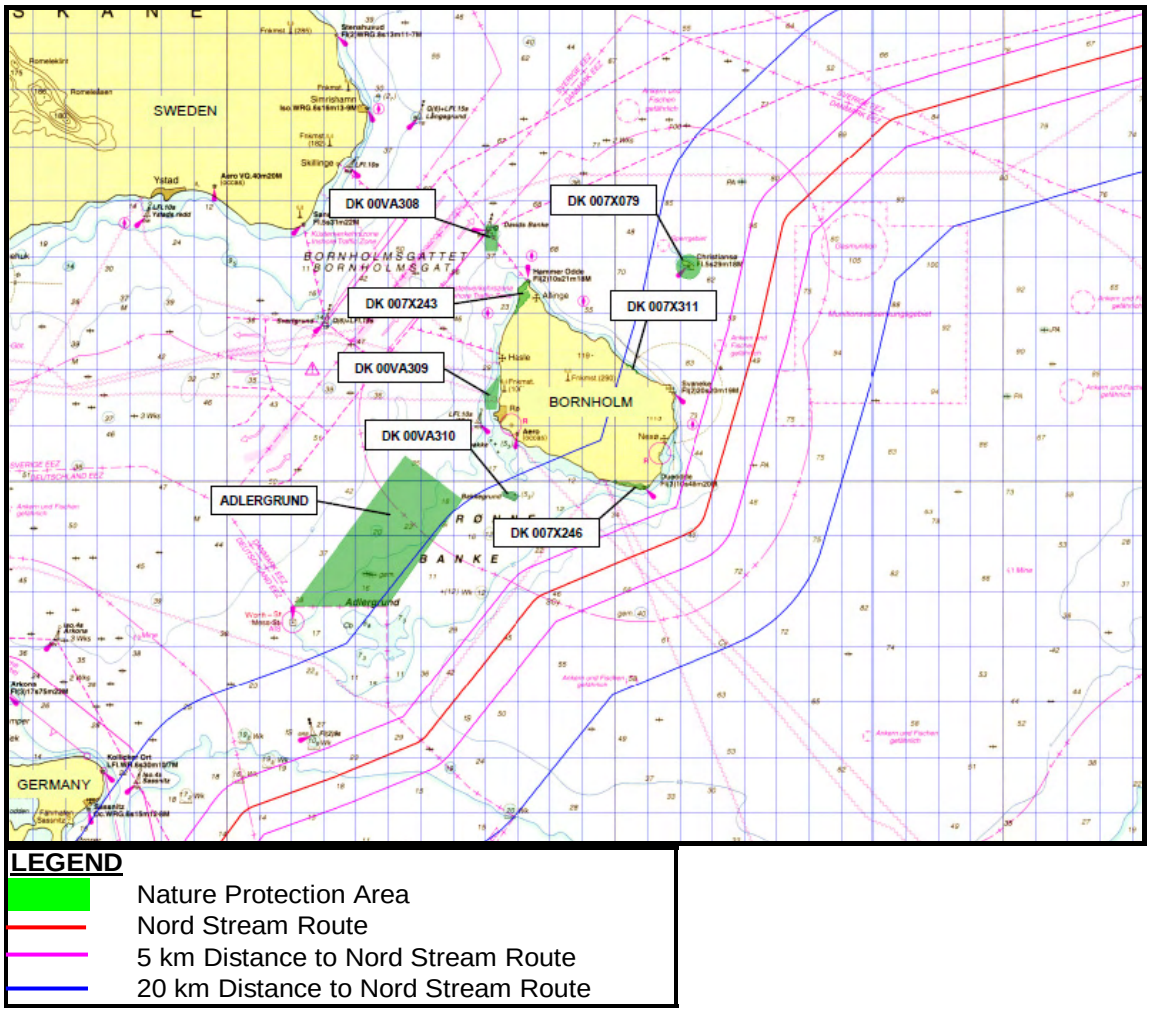

Figure 10.6 Natura 2000 sites along the Pipeline Route in the Danish sector

Table 10.6 Potentially Affected Natura 2000 areas in Denmark

Natura 2000 area	Status	Designated offshore/coastal habitats and species	Distance to pipeline route
DK00VA308 Davids Bank	SAC	Reefs (Habitat code 1170)[2]	44.3 km
DK007X243 Hammeren og Slotslyngen[1]	SAC	Vegetated sea cliffs of the Atlantic and Baltic coasts (Habitat code 1230)[2] Submerged or partially submerged sea caves (Habitat code 8330)[2]	38.3 km
DK007X079 Ertholmene	SAC	Reefs (Habitat code 1170)[2] Vegetated sea cliffs of the Atlantic and Baltic coasts (Habitat code 1230)[2]	11.2 km
	SPA	Common guillemot (*U. aalge*)[3] Razorbill (*A. torda*)[3]	
DK007X311 Randkløve Skår[1]	SAC	Vegetated sea cliffs of the Atlantic and Baltic coasts (Habitat code 1230)[2]	17.0 km
DK007X246 Dueodde[1]	SAC	Embryonic shifting dunes (Habitat code 2110)[2]	9.2 km
DK00VA310 Bakkebraedt Bakkegrund	SAC	Reefs (Habitat code 1170)[2]	16.1 km
DK00VA309 Hvideodde Rev	SAC	Reefs (Habitat code 1170)[2]	32.5 km
Adlergrund	Proposed SAC	Reefs (Habitat code 1170)[2] Sand banks (Habitat code 1110)[2] Harbour porpoise (*P. phocoena*)[3]	18.4 km

1: Also designated for several habitats and species on land, according to the Habitats Directive

2: Designated habitats according to the Council Directive 92/43/EEC on the conservation of natural habitats

3: Designated species according to Annex I of the Council Directive 79/409/EEC on the conservation of wild birds

Davids Banke (DK00VA308 SAC)

Davids Banke is a marine area of 838 hectares, located to the north of Bornholm. The area is designated on the basis of its reef structures. It is comprised of a shallow water area with a water depth up to 12 metres that is surrounded by areas with a water depth of 40 – 55 metres. Investigations of the macroalgae vegetation in 2005 observed only scarce macroalgae vegetation, with a total of six species. Common mussel (M. edulis) was observed with coverage of the seabed up to 60 per cent at 19 metres depth. The mussel was found down to depths of 32 metres.

Benthic fauna, fish, fishery and birds in the area have not been investigated since they are not relevant to the designation of the area. It should be noted that harbour seals and harbour porpoise are very rarely observed in the area.

The most significant threats to the area are fisheries, eutrophication and contaminants.

Davids Banke is approximately 44.3 kilometres from the planned Nord Stream pipeline route south of Bornholm.

Hammeren and Slotslyngen (DK007X243 SAC)

Hammeren and Slotslyngen is an area of 549 hectares, located on the northern coast of Bornholm. The area is designated on the basis of 18 habitat types and one species, the great crested newt (T. cristatus cristatus). Most of the habitat types are located on land; the only habitat types very close to, or at the coastline, are “Vegetated sea cliffs of the Atlantic and Baltic coasts” and “Submerged or partially submerged sea caves”. There are no investigations or data detailing the flora and fauna of these two habitats.

The Hammeren and Slotslyngen area is approximately 38.3 kilometres from the planned Nord Stream pipeline route south of Bornholm.

Ertholmene (DK007X079 SAC, SPA)

Ertholmene is an area of 1,256 hectares, located east of the northern part of Bornholm. The islands (Christiansø, Frederiksø, Græsholmene, Tat, Østerskær) and the water area around the islands are designated on the basis of one marine habitat (“Reef”) and five terrestrial habitats, one of which is “Vegetated sea cliffs of the Atlantic and Baltic coasts”. The area is also designated based on the bird species Common guillemot (U. aalgae) and razorbill (A. torda), which are listed in Annex I of the Birds Directive.

The Natura 2000 area is restricted to islands and to water depths of less than 50 metres. The reefs around Ertholmene are relatively densely covered by brown algae at water depths of less than 10 metres and by common mussel (*M. edulis*) down to approximately 12 metres depth.

The island of Græsholm is an important breeding area for birds, especially guillemots and razorbills. Guillemots also winter in the area. Græsholm also houses the second largest colonies of herring gull (*L. argentatus*) and common eider (*S. mollissima*) in Denmark. The following bird species found in the area are also of note: lesser black-backed gull (*L. marinus*), mew gull (*L. canus*), cormorant (*P. carbo*), red-breasted merganser (*M. serrator*), tufted duck (*N. fuligula*) and mallard (*A. platyrhynchos*).

Harbour porpoise and seals (harbour seal and grey seal) are very rarely observed in the area.

The most significant threats to the marine environment around the islands are bottom-trawler fishing and increased inputs of nutrients and contaminants.

Ertholmene is approximately 11.2 kilometres from the planned Nord Stream pipeline route.

Randkløve Skår (DK007X311 SAC)

Randkløve Skår is an area of 37 hectares, located on the eastern coast of Bornholm. The area is designated on the basis of nine habitat types, including the habitat “Vegetated sea cliffs of the Atlantic and Baltic coasts” near/at the coastline.

Randkløve Skår is approximately 17 kilometres from the planned Nord Stream pipeline route.

Dueodde (DK007X246 SAC)

Dueodde is an area of 253 hectares, located at the southern end of Bornholm. The area is designated on the basis of eight habitat types, with the habitat “Embryonic shifting dunes” located close to the coastline. The Natura 2000 area does not include the water area around the southern end of Dueodde, but the habitat “Embryonic shifting dunes” can become flooded during winter storms.

Dueodde is approximately 9.2 kilometres from the planned Nord Stream pipeline route.

Bakkebrædt and Bakkegrund (DK00VA310 SAC)

Bakkebrædt and Bakkegrund are three small, separate stone reefs with a total area of 299 hectares, located offshore at Rønne Banke, west of Bornholm. The area is designated on the basis of the marine habitat “Reef”. The reefs are restricted to water depths of less than 10 metres, and Bakkegrund, with a depth of 5.3 metres, is the shallowest. The area is dominated by the common mussel (*M. edulis*), but it houses very few marine species. Only three perennial macroalgae species, with low coverage of the seabed, were observed during investigations in 2005.

Together with Rønne Banke, Bakkebrædt and Bakkegrund is an important location for wintering long-tailed ducks (*C. hyemalis*).

Harbour porpoise and harbour seals are rarely observed in the area.

The most significant threats to the area are fishing, eutrophication and contaminants. The risk of eutrophication due to high levels of nutrients is evaluated to be significant.

Bakkebrædt and Bakkegrund are approximately 16.1 kilometres from the planned Nord Stream pipeline route.

Hvideodde Rev (DK00VA309 SAC)

Hvideodde Rev is an area of 789 hectares, located offshore to the north of the city of Rønne on Bornholm. The area is designated on the basis of the marine habitat “Reef”. The area also includes Kåsgård Rev and Nyker Rev in addition to Hvideodde Rev. The seabed is comprised of sandstone, heaps of stones and sand areas. The water depth varies from 0.5 metres to 20 metres at the outer border of the Natura 2000 area. Where the seabed consists of stones, it is covered by vegetation dominated by red seaweeds (*F. lumbricalis*) and different perennial macroalgae species.

The most significant threat to marine flora and fauna in the area is eutrophication.

Hvideodde Rev is located approximately 32.5 kilometres from the planned Nord Stream pipeline route.

Adlergrund (proposed SAC)

Adlergrund is an area of 31,900 hectares, located to the west of Bornholm at Adlergrund and Rønne Banke. The area is proposed as a Natura 2000 area on the basis of the marine habitats “Reefs” and “Sandbanks which are slightly covered by sea water all the time”, and on the basis of the Annex II species harbour porpoise (*P. phocoena*).

Adlergrund is approximately 18.4 kilometres from the planned Nord Stream pipeline route.

10.7.4 Potential Impacts on Habitats and Species

Due to the distances between the pipeline and the Natura 2000 sites discussed in **Section 10.7.3**, and the fact that one of the two closest sites is terrestrial (Dueodde), only the site at Ertholmeme which is closest to any seabed intervention works has been assessed in detail.

Impacts during Construction

Impacts from sedimentation

Both pipelaying and seabed intervention works, i.e. anchor handling during pipelaying, and trenching of the 10 and 15 kilometres section 11.6 kilometres southeast of Ertholmene, will result in impacts on the seabed, with spreading of sediment.

The model calculations of sediment spreading and re-sedimentation of sediment brought into suspension by the trenching operation shows that the concentration of suspended sediment in the water from 0 – 10 metres above the seabed will be **insignificant** and be < 1 mg/l 3 -4 kilometres from the construction site.

Sediment spreading during pipelaying and anchor handling has been described and evaluated to be **low** in terms of its potential effects and effects will be restricted to the immediate vicinity (3 -4 kilometres) where pipelaying and anchor handling is carried out.

Impacts from sediment spreading and sedimentation is, on basis of the results of modelling, evaluated to have **no impact** inside the protected areas.

Impacts on feeding areas of the two designated birds at Ertholmene, outside the protected areas, are also assessed to be **insignificant**. This is based on the fact that the area with trenching, is located outside the important feeding areas for these two bird species.

Generally, a concentration of 15 mg/l or more sediment is regarded as being problematic for the visibility of diving seabirds. If impacts from suspended sediments could occur, impacts would be restricted to the very close vicinity of the construction site.

Impacts from noise

The noise levels from pipelaying and trenching have been shown to be **below disturbance levels** 2-3 kilometres from the construction site, and there will not be increased noise levels from the construction inside the Natura 2000 areas that could affect the marine fauna or designated bird species. The same will be true for feeding areas of the designated bird species outside the Natura areas, where no increased noise levels will occur.

Impacts from physical disturbances

Physical disturbances (motion, noise, light signalling) from the lay vessel, support vessels and vessels used during seabed intervention works are not assessed to have any significant impacts on the environment.

Disturbance and flight reactions of different bird species in response to slow-moving vessels in general are recorded to be up to a distance of around 1 – 2 kilometres.

It is assessed that there will be **no overall impact** inside the protected areas.

Impacts during Operation

It is assessed that there will be **no impacts** on Natura 2000 sites in Denmark during operation of the pipelines.

10.7.5 Summary of Impact on Natura 2000 areas in Denmark

The impacts on protected areas from construction and operation of the planned Nord Stream pipelines within the Danish EEZ and territorial waters are summarised in **Table 10.7** below, with respect to the intensity, scale and duration of the effects, and the overall significance of the impacts on the environment. All the effects outlined above occur outside the designated protected areas and also outside areas that the designated birds use as feeding areas.

Table 10.7 Summary of Impacts on Natura 2000 areas in Denmark

Impact	Intensity of effect	Scale of effect	Duration of effect	Overall significance of impact
Sediment spreading and sedimentation	Not Significant	Local 3-4 kilometres	Short-term Days (2-3)	Not Significant
Noise during construction and operation	Not Significant	Local 2-3 kilometres	Short-term Days (1-2)	Not Significant
Physical disturbance during construction	Not Significant	Local 1-2 kilometres	Short-term Days (1-2)	Not Significant
Transboundary and cumulative impacts on protected areas	Not Significant	-	-	Not Significant

10.8 Summary of the assessment of potentially affected Natura 2000 areas in Germany

10.8.1 Introduction

Potential impacts of the Nord Stream Project on the conservation objectives of various Natura 2000 sites in the Territorial Waters and the EEZ of Germany have been assessed according to the legal requirements of Art. 6(3) of the EU directive in the context of the overall preparation of the application documentation in Germany.

10.8.2 Basis for the Assessment of Impacts

Potential impacts were analysed based on the potential impacts caused during construction, pre-commissioning, maintenance and operation of the pipelines. Potential impacts during construction and pre-commissioning may result from various temporary situations, especially:

- Habitat loss due to seabed intervention works (dredging, dumping, etc.)
- Re-suspension of sediment
- Noise and light pollution
- Chemical pollution
- Disturbance from construction traffic and construction works

Temporary habitat losses were judged on the basis of calculations of impact areas in the vicinity of trenching and dumping activities described in the Technical Explanatory Report (TER) (part of the German application document). Predictions on recovery times for affected habitats were derived from previous research and surveys. Turbidity was calculated by oceanographic modelling for all seabed intervention works inside the Greifswalder Bodden. The intensity and timing of noise and light emissions were also described based on the TER. Potential displacement reactions were analyzed on the basis of the time schedule for construction works, described in the TER.

The pipelines (either laid on the sea floor or covered by sediment) will cause constant emissions of various chemicals (anode protection, plastic coatings etc) throughout the period of maintenance. If laid on top of sandy sediments, the pipelines will provide an artificial hard bottom substrate for red algae and benthic invertebrates. The pipeline will cause a negligible cooling effect during operation. Short term disturbances will result from pipeline integrity inspections.

Spatial aspects of potential impacts were investigated on the basis of potential impact ranges, defined for all receptors of importance (habitats, birds, and other animal species) through the Scoping Conference held in Germany.

The spatial criteria adopted for the assessment of potential impacts on Natura 2000 sites were as follows:

- Offshore
    - Habitats – pipeline/trench area + 150 metres to both sides
    - Fishes - pipeline/trench area + 1000 metres to both sides
    - Seabirds/marine mammals - pipeline/trench area + 3000 metres to both sides
    - (Under water noise emissions in relation to marine mammals for entire sites, if recognised as relevant objects of conservation)
- Onshore
    - Habitats - dry section construction site + 250 metres radius
    - Animals - dry section construction site + 300-1000 metres radius

10.8.3 Potentially Affected Natura 2000 areas

In total there are six designated Natura 2000 sites which will be crossed by the Nord Stream Project. Two of them belong to the same area (Greifswalder Bodden, designated twice to enlarge the size of the site).

Two SCIs are situated in close vicinity (< 5 kilometres distance). Another nine sites are located within a 20 kilometres corridor (see **Table 10.8**). Some of these sites were designated to protect exclusively terrestrial habitats and species. Others protect marine habitats of coastal waters, at some distance from areas which will be crossed by the pipelines. Thus not all 17 Natura 2000 sites within the 20 kilometres corridor were assessed for the German application documentation. The nature conservation authorities of Mecklenburg-West Pomerania and the Federal Agency for Oceanography and Maritime Transport (BSH) compiled a list of 14 Natura 2000 sites in German Territorial Waters and the EEZ after the Scoping Conference which had to be assessed.

The sites considered in the assessment are presented in **Table 10.8** below.

Table 10.8 Natura 2000 sites closer than 20 kilometres to the pipeline

Name	Official number	Type of conservation areas (SPA, SAC, SCI)	Conservation objectives	Distance to pipelines
Territorial Waters				
Greifswalder Bodden and Parts of Stralsund and Nordspitze Usedom	DE 1747-301	SCI	Habitats Marine habitat types: Sandbanks (1110), Mudflats and sandflats (1140), Coastal lagoons (1150*), large shallow inlets and bays (1160),Reefs (1170). Habitats Directive Annex II. Terrestrial habitat types (in the vicinity of the dry section): 1210, 1230, 1310, 1330, 2110, 2120, 2130*, 6230* Plus another 15 habitat types outside the potential impact area Species: *Halichoerus grypus* *Phoca vitulina* *Lutra lutra* *Myotis myotis* *Myotis dasycneme* *Rhodeus amarus* *Petromyzon marinus* *Lampetra fluviatilis* *Aspius aspius* *Alosa fallax* *Lycaena dispar* *Leucorrhinia pectoralis* *Vertigo angustior* *Vertigo moulinsiana* *Liparis loeselii*	Crossed

Name	Official number	Type of conservation areas (SPA, SAC, SCI)	Conservation objectives	Distance to pipelines
Greifswalder Bodden-randschwelle and Parts of the Pomeranian Bight.	DE 1749-302	SCI	Habitats Marine habitat types: Sandbanks (1110), large shallow inlets and bays (1160), Reefs (1170) Species: *Phocoena phocoena* *Halichoerus grypus* *Phoca vitulina* *Petromyzon marinus* *Lampetra fluviatilis* *Acipenser oxyrinchus* *Alosa fallax*	Crossed
Jasmund	DE 1447-302	SCI	Habitats Marine habitat types: Reefs (1170) Terrestrial habitat types: 16 Species: *Halichoerus grypus* *Lampetra planeri* *Triturus cristatus* *Bombina bombina* *Vertigo moulinsiana Cypripedium calceolus*	20.4 km
Granitz	DE 1647-303	SCI	Habitats Marine habitat types: Reefs (1170). Terrestrial habitat types: 9 Species:	10.5 km

Name	Official number	Type of conservation areas (SPA, SAC, SCI)	Conservation objectives	Distance to pipelines
			Halichoerus grypus *Triturus cristatus* *Vertigo angustior*	
Coastal Area Southeast Rugen	DE 1648-302	SCI	Habitats Marine habitat types: Sandbanks (1110), Mudflats and sandflats (1140), Coastal lagoons (1150*), large shallow inlets and bays (1160), Reefs (1170). Terrestrial habitat types: 14 Species: *Halichoerus grypus* *Lutra lutra* *Vertigo angustior*	1.8 km
Peeneunterlauf, Peenestrom, Achterwasser und Kleines Haff	DE 2049-302	SCI	Habitats Marine habitat types: Estuaries (1130) Terrestrial habitat types: 17 Species: *Castor fiber* *Lutra lutra* *Rhodeus amarus* *Petromyzon marinus* *Lampetra fluviatilis* *Lampetra planeri* *Aspius aspius* *Alosa fallax* *Misgurnus fossilis* *Cobitis taenia* *Salmo salar*	6.3 km

Name	Official number	Type of conservation areas (SPA, SAC, SCI)	Conservation objectives	Distance to pipelines
			Lycaena dispar *Carabus menetriesi* *Osmoderma eremita* *Vertigo moulinsiana* *Liparis loeselii*	
Greifswalder Oie	DE 1749-301	SCI	Habitats Marine habitat types: Reefs (1170). Species: *Halichoerus grypus* *Phoca vitulina*	9.5 km
Greifswalder Bodden	DE 1747-401/ DE 1747-402 (later expansion of site)	SPA	Breeding species 20 (Annex I) Waterfowl, raptors, waders, woodpeckers, songbirds Migrating species: 30+ (Annex I) 30+ (Art. 4.2) Ducks, geese, swans, waders, terns, gulls	Crossed
Western Pomeranian Bight	DE 1649-401	SPA	Migrating species: 5 (Annex I) 6 (Art. 4.2) seaducks, divers, grebes, auks, gulls	Crossed
EEZ				
Pomeranian Bight and Oderbank	DE 1652-301	SCI	Habitats Marine habitat types: Sandbanks (1110) Species: *Phocoena phocoena*	0.6 km

Name	Official number	Type of conservation areas (SPA, SAC, SCI)	Conservation objectives	Distance to pipelines
			Alosa fallax	
Adlergrund	DE 1251-301	SCI	Habitats Marine habitat types: Sandbanks (1110), Reefs (1170). Species: *Phocoena phocoena* *Halichoerus grypus*	7.2 km
Western Rönnebank	DE 1249-301	SCI	Habitats Marine habitat types: Reefs (1170). Species: *Phocoena phocoena*	15.9 km
Pomeranian Bight	DE 1552-401	SPA	Migrating species: 4 (Annex I) 15 (Art. 4.2) seaducks, divers, grebes, auks, gulls	Crossed

Table 10.9 Habitats Directive Areas in the German Section and their Conservation Criteria

	HD site "Adlergrund" (DE 1251-301)	HD site "Western Rönnebank" (DE 1249-301)	HD site "Pommeranian Bight with Oderbank" (DE 1652-301)	HD site "Jasmund" (DE 1447-302)	HD site "Granitz" (DE 1647-303)	HD site "Greifswalder Boddenrandschwelle and part of Pommeranian Bight" (DE 1749-302)	HD site "Greifswalder Bodden, part of Strelasundes and Nordspitze Usedom" (DE 1747-301)	HD site "Küstenlandschaft Südostrügen' (DE 1648-302)	HD site 'Greifswalder Oie" (DE 1749-301)	HD site "Peeneunterlauf, Peenestrom, Achterwasser and Kleines Haff" (DE 2049-302)
Shortest distance to the pipeline route	7.2 km	15.9 km	0.6 km	20.4 km	10.5 km	Crossing	Crossing	1.8 km	9.5 km	6.3 km
Marine and Coastal Habitats from Appendix I of the Habitats Directive										
1110 Sandbanks which are slightly covered by sea water all the time	X		X			X	X	X		
1130 Estuaries										X
1140 Mudflats and sandflats not covered by seawater at low tide							X	X		
1150* Coastal lagoons								X		
1160 Large shallow inlets and bays						X	X	X		
1170 Reefs	X	X		X	X	X	X	X	X	
1210 Annual vegetation of drift lines					X		X	X	X	X
1220 Perennial vegetation of stony banks				X			X	X	X	
1230 Vegetated sea cliffs of the Atlantic and Baltic coasts				X	X		X	X	X	X
1310 *Salicornia* and other annuals colonizing mud and sand							x		X	
1330 Atlantic salt meadows							X			X
2110 Embryonic shifting dunes							X			

	HD site "Adlergrund" (DE 1251-301)	HD site "Western Rönnebank" (DE 1249-301)	HD site "Pommeranian Bight with Oderbank" (DE 1652-301)	HD site "Jasmund" (DE 1447-302)	HD site "Granitz" (DE 1647-303)	HD site "Greifswalder Boddenrandschwelle and part of Pommeranian Bight" (DE 1749-302)	HD site "Greifswalder Bodden, part of Strelasundes and Nordspitze Usedom" (DE 1747-301)	HD site "Küstenlandschaft Südostrügen' (DE 1648-302)	HD site 'Greifswalder Oie" (DE 1749-301)	HD site "Peeneunterlauf, Peenestrom, Achterwasser and Kleines Haff" (DE 2049-302)
2120 Shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes`)							X	X		
2130* Fixed dunes with herbaceous vegetation (`grey dunes`)							X	X		
6230* Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)							x		X	
Animal species of the sea and coastal waters from <u>Appendix II</u> of the Habitats Directive										
Harbour porpoise (*Phocoena phocoena*)	X	X	X			X				
Grey seal (*Halichoerus grypus*)	X			X	X	X	X	X	X	
Harbour seal (*Phoca vitulina*)						X	X		X	
Otter (*Lutra lutra*)							X	X		X
Beaver (*Castor fiber*)										X
Myotis myotis							X			
Myotis dasycneme							X			
Bitterling (*Rhodeus sericeus amarus*)							X			X
River lamprey (*Lampetra fluviatilis*)						X	X			X
Sea lamprey (*Petromyzon marinus*)						X	X			X
Asp (*Aspius aspius*)							X			X
Atlantic salmon (*Salmo salar*)										(S)

	HD site "Adlergrund" (DE 1251-301)	HD site "Western Rönnebank" (DE 1249-301)	HD site "Pommeranian Bight with Oderbank" (DE 1652-301)	HD site "Jasmund" (DE 1447-302)	HD site "Granitz" (DE 1647-303)	HD site "Greifswalder Boddenrandschwelle and part of Pommeranian Bight" (DE 1749-302)	HD site "Greifswalder Bodden, part of Strelasundes and Nordspitze Usedom" (DE 1747-301)	HD site "Küstenlandschaft Südostrügen' (DE 1648-302)	HD site 'Greifswalder Oie" (DE 1749-301)	HD site "Peeneunterlauf, Peenestrom, Achterwasser and Kleines Haff" (DE 2049-302)
Twaite shad (*Alosa fallax*)			X			X	X			X
Atlantic sturgeon (*Acipenser oxyrinchus*)			(D)			X				

Key:

HD Habitats Directive

* Priority habitat

(D) Assessment of the conservation status after standard data sheets step "D" – not significant

(S) Target species only in reference to fresh water habitats

Crossing of an area - possibility of direct influence on a habitat

Natura 2000 site lies in the effect area of the Project – direct impact possible

Natura 2000 site lies outside of the direct effect area of the Project – only indirect impact possible

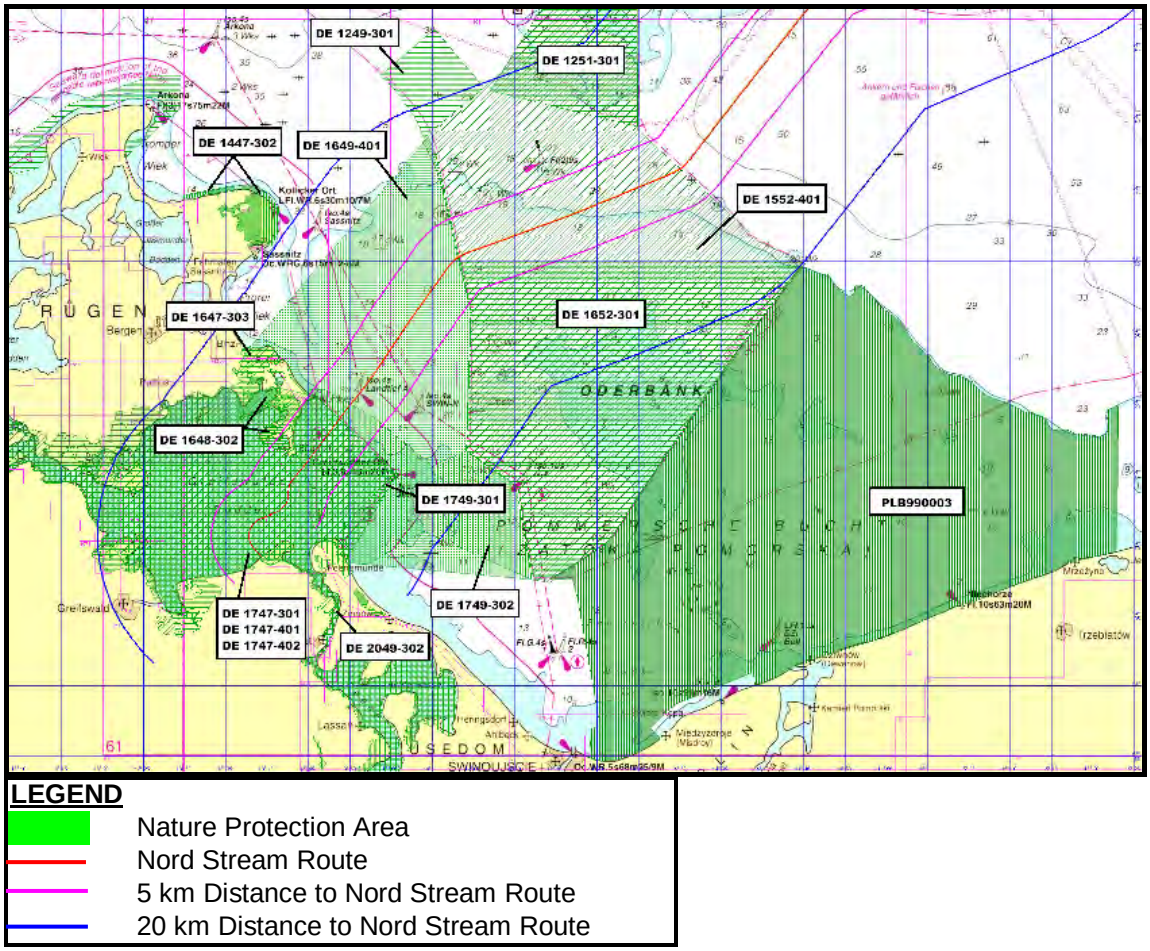

Figure 10.7 Natura 2000 areas in the German EEZ and Territorial Waters

Greifswalder Bodden and Parts of Stralsund and Nordspitze Usedom (DE 1747-301 SCI)

The Habitats Directive area encompasses the Bay of Greifswald and its shoreline as well as large portions of the Boddenrandschwelle. An approximately 15.5 kilometre stretch of the pipeline route runs within the Natura 2000 area, encroaching on the Habitats Directive Annex I habitat types found throughout the protection area. The coastal route crosses the Habitats Directive habitat types: "Sandbank"(1110), in the area of the Boddenrandschwelle and in the shallow waters off Lubmin; "Wind Flats" (1140), also in the shallow waters off Lubmin; "Large Wide Inlets and Bays" (1160), between the Boddenrandschwelle and the shallow waters off Lubmin; and "Reef"(1170), locally in shallows such as the Neptungrund.

This protected area contains a large number of Annex I habitats. These are as follows: Sandbanks (1110), Mudflats and sandflats (1140), large shallow inlets and bays (1160); Reefs (1170), Annual vegetation of drift lines (1210), Perennial vegetation of stony banks 1220),

Vegetated sea cliffs of the Atlantic and Baltic coasts (1230), Atlantic salt meadows (1330), Embryonic shifting dunes (92110), Shifting dunes (2120) and Fixed dunes (2130).

It also contains a number of Annex II species. These include the Grey and Harbour seal, Bitterling, River and Sea lampreys, Asp, Twaite shad and European Otter.

Greifswalder Boddenrandschwelle and Parts of the Pomeranian Bight (DE 1749-302 SCI)

The Boddenrandschwelle is a shallow sandbar formed during the last glaciations which separates the Greifswalder Bodden (coastal inlet) from the Pommeranian Bight (open Baltic Sea). The Nord Stream pipeline crosses this area.

The extensive reefs and sandbanks in the vicinity of the Boddenrandschwelle are one of the major spawning grounds for spring spawning Herring in the western Baltic Sea. Herring, Herring eggs as well as benthic invertebrates (especially blue mussels Mytilus spec.) are a major food source for a variety of sea bird species.

This Natura 2000 area contains the following Annex I priority habitat types; Sandbanks (1110), Large shallow inlets and bays (1160) and Reefs (1170). It also contains a number of Annex II species, Grey and Harbour seals, Harbour porpoise, River and Sea Lampreys, the Twaite Shad and the Atlantic Sturgeon.

Peeneunterlauf, Peenestrom, Achterwasser and Kleines Haff (DE 2049-302 SCI)

This SCI covers the western part of the Oder estuary, comprising coastal inlets and lagoons and the Peenestrom, a stream characterized by stochastic changes in salinity in relation to fresh water runoff and weather induced sea level changes. The route of the Nord Stream pipeline runs 6.3 kilometres from this site.

A great variety of marine, coastal and terrestrial habitats occur. The site aims to protect 16 species of Annex II of the habitat directive: beaver, otter, fishes, lamprets, insects, terrestrial snails and the orchid *Liparis loeselii.*

Estuaries (1130), Annual vegetation of drift lines (1210), Vegetated sea cliffs of the Atlantic and Baltic costs (1230) and Atlantic salt meadows (1330) are the Annex I habitat types found in this area. The Annex II species found include Bitterling, River Lamprey, Sea Lamprey, Asp, Atlantic Salmon and European Otter.

Greifswalder Oie (DE 1749-301 SCI)

The island Greifswalder Oie is surrounded by extensive shallow reefs which result from erosion of glacial tilt since the transgression of the south western Baltic sea started about 2000 years ago. The route of the Nord Stream pipeline runs 9.5 kilometres from this site.

Several Annex I habitat types are found in this protected area (see **Table 10.3**). They are Reefs (1170), Annual vegetation of drift lines (1210), Perennial vegetation of stony banks (1220) and vegetated sea cliffs of the Atlantic and Baltic coasts (1230). This Natura 2000 area also contains the Annex II species Grey seal and Harbour seal.

Coastal Area Southeast Rügen (DE 1648-302 SCI)

The Habitats Directive area "Coastal Area Southeast Rügen" lies in the effective range of Nord Stream construction activities. The route of the Nord Stream pipeline runs 1.8 kilometres form this site. However, the route of the pipeline runs outside the protected area and does not physically encroach on its territory. The reserve comprises a mosaic of marine, coastal and especially terrestrial habitats of glacial origin. Grey seals occasionally use exposed boulders as haul out sites.

The Annex I habitats types found in this area are Sandbanks (1110), Mudflats and sandflats (1140), Coastal lagoons (1150), large shallow inlets and bays (1160), Reefs (1170), Annual vegetation of drift lines (1210), Perennial vegetation of stony banks (122-0), vegetated sea cliffs of the Atlantic and Baltic coasts (1230), Shifting sand dunes (2120) and Fixed dunes (2130).

The Annex II species grey Seal and European Otter are found in this protected area. The site also aims to protect the snail *V. angustior*.

Granitz (DE 1647-303 SCI)

The Granitz is one of the largest moraine cliffs on Rügen Island. The route of the Nord Stream pipeline runs 10.5 kilometres from this site.

Extensive broadleaf forests are the major object of protection of this SCI. Offshore shallow reefs result from coastal erosion processes and Grey Seals (an Annex II species) occasionally use exposed boulders as haul out sites.

This Natura 2000 area has the following Annex I habitats; Reefs (1170) and Annual vegetation of drift lines (1210) and also Vegetated sea cliffs of the Atlantic and Baltic coasts (1230).

Jasmund (DE 1447-302 SCI)

This SCI is part of a National Park covering a great variety of forest and bog habitats, a spectacular chalk cliff as well as offshore reefs. The route of the Nord Stream pipeline runs 20.4 kilometres from this site.

The Jasmund Natura 2000 area contains the following Habitats Directive Annex I habitats; Reefs (1170), Perennial vegetation of stony banks (1220) and Vegetated sea cliffs of the Atlantic and Baltic coasts (1230). Grey seals, an Annex II species occasionally use exposed boulders as haul out sites.

Pomeranian Bight and Oderbank (DE 1652-301 SCI)

The Oderbank is the central morphological structure of the Pomeranian Bight. The route of the Nord Stream pipeline runs 0.6 kilometres from this site.

It is the largest sandbank of the southern Baltic Sea (best representative of this habitat in the entire Baltic Sea). It rises up to 8 metres water depth and serves as a wintering area for numerous seabirds. Furthermore, the Oderbank is a nursery ground for flat fish species. Two distinct groups of Harbour Porpoise occur on the Oderbank at low densities: animals from the Danish Belt Sea during summer and autumn, animals from the highly endangered sedentary stock of the southern Baltic Sea in winter, especially during the ice season.

In terms of the classification of habitats in the Habitats Directive it is categorised as 'Sandbanks which are slightly covered by sea water all the time' in terms of its Annex I categorisation. In terms of the species listed in Annex II of the Habitats Directive the site is of significance for both Harbour Porpoise and Twaite shad.

Adlergrund (DE 1251-301 SCI)

The Adlergrund encompasses the shallowest parts of the Rönnebank between the islands of Rügen and Bornholm. The route of the Nord Stream pipeline runs 7.2 kilometres from this site.

The SCI represents the largest and highest rising underwater area in the southern Baltic Sea with reefs and sandbanks. The shallow ridges are colonised by macroalgae (*F. serratus, H. tomentosus, L. saccharina, F. lumbricina*). Blue Mussels (*Mytilus* spec). dominate on the deeper boulder fields. At the outer edges of the reef the site is dominated by sandbanks formed form glacial sands.

The Adlergrund is an important macrophyte site and an important feeding area for over-wintering sea ducks and black guillemots and serves in severe winters as a sanctuary for the sea ducks of the Pomeranian Bight.

In terms of the classification of habitats in Annex I of the Habitats Directive, the area contains the following priority habitats, 'Sandbanks' and 'reefs'. In terms of Annex II species of the Habitats Directive the Harbour Porpoise and the Grey Seal are key species.

Western Rönnebank (DE 1249-301 SCI)

This area comprises an extensive moraine ridge close to the coast at Rønnebank, with extensive strata of glacial material to a depth of 43 metres with stone reefs through it. The route of the Nord Stream pipeline runs 15.9 kilometres from this site.

In terms of Annex I of the Habitats Directive the priority habitat is ‘Reefs’ (1170). The Annex II species of concern is the Harbour Porpoise. Another Annex II species, the Twaite shad, is also found in the area.

Greifswalder Bodden and Southern Strelasund (DE 1747-402 SPA and DE 1747-401 SPA)

The area of the Greifswalder Bodden SPA is slightly larger than the SCI. The site has been designated twice to enlarge its size. The route of the Nord Stream pipeline crosses this site.

The large variety of marine and coastal habitats provides suitable breeding habitats for 20 species of Annex I of the Birds Directive. Most of them are coastal breeding water birds (waders, terns, gulls). Huge concentrations of migratory waterfowl are the major food source for some rare raptors such as the Peregrine Falcon (*F. peregrinus*) and White-tailed Eagle (*H. albicilla*). In addition several passerine species listed in Annex I breed in the coastal dune and pasture habitats.

The Greifswalder Bodden is the core section of an extensive system of coastal inlets which form the most important wintering area for waterfowl in the Baltic Sea. About 80 different species of ducks, geese, swans, mergansers, waders, terns and gulls use the Greifswalder Bodden as a stop over site during migration, or either as a wintering or moulting area. Aggregations of several species by far exceed the 1 per cent criteria of their western Palaearctic population (e.g. Bewick´s Swan *C. columbianus*, Tufted Duck *A. fuligula*, Scaup *A. marila*, Long-tailed Duck *C. hyemalis*, Caspian Tern *S. caspia*).

Western Pomeranian Bight (DE 1649-401 SPA)

This SPA forms the western section of the Pomeranian Bight, the second most important wintering area for seabirds in the Baltic Sea. It connects the inner coastal lagoon system (SPA Greifswalder Bodden) with the shallow banks of the open sea (Oderbank and Adlergrund, SPAs Pomeranian Bight and Zatoka Pomorska in the German and Polish EEZ). The route of the Nord Stream pipeline crosses this site.

Red-throated Divers *G. stellata*, Slavonian Grebes *P. auritus*, and sea ducks are the most abundant species staging there during winter and spring. Spawning Herring is the most important food source for all species between February and May.

Pomeranian Bight (DE 1552-401 SCI)

The SPA is one of the most important staging areas for sea birds in the Baltic Sea. Up to half a million individuals winter there. The route of the Nord Stream pipeline crosses this site.

The Pomeranian Bight is the most important wintering area for Slavonian Greebes *P. auritus* in the entire western Palaearctic. It is one of three important wintering areas for Long-tailed Ducks

C. hyemalis and Velvet Scoters *M fusca* in the entire western Palaearctic. Common Scoters *M nigra*, another very abundant species, use the SPA also as an important stop over site and as a moulting area during summer. The Pomeranian Bight is an important stop over site for Red-throated Divers *G stellata* during the spring migration between February and April. All together about 20 seabird species occur in the Pomeranian Bight throughout the year.

10.8.4 Potential Impacts on Habitats and Species

Potential impacts of the Nord Stream Project inside the German EEZ and Territorial waters differ between sites which have to be crossed, sites in close vicinity (< 5 kilometres), and sites at greater distances (> 5 kilometres). Terrestrial sites, far away from the pipeline route and not bordering the sea, will not be affected at all (for example DE 1647-401).

In relation to sites which have to be crossed, potential impacts vary between inner coastal waters and the open sea, because the pipelines will be laid on the seabed in deeper waters (> 15 metres water depth) and covered by sediment in shallow waters. Hence, both the construction and operational phases will differ in terms of their potential adverse effects.

The following description summarises the potential impacts for:

- Shallow water sites to be crossed (SCIs DE 1747-301, DE 1749-302, and SPA DE 1747-401/DE 1747-402)
- Deep water sites to be crossed (SPA DE 1552-401, DE 1649-401)
- Sites at close range (< 5 kilometres distance, SCIs DE 1652-301, DE 1648-302)
- Sites beyond 5 kilometres, aiming to protect marine mammals (SCIs DE 1447-302, DE 1647-303, DE 1249-301, DE 1749-301)
- Sites beyond 5 kilometres distance, not aiming to protect marine mammals (SCIs DE 2049-302, DE 1849-301, DE 1251-301, and SPA DE 1949-401)

Shallow Water Sites to be Crossed - Greifswalder Bodden and the Boddenrandschwelle

Habitats

Dredging and backfilling of the pipelines route will cause a temporary loss to limited areas of marine Natura 2000 habitats inside Greifswalder Bodden and across the Boddenrandschwelle. The pipelines will have to be covered by sediment in shallow waters for pipeline integrity reasons as well as for ship traffic safety. The depth of the trenches will vary according to the technical and safety requirements in order to minimise the impact area, the excavation volume,

the re-suspension of sediments and the overall construction process. In addition, a number of special mitigation measures are being taken to minimise the environmental impact:

- Trenching and pipe-laying will be performed stepwise in such a way that no section of the trench will stay open for longer than six and a half months
- Dredging and backfilling will be restricted to one season from mid May until the end of December. No seabed intervention works will take place from January until mid May, the spawning season of Herring
- Dredged sediments will be stored temporarily on a spoil ground outside Natura 2000 sites. They will be clustered there according to their ecological function to ensure proper restoration of the seabed. Restoration will focus on both the natural relief as well as the original sediment quality of the top soil layer (fine or medium sand, pebbles, boulders, etc)
- Organically enriched sediments will not be used for backfilling. They will be deposited on an onshore spoil ground
- The belt of macrophytes in the shallow waters near the beach at Lubmin harbour will be crossed by a cofferdam to minimise the trench width. The dredged material will be stored there inside an additional cofferdam to prevent major re-suspension of sediments

Dredging and backfilling will be connected with re-suspension of dredged/dumped sediment. Since most of the sediment that has to be moved is comprised of fine and medium sand with an organic matter content of 1-2 per cent, the turbidity modelling carried out by the Project has revealed only a few locations where the particulate matter concentration in the water column might exceed natural values during stormy weather at distances of more than 500 metres. A permanent feed-back monitoring during seabed intervention works will ensure the implementation of mitigation measures (screens) if defined threshold values will be exceeded. **No impacts** will result from re-suspension of nutrients or chemical pollutants, because their sediment concentrations are **very low**.

Sediment plumes and sedimentation will have only a **minor temporary impact** on the zoobenthic communities around the trench (reduction of filtration rates in filter feeders, extra food supply for deposit feeders, etc.).

Based on previous investigations of benthic re-colonisation processes in the inner coastal waters of the German Baltic Sea it can be concluded, that recovery of macrophytes and zoobenthic communities will take place within three years after construction. Thus, negative effects on Natura 2000 habitats will affect only a small portion of the overall area of each habitat and will be limited to an overall period of about four years (**Table 10.10**). According to recommendations from the Federal Agency of Nature Conservation (BfN) these impacts can be judged as **non-significant**.

Table 10.10 Temporary loss of Natura 2000 habitats inside the Greifswalder Bodden and at the Boddenrandschwelle

Habitat type (Annex II Habitats Directive)	Area (ha) inside DE 1747-301	Area (ha) affected by trenching	Area (ha) inside DE 1749-302	Area (ha) affected by trenching
1110 sandbank	6000	10.6	3600	-
1140 temporarily exposed flat	1200	0.3	-	-
1160 costal inlet	45000	32.3	400	
1170 reef	1800	6.6	12600	3.8

No significant negative effects are predicted for the operational phase. The cool gas will not affect the seabed temperature in the upper layer, inhabited by benthic invertebrates (polychaetes, clams).

Species of Annex II of the Habitats Directive

Fishes and marine mammals might be disturbed by seabed interventions (turbidity and underwater noise emissions). However, most species are extremely rare inside these Natura 2000 sites, that disturbance effects will be restricted to single individuals and only short periods of time. Significant negative effects are not likely to occur, therefore.

Grey Seals (up to five individuals in total) might be displaced from the Greifswalder Bodden during the construction of the pipeline (see above). **No significant negative effects** are expected, since they do not reproduce in this region of the Baltic Sea.

Offshore construction works will not affect terrestrial species.

Bird Species

Offshore construction works will cause local displacement to staging waterfowl (noise and light emissions, ship traffic outside the traditional shipping routes, turbidity). However, a number of mitigation measures will limit the intensity and onset of disturbances:

- No offshore construction during the Herring spawning season, the peak period for staging seaducks, grebes, mergansers, and divers at the Boddenrandschwelle
- Routing of the pipeline in close vicinity of existing shipping routes (i.e. existing disturbance corridors of minor relevance for staging birds)
- Restriction of construction to one season

Hence, disturbance will affect only few individuals for short periods of time, especially in early winter, because intensive maritime tourism already restricts waterfowl occurrence to the shallow windflat areas and the Boddenrandschwelle during summer.

Re-suspension of sediment during seabed intervention works will temporarily reduce the feeding area of staging terns and gulls during autumn migration, especially at the Boddenrandschwelle. Seabed interventions will potentially affect feeding areas of ducks that feed on benthos. The temporary reduction of available feeding areas will **not cause significant negative effects**.

Minor cumulative displacement effects might result, if other offshore constructions will be carried out at the same time (upgrading of shipping channels, trenching for sea cables).

Deep Water Sites to be Crossed - Pomeranian Bight (> 15 metres water depth)

Habitats

The pipelines will be laid on the seafloor between the northern border of DE 1749-302 and the German EEZ border. Thus, only minor seabed interventions will be required (local ploughing or rock dumping) to avoid free spans and to ensure pipeline stability. These seabed interventions will not cause major re-suspension of sediment, because fine and medium sand with a very low organic matter content dominate along this route section. Turbidity will, therefore, **not affect** any Natura 2000 habitat.

The pipeline itself will create an artificial reef structure, covered most likely completely with Blue Mussels *Mytilus* spec. within about a year. The temperature of the pipe cover protection will be the same as of the ambient seawater, irrespective of the cool gas stream inside the pipe.

Species of Annex II of the Habitats Directive

Pipe-laying activity will cause disturbances to marine mammals for about two months in two successive years. Disturbance effects will be restricted to single individuals and only **short periods of time** because of the general scarcity of Harbour Porpoises and seals in the Pomeranian Bight.

The reef effect of the pipelines might attract feeding marine mammals during operation, in this case fish biomass will be constantly increased on a local scale.

Sites at Close Range - Coastal Area Southeast Rügen

Habitats

Sediment spills, is the only effect of pipeline construction that might reach the nearby SCIs but are **not likely to cause significant negative effects** to marine habitats. Particulate matter concentrations in the water column will not exceed natural values during stormy weather beyond 500 metres distance from the pipeline trench.

Species of Annex II of the Habitats Directive

Fishes might be disturbed by seabed interventions (turbidity and underwater noise emissions). However, most species are extremely rare inside these Natura 2000 sites so that disturbance effects will be restricted to single individuals and only over short periods of time. **Significant negative effects are not likely to occur**.

Grey Seals (up to five individuals in total) might be displaced from the Greifswalder Bodden during the construction of the pipeline. **No significant negative effects** are expected, since they do not reproduce in this region of the Baltic Sea.

Offshore construction works will **not affect** terrestrial species.

Sites at Close Range - Pomeranian Bight and Oderbank

Habitats

Turbidity caused during pipe-laying activities in waters > 15 metres deep will **not affect** any Natura 2000 habitat inside the SCI.

Species of Annex II of the Habitats Directive

Twaite Shad will not be affected by pipe-laying in the Pomeranian Bight. Construction activities (pipe-laying, ploughing, rock dumping) on medium to fine sandy sediments with very low organic matter content will not cause major sediment plumes which could reach the Oderbank.

Harbour Porpoises and seals will be able to recognise underwater noise emissions resulting from seabed intervention works and pipe-laying activities even at distances of several kilometres. These emissions might cause temporary behavioural responses (avoidance reactions, disturbance to social vocalisation). Both, the short term temporary onset of the construction works (about two months per pipeline), and the extreme overall scarcity of marine mammals in the Pomeranian Bight, especially in spring, lead to the conclusion that **no significant negative effects** will occur in these sites.

The Habitats Directive area "Coastal Area Southeast Rügen" lies in the effective range of Nord Stream construction activities. However, the route of the pipeline runs outside the protected area and does not physically encroach on its territory.

In the north-west corner of the Habitats Directive area ‘Pomeranian Bight and Oder Bank’ the Nord Stream route runs approximately 0.5 kilometres from the protected area. North of the protected area the pipeline runs at a depth of approximately 16 to 26 metres, at a distance of approximately 17 to 21 kilometres from the Oder Bank. The location of the route of the pipelines in relation to the protection area is as follows: one section of approximately 2 kilometres lies at a distance of approximately 0.5 to 1 kilometres; two sections of approximately 12 kilometres in total lie at a distance of 1 to 3 kilometres; and two sections of approximately 20 kilometres in total lie at a distance of 3 to 5 kilometres. The course of the Nord Stream route at no point encroaches on the territory of the protected area.

Potential Impacts on Sites Beyond 5 kilometres Distance - Aiming to Protect Marine Mammals

Habitats

Neither the construction nor the operation of the pipelines **will cause any significant negative effects** to Natura 2000 habitats at distances beyond 150 metres.

Species of Annex II of the Habitats Directive

Harbour Porpoises and seals will be able to recognise underwater noise emissions resulting from seabed intervention works and pipe-laying activities even at distances of several kilometres. These emissions might cause temporary behavioural responses (avoidance reactions, disturbance of social vocalisation). Both, the short term temporary onset of the construction works (about two months per pipeline), and the extreme overall scarcity of marine

mammals in the Pomeranian Bight, especially in spring, lead to the conclusion that **no significant negative effects** will occur in these sites.

Sites beyond 5 kilometres - Not Aiming to Protect Marine Mammals

Neither the construction nor the operation of the pipelines **will cause any significant negative effects** to Natura 2000 habitats at distances beyond 150 metres.

In the case of the Adlergrund, the Nord Stream route runs at a considerable distance from the Habitats Directive area. At its closest point it passes approximately 7.6 kilometres from the south-eastern edge of the protection area; however, most of the protection area is located in excess of 10 kilometres from the course of the Nord Stream route. The Project will not therefore impact on the protection area in terms of direct encroachment. The possibility of the Project affecting the protection area within the relevant impact zone (e.g. through drifting of air-borne particles or noise disturbance) may also effectively be excluded.

10.8.5 Summary of Impacts on Natura 2000 areas in Germany

The impacts on protected areas from construction and operation of the planned Nord Stream pipelines within the German EEZ and territorial waters are summarised in **Table 10.11** below, with respect to the intensity, scale and duration of the effects, and the overall significance of the impacts on the environment. All the effects outlined above occur outside the designated protected areas and also outside areas that the designated birds use as feeding areas.

Table 10.11 Summary of Impacts on Natura 2000 areas in Germany

Impact	Intensity of effect	Scale of effect	Duration of effect	Overall significance of impact
Sediment spreading and sedimentation	Managed via detailed mitigation	0.3 – 32,2 hectares affected depending on habitat type	4 years	Not Significant
Noise during construction	Not Significant	Local	Temporary (days)	Not Significant
Physical disturbance during construction	Not Significant	Local	Temporary (days)	Not Significant
Transboundary and cumulative impacts on protected areas	Not Significant	-	-	Not Significant

10.9 Potential Cumulative Impacts

Each of the Natura 2000 assessments have considered the potential for cumulative impacts due to Nord Stream and other planned projects.

No significant potential cumulative impacts have been identified. This reflects the detailed planning of the route alignment which has taken account of proposed developments and has also, for example in the case of the German section of the route, taken advantage of the fact that there are established zones where the implementation of projects is foreseen which can accommodate the pipelines.

10.10 Assessment of Potential Transboundary Impacts

Potential transboundary impacts might occur in the vicinity of the border areas of the Finnish, Swedish, Danish and German EEZ. Due to the relative proximity of Natura 2000 sites to the pipeline route, and in agreement with the responsible authorities Nord Stream has assessed potential impacts from the Nord Stream Project from activities

- In the Russian sector of the Nord Stream Pipeline on Natura 2000 sites in Finland
- In the Finnish sector of the Nord Stream Pipeline on Natura 2000 sites in Estonia
- In the German sector of the Nord Stream Pipeline on Natura 2000 sites in Poland

An assessment of the potential transboundary impacts on the **Eastern Gulf of Finland** archipelago and water areas Natura 2000 site (FI 0408001 SPA, SPI) due to **Project activities in Russia** (see **Figure 10.2**) has concluded the site will not experience any significant impacts. The site, located a minimum of 6.8 km from the pipeline route in Russia, is only within the range of impact from noise and vibration generated by munitions clearance. The latter would impact marine mammals, which are not a conservation objective of this site.

Three **Natura 2000 sites in Estonia** are located in the relative proximity of the pipeline route (see **Figure 10.8**):

- Lahemaa (EE 0010173 SAC) is located in a distance of approximately 19 kilometres from the pipeline route
- Prangli (EE 0010126 SAC) is located in a distance of approximately 24 kilometres from the pipeline route
- Naissaare (EE 0010127 SAC) is located in a distance of approximately 17 kilometres from the pipeline route

The Natura 2000 site EE 0010126 is located more than 20 kilometres away from the Nord Stream pipeline route and has been assessed as not being affected by potential negative impacts from the Nord Stream Project.

The Natura 2000 sites EE 0010173 and EE 0010127 are located within the 20 kilometres corridor. The predicted maximum range of potential negative impacts of 20 kilometres is based on the observation that noise emissions during the construction phase could cause disturbance of seals in a distance of up to 20 kilometres from the pipeline route. The mentioned Natura 2000 sites aim mainly to protect terrestrial habitats and species. Disturbance of seals as a result of noise emissions during construction is not relevant, because seals are not considered a conservation objective at these sites. Thus, no significant transboundary effects have been identified in the current assessments of potential impacts on Natura 2000 areas for sites located in Estonia.

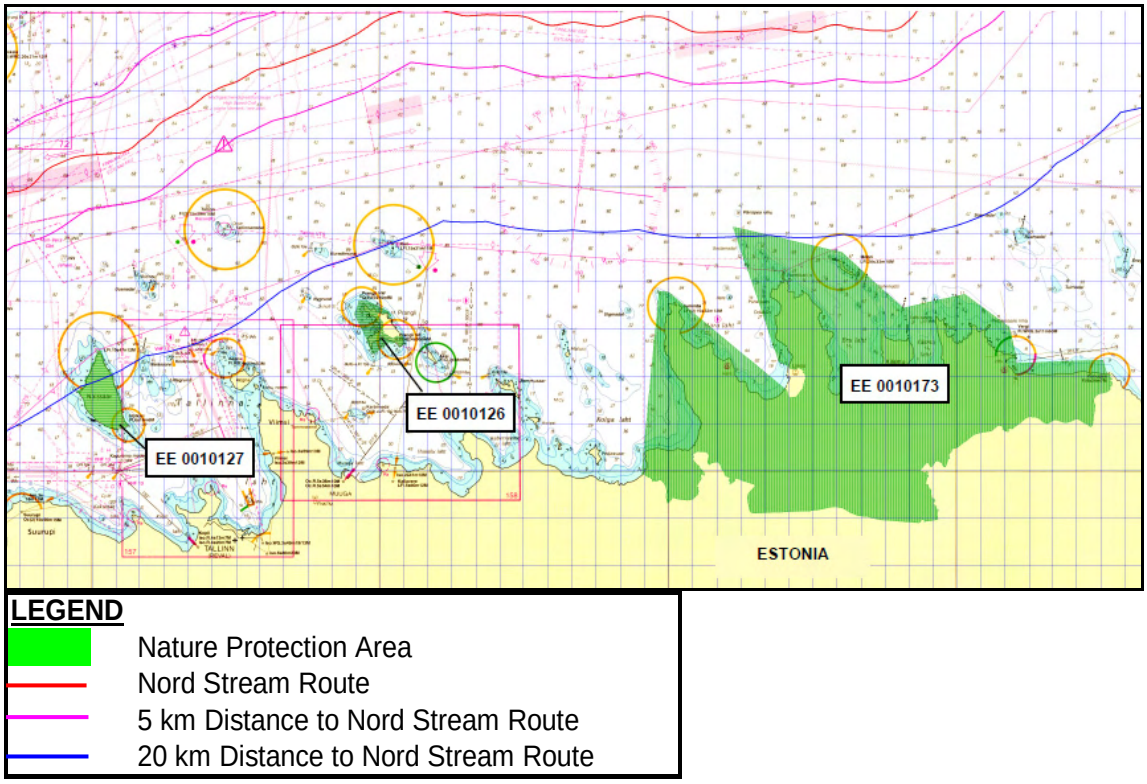

Figure 10.8 Potential transboundary effects on Natura 2000 areas in Estonia

Natura 2000 sites in Poland (see **Figure 10.7**) are located more than 20 kilometres away from the Nord Stream pipeline route and have been assessed as not being affected by potential negative impacts from the Nord Stream Project.

10.11 References

Denmark. Consolidated Act No. 1101 of 11 November 2005 on the Continental Shelf.