ENVIRONMENTAL IMPACT ASSESSMENT FOR THE ESTONIAN AREA OF THE ESTONIA-LATVIA OFFSHORE WIND FARM (ELWIND)

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ROHE plaan

Client: Environmental Investment Centre SA

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1. Introduction

Based on the application for a superficies licence filed on 20.03.2023 by the Environmental Investment Centre SA (registry code 90005946), the Consumer Protection and Technical Regulatory Authority initiated the superficies licence proceedings with decision No 1-7/24-102 of 28.03.2024 to encumber the public marine territory of the Estonian area of the Estonia-Latvia offshore wind farm with the wind farm. The same decision also initiated the environmental impact assessment (EIA) for the construction of the offshore wind farm, including the underwater cable line.

The application for a superficies licence filed by the Environmental Investment Centre (hereinafter EIC) is an application filed by the state. According to clause 1 of subsection 1 of § 113^2 of the Building Code, the state may apply for a superficies licence in order to encumber a public water body with an offshore wind farm. According to the superficies licence application filed by the EIC, the objective of the ELWIND project is the pre-development of the offshore area applied for. The Estonian state does not plan to build the offshore wind farm itself but will make all necessary preparations, including conducting the EIA and necessary studies, resulting in obtaining the superficies licence for the project. Within 18 months following the issuing of the superficies licence, the state arranges a public auction or a selective tender to transfer the licence (subsection 2 of § 113^2 of the Building Code).

ELWIND is a transnational project between Estonia and Latvia to establish two offshore wind farms and a connecting hybrid network in the Baltic Sea, aiming to increase the region's energy independence, increase renewable energy production and improve transnational electricity interconnection. The development of both offshore wind farms, including the EIA, will be carried out separately according to Estonian and Latvian legislation, but as it is a joint project, cooperation in ordering and conducting studies and other related activities will be undertaken whenever possible.

The planned offshore wind farm area is located west of the western coast of Saaremaa (Sõrve Peninsula), in an area suitable for wind energy development according to the Estonian Maritime Spatial Plan, in the open part of the Baltic Sea. According to the superficies licence application, the marine area to be encumbered by the planned offshore wind farm is approximately 200.44 km^2.

The aim of the EIA is to assess the potential environmental impacts of the proposed activity and its alternatives.

Environmental impact means potential, direct or indirect effect of an activity on the environment, human health and well-being, cultural heritage or property. Environmental impact is significant where it is likely to exceed the environmental capacity of the impact area, cause irreversible changes to the environment, endanger human health and well-being, the environment, cultural heritage or property[1].

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1 https://www.riigiteataja.ee/akt/103012022010, § 2^1 ja 2^2

The EIA programme has been prepared by Roheplaan OÜ in cooperation with the experts involved (see chapter 8). The leading expert of the EIA is Riin Kutsar (EIA license No. KMH0131).

2. Proposed activity

2.1. ELWIND project

ELWIND is a cross-border offshore wind energy joint project between Estonia and Latvia. The Ministry of Economic Affairs and Communications of the Republic of Estonia and the Ministry of Economics of the Republic of Latvia signed a Memorandum of Understanding (MoU) in September 2020 for the pre-development of a joint offshore wind energy project (hereinafter referred to as the ELWIND agreement). The aim of the ELWIND agreement is to contribute, in cooperation between countries, to the faster development of offshore wind energy and the increase of electricity transmission capacity between countries, including the development of a multi-purpose submarine cable (hybrid network) connecting the electricity networks of both countries.

The ELWIND project contributes to the European Union's objective of strengthening cooperation between Member States in the field of renewable energy, as outlined in Directive (EU) 2018/2001 of the European Parliament and of the Council, by being a cooperative project between Estonia and Latvia. Among other things, cooperation will be undertaken for the EIA and the conducting of studies. If national public procurement is not required by law, procurements will be conducted jointly wherever possible.

The hybrid network, which will be pre-developed in the framework of the ELWIND project, which will connect offshore wind farms, will benefit the country on several levels. A significant value of the ELWIND project is the additional electrical interconnection between Estonia and Latvia, which strengthens the economic independence and energy security of the state and the entire region. Renewable energy produced within the ELWIND project areas can be fed into the transmission network of both countries, connecting their electricity systems. An additional Estonian-Latvia electricity transmission line will reduce the dependence of countries on imported energy outside the Baltic region and ensure better functioning of the electricity market, contributing to the stabilisation of electricity prices in the entire region. The Estonian-Latvia transmission line makes connection to the electricity network more accessible and more affordable for other developers building wind farms in the same area. The EU co-funding for the transmission line construction means lower costs for Estonian taxpayers. The ELWIND project is part of the European Union's priority cross-border renewable energy projects (CB-RES[2)] list.

The ELWIND project offers developers a comprehensive solution necessary to achieve national renewable energy targets. In addition to other offshore wind farm developments, the hybrid solution offers a solution that contributes to the fulfilment of the strategic energy security goals set by both countries. The project will increase practical cooperation between the countries, creating the necessary preconditions and motivation for establishing an international connection at sea.

2The European Climate, Infrastructure and Environment Executive Agency (CINEA) Cross-Border Renewable Energy Projects 2023 Call for Proposals: https://cinea.ec.europa.eu/news-events/news/cef-energy-two-studies-selected-funding-under-cross-border-renewables-2023-07-10_en

Pursuant to subsection 2 of § 113[2] of the Building Code, the State arranges a public auction or a selective tender. State-led pre-development of marine areas reduces business risks and study costs for developers. Before arranging a public auction or a selective tender for a superficies licence, studies are carried out in the marine area and an EIA is conducted. All developers have equal opportunities to obtain the ELWIND superficies licence in the course of a public auction or a selective tender.

2.2. Purpose and need for the proposed activity

The proposed offshore wind farm in the Estonian ELWIND area plans to install 20–100 turbines with a maximum tip height of 330 metres above sea level, according to the superficies licence application. The planned maximum capacity of one wind turbine is 10–25 MW and the maximum nominal capacity of the planned offshore wind farm is 1000 MW.

The proposed activity will help the state achieve its goals of transitioning to renewable energy and ensuring energy security, which include reducing emissions, producing affordable sustainable energy and achieving climate neutrality.

2.3. Location of the proposed activity

To find the most suitable locations for offshore wind farms, preliminary studies[3] were conducted in both Estonia and Latvia. These studies thoroughly analysed various environmental, socio-economic, and technical criteria, including impacts on birds, fish and nature, as well as seabed, ice and wind conditions. According to the preliminary study, the waters around Saaremaa are the most suitable areas for offshore wind energy development in Estonian maritime areas. The planned offshore wind farm area is located west of the western coast of Saaremaa (Sõrve Peninsula), in an area suitable for wind energy development according to the Estonian Maritime Spatial Plan (see Figure 2-1). According to the superficies licence application, the marine area to be encumbered by the planned offshore wind farm is approximately 200.44 km².

The ELWIND offshore wind farm area borders the Saare Wind Energy (hereinafter SWE) superficies licence area to the north and the wind energy reserve area designated by the Estonian Maritime Spatial Plan to the south and west. Reserve areas are areas that overlap with historically more intensive trawling areas that can be deployed from 2027 onwards, when procedural processes and studies carried out in other areas suitable for the development of offshore wind energy have shown that it is not possible to develop offshore wind farms on a sufficient scale in these areas. The Environmental Impact Assessment (EIA) report for the offshore wind farm planned in the SWE superficies licence area was approved by the Ministry of Climate on 10.06.2024, decision number 7-12/24/781-11. The cumulative impacts assessment takes into account the planned SWE wind farm (see chapter 5.3 for details).

The ELWIND offshore wind farm area in Latvia is located in the waters off the western coast of Latvia, between Liepāja and Ventspils, in an area designated for wind energy development by the

3 Preliminary study of the location selection of the Estonian Latvian offshore wind farm project. https://kik.ee/sites/default/files/final_report_feasibility_study_elwind_v2.0.pdf

Latvian maritime spatial plan (see Figure 2-1). The distance between the offshore wind farms being developed by the ELWIND project in Estonia and Latvia is approximately 100 km.

This EIA addresses only the ELWIND offshore wind farm area in Estonia and its connection to the hybrid network.

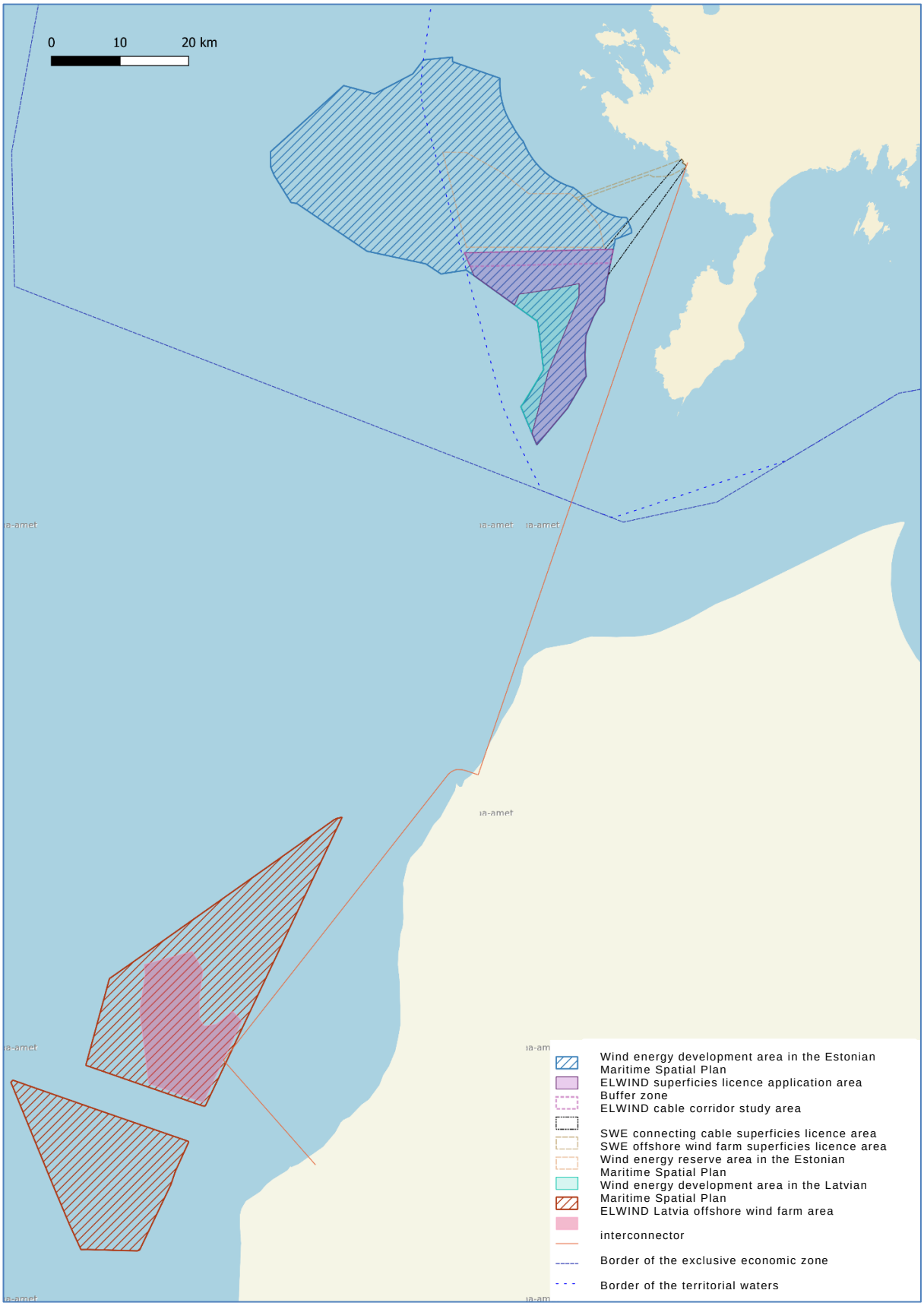

Figure 2-1. *Location of the proposed offshore wind farm*

2.4. Brief description of the proposed activity and reasonable alternatives therefor

According to the superficies licence application, the number of wind turbines in the ELWIND offshore wind farm is 20–100. The distance between the turbines is estimated to be approximately 1–1.25[4 km]

The task of the EIA is to analyse the reasonable alternatives to the proposed activity compared to the existing situation. Based on the information available at the time of preparing the EIA programme, the EIA considers the **primary alternative 1 as a reasonable alternative, which is an offshore wind farm area with up to 100 turbines (superficies licence application area).**

The area of the proposed activity has been determined under the decision to initiate the Estonian Maritime Spatial Plan and superficies licence procedure, so it is not possible under this EIA to find or analyse other location alternatives outside the superficies licence application area, eg beyond the coast, as requested by the community at the meetings.

As so-called sub-alternatives to the primary alternative 1 of the proposed activity, the following alternative technical solutions will be considered and evaluated in the course of the EIA:

- **number of wind turbines**

The final possible number and placement of the turbines will depend on the environmental constraints identified during the studies conducted within the superficies licence area and the exact technical parameters of the selected turbines. Based on the primary alternative 1 of the EIA, the **maximum number of turbines to be assessed and planned is up to 100 turbines**.

- **wind turbine tip height and rotor diameter**

The exact type of wind turbines to be used will be determined during the operational design phase. **During the EIA, turbines with a nominal capacity ranging from 10 to 25 MW and a maximum tip height of up to 330 meters above sea level will be evaluated.**

The world's most common and largest offshore wind turbine manufacturers at the time of initiating the EIA (Environmental Impact Assessment) are Siemens Gamesa, Vestas, and GE Renewable Energy. These are currently certified offshore wind turbine manufacturers that comply with existing European requirements. The largest publicly offered offshore wind turbines announced by these manufacturers are as follows:

- Vestas V236-15.0 MW™, with a rotor diameter of 236 meters and a capacity of 15 MW,
- Siemens Gamesa SG 14-236 DD, with a rotor diameter of 236 meters and a capacity of 14 MW,
- GE Haliade-X 14 MW, with a rotor diameter of 220 meters and a capacity of 14 MW.

41.25 km is the distance that corresponds to five times the diameter of a turbine with a 250-meter rotor.

Manufacturers are already developing more powerful turbines, with an expected capacity range of 14–20 MW, rotor diameters of 250–290 metres, and a tip height of up to 330 metres.

In recent years, wind turbine technology has advanced rapidly, and consequently, we anticipate that by the time the proposed offshore wind farm is constructed, even larger and more powerful turbines will be available on the market. The EIA was compiled taking into account the largest dimensions of offshore wind turbines that could be available by the time of the wind farm's construction, potentially featuring tip heights of up to 400 metres above sea level (ie, larger than the turbines currently in production).

If additional manufacturers that comply with existing European requirements and are certified become available by the time the wind farm is designed, their turbines will also be considered, provided that their parameters are not inferior to those of the aforementioned turbines.

- **type of foundation**

For the construction of offshore wind turbines, various types of foundations are used. The most common are monopile and gravity foundations. Tripod and jacket foundations are somewhat less commonly used. See Figure 2-2.

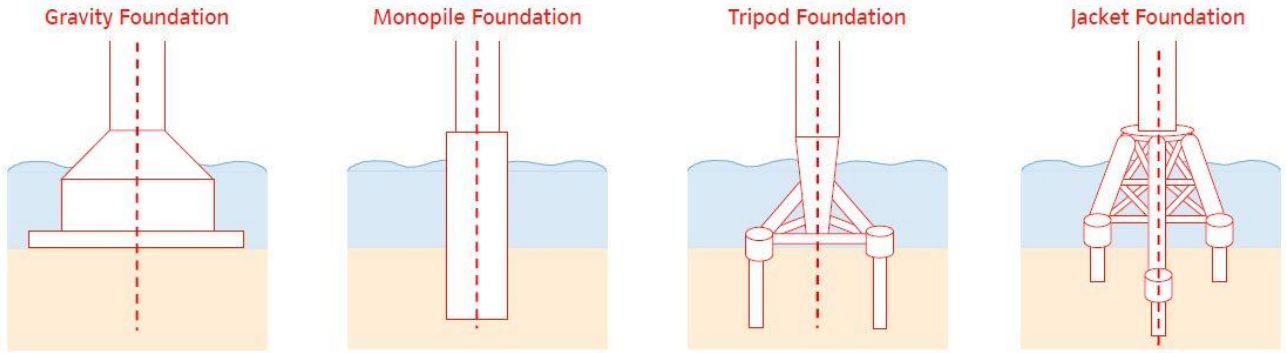

Figure 2-2. *Offshore wind turbines foundation types*[5]

The type of foundation to be used for the proposed wind turbines will be determined after more detailed studies and will primarily depend on the geology of the seabed.

The types of foundations selected and their associated impacts are discussed in the EIA report.

- **transmission system and locations of facilities (substation, cables)**

For the operation of the offshore wind farm and the transmission of the generated electricity to the network, it is essential to establish a system of underwater cables and a connection to the transmission network. There are primarily two possible alternatives for connecting the ELWIND offshore wind farm (see Figure 2-3):

  - A radial connection to the planned substation by Elering AS on the western coast of Saaremaa;

5 Miceli F. Offshore wind turbines foundation types; 2012 (https://www.windfarmbop.com/tag/monopile/)

- A connection to the Estonia-Latvia interconnector through an offshore substation located within the proposed buildable area.

a) b)

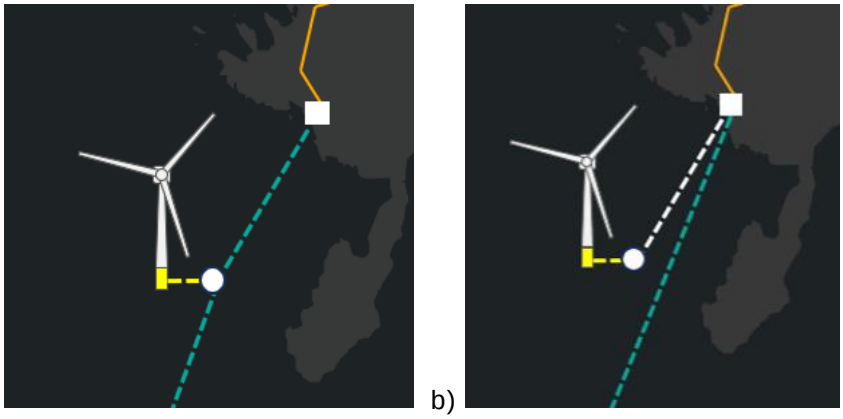

Figure 2-3. *Fundamental alternatives for connecting the ELWIND offshore wind farm to the transmission network: a) connection directly to the interconnector, b) radial connection to an onshore substation, which will be connected by the planned Estonia-Latvia interconnector.*

To establish the radial connection, a cable corridor study area has been defined (see Figure 2-1), within which the best cable route will be selected based on the EIA and the results of the studies. Generally, the maximum transmission capacity of the connection cable is 350 MW, necessitating the installation of up to four parallel cables. The preferred distance between the cables in the sea is approximately 100 metres, resulting in a total corridor width of around 300 metres for four parallel cables. The study area for the cable corridors is approximately 2000 metres wide and 18 kilometres long. The exact parameters of the cables (type, number, capacity, etc) will be determined during the further detailed design of the cable line and the offshore wind farm. To prevent mechanical damage to the underwater cable line, the cable will be installed in seabed sediments or covered with material. The installation technique and technology for laying the seabed cable will be specified during the design work and the current environmental impact assessment.

The establishment of the interconnector and the potential onshore substation in Saaremaa is not part of this superficies licence application and EIA. On 15.02.2024, the Government initiated a designated national spatial plan and strategic environmental assessment for the fourth Estonia-Latvia electricity connection to address onshore connections and substations. The interconnector's offshore cable installation will require a separate superficies licence.

At least one collector substation will also be built in the offshore wind farm, where medium-voltage cables from the turbines will converge, and the voltage will be converted to a level suitable for connection to the electrical network. Additionally, an internal underwater cable system connecting the turbines to the substation will be established. If necessary, the electrical cables within the wind farm will be buried in the seabed.

The locations of the selected cable routes and their associated impacts will be assessed in conjunction with the proposed offshore wind farm, including the impacts of the internal infrastructure (substation and internal cabling) of the wind farm.

Analysis and clarification of solutions of the primary alternative and the sub-alternatives will take place in the subsequent EIA report process (including based on data from the studies conducted in the proposed area) and in development of the technical solution in cooperation with the government bodies and experts from the respective field. Alternative solutions that arise during the EIA process and/or determining of the best alternative solution (including drafts in regard to the locations of wind farms and parameters) will be described in the EIA report.

3. Connection between the proposed activity and strategic planning documents

3.1. The European Green Deal.

The European Green Deal[6] is an umbrella strategy, adopted by the European Commission on 11.12.2019, aimed at achieving a resource-efficient and competitive economy in Europe where by 2050 climate neutrality will have been achieved along with sustainable use of resources along with sufficient economic growth[7]. The goal must be achieved while preserving the natural environment and protecting citizens from dangers and impacts related to environmental pollution.

The European Green Deal focuses on 3 key principles for the clean energy transition, which will help reduce greenhouse gas emissions and enhance the quality of life of citizens:

1. ensuring a secure and affordable EU energy supply;
2. developing a fully integrated, interconnected and digitalised EU energy market;
3. prioritising energy efficiency, improving the energy performance of our buildings and developing a power sector based largely on renewable sources.

In the context of this EIA, the relevant goals set to achieve the previously mentioned principles include:

- build interconnected energy systems and better integrated grids to support renewable energy sources;
- promote innovative technologies and modern infrastructure;
- promote EU energy standards and technologies at global level
- develop the full potential of Europe's offshore wind energy

The proposed activity will directly contribute to achieving transition to pure energy – a goal at the core of the European Green Deal.

3.2. European Union Biodiversity Strategy 2030

On 20.05.2020, the European Commission adopted the Biodiversity Strategy for the European Union for 2030[8], which seeks to contribute to Europe's biodiversity recovery by 2030, benefiting people, the climate and the planet as a whole.

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6 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_et

[7] *The EU-wide climate target to reduce net greenhouse gas emissions by 55% by 2030 compared to 1990 levels (previously 40%) was agreed upon by the heads of state at the European Council in December 2020. This target, along with the target of climate neutrality, was legally established in the European Climate Law adopted in the summer of 2021.*

8 https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030_et

The most Important topics in the context of this EIA are set out in Chapter 2.2 of the strategy. (EU nature restoration plan: restoring land and marine ecosystems):

- 2.2.5. Win-win solutions for energy generation Decarbonising the energy system is critical for climate neutrality, as well as for the EU's recovery from the COVID-19 crisis and long-term prosperity. More sustainably sourced renewable energy will be essential to fight climate change and biodiversity loss. The EU will prioritise solutions such as ocean energy, offshore wind, which also allows for fish stock regeneration, solar-panel farms that provide biodiversity-friendly soil cover, and sustainable bioenergy.

- 2.2.6. Restoring the good environmental status of marine ecosystems. Restored and properly protected marine ecosystems bring substantial health, social and economic benefits to coastal communities and the EU as a whole. The need for stronger action is all the more acute as marine and coastal ecosystem biodiversity loss is severely exacerbated by global warming. Achieving good environmental status of marine ecosystems, including through strictly protected areas, must involve the restoration of carbon-rich ecosystems as well as important fish spawning and nursery areas. Some of today's sea uses endanger food security, fishers' livelihoods, and the fishery and seafood sectors. Marine resources must be harvested sustainably and there must be zero-tolerance for illegal practices. In this regard, the full implementation of the EU's Common Fisheries Policy, the Marine Strategy Framework Directive and the Birds and Habitats Directives is essential.

The proposed activity is in line with the EU Biodiversity Strategy.

3.3. National strategy Sustainable Estonia 21

The principles of sustainable development are defined in the national strategy Sustainable Estonia 21[9], which was approved by the Riigikogu on 14.09.2005. Estonian objectives for 2030 were formulated in line with global (Agenda 21) and European Union long-term development visions. Among other things, the need to plan steps for the transition to post-oil shale energy was mentioned.

The proposed offshore wind farm is in line with the national strategy.

3.4. National Strategy Estonian 2035

The national strategy Estonia 2035[10], adopted by the Riigikogu on 12.05.2021, is the country's long-term development strategy, aimed at enhancing and supporting the well-being of our people so that Estonia will be the best place to live and work in twenty years. Estonia 2035 is a strategic management tool that allows for the coordination of the country's long-term strategic planning and financial management, taking into account the possibilities of public finances. The

9 https://www.riigiteataja.ee/akt/940717

10 https://valitsus.ee/strateegia-eesti-2035-arengukavad-ja-planeering/strateegia/materjalid

strategy promotes cooperation between the Riigikogu and the Government of the Republic to ensure the unified management of Estonian development and strengthens the links between various strategic policy documents. The strategy Estonia 2035 is primarily implemented through sectoral development plans and corresponding sectoral programmes. The Estonian 2035 strategy sets five long-term strategic goals, which are value-based goals and serve as the basis for making the country's strategic choices, the implementation of which is facilitated by all Estonian strategic development documents:

- Estonia's people are smart, active and care about their health.
- Estonia's society is caring, cooperative, and open
- Estonia's economy is strong, innovative, and responsible
- Estonia offers a safe and high-quality living environment that takes into account the needs of all its inhabitants
- Estonian is an innovative, reliable and people-centred country.

In order to maintain Estonian fundamental principles, achieve strategic goals and meet development needs, changes are needed in different areas.

In the context of this EIA, the relevant topics are:

- Transition to climate-neutral energy production while ensuring energy security. The transition to climate-neutral energy production, which ensures good air quality, requires considering the possible alternatives and making choices. We must ensure the continuity of energy security and security of supply, both during and before the transition to climate-neutral energy production. In order to increase the share of renewable energy, we will find a solution that takes into account security, environmental protection and the interests of the population. We are open and support new solutions, such as offshore wind energy.

- We will implement a safe, environmental-friendly, competitive, needs-based and sustainable transport and energy infrastructure We are open and support new technologies such as the use of hydrogen. The transition to climate-neutral energy production also requires the construction of supporting infrastructure. To this end, we will synchronise the electricity grid with the continental European frequency band, create the necessary grid connections for renewable energy production, and deploy smart grids, short-term and long-term storage options.

Based on the above, the planned offshore wind farm will directly contribute to fulfilling the set goals of ensuring sustainable and climate-neutral energy generation.

3.5. National spatial plan Estonian 2030+

The Government of the Republic established the national spatial plan Estonia 2030 [11] on 30.08.2012. According to the plan, one of the most important areas for increasing energy production capacity based on local renewable resources is wind energy and bioenergy. According

11 https://www.rahandusministeerium.ee/et/ruumiline-planeerimine/uleriigiline-planeering

to the plan, it is necessary to increase the share of other energy sources (besides one fossil energy source) in the country's energy balance. The western coastal sea of Estonia is suitable for the construction of offshore wind farms. The main goals of Estonia 2030+ in the field of energy are:

1. When developing electricity generation capacity, it is necessary to focus on ensuring Estonia's energy supply. New energy production units must be placed rationally and sustainably. It is noted that electricity production in Estonia has primarily relied on oil shale energy, which is not competitive in the long term (eg, due to increasing environmental charges). For reasons of energy security and environmental considerations, it is not advisable to have such a large share of a single fossil energy source in the country's energy balance, as this is associated with supply security, energy market and environmental protection risks. Therefore, it is necessary to increase the share of other energy sources and develop infrastructure to trade more extensively in the energy sector with other European Union member states.
2. Estonia's energy supply options must be expanded by creating external connections with the energy networks of the Baltic Sea region.
3. It is necessary to avoid undesirable impacts on the climate, achieve a higher share of renewable energy in the energy supply, and ensure the implementation of energy-saving measures. It is noted that 'it is necessary to consider the possibility and need to establish new onshore or offshore wind farms, as Estonia's good wind potential allows a significant portion of electricity to be produced using wind turbines'.

The proposed offshore wind farm is in alignment with the objectives of the National Development Plan of the Energy Sector until 2030.

3.6. General Principles of Climate Policy until 2050

According to the Foundations of Climate Policy Until 2050[12], approved by the Riigikogu on 05.04.2017, and the update of the Foundations of Climate Policy, approved on 08.02.2022, Estonia's long-term goal is to achieve climate neutrality by 2050.

The fundamentals of climate policy is a vision document, in which the principles and policy directions are set forth to be implemented in the future through the updating of sectoral development plans. Estonia's long-term objective is to transition to a low-carbon economy, which entails gradually transforming the economic and energy systems into more resource-efficient, productive and environmentally sustainable ones. By 2050, Estonian will be a competitive climate-neutral country with a knowledge-based society and economy.

The proposed activity is in line with the Fundamentals of Estonian Climate Policy until 2050 objectives.

12 https://envir.ee/kliimapoliitika-pohialused-aastani-2050

3.7. Estonian Environmental Strategy 2030

Estonian Environmental Strategy 2030 [13] is the development strategy for the environmental sector, guided by the principles of the national sustainable development strategy Sustainable Estonia 21 and serves as an overarching strategy for all sub-sectoral development plans in the environmental field, which must follow the principles outlined in the environmental strategy during their preparation or revision.

The goal of the Estonian Environmental Strategy 2030, approved by the Riigikogu on 14.02.2007, is to define long-term development directions to maintain the good condition of the natural environment, considering the interconnections of the environmental sector with the economic and social sectors and their impacts on the surrounding natural environment and humans. The environmental strategy's objective regarding climate change and air quality is as follows: to produce electricity in volumes that meet Estonia's consumption needs and to develop diverse, low-environmental-impact sustainable production technologies based on various energy sources that also allow for electricity production for export.

The proposed activities are in line with the Estonian Environment Strategy 2030.

3.8. Climate Change Adaptation Development Plan until 2030.

On 2 March 2017, the Government of the Republic adopted the Climate Change Adaptation Development Plan 2030,[14] whose strategic objective is to increase the readiness and ability of the Estonian state, at regional and local level, to adapt to the impacts of climate change.

To prepare the Climate Change Adaptation Development Plan, researchers identified the impact of climate change on Estonia across eight key areas: spatial planning and land use, human health and rescue capability, natural environment, bioeconomy, infrastructure and buildings, energy and energy supply, economy, society, awareness, and cooperation.

In the context of this EIA, the relevant sub-objective in the key area of energy and energy supply is: due to climate change, energy independence, security, supply reliability and the usability of renewable energy resources have not decreased, and the volume of primary energy end-use has not increased. The guiding principle of energy independence is independence from energy carrier imports, reliance on domestic fuels for energy production and renewable fuels in particular, the use of renewable energy sources and the diversification of the energy production portfolio. The best way to ensure energy supply security is through the availability of sufficient and rapidly responsive production capacities and the diversification of energy production. It is important that long-term planning for the development of the energy sector takes into account not only the availability of resources, technologies, and the cost of energy, along with other aspects

13 https://www.riigiteataja.ee/aktilisa/0000/1279/3848/12793882.pdf

14 https://valitsus.ee/strateegia-eesti-2035-arengukavad-ja-planeering/arengukavad/muud-arengudokumendid

affecting the sector's development, but also changing climatic conditions and their impact on energy production and the delivery of electricity to consumers.

The proposed activities are in line with the objectives of the Climate Change Adaptation Development Plan 2030, supporting the achievement of the objectives set for energy and energy supply.

3.9. National Energy and Climate Plan of Estonia 2030

On 19.12.2019, the government approved the National Energy and Climate Plan 2030 [15] (NECP 2030), which consolidates Estonia's energy and climate policy objectives and the 71 measures developed to achieve them. The wider objective of the 2030 National Energy and Climate Plan of Estonia is to provide precise information to Estonian people, companies, and other EU Member States on the measures that Estonia intends to take to meet the agreed energy and climate policy objectives of the European Union.

The main objectives of NECP 2030, which are relevant in the context of this EIA, are as follows:

- Reduction of Estonian greenhouse gas emissions by 80% by 2050 (including 70% by 2030)
- The share of renewable energy in the total final energy consumption must be at least 42% in 2030: in 2030, renewable energy makes up 16 TWh, i.e. 50% of the final energy consumption, including renewable electricity 4.3 TWh (2018 = 1.8 TWh), renewable heat 11 TWh (2018 = 9.5 TWh), transport 0.7 TWh (2018 = 0.3 TWh).
- Ensuring energy security by keeping the degree of dependence on imported energy as low as possible: the use of local fuels is kept as high as possible (including increasing the use of fuel-free energy sources), the potential of biomethane production and use must be used.

Estonia's national renewable energy targets are set out in subsection 1 of § 32^1 of the Energy Sector Organisation Act[16], which states that by the year 2030, renewable energy accounts for at least 65 per cent of gross domestic final consumption of energy. Renewable energy accounts for at least 100 per cent of gross final consumption of electricity.

The proposed activity makes a direct contribution to fulfilling the Estonian national energy and climate goals by supporting an increase in the proportion of renewable energy.

3.10. Estonian Energy Sector Development Plan 2035

During the preparation of the EIA programme, the National Development Plan of the Energy Sector Until 2030[17,] approved by the Government of the Republic on 06/10/2016, is still in effect.

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15 https://www.mkm.ee/et/eesmargid-tegevused/energeetika/eesti-riiklik-energia-ja-kliimakava-aastani-2030

16 Energy Sector Organisation Act, RT I, 30.06.2023, 8

17 https://www.mkm.ee/sites/default/files/enmak_2030.pdf

However, a draft18 of the National Development Plan of the Energy Sector Until 2035 has been completed, and it is appropriate to refer to the updated development plan. The National Development Plan of the Energy Sector Until 2035 sets out the long-term goals (Figure 3-1) and vision for Estonia's energy sector up to 2050.

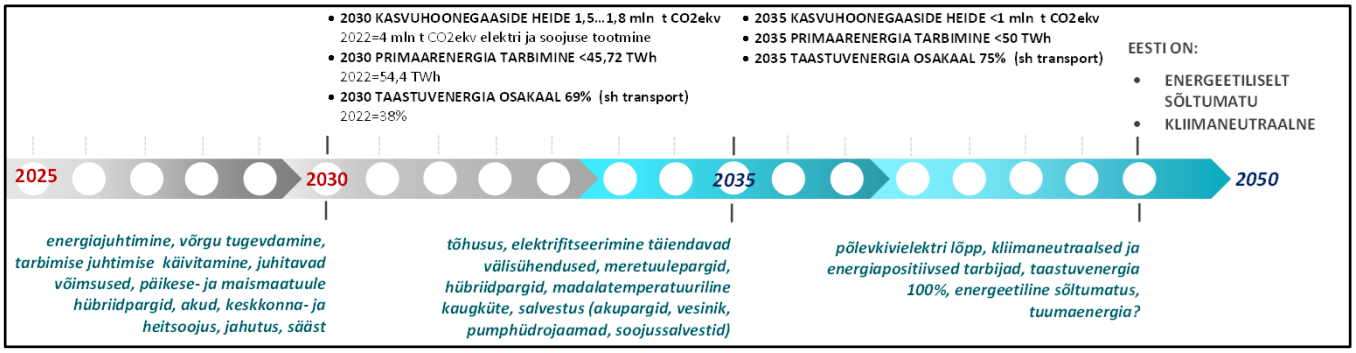

Figure 3-1. *Long-term goals for the Estonian energy economy*[19]

Vision for the Estonian energy sector in 2050 is as follows:

By 2050, Estonia will primarily use domestic resources to meet its energy needs, not only for electricity but also for heat production and the transportation sector. According to the Estonia 2035 strategy (and/or the Climate Act to be drafted, if it sets a different goal), Estonia will ensure energy security by 2050 through climate-neutral energy production. In the established regional gas market, Estonia's locally sourced gas fuels are competitive, and their production potential has been realised.

Estonia has become a country that uses modern and environmentally friendly technologies to apply energy in the most socially optimal way on the European energy market. Estonia's energy independence and its long-term assurance are the main pillars of the economic well-being of the country's residents, the competitiveness of companies operating in Estonia and Estonia's energy security.

The state has developed a solid and long-term vision for resource ownership policy, which supports the development of Estonia's industrial sector. The state revenue generated from the use of renewable energy sources will be directed towards ensuring energy sustainability, thereby guaranteeing the continuation of the country's energy independence after the cessation of fossil fuel use.

State budget funds directed towards energy efficiency, the promotion of domestic fuel production, and the knowledge-based economy are key drivers of economic growth and the long-term competitiveness of the country, through the growth of tax revenue, employment, and improvement of the country's foreign trade balance.

18 *https://kliimaministeerium.ee/energiamajanduse_arengukava*

[19] *Draft Energy Sector Development Plan until 2035. Estonian Ministry of Climate.*

Investments in Estonia's energy sector are balanced with economic development. New investments are made in good cooperation with new large consumers, providing the necessary assurance to all parties involved. Estonia's energy landscape is diverse, maximally utilising local resources, thus being flexible, ensuring supply security, energy security and remaining within the limits of nature. External connections of the energy infrastructure are of strategic importance in the context of economic development, ensuring greater flexibility for consumers and producers, additional supply security, energy security and supply with fossil-free energy. Estonia has achieved its set goals towards a climate-neutral energy system.

The development plan includes activities related to the production and supply of energy and the improvement of energy efficiency with regard to the following topics:

- Ensuring energy security
- Transition to renewable energy
- Increasing energy efficiency.

The proposed activities are consistent with and contribute directly to the objectives of the Energy Sector Development Plan by supporting the transition to renewable energy and energy security.

3.11. Estonian Marine Strategy

When managing the protection and use of the sea, Estonia, like other EU countries, follows the Marine Strategy Framework Directive (2008/56/EC; MSFD). The main objective of this Directive is to maintain or achieve, by 2020, at the latest, good environmental status (GES) in its marine environment. Each EU country must develop and implement its marine strategy to promote the sustainable use of the seas and preserve marine ecosystems.

The implementation of the marine strategy takes place in six-year cycles, each comprising three main stages: Stage 1 - assessment of the state of the marine area and setting of targets, stage 2 - development and implementation of a marine area monitoring programme, and stage 3 - preparation and implementation of a marine area action plan. Each of the above-mentioned stages of the Marine Strategy will be updated every six years. The assessment of the state of the marine area will be updated this year, 2024. The marine area monitoring programme was updated in 2020. The marine area Action Plan was updated in 2020-2023.

The plan of measures was approved by Minister of the Environment directive no. 16-7/23/5 of 22.02.2023. The aim of updating the Action Plan was to identify shortcomings in achieving good environmental status and, if necessary, to introduce additional measures to control anthropogenic impacts affecting the Estonian marine environment and to achieve the established environmental targets and thus good environmental status of the marine area. Of the measures set out in the Action Plan, the following measures in particular relate to the planning and construction of offshore wind farms:

- Developing compensatory measures for disturbing or destroying the integrity of the seabed (BALEE-M032), which sees the development and establishment of a package of measures to compensate for seabed disturbance and habitat destruction during various developments and

other activities. One of the aims of the package of measures is to ensure that the seabed is disturbed as little as possible and that it is restored to its usual state after use.

- Implementation of the HELCOM regional action plan on underwater noise and necessary regulations in Estonia (BALEE-M055), in the context of which the implementation of the HELCOM marine noise plan in Estonia is organised and coordinated.

The proposed activity is in line with the Estonian Maritime Strategy.

3.12. Estonian Maritime Spatial Plan

The Estonian maritime spatial plan[20] is the most recent and strategic spatial planning document that includes all sectors. This is a thematic plan of a national spatial plan, which covers the entire Estonian marine area, except for the marine areas in Pärnu County and Hiiumaa, which were already prepared as county-wide spatial plans.

The objective of the planning of the marine area is to agree on principles for use of the Estonian marine areas in the long term in order to contribute to achieving and preserving good condition of the maritime environment and promoting the maritime economy. The spatial plan determined which parts of the marine area activities can be implemented and on what conditions. In the course of preparing the maritime spatial plan, the combined effect of the activities already taking place in the marine area and still in the planning stage were treated. Their impact on the maritime environment and economy and the activities' social and cultural impact were also assessed. Among other things, the spatial plan also determines the suitable areas, guidelines and conditions for developing wind energy.

In the preparation of this EIA programme and the planning of the content and process of the EIA, the best practices and latest principles set out in the Estonian Maritime Spatial Plan have been taken into account.

3.13. West Estonian Archipelago Biosphere Reserve

The area of the proposed ELWIND wind farm is located within the West Estonian Archipelago Biosphere Reserve. According to subsection 1 of § 13 of the Sustainable Development Act, a biosphere programme area is an area included in the UNESCO MAB (Man and Biosphere) Programme in order to organise education, monitoring and research activities and to integrate the protection and the sustainable use of natural resources. The biosphere reserve is zoned into core areas, buffer zones and transition areas. The area of the wind farm is located in the transition area (Figure 3-2), the function of which is a diverse sustainable use of nature.

The aim of UNESCO's 'Man and the Biosphere' programme (abbreviated as MaB) is to contribute to the conservation of biological diversity, the provision of ecosystem services, and the sustainable use of natural resources in member states, offering communities ideas for adapting to and mitigating climate change. Producing renewable energy from wind power is one way to

20 http://mereala.hendrikson.ee/

mitigate climate change and ensure sustainable use of natural resources, so there is no conflict between the planning of a wind farm and the objectives of the biosphere reserve.

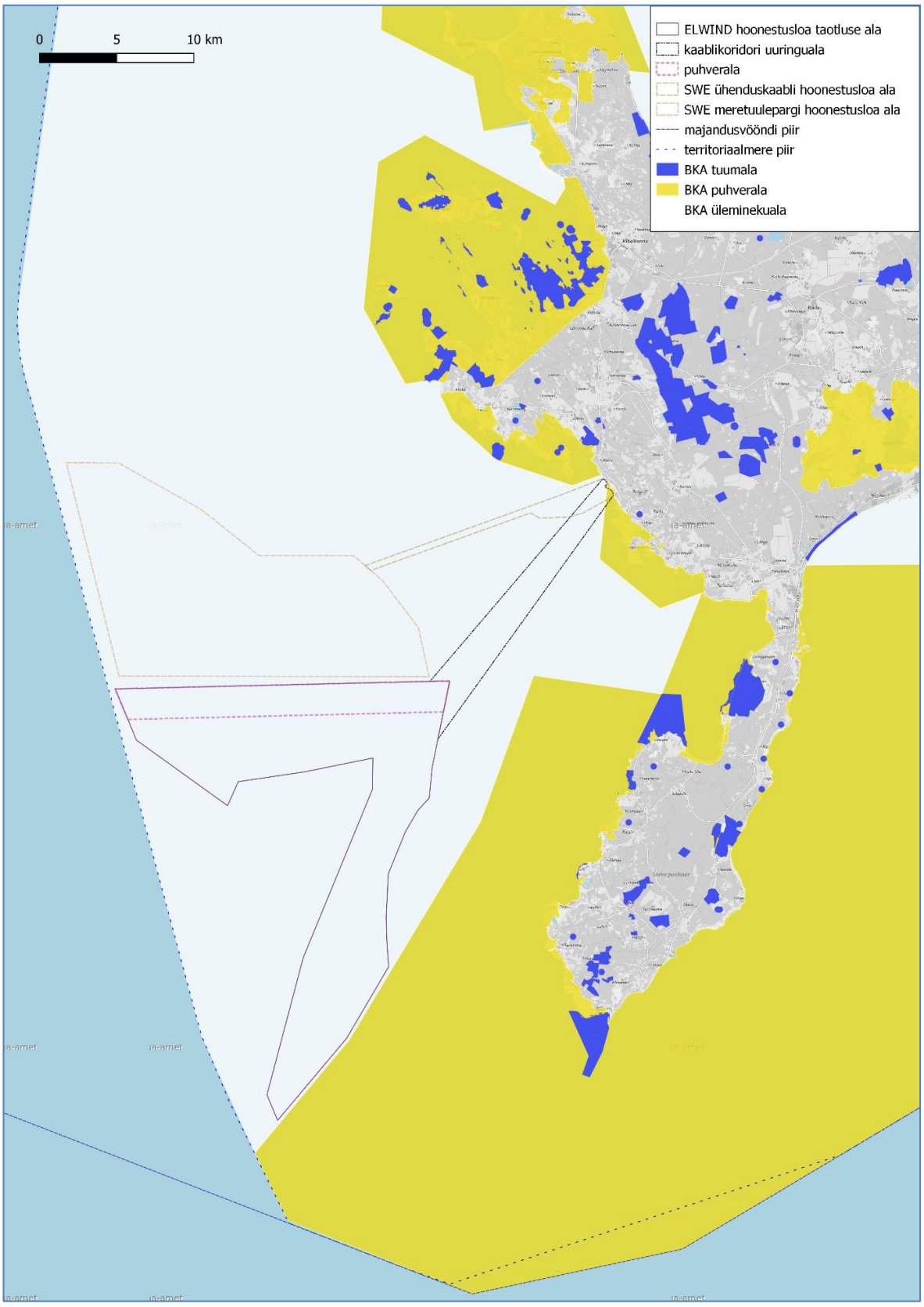

Figure 3-2. *Location of the ELWIND offshore wind farm area in the West Estonian Archipelago Biosphere Reserve*

4. Description of the environment expected to be impacted.

4.1. Natural environment

Estonian marine area consists of parts of several major basins of the Baltic Sea, which differ in natural conditions and anthropogenic pressures: the Gulf of Finland, the Gulf of Riga, the open part of the Baltic Sea and Väinameri in the region of the West Estonian archipelago. The area of the ELWIND wind farm is in the open part of the Baltic Sea.

4.1.1. Geological conditions

The depths of the seabed in the ELWIND wind farm area are between 20 and 50 metres. No detailed bathymetric surveys have been conducted so far.

To characterize the geology of the seabed in the ELWIND wind farm area, only indirect data are available at the stage of preparing the EIA programme, accurate geological studies have not yet been carried out. In the EMODnet[21] system, data on seabed sediments in the area, compiled from archive materials, date back to the 1980s and contain only very general information. The main sources of information about the geological cross-section of deeper sediments/rocks beneath the seabed are seismic-acoustic profiles made during the Swedish-Estonian cooperation project from 1991 to 2004, interpreted by the Geological Survey of Estonia[22.] Comprehensive geological studies have been conducted in the Saare Wind Energy wind farm area located north of the ELWIND wind farm area[23.]

Based on seismoacoustic profiles, the west coast of Saaremaa is clearly characterised by an extensive erosion-related depression that has developed by the end of the late Ice Age, complicated by clear valley-like structures. The bedrock depressions are largely filled with (varved) clay sediments from the Baltic Sea's early stages of the Baltic Ice Lake and Yoldia Sea / Ancylus Lake, their thickness reaching almost 50 m in some places. Thus, the Silurian limestone bedrock is in places more than 60–80 m below sea level. The presence of bedrock depressions is also indicated by studies carried out in the SWE area. Various studies, including HELCOM HUV habitat studies (Figure 4-5), suggest that the bedrock is covered with various Quaternary sediments.

4.1.2. Hydrometeorological conditions

Temperature. In the open part of the Baltic Sea, the water temperature in the surface layer averages 15–17 °C in July and August. In the near-bottom layer, the water temperature remains

21 https://emodnet.ec.europa.eu/en/emodnet-data-layers-catalogue-within-atlas

[22] General geological characteristics of the west coast of Saaremaa and the seabed of the Gulf of Riga (ELWIND offshore wind farm areas). Geological Survey of Estonia, 2021.

[23] Marine Geophysical Survey. Saaremaa offshore wind farm development. VBW Weigt GmbH, 2022.

between 2–5 °C. Due to the water temperature, seasonal stratification of water occurs in the conditions of the Baltic Sea. This stratification lasts from May to September. The stratification is significant mainly because it inhibits the vertical transport of nutrients and dissolved oxygen.[24]

Salinity. One important factor influencing the distribution of biota in the Baltic Sea is water salinity. The salinity of the Estonian marine waters ranges from 0 to 8 g/kg.The salinity of the surface water layer varies by region as follows:

- Southeastern Gulf of Finland: 2.5–6 g/kg and Western Gulf of Finland: 4.5–6.5 g/kg
- Open part of the Western Islands: 6–7 g/kg
- Väinameri: 3–6.5 g/kg
- Gulf of Riga: 4–6 g/kg (Pärnu Bay: 3–5.5 g/kg)

Saltwater inflow to the Baltic Sea occurs through the Danish Straits. At the same time, fresh water from rivers is added to the sea. Fresher water remains in the surface layer due to its lower density and flows out of the Baltic Sea in the surface layer, whereas the saltier water from the North Sea submerges into the deeper layers. Consequently, the water column in the Baltic Sea is vertically stratified.[25] The open part of the Baltic Sea, which includes the ELWIND wind farm area, is in a constantly stratified state.

Wind. Estonia's wind climate is determined by the frequent alternation of low-pressure systems and high-pressure systems typical of the northern part of the temperate zone – cyclonic activity that causes windy weather. The intensity of cyclonic activity in the Baltic Sea region depends on the general atmospheric circulation over the Atlantic Ocean and the Eurasian continent, broadly determining the wind speed and direction in Estonia and its seasonal variability. The strongest winds and most frequent storms are characteristic of the period from October to January, while the period from May to August typically features weaker winds and more calm days.

The long-term average wind energy (energy density, W/m^2) at a height of 150 metres is 810–880 W/m^2 offshore west of Saaremaa, 800–840 W/m^2 near Hiiumaa, 700–780 W/m^2 in the central Gulf of Riga, and decreases from 750 W/m^2 in the western Gulf of Finland to 550 W/m^2 towards the east.[26]

The marine area west of Saaremaa, including the planned ELWIND offshore wind farm area, has favourable wind conditions. The most frequent winds blow from the southwest (see Figure 4-1), and this direction is also the most energy-rich.

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[24] Environmental status of Estonian marine area 2024. Summary Report (Draft) of the status assessment under MSFD Art 8 to 10.

[25] Environmental status of Estonian marine area 2024. Summary Report (Draft) of the status assessment under MSFD Art 8 to 10.

26Estonian Maritime Spatial Plan Impact Assessment Report, established in 2021. (https://mereala.hendrikson.ee/dokumendid/Planeeringulahendus/Kehtestamisele/4_MSP_M6jude_hindamise_aruanne.pdf)

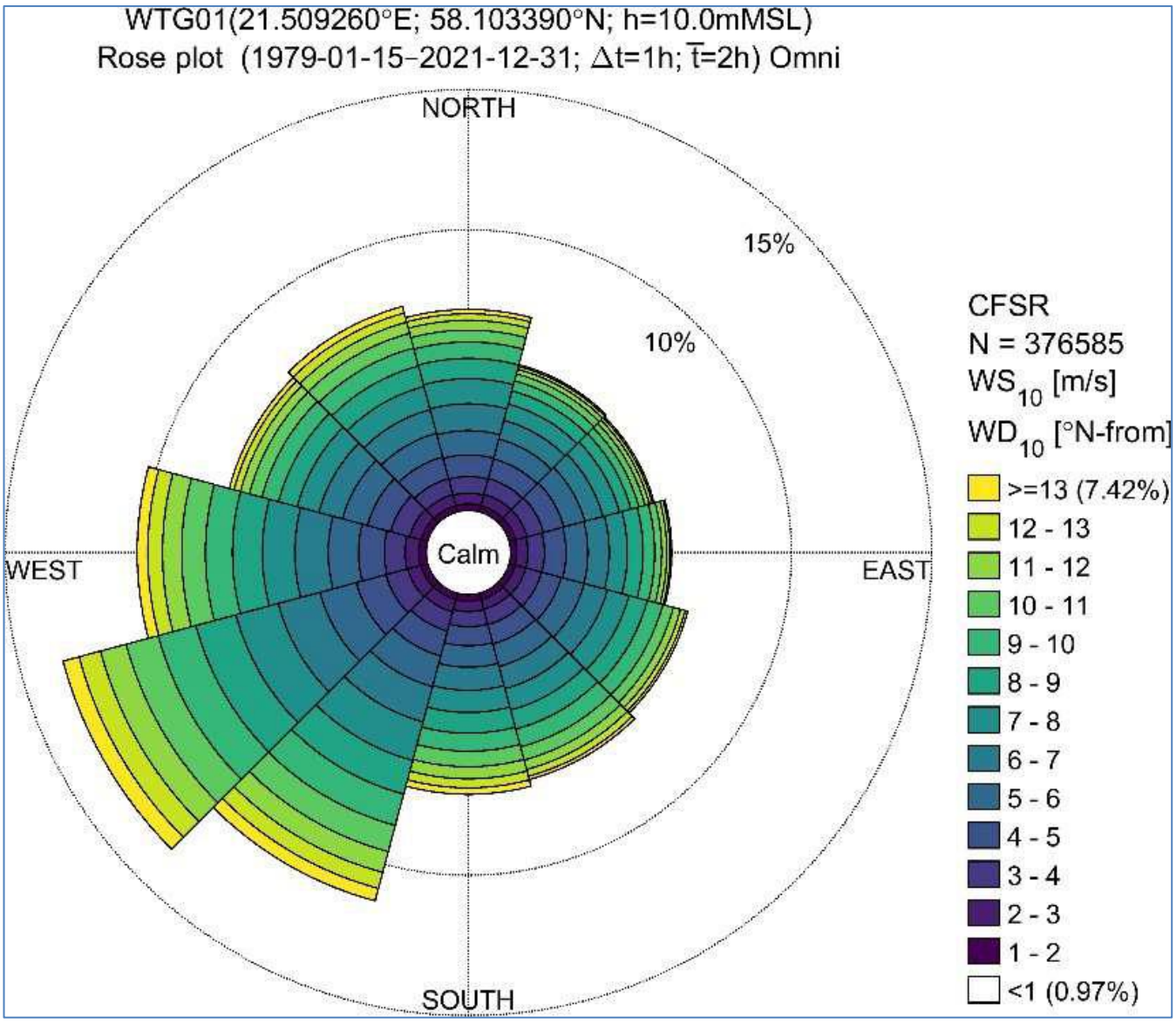

Figure 4-1. *Wind rose for the SWE offshore wind farm area. The analysis period covers from 15.01.1979 to 31.12.2021. (DHI, 2023). (DHI, 2023[27]).*

Waves and currents. The wind climate also shapes the characteristics of waves and currents. Water flow along the Estonian coast is most frequently directed eastwards. The typical current speed in the surface layer of the Estonian marine area is 10–20 cm/s[28]. Measurements and modelling[29] conducted in the SWE wind farm area indicate that the direction and speed of currents differ between the surface and the seabed, as surface currents are driven by wind, while bottom currents are influenced by baroclinic processes. The current velocity is less than 0.1 m/s at the bottom and less than 0.3 m/s at the surface. Currents are generally stronger in winter and weaker in summer. The predominant current directions are from the northwest and north.

[27] *Saaremaa offshore wind farm. Meteorological and oceanographic conditions. Report. DHI, 2023*

28 Vesiviljelus Eesti merealal alusandmed ja uuringud [Aquaculture in Estonian Marine Waters: Basic Data and Studies]. University of Tartu Estonian Marine Institute 2020 (https://pta.agri.ee/media/2129/download)

[29] *Saaremaa offshore wind farm. Meteorological and oceanographic conditions. Report. DHI, 2023*

Wave heights in the Baltic Sea are usually 1–2 metres, reaching 5–6 metres during storms at sea, and up to 10 metres during exceptional westerly storms.[30] The wave roses prepared for the SWE wind farm area show that the predominant wave directions are from the southwest and west, and wave heights generally do not exceed 1.5 metres[31].

Ice conditions. On the basis of the analysis of ice conditions, the marine area of Estonia can be divided into six regions: (i) Väinameri and Pärnu Bay, (ii) open part of the Gulf of Riga, (iii) west coast of Saaremaa and Hiiumaa, (iv) western part of the Gulf of Finland (area north of Hiiumaa and Vormsi), (v) central part of the Gulf of Finland (from Kunda to Paldiski), and (vi) eastern part of the Gulf of Finland (Narva Bay). The ELWIND wind farm area is located in Region III, where ice conditions are the mildest and the probability[32] of ice occurrence is low (see Figure 4-2). An ice cover is present only during severe winters, lasting up to 30 days. Extreme/severe winters occur on average 1–2 times every 10 years in Estonia. During severe winters, drift ice may also occur west of Saaremaa, moving predominantly from north to south with an average speed of up to 0.03 m/s.

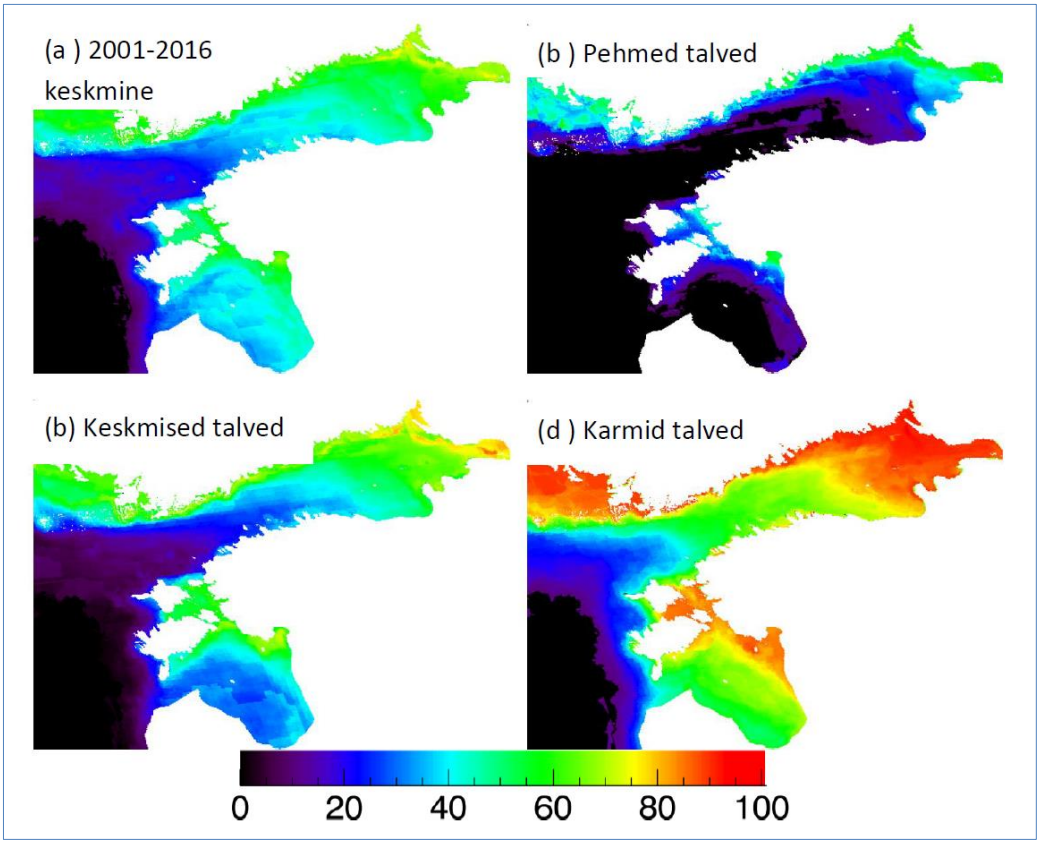

Figure 4-2. *Probability of ice occurrence (%) in the Estonian marine area in the period 2000 to 2016 and in different winter scenarios (Department of Marine Systems at Tallinn University of Technology, 2016[33])*

[30] *Vesiviljelus Eesti merealal alusandmed ja uuringud [Aquaculture in Estonian Marine Waters: Basic Data and Studies]. Estonian Marine Institute, University of Tartu, 2020 (https://pta.agri.ee/media/2129/download)*

[31] *Saaremaa offshore wind farm. Meteorological and oceanographic conditions. Report. DHI, 2023*

[32] *The probability of ice occurrence indicates the percentage of days on which there was ice in the given grid point from 15 December to 1 May. If at least 10% of the grid square was covered in ice (i.e. ice concentration exceeded 10%), the grid point was considered covered in ice.*

[33] *An Analysis of Ice Conditions and Compilation of Maps, Department of Marine Systems at Tallinn University of Technology, 2016*

In the middle of winter, water temperatures in the ELWIND wind farm area do not fall below 0 degrees Celsius and no ice is formed or forms very briefly. To the west of Saaremaa, the first ice may form only in mid-January, and from there the ice will also disappear at the earliest - in February.[34]

4.1.3. Sea water quality

The open part of the Baltic Sea where the ELWIND wind farm area lies is a typical area of the eastern part of the Baltic Sea in terms of sea water quality, with almost no impact of land inflows. In the context of the Estonian coastal waters, it is the marine area least affected by human activity (direct influx of nutrients from land is minimal, there are no local sources of pollution, other uses of the sea are not intense). The area is hydrodynamically active, and the parameters of the water column are influenced by the movement of water (wind direction) and the time of year (seasonal stratification). [35]

The environmental status of Estonian marine area is assessed on the basis of 11 characteristics. According to the 2024 assessment of the environmental status of Estonian marine area[36] the highest proportion of Estonian marine area that have not achieved good environmental status (GES) is with regard to characteristics 3 (Commercial fishing), 4 (Food chains) and 5 (Eutrophication). However, the proportion of marine area that has achieved GES is highest for characteristics 6 (Seabed Integrity), 8 (Pollutants in the Environment), 10 (Marine litter) and 11 (Noise) (Figure 4-3). Regarding these characteristics, the GES had achieved more than 65 % of the marine area.

[34] *An Analysis of Ice Conditions and Compilation of Maps, Department of Marine Systems at Tallinn University of Technology, 2016*

[35] *Study of seabed biota, habitat and water quality in the proposed SWE wind farm area. Estonian Marine Institute, University of Tartu, 2023*

[36] *Environmental status of Estonian marine area 2024. Summary Report (Draft) of the status assessment under MSFD Art 8 to 10.*

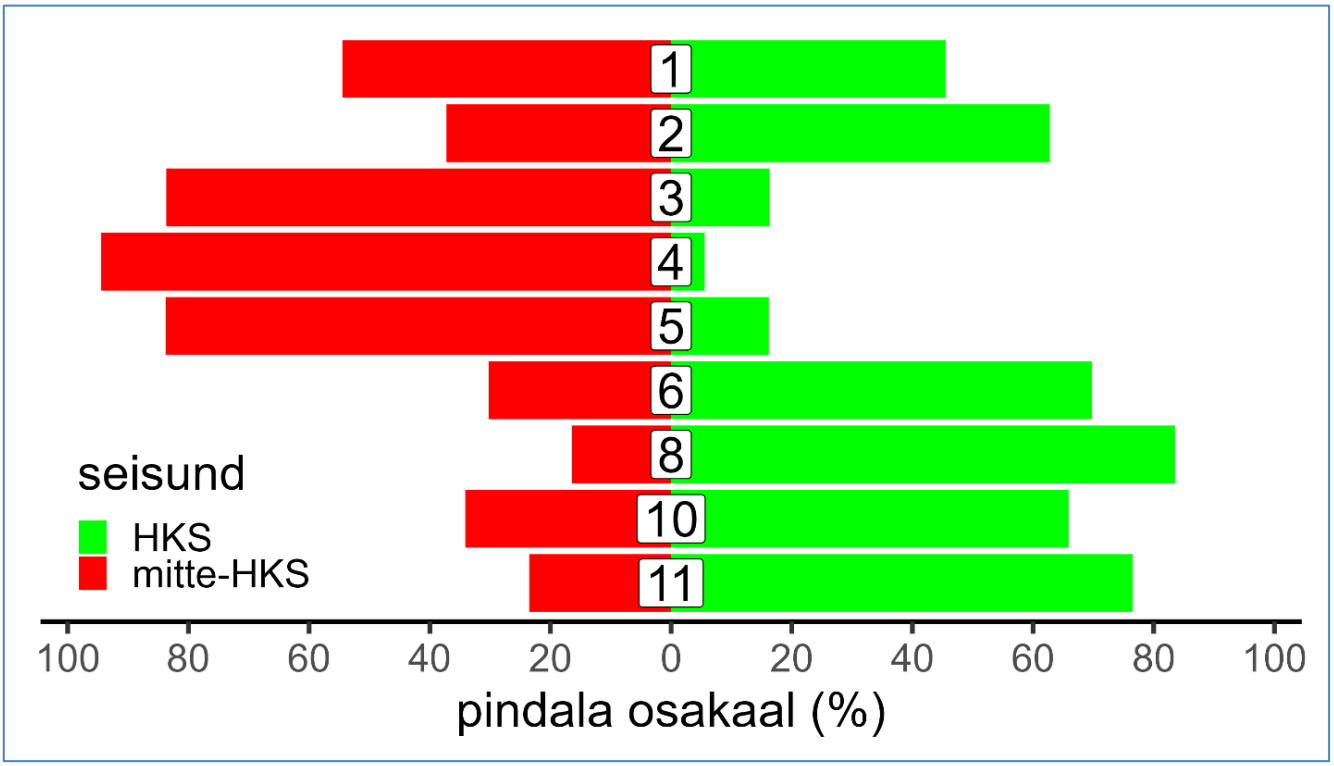

Figure 4-3. *Share of Estonian marine area that has achieved or not achieved good environmental status by different characteristics (Environmental status of Estonian marine area 2024)*

The strongest pressure factors that lead to non-achievement of the GES in Estonian marine area are: nutrient inflows and resulting eutrophication (characteristics D1, D5), commercial fishing (D3, D4) and non-native species (D2).

4.1.4. Habitats and biota

Seabed habitats. No inventory of seabed biota and habitats has not yet been conducted in the entire proposed offshore wind farm area. The northern part of the wind farm area [37] and the cable corridor survey area are partially covered by studies conducted by the Estonian Marine Institute [38].

To describe the distribution of natural values in Estonian marine area, two different habitat classifications are used: Habitat types specified in Annex I to the Habitats Directive and HELCOM *Underwater Biotopes* (abbreviated as HELCOM HUB).

The sea-related habitat types in Annex I to the Habitats Directive (Directive 92/43/EEC on the conservation of natural habitats and natural fauna and flora) have been modelled all over Estonia by the UT Estonian Marine Institute in 2018[39]and 2020[40]. Annex I to the Habitats Directive lists a

[37] *'Survey of seabed biota and habitats to assess the distribution of Natura and HELCOM habitat types and to elucidate the CO2 sequestration potential of the sea'. Estonian Marine Institute, University of Tartu, 2020*

[38] *A benthic biota and habitat study of the cable route connecting the SWE wind farm area with land. Estonian Marine Institute, University of Tartu, 2023*

[39] *Updating map data of Estonian marine habitats. Estonian Marine Institute, University of Tartu, 2018*

[40] *'Survey of seabed biota and habitats to assess the distribution of Natura and HELCOM habitat types and to elucidate the CO2 sequestration potential of the sea'. Estonian Marine Institute, University of Tartu, 2020*

total of eight habitat types related to the sea, of which six are found in the Estonian marine area (the code of Annex I to the Habitats Directive in brackets):

- Sandbanks which are slightly covered by sea water all the time (1110, hereinafter 'sandbanks'),
- Estuaries (1130),
- Mudflats and sandflats not covered by seawater at low tide (1140, hereinafter 'flats'),
- Coastal lagoons (1150),
- Large shallow inlets and bays (1160),
- Reefs (1170).

Of the ones mentioned, sandflats and reefs can be considered wholly benthic habitat types, as their definition is not in any way related to the shoreline or mainland. Based on modelling, the 'reefs' habitat type occurs only in the southern part of the ELWIND offshore wind farm area (Figure 4-4).

The HELCOM HUB habitat classification is a system jointly developed by the Baltic Sea countries, which makes it possible to classify the habitats of the entire water column and the seabed of the entire marine area. HUB hierarchical classification system, divided into six levels, where a larger level number indicates a more detailed degree of classification. Based on HUB level 5 modelling conducted in the Estonian marine area[41] the distribution of 25 HELCOM HUB level 5 habitat types is described in the proposed wind farm area (Figure 4-5 and Table 4-1).

[41] *HELCOM HUB Level 5 habitat distribution modelling. Report, version 19.02.2021. Estonian Marine Institute, University of Tartu*

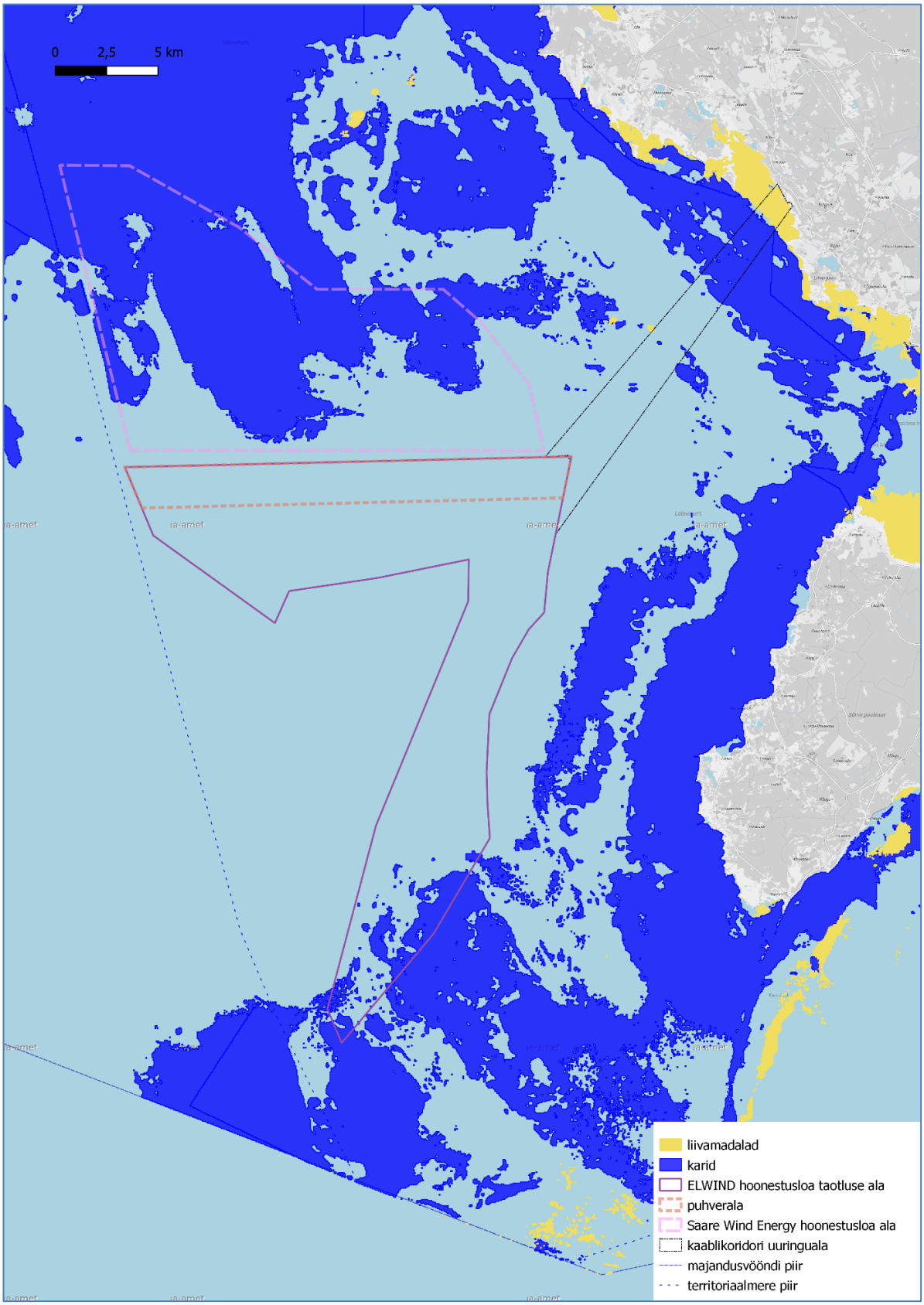

Figure 4-4. *Distribution of habitat types specified in Annex I to the Habitats Directive in the wind farm area. Data: EELIS*

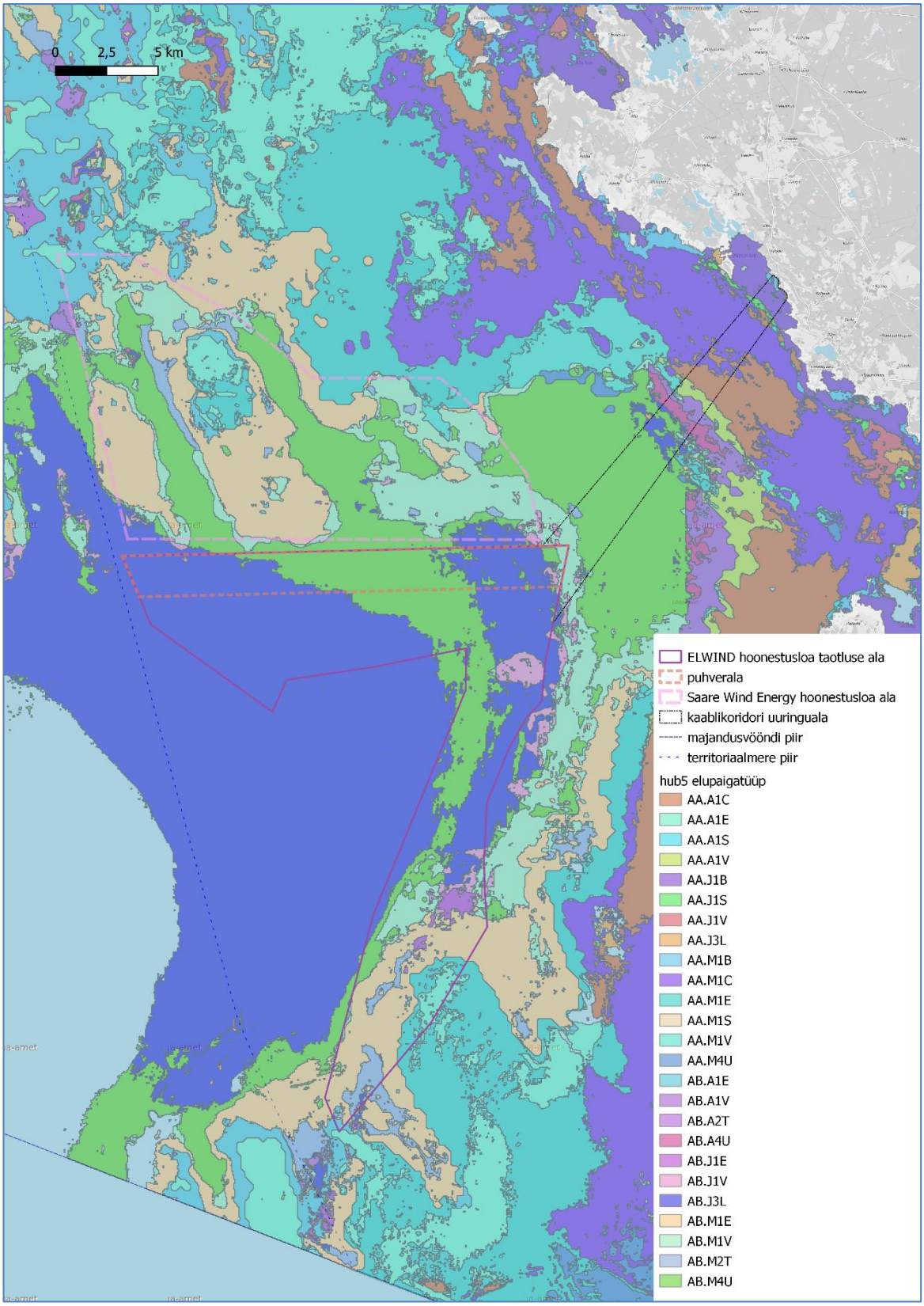

Figure 4-5. *HELCOM HUB Level 5 seabed habitat distribution in the proposed wind farm area*[42]

[42] *HELCOM HUB Level 5 habitat distribution modelling. Report, version 19.02.2021. Estonian Marine Institute, University of Tartu.*

Table 4-1. *Range of HELCOM HUB (level 5) benthic habitats in the offshore wind farm area and the cable corridor survey area based on 2021 modelling work*[43]

Code	*Name*
AA.A1C	Baltic photic rock and boulders characterised by perennial algae
AA.A1E	Baltic photic rock and boulders characterised by epibenthic bivalves
AA.A1S	Baltic photic rock and boulders characterised by annual algae
AA.A1V	Baltic photic rock and boulders characterised by mixed epibenthic macrocommunity
AA.J1B	Baltic photic muddy sediment characterised by submerged rooted plants
AA.J1S	Baltic photic sand characterised by annual algae
AA.J1V	Baltic photic sand characterised by mixed epibenthic macrocommunity
AA.J3L	Baltic photic sand characterised by infaunal bivalves
AA.M1B	Baltic photic mixed substrate characterised by submerged rooted plants
AA.M1C	Baltic photic mixed substrate characterised by perennial algae
AA.M1S	Baltic photic mixed substrate characterised by annual algae
AA.M1V	Baltic photic mixed substrate characterised by mixed epibenthic macrocommunity
AA.M4U	Baltic photic mixed substrate characterised by no macrocommunity
AA.M1E	Baltic photic mixed substrate characterised by epibenthic bivalves
AB.A1E	Baltic aphotic rock and boulders characterised by epebenthic bivalves
AB.A2T	Baltic aphotic rock and boulders characterised by sparse epibenthic macrocommunity
AB.J1E	Baltic aphotic sand characterised by epibenthic bivalves
AB.J1V	Baltic aphotic sand characterised by mixed epibenthic macrocommunity
AB.J3L	Baltic aphotic sand characterised by infaunal bivalves
AB.M1E	Baltic aphotic mixed substrate characterised by epibenthic bivalves
AB.M1V	Baltic aphotic mixed substrate characterised by mixed epibenthic macrocommunity
AB.M2T	Baltic aphotic mixed substrate characterised by sparse epibenthic macrocommunity
AB.A1V	Baltic aphotic rock and boulders characterised by mixed epibenthic macrocommunity
AB.A4U	Baltic aphotic rock and boulders characterised by no macrocommunity
AB.M4U	Baltic aphotic mixed substrate characterised by no macrocommunity

Seabed biota. The vegetation in macroscopic benthic biota (macroalgae and higher plants) and zoobenthos make up benthic biota in the Estonian marine area. In terms of species, the biota is quite varied, with both marine origin and freshwater species.

On basis of data for 1992–2018, 60 macrophyte taxons have been recorded in the Estonian marine area (including 57 species and taxons *Ulotrix*, *Pseudolithodermaja Fontinalis* designated up to genus level). The most common species in the Estonian marine area are *Vertebrata fucoides*, *Cladophora glomerata* and *Ceramium tenuicorne*. The greatest number of species/taxons in the Estonian marine area are in the brown algae phylum. The differences between HELCOM marine subbasins in regard to species/taxons of plants are relatively minor, with the species-richest basin being the Gulf of Riga.[44]

[43] *HELCOM HUB Level 5 habitat distribution modelling. Report, version 19.02.2021. Estonian Marine Institute, University of Tartu.*

[44] Impact Assessment Report of the Estonian Maritime Spatial Plan.
(https://mereala.hendrikson.ee/dokumendid/Planeeringulahendus/Kehtestamisele/4_MSP_M6jude_hindamise_aruanne.pdf)

In the area of the proposed offshore wind farm, there is no prior data on the species composition of benthic flora and fauna. There are no state maritime environmental monitoring stations in the proposed offshore wind farm area. Since most of the area of the proposed offshore wind farm is located in the aphotic zone (Figure 4-5), it is expected to have low vegetation coverage. Part of the cable corridor survey area and the southeastern part of the wind farm are located in the photic zone where greater vegetation coverage can be expected.

On basis of data for 1992–2018, 92 zoobenthos taxons have been recorded in the Estonian marine area (including 73 species and 19 taxons). The invertebrate most frequently found in the Estonian marine area is bay mussel (*Mytilus trossulus)*, the Baltic macoma (*Limecola balthica*), and the *bay* barnacle (*Amphibalanus improvisus*). A total of 59% of the zoobenthos species/taxons are in the phylum Arthropoda. Species diversity is highest in the Gulf of Riga sub-basin and lowest in the Eastern Gotland Basin.[45]

Fish fauna[46] The Baltic Sea has low and variable salinity, which restricts the distribution of both marine and freshwater fish species. Consequently, the number of species is lower than in seas with normal salinity. Approximately 30 fish species of marine origin, 10 species of diadromous fish, and about 20 species of freshwater fish are found in Estonia's Baltic Sea waters. The preferences of fish when it comes to habitats and spawning sites vary widely by species: some species require deeper areas of the Baltic to spawn, needing the oxygen and salinity levels found there, while other species are dependent on free access to spawning areas in freshwater or spawn in coastal areas of different depths, with different temperature, salinity, substrate preferences among others.[47]

No fisheries surveys have been carried out so far in the ELWIND offshore wind farm area, but with similar conditions to the fisheries survey carried out in 2021 at the SWE offshore wind farm area[48], it was explained that, characteristic of the offshore location, the region's fish fauna consisted predominantly of marine and estuarine species common in the Baltic Sea. Of the diadromous fish, there were non-large quantities of European smelt. The freshwater fish characteristic of the lower coastal seas and bays of Western Saaremaa, such as carp and Percidae, were completely absent. The survey concerning the SWE cable route, which partly overlaps with the ELWIND cable route, recorded[49] the presence of 20 species of fish. The fish fauna consisted of species belonging to 12 families, with marine species, estuary species living in brackish water, as well as freshwater fish species represented.

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45 'Compilation of species lists of macrophytes and invertebrates'. Georg Martin, University of Tartu, Estonian Marine Institute, 2018.

46Impact Assessment Report of the Estonian Maritime Spatial Plan. (https://mereala.hendrikson.ee/dokumendid/Planeeringulahendus/Kehtestamisele/4_MSP_M6jude_hindamise_aruanne.pdf)

48 A study of the fish population of the offshore wind farm area proposed by Saare Wind Energy. Estonian Marine Institute, University of Tartu, 2022

49 Interim report of the study of the possible ichthyological and fisheries impacts of the cable route of the Saare Wind Energy offshore wind farm. Estonian Marine Institute, University of Tartu, 2022

In general, shallower (less than 15 m) coastal waters and marine shoals are the most important marine areas for fish. Shallower coastal areas (max. 5 m) are where the majority of dish species' spawning areas and nurseries are found, and are crossed by anadromous species heading to fresh water to spawn. More open sea areas, where the depth is already > 5 m, can serve as spawning grounds for the Baltic herring and Baltic flounder. The hydroacoustic study of spring herring carried out as part of the SWE offshore wind farm fisheries survey[50] covering a large part of the ELWIND wind farm area, did not identify any significant herring migration corridors in the area. Figure 4-6 shows an example of the results of the survey from the end of February 2022, when the location of one of the smaller Baltic herring shoal/school in the area was observed. Also, no spawning area of any economically significant fish species was found in the buildable area of the SWE cable corridors[51].

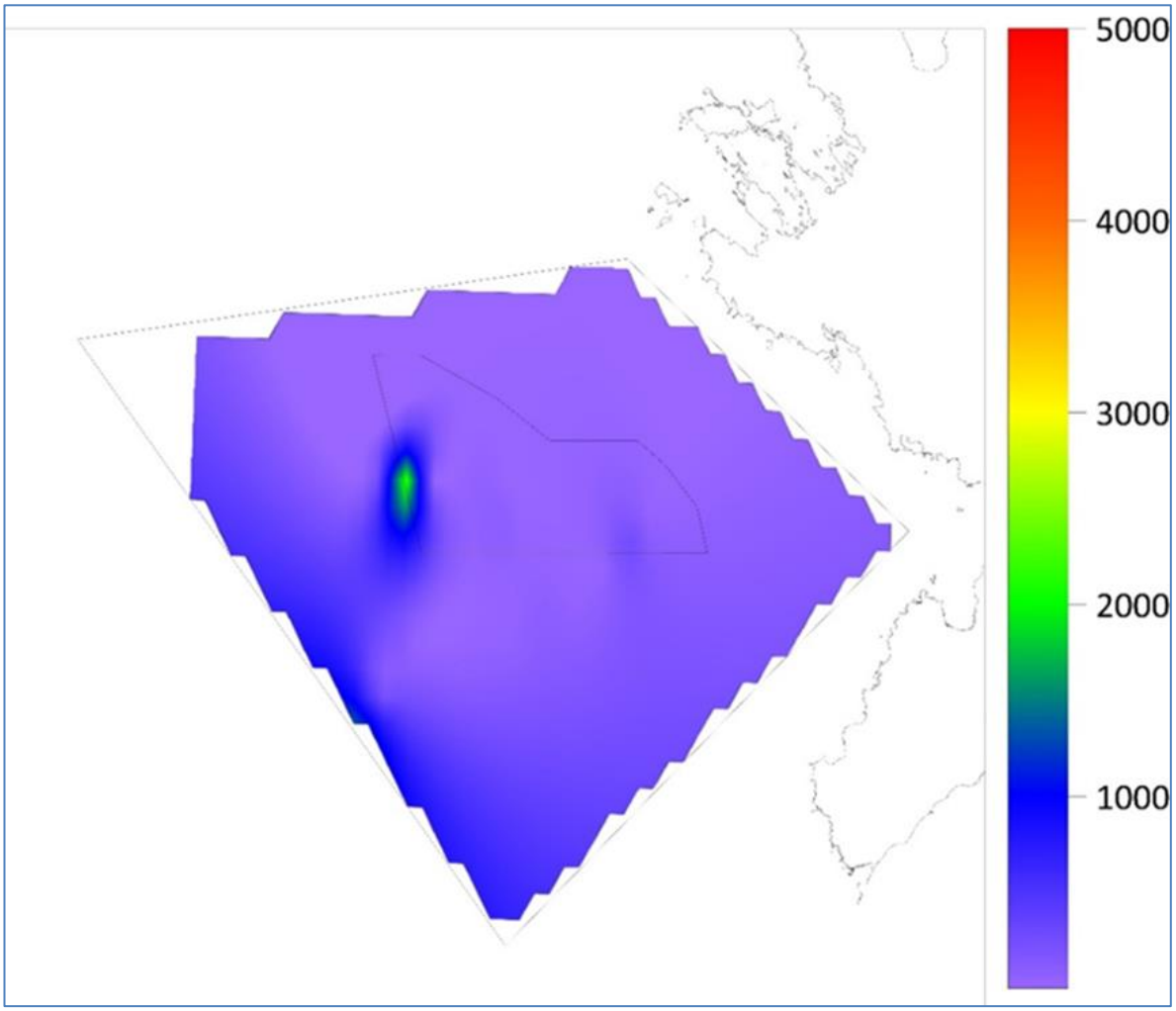

Figure 4-6. *Location of Baltic herring shoals in the area of the planned SWE and ELWIND wind farms in the second half of February 2022*[52]

[50] *A study of the fish population of the offshore wind farm area proposed by Saare Wind Energy. Estonian Marine Institute, University of Tartu, 2022*

[51] *Interim report of the study of the possible ichthyological and fisheries impacts of the cable route of the Saare Wind Energy offshore wind farm. Estonian Marine Institute, University of Tartu, 2022*

[52] *A study of the fish population of the offshore wind farm area proposed by Saare Wind Energy. Estonian Marine Institute, University of Tartu, 2022*

Seals.[53] The Baltic Sea is permanently inhabited by three species of seals and one cetacean: the grey seal, the ringed seal, the harbour seal and the harbour porpoise. In the open part of the Baltic Sea, west of Saaremaa, only the grey seal is constantly present. Others, according to today's knowledge, are rather in the status of an errant visitor in this part of the sea, because suitable habitats for them are located elsewhere - for harbour porpoises and harbour seals in the southern part of the Baltic Sea, and the closest permanently inhabited habitat of ringed seals is the Väinameri and the Gulf of Riga. The grey seals of the Baltic Sea are a predominantly coastal species bordering the high seas, unlike the ringed seal and the harbour seal, which inhabit the inland sea sides and archipelagoes along articulated coasts. Thus, it is also possible to meet grey seals along the entire coastline in Estonia, but large groups (more than a few dozen individuals) are rather rare in the inner parts of the Väinameri.

Estonian distribution of grey seals can be generally divided into four sub-regions: Gulf of Finland, Northern Hiiumaa, the west coast of the islands and the Gulf of Riga (Figure 4-7). Four breeding grounds are known from the waters of Western Saaremaa, which are regularly used by seals: Laevarahu ja Innarahu in Vilsandi National Park, Võrkrahu in Lõu Bay in the Kaugatuma-Lõu limited-conservation area and Vesitükimaa at the tip of the Sõrve Peninsula in the Sääre nature conservation area. Of these, Laevarahu on the northwestern border of Vilsandi National Park is the only one in use all year round, while there are periods for other breeding grounds when there are no seals.

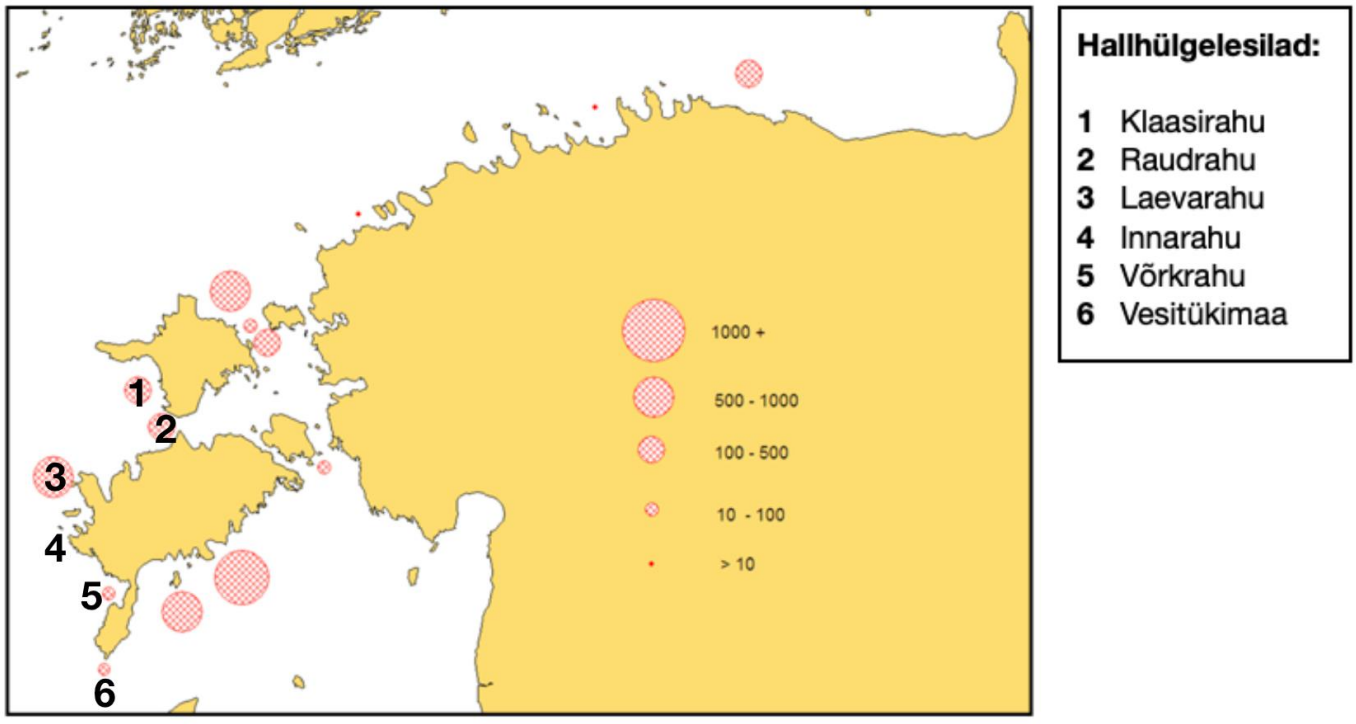

Figure 4-7. *The distribution of grey seals and the size of the populations Estonian coastal waters as counted in national monitoring. Seal breeding grounds on the west coast of the big islands marked with numbers.* [54.]

[53] *The section is based on the Saare Wind Energy wind farm's seal survey report. MTÜ Pro Mare, 2023*

54 Saare Wind Energy wind farm seal survey report. MTÜ Pro Mare, 2023

The abundance of the grey seal in the Baltic Sea has increased to a minimum of 42,000 in 2021 (HELCOM 2021) since its historic low in the 1970s, when the total abundance was estimated at about 3,000 individuals (Hårding et al. 2007). The rate of population growth has shown signs of decline over the past five years, but the trend is positive, seals are numerous and the species is not considered endangered based on these indicators. The main anthropogenic hazards that inhibit the growth of the population are related to fishing, and the natural risk factor is low sea ice during the breeding season, which reduces reproductive success through high mortality and malnutrition of pups (Jüssi et al, 2008). In Estonia, the number of grey seals has increased from at least 1,148 (2000) to 5,131 in 2021.

As part of the Saare Wind Energy wind farm seal survey, the use of four grey seal breeding grounds related to the west coast of Saaremaa – Laevarahu, Innarahu, Võrkrahu and Vesitüki – was monitored among other things. The number of grey seals is at the highest, ca 2,000, during the pupping season as grey seals from other areas of the Baltic Sea also gather at Innarahu and Vesitüki. During the moulting period following pupping, the size of the flock to be monitored is ca 1,000 individuals, as the pupping seals disperse back to their summer habitats. As is characteristic of the open system, rotation takes place throughout the central part of the Baltic Sea, but during the period of intensive feeding, the breeding grounds have no more than a few hundred individuals in total at a time. Flocks increase only in the fall, when seals have maximized their energy reserves. As a generalization, it can be said that West-Saaremaa is associated with ca 1,000 grey seals, which account for a fifth of Estonian and less than 4% of the countable population of the Baltic Sea.

The good environmental status of the Baltic Sea grey seal has been achieved, considered according to abundance, range and distribution pattern criteria[55.]

Avifauna. The significance of the Estonian coastal sea for waterfowl comes primarily from the fact that it is a stop on one of the most important migratory routes in the region, which is called the Eastern Atlantic migratory route. It is used by the majority of Arctic waterfowl en route from Arctic nesting areas in Eurasia to wintering areas, which may extend all the way to southern Africa (e.g. for the Arctic tern). It is known that Estonian marine shallows are suitable stopover sites for waterfowl, where they replenish their fat reserves for continued migration. Many Arctic waterfowl use the Estonian coastal sea to overwinter. Some parts of the Estonian coastal sea have become important waterfowl moulting areas (eg common eider and scoters). In addition, a number of bird species whose habitat is the coast and coastal sea nest on the coast and sea islands. In addition to waterfowl, many terrestrial birds are also connected to the marine area through migration.

As part of the preparation of the Estonian Maritime Spatial Plan, two comprehensive reviews were conducted on avifauna related to the marine environment and the potential impacts of various marine uses[56]. These were large-scale studies that provide a comprehensive overview of the behavioural patterns of different bird species. On the basis of the studies, sensitive areas for

55 Environmental status of Estonian marine area 2024. Summary Report (Draft) of the status assessment under MSFD Art 8 to 10.

56 'Consolidation of existing data on migration corridors of birds located in the Estonian marine area and preparation of an analysis of the impact of wind farms on birds' feeding areas' Estonian Ornithological Society 2016 and 'Analysis of birds' staging areas' Estonian Ornithological Society 2019.

birds (migration, feeding and moulting areas) were identified (Figure 4-8) and areas that from the point of view of avifauna are most suitable for wind energy production, including development area No 2 where the ELWIND offshore wind farm area is located.

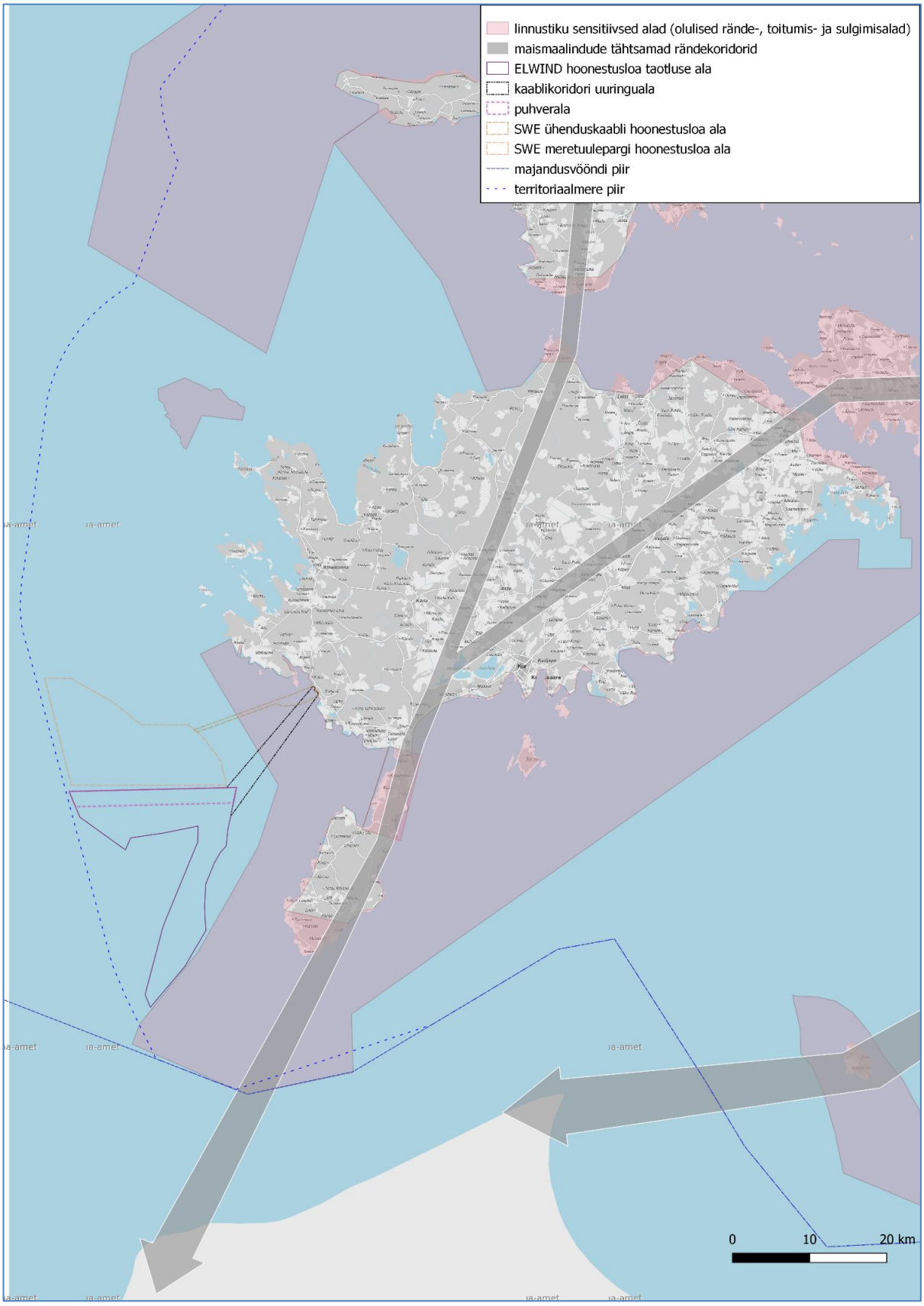

Figure 4-8. *Sensitive bird areas and migration corridors. Source: Impact Assessment Report of the Estonian Maritime Spatial Plan)*[57]

Following the example of the international organization for the protection of birds BirdLife International (BirdLife International, 2004), the subject of the conservation of seabirds can be divided into four topics:

1) **Concentration and wintering sites of migratory waterfowl** By type of diet, waterfowl are divided into benthos-eating and fish-eating birds. Benthivorous waterfowl, or benthic foraging waterfowl, use shoals with a suitable depth for diving (up to 20 metres) as feeding areas.
2) **Areas of importance for pelagic species** Such areas are often associated with special hydrological conditions (rising currents, fronts between water masses), which lead to high biological productivity. Internationally, pelagic species include representatives of the *Procellariiformes* order of storm birds of high conservation value. In Estonia, storm birds occur only as stray guests, while of the pelagic species we have gulls, terns and skuas. Out of these, the little gull (*Hydrocoloeus minuta*) has the highest conservation value in Estonia.
3) **'Bottleneck areas' of the migratory path.** A significant proportion of the populations of several species pass through Estonia. Transit migration of terrestrial birds often follows the coastline, leading to large concentrations at cape peaks and narrow straits. The concentration occurs for the reason that terrestrial bird, especially gliders who use rising air currents for migration, avoid crossing the sea (Falconiformes and white storks). The sea is also an obstacle for migrants active during the day and at night (passerines, woodpeckers, etc). Part of the migration flow along the Estonian coast follows the Sõrve peninsula to the east of the planned wind farm (Figure 4-8).
4) **Nesting colonies.** Birds nesting on islands and islets use the sea surrounding the islands for food. In previous materials published by BirdLife International, the species have been divided into three groups based on feeding radii: 5 km (little tern, black guillemot), 15 km (Arctic tern, common tern and sandwich tern, mew gull, great cormorant) and 40 km (lesser black-backed gull, razorbill), (BirdLife International, 2004).

In the area of the SWE offshore wind farm north of the ELWIND offshore wind farm and the surrounding area, including the northern part of the ELWIND wind farm, in connection with bird surveys of the SWE wind farm[58] the results of the flight census carried out and their analysis confirmed previous estimates[59] [60] that this area is not an important staging area for waterfowl. The only species worthy of attention was the little gull (*Hydrocoloeus minutus*), whose abundance in the region has fluctuated over the years.

Islets and small islands suitable for nesting birds are located 10 to 20 km to the east and north of the proposed wind farm. According to the SWE wind farm bird survey[61] the nesting species there are the lesser black-backed gull (*Larus fuscus*) and the little gull (*Larus minutus*), and the Caspian tern (*Sterna caspia*) and the sandwich tern (*Sterna sandvicensis*). For all these species, the risk posed by the barrier effect has been assessed as low.

Therefore, the most important issue is the risk of collisions with overflying/migrating birds, the cumulativeness of which is increasing with the addition of wind farms. Bird surveys carried out

57 https://mereala.hendrikson.ee/dokumendid/Planeeringulahendus/Kehtestamisele/4_MSP_M6jude_hindamise_aruanne.pdf

58 Bird population surveys of Saare Wind Energy wind farm. Estonian Ornithological Society, 2023

59Analysis of bird stopover sites. Estonian Ornithological Society, 2019.

60Renewal of Marine Important Bird Areas Estonian Ornithological Society, 2022

61 Bird population surveys of Saare Wind Energy wind farm. Estonian Ornithological Society, 2023

in the SWE wind farm area[62] established that for all waterfowl observed, with the exception of terns and tufted duck, the seasonal estimate of the abundance of birds migrating through the wind farm area exceeded 1% of the total biogeographical population[63] (Table 4-2). In the case of the tufted duck, the estimate of the number of birds passing through the site exceeded the numerical threshold of the area of national importance.

Table 4-2. *The seasonal abundance estimates of migratory birds and their share of the biogeographical population based on observations carried out in the SWE wind farm area*[64]

Species / Group	*Season's abundance-estimate*	Season	*1% of biogeographical population size (Wetlands International)*	*Share of migratory birds in the size of the biogeographical population, %*
barnacle goose, brent goose (*Branta leucopsis, B. bernicla*)	1086966	Spring	16100	67.51
bean goose and greater white-fronted goose (*Anser fabalis, A. albifrons*)	182,186	Spring	17,500	10.41
terns	24,345	Spring	45,100	0.54
Eurasian crane (*Grus grus*)	14,932	Spring	1500	9.95
great cormorant (*Phalacrocorax carbo*)	21,030	Autumn	6,200	3.39
swimming ducks	164,320	Autumn	14,000	11.74
Divers (*Gavia sp.)*	62,022	Spring	7800	7.95
little gull (*Hydrocoloeus minutus*)	22,167	Autumn	1300	17.05
long-tailed duck *(Clangula hyemalis*)	344,069	Spring	16,000	21.5
smews (*Mergus sp*.)	9,799	Spring	3400	2.88
black scoter *(Melanitta nigra*)	274,257	Spring	7500	36.57
tufted duck *(Aythya fuligula*)	5,883	Autumn	8900	0.66
nocturnal migrants	3,784,567	Spring	-	-

Bats[65]

Estonia has 14 proved species of bats, seven spend the winter here and are considered non-migratory. These are 5 species in the genus *Myotis*, northern bat (*Eptesicus nilssonii*) and the brown long-eared bat (*Plecotus auritus*). The following species have been confirmed by previous

62 Bird population surveys of Saare Wind Energy wind farm. Estonian Ornithological Society, 2023

63 1% of the biogeographical population is the threshold for an area of international importance (Wetlands International).

64 Bird population surveys of Saare Wind Energy wind farm. Estonian Ornithological Society, 2023

65 The chapter is largely based on the basic research of the Maritime Spatial Plan 'Survey of bats at sea around Saaremaa from July to October 2018', Estonian Fund for Nature, 2019

studies in the Estonian offshore area: *Eptesicus nilssonii*, *Nathusius's pipistrelle* and *Större brunfladdermu*s.

Bats are known to be able to cross extensive sea areas. A few bats that have arrived across the sea have been found in the Faroe Islands, Iceland, as well as on oil rigs and ships in the North Sea, sometimes even species from the Americas. To get from the Shetland Islands to the Faroe Islands, bats must travel at least 290 km above the ocean, from there to the Faroe Islands to Iceland is at least 430 km. In Estonian context, for example, when crossing the Gulf of Riga, bats do not need to take such long flights. The distance to be covered is only 29 km in the narrowest part of the Irbe Strait. It can be assumed that in such a place the activity of bats during migration is higher than, for example, over the Baltic Sea between Hiiumaa and Sweden.

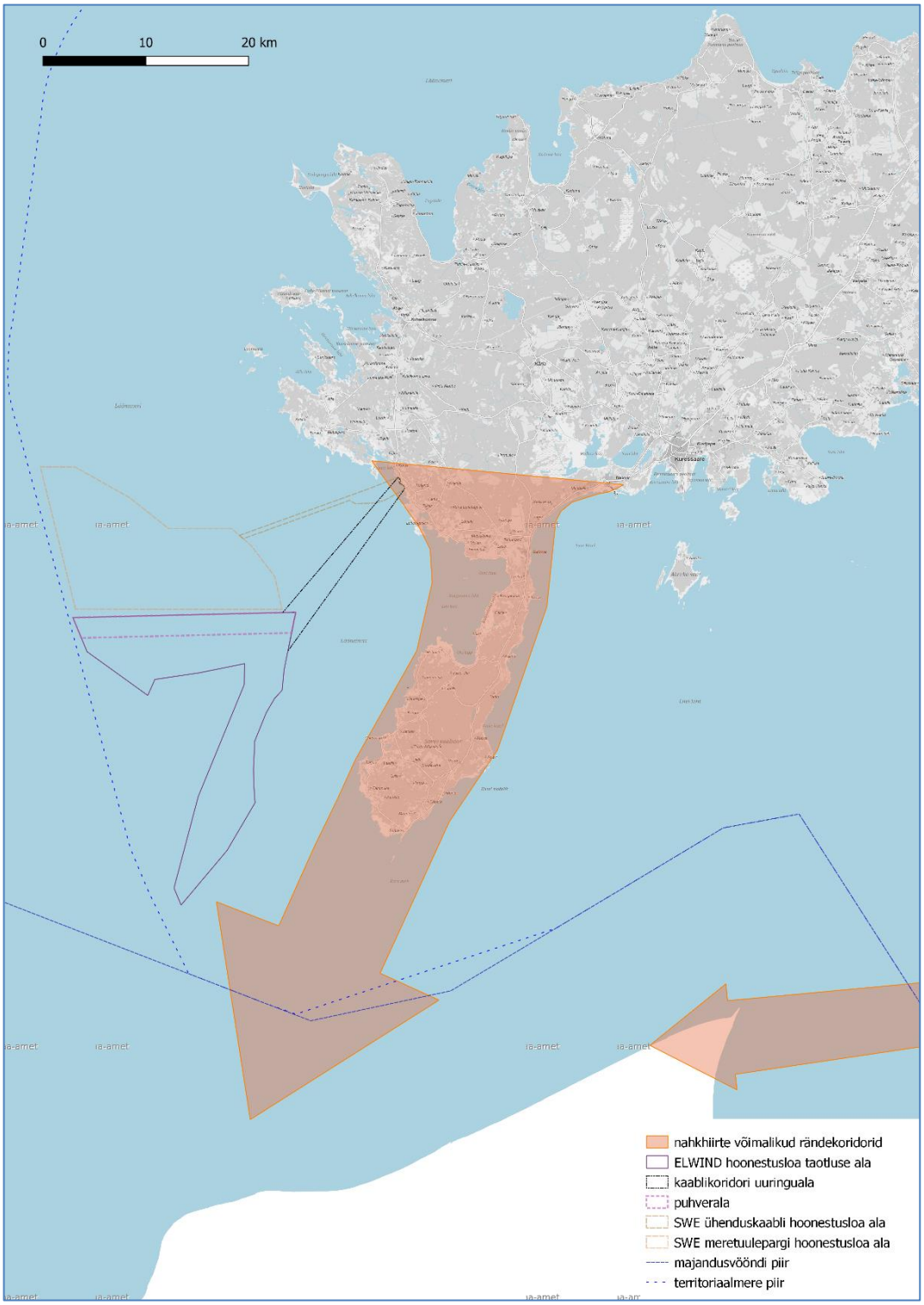

Figure 4-9. *Sensitive areas for bats (Source: Estonian Impact Assessment Report of the Maritime Spatial Plan)*[66]

According to current knowledge, it can be assumed that migratory species from Finland and elsewhere in Estonia will be concentrated in autumn on the southern coast of Saaremaa, especially on the Sõrve peninsula (the main direction of autumn migration is to the southwest), where they are waiting for suitable weather to cross the Gulf of Riga. Moving westward to Sweden

66
https://mereala.hendrikson.ee/dokumendid/Planeeringulahendus/Kehtestamisele/4_MSP_M6jude_hindamise_aruanne.pdf

is less likely, but cannot be ruled out. Current knowledge suggests that the autumn migration of bats is more active precisely in the Irbe Strait (Figure 4-9). On a few favourable nights, migrating bats can head west from Saaremaa. Little is known about the spring migration of bats. The abundance of the bat population is less in the spring than in the fall, because not all specimens survive the winter. Thus, the probability of encountering bats during spring migration is probably also smaller at sea than in autumn. So far, the autumn migration of bats has mainly been observed, since at that time the greatest abundance can be assumed, and based on the migration direction, it can be assumed in which places at sea are bats flying more numerously.

So a study conducted in the area of the SWE offshore wind farm[67] as well as studies previously carried out in the same Estonian marine area using the same methodology[68] [69] [70] [71] [72] [73] have confirmed that bats are most often encountered above the sea in the second half of August, and about half of the observations are concentrated in the last two weeks of August. Approximately 75% of bat registrations remain between 1 August and 1 September, and ca 50% of registrations from mid-August to 1 September.

In the case of bat migration, it is important to note that bats usually fly up to 10 m above the surface, but when approaching objects at sea (masts, wind turbines etc.) bats rise much higher, also flying around the turbine blades. Bats, especially migratory species, may gather in certain places near the coast where they await better weather for crossing the sea. Migration is possible only during relatively calm weather and favourable wind direction. On the basis of the bat study[74], bats flew above the sea when the wind speed was 0.3–7.7 m/s (the 2020 study reported 0.4...7.1 m/s). The study also established that bats flew above the sea mainly at a wind speed of less than 5–6 m/s.

4.1.5. Protected natural objects, including Natura 2000 network areas

Protected natural objects

Pursuant to § 4 of the Nature Conservation Act protected natural objects include protected areas, limited-conservation areas, protected species and fossils, species' protection sites; individual protected natural objects, natural objects protected at the local government level.

There are no protected natural objects directly in the area of the proposed offshore wind farm. The following protected areas are located within the area of impact of the proposed offshore wind farm and cable: Irbe Strait's limited-conservation area, Sääre nature conservation area, Vesitükimaa limited-conservation area, Jaandi limited-conservation area, Ohessaare landscape

67 'Bat Survey at Sea West of Saaremaa from May to October 2021'. Lauri Lutsari (MTÜ Sicista Arenduskeskus, 2022).

68 Lutsar, Lauri. 2017. 'Bat Survey at Veiserahu and Kerjurahu in August, September and October 2016.'

69 Lutsar, Lauri. 2018 'Bat Survey at Sea around Saaremaa from July to October 2018'

70 Lutsar, Lauri. 2021. 'Bat Survey in the Gulf of Riga and the Gulf of Finland from June to October 2020'.

71 Lauri Lutsar. 2012. 'Bat Survey at Western Part of Kõpu Peninsula and its Surrounding Sea in July and August 2011'.

72 Lutsar, Lauri. 2013. 'Bat Survey at the Uusmadala, Kuradimuna and Tallinn Shallows in August and September 2012'. Tallinn.

73 Kalda, Oliver, ja Rauno Kalda. 2022. 'Nasva Bat Survey'. Tallinn, Tartu.

74 "Study of bats at sea in the area of Saaremaa from July to October 2018", Estonian Fund for Nature, 2019

protection area, Kaunispe limited-conservation area, Lindmetsa landscape protection area, Lindmetsa limited-conservation area, Kaugatoma-Lõu limited-conservation area, Rahuste nature conservation area, Riksu Coast limited-conservation area, Karala-Pilguse limited-conservation area and Vilsandi National Park. In addition, there are three projected protected areas in the area: Irbe madaliku nature conservation area, Kolgi madaliku nature conservation area and the expansion of the offshore part of Vilsandi National Park. The location of protected natural objects is illustrated in Figure 4-10 and descriptions are given in Table 4-3.

Within the protected areas, sites of various bird species have been recorded (eg tundra swan (protection II), Steller's eider (protection II), etc).

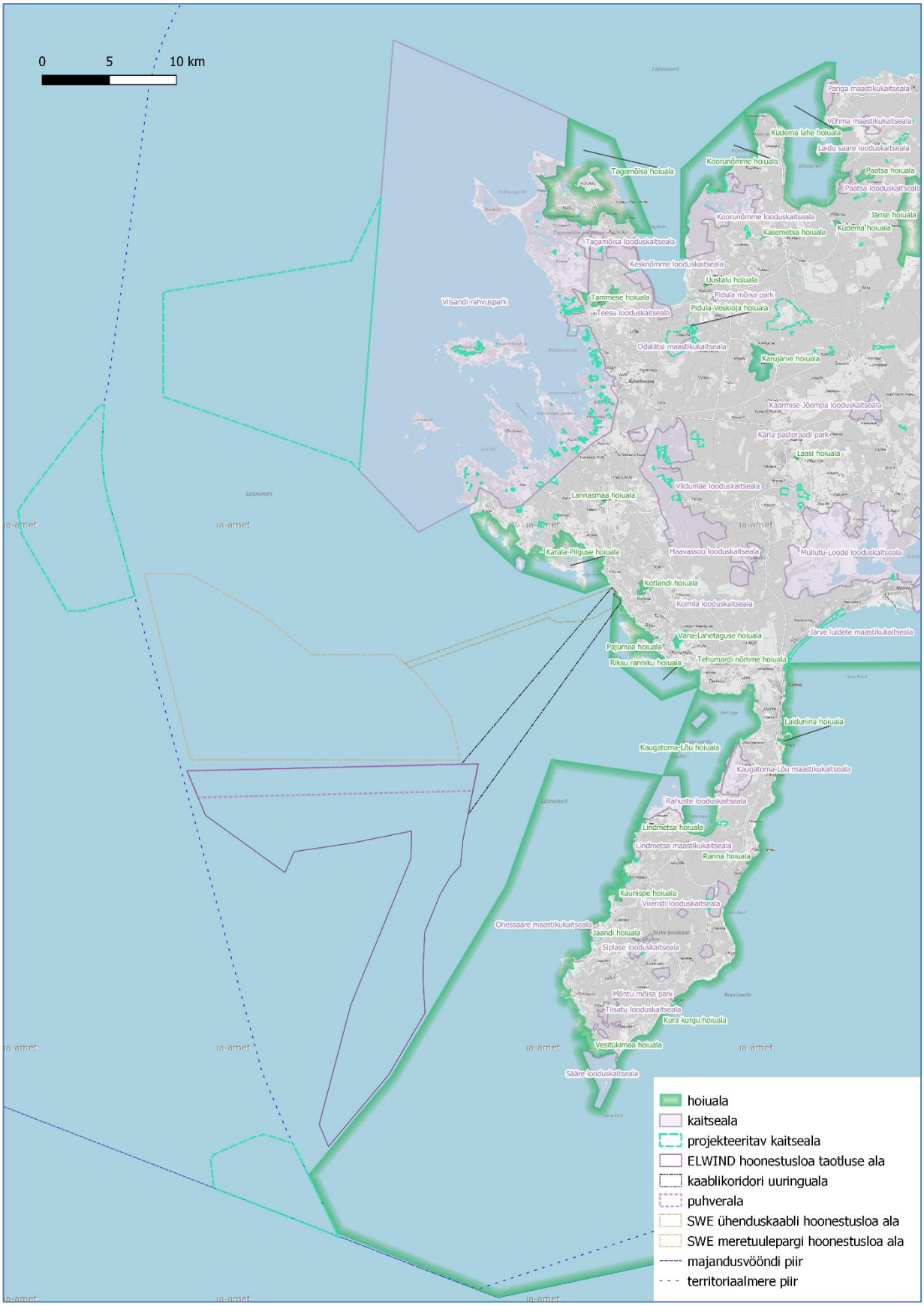

Figure 4-10. *Overview of protected natural objects in the area of impact of the proposed wind farm (Basis: Land Board and EELIS, 2024)*

Table 4-3. *Protected natural objects in the area of the proposed wind farm or cable corridor and their area of impact*

Protected natural object	*Description of the area*
Irbe Strait's limited-conservation area (KLO2000316)	It was placed under protection by the Government of the Republic Regulation No 156 of 18 May 2007 'Amending the Government of the Republic Regulation No 176 'Protection of limited-conservation areas in Saare County' of 27 July 2006'. The Irbe Strait's limited-conservation area covers an area of 189,792.2 ha, of which 189,429.5 ha is sea, 352.9 ha is land and 9.8 ha is internal bodies of water.The following habitat types specified in Annex I to Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora are under protection: reefs (1170), annual vegetation of drift lines (1210), Boreal Baltic coastal meadows (1630*), Boreal Baltic islets and small islands (1620), Boreal Baltic sandy beaches with perennial vegetation (1640), fixed coastal dunes with herbaceous vegetation ('grey dunes') (2130*) and Molinion caeruleae (6410). In addition, the habitats of the grey seal (*Halichoerus grypus*) as specified in Annex II to the Habitats Directive are protected. In addition, the conservation objective of the Irbe Strait's limited-conservation area is the conservation of the bird species referred to in Annex I to Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds and the habitats of migratory bird species not included in Annex I. The species under protection are: red-throated loon (*Gavia stellata*), Arctic Loon (*Gavia arctica*), great cormorant (*Phalacrocorax carbo*), mute swan (*Cygnus olor*), tundra swan *(Cygnus columbianus bewickii*), greylag goose (*Anser anser*), barnacle goose (*Branta leucopsis*), brent goose (*Branta bernicla*), Eurasian wigeon (*Anas penelope*), common teal (*Anas crecca*), mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), northern shoveler (*Anas clypeata*), gadwall (*Anas strepera*), greater scaup (*Aythya marila*), common eider (*Somateria mollissima*), long-tailed duck (*Clangula hyemalis*), velvet scoter (*Melanitta fusca*), common goldeneye (*Bucephala clangula*), smew (*Mergus albellus*), red-breasted merganser (*Mergus serrator*), goosander (*Mergus merganser*), pied avocet (*Recurvirostra avosetta*), common ringed plover (*Charadrius hiaticula*), grey plover (*Pluvialis squatarola*), red knot (*Calidris canutus*), little stint (*Calidris minuta*), dunlin (*Calidris alpina*), bar-tailed godwit (*Limosa lapponica*), spotted redshank (*Tringa erythropus*), ruddy turnstone (*Arenaria interpres*), razorbill (*Alca torda*) and black guillemot (*Cepphus grylle*). The area is also part of HELCOM Baltic Sea Protected Areas network as HELCOM area of Irbe Strait (registry code RAH0000670, international code 95, approved on 09.04.2010) and is also an Important Bird Area (IBA area) of European Union (Irbe Strait; code 049).
Kaugotoma-Lõu limited-conservation area (KLO2000313	It was placed under protection by the Government of the Republic Regulation No 176 'Protection of limited-conservation areas in Saare County' of 27 July 2006. The area of the Kaugatoma-Lõu limited-conservation area is 4,154.8 ha and occupies the water area and coast of the Kaugatoma Bay (except for the territory belonging to under the Kaugatoma-Lõu landscape protection area). The conservation objective of the Kaugatoma-Lõu limited-conservation area is to protect the habitat types specified in Annex I to Council Directive 92/43/EEC: mudflats and sandflats not covered by seawater at low tide (1140), large shallow inlets and bays (1160), reefs (1170), perennial vegetation of stony banks (1220), Boreal Baltic islets and small islands (1620), Boreal Baltic coastal meadows (1630*1), *Juniperus communis* formations (5130), semi-natural dry grasslands and scrubland facies on calcareous substrates (6210*), Fennoscandian lowland species-rich dry to mesic grasslands (6270*), Nordic alvar and precambrian calcareous flatrocks (6280*), Alkaline fens (7230), Fennoscandian deciduous swamp woods (9080*), and the bird species referred to in Annex I to Directive 2009/147/EC of the European Parliament and of the Council and the habitats of migratory bird species not included in Annex I. The species of birds whose habitats within the limited-conservation area are protected are: mute swan (*Cygnus olor)*, tundra swan (*Cygnus columbianus bewickii)*, whooper swan (*Cygnus cygnus)*, greylag goose (*Anser anser)*, barnacle goose (*Branta leucopsis)*, mallard (*Anas platyrhynchos)*, common teal (*Anas crecca)*, tufted duck (*Aythya fuligula)*, greater scaup (*Aythya marila)*, common eider

Protected natural object	*Description of the area*
	(*Somateria mollissima)*, long-tailed duck (*Clangula hyemalis)*, common goldeneye (*Bucephala clangula)*, smew (*Mergus albellus)*, red-breasted merganser (*Mergus serrator)*, goosander (*Mergus merganser)*, Eurasian golden plover (*Pluvialis apricaria)*, northern lapwing (*Vanellus vanellus)*, southern dunlin (*Calidris alpina schinzii)*, spotted redshank (*Tringa erythropus*), common redshank (*Tringa totanus)*, common greenshank (*Tringa nebularia)*, lesser black-backed gull (*Larus fuscus)* and common ringed plover (*Charadrius hiaticula)*.
Rahuste nature conservation area (KLO1000305)	It was placed under protection by the Government of the Republic Regulation No 11 'Protection rules of the Rahuste nature conservation area' of 11.01.2007. The nature conservation area was formed on the basis of the Ooslamaa bird protection zone, which was placed under protection by Decision No. 32 'On the Protection of Nature in the Kingissepa District' of 3 April 1965 as adopted by the Soviet Executive Committee of Workers Assembly of the Kingissepa District [Kingissepa Rajooni TSN Täitevkomitee]. The total area of the nature conservation area is 689.5 ha, including 183.4 ha of land and 506.1 ha of water. The conservation objective of the Rahuste nature conservation area is the protection of species listed in Annexes I to Council Directive 79/409/EEC on the conservation of wild birds, which are also protected species under category II, the barnacle goose (*Branta leucopsis*) and Arctic Tern (*Sterna paradisaea*), which are also protected species under category III; the protection of species under category II, species under category III which are the common ringed plover (*Charadrius hiaticula*) and common redshank (*Tringa totanus*) and migratory bird species. The protection of the habitat type listed in Annex I to Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, namely Boreal Baltic coastal meadows (1630*).
Riksu coast limited-conservation area (KLO2000327)	It was placed under protection by the 18.05.2007 amendment (by Regulation No 156) of Government of the Republic Regulation No. 176 'Protection of limited-conservation areas in Saare County' of 27.07.2006. The total area of the limited-conservation area is 2,188 hectares, of which 1,683.4 hectares are water and 504.6 hectares are land. The conservation objective of the Riksu coast limited-conservation area is to protect the habitat types specified in Annex I to Council Directive 92/43/EEC: coastal lagoons (1150*), annual vegetation of drift lines (1210), perennial vegetation of stony banks (1220), Boreal Baltic islets and small islands (1620), Boreal Baltic coastal meadows (1630*), Boreal Baltic sandy beaches with perennial vegetation (1640), 'grey dunes' or fixed coastal dunes (2130*), *Juniperus communis* formations (5130), semi-natural dry grasslands on calcareous substrates (6210*), Nordic alvar (6280*), Molinion caeruleae (6410), Fennoscandian wooded pastures (9070), and the bird species referred to in Annex I to Council Directive 79/409/EEC and the habitats of migratory bird species not included in Annex I. The species of birds whose habitats are protected are: red-necked grebe (*Podiceps grisegena*), horned grebe (*Podiceps auritus*), mute swan (*Cygnus olor*), whooper swan (*Cygnus cygnus*), lesser white-fronted goose (*Anser erythropus*), barnacle goose (*Branta leucopsis*), mallard (*Anas platyrhynchos*), tufted duck (*Aythya fuligula*), common eider (*Somateria mollissima*), long-tailed duck (*Clangula hyemalis*), black scoter (*Melanitta nigra*), velvet scoter (*Melanitta nigra*), common goldeneye (*Bucephala clangula*), smew (*Mergus albellus*), red-breasted merganser (*Mergus serrator*), goosander (*Mergus merganser*), western marsh-harrier (*Circus aeruginosus*), common ringed plover (*Charadrius hiaticula*), northern lapwing (*Vanellus vanellus*), southern dunlin (*Calidris alpina schinzii*), *Calidris alpina alpina*, ruff (*Philomachus pugnax*), spotted redshank (*Tringa erythropus*), common redshank (*Tringa totanus*), common greenshank (*Tringa nebularia*), Arctic tern (*Sterna paradisaea*), barred warbler (*Sylvia nisoria*) and red-backed shrike (*Lanius collurio*).
Karala-Pilguse limited-conservation area (KLO2000310)	It was placed under protection by the Government of the Republic with Regulation No. 156 of 18 May 2007, amending Regulation No. 176 of 27 July 2006, 'Protection of limited-conservation areas in Saare County'. The area of the limited-conservation area is 2507.5 ha, including 1055.2 ha of land, 136 ha of internal bodies of water and 1316.3 ha of marine part. The following habitat types listed in Annex I to Council Directive

Protected natural object	*Description of the area*
	92/43/EEC on the conservation of natural habitats and of wild fauna and flora are placed under protection in the Karala-Pilguse limited-conservation area: coastal lagoons (1150*), annual vegetation of drift lines (1210), vegetated sea cliffs of the Atlantic and Baltic Coasts (1230), Boreal Baltic islets and small islands (1620), Boreal Baltic coastal meadows (1630*), Boreal Baltic sandy beaches with perennial vegetation (1640), 'white dunes' (shifting dunes along the shoreline – 2120), 'grey dunes' (fixed coastal dunes – *2130), *Juniperus communis* formations (5130), semi-natural dry grasslands on calcareous substrates (6210*), Nordic alvar (6280*), Molinion caeruleae (6410), Calcareous fens with *Cladium mariscus* (*7210), alkaline fens (7230), Western Taïga (*9010). In addition, the habitats of the species *Cypripedium calceolus,* as specified in Annex II to the Habitats Directive, and the bird species referred to in Annex I to Directive 2009/147/EC of the European Parliament and of the Council and the habitats of migratory bird species not included in Annex I are being protected. The species of birds whose habitats are protected are: mute swan (*Cygnus olor*), barnacle goose (*Branta leucopsis*), common teal (*Anas crecca*), mallard (*Anas platyrhynchos*), northern shoveler (*Anas clypeata*), common goldeneye (*Bucephala clangula*), white-tailed eagle (Haliaeetus albicilla), Eurasian crane (*Grus grus*), pied avocet (*Recurvirostra avosetta*), common ringed plover (*Charadrius hiaticula*), northern lapwing (*Vanellus vanellus*), southern dunlin (*Calidris alpina schinzii*), ruff (*Philomachus pugnax*), common redshank (*Tringa totanus*), Eurasian eagle-owl (*Bubo bubo*), woodlark (*Lullula arborea*), barred warbler (*Sylvia nisoria*) and red-backed shrike (*Lanius collurio*).
Vilsandi National Park (KLO1000250)	Vilsandi nature conservation area was reorganised into a national park in 1993. The protection rules approved by the Government of the Republic Regulation No 29 of 17.03.2023 apply. The conservation objective is to protect: 1) the coastal landscape and marine nature of the Western Estonian archipelago, including natural and semi-natural communities, protected species, bird nesting, moulting, wintering, feeding and staging areas and cultural heritage, including folk culture, heritage landscapes, farm architecture and settlement structure, ensuring their preservation, restoration, research and demonstration; 2) habitat types listed in Annex I to Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (OJ L 206, 22.07.1992, p. 7–50). These are sandbanks which are slightly covered by sea water all the time (1110)[3], mudflats and sandflats not covered by seawater at low tide (1140), coastal lagoons (1150*), large shallow 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), salicornia and other annuals colonizing mud and sand (1310), Boreal Baltic islets and small islands (1620), Boreal Baltic coastal meadows (1630*), Boreal Baltic sandy beaches with perennial vegetation (1640), embryonic shifting dunes (2110), shifting dunes along the shoreline with Ammophila arenaria ('white dunes') (2120), fixed coastal dunes with herbaceous vegetation ('grey dunes') (2130*), wooded dunes of the Atlantic, Continental and Boreal region (2180), humid dune slacks (2190), hard oligo-mesotrophic waters with benthic vegetation of *Chara spp.* (3140), water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (3260), *Juniperus communis* formations (5130), mountain *Cytisus purgans* formations (6210*), Fennoscandian lowland species-rich dry to mesic grasslands (6270*), Nordic alvar and precambrian calcareous flatrocks (6280*), Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) (6410), Hydrophilous tall herb fringe communities of plains (6430), Northern boreal alluvial meadows (6450), Fennoscandian wooded meadows (6530*), transition mires and quaking bogs (7140), Fennoscandian mineral-rich springs and springfens (7160), Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae (7210*), petrifying springs with tufa formation (*Cratoneurion*) (7220*), Alkaline fens (7230), limestone pavements (8240*), Western Taïga (9010*), fennoscandian hemiboreal natural old broad-leaved deciduous forests (*Quercus, Tilia, Acer, Fraxinus* or *Ulmus*) rich in epiphytes (9020*), Fennoscandian wooded pastures (9070), Fennoscandian deciduous swamp woods (9080*), Tilio-Acerion

Protected natural object	*Description of the area*
	forests of slopes, screes and ravines (9180*); 3) protected species listed in Annex II of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, and their habitats. These species are *Cypripedium calceolus*, *Halichoerus grypus*, *Liparis loeselii, Rhinanthus rumelicus*ssubsp.*osiliensis* and*Sisymbrium supinum*; 4) fish species listed in Annex II of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, and their habitats. This species is *Lampetra fluviatilis*; 5) protected animal species and their habitats. These species are *Bufo calamita* and *Hirudo medicinalis*; 6) protected plant species and their habitats. These species are *Anacamptis pyramidalis, Artemisia maritima, Asplenium trichomanes, Asplenium ruta-muraria, Berula erecta, Bromus benekenii, Buxbaumia viridis, Carex extensa, Cephalanthera longifolia, Cephalanthera rubra, Cochlearia danica, Corallorhiza trifida, Corydalis intermedia, Dactylorhiza baltica, Dactylorhiza incarnata subsp. cruenta, Dactylorhiza osiliensis, Dactylorhiza russowii, Draba muralis, Elymus farctus, Eryngium maritimum, Exsertotheca crispa, Festuca altissima, Geranium lucidum, Hedera helix, Herminium monorchis, Hydrocotyle vulgaris, Hypericum montanum, Listera cordata, Littorella uniflora, Malaxis monophyllos, Ophrys insectifera, Orchis mascula, Orchis morio, Orchis ustulata, Polystichum aculeatum, Prunus spinosa, Sagina maritima, Salix repens, Samolus valerandi, Schoenus nigricans, Spergularia media, Suaeda maritima, Taxus baccata, Trifolium campestre, Viola pumila*. 7) protected lichen species and their habitats. These species are *Chaenotheca gracilenta, Sclerophora peronella, Squamarina lentigera;* 8) protected mushroom species and their habitats. These species are *Bankera violascens* and *Sparassis crispa*; 9) the protected bird species listed in Annex I to Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (OJ L 20, 26.1.2010, p. 7–25) and their habitats. The species are: tawny pipit (*Anthus campestris*), barnacle goose (*Branta leucopsis*), Eurasian eagle-owl (*Bubo bubo*), southern dunlin (*Calidris alpina schinzii*), corncrake (*Crex crex*), tundra swan (*Cygnus columbianus*), whooper swan (*Cygnus cygnus*), Eurasian crane (*Grus grus*), white-tailed eagle (*Haliaeetus albicilla*), Caspian tern (*Hydroprogne caspia*), red-backed shrike (*Lanius collurio*), little gull (*Larus minutus*), woodlark (*Lullula arborea*), smew (*Mergus albellus*), steller's eider (*Polysticta stelleri*), spotted crake (*Porzana porzana*), pied avocet (*Recurvirostra avosetta*), little tern (*Sterna albifrons*), common tern (*Sterna hirundo*), Arctic tern (*Sterna paradisaea*), sandwich tern (*Sterna sandvicensis*), red-breasted flycatcher (*Ficedula parva*) and barred warbler (*Sylvia nisoria*); 10) protected bird species and their habitats. The species are: razorbill (*Alca torda*), rock pipit (*Anthus petrosus*), ruddy turnstone (*Arenaria interpres*), greater scaup (*Aythya marila*), purple sandpiper (*Calidris maritima*), common ringed plover (*Charadrius hiaticula*), black guillemot (*Cheppus grylle*), lesser black-backed gull (*Larus fuscus*), black-tailed godwit (*Limosa limosa*), velvet scoter (*Melanitta fusca*), common shelduck (*Tadorna tadorna*) and common redshank (*Tringa totanus*); 11) bird species and their habitats. These species are: mallard (*Anas platyrhynchos*), greylag goose (*Anser anser*), tufted duck (*Aythya fuligula*), common goldeneye (*Bucephala clangula*), long-tailed duck (*Clangula hyemalis*), mute swan (*Cygnus olor*), Eurasian oystercatcher (*Haematopus ostralegus*), goosander (*Mergus merganser*), red-breasted merganser (*Mergus serrator*) and common eider (*Somateria mollissima*); 12) the protected natural monument, the Kuralase Oak. The area is also part of HELCOM Baltic Sea Protected Areas network as HELCOM area of Vilsandi (registry code RAH0000002, international code 91).
Sääre nature conservation area (KLO1000662)	It was placed under protection by the Government of the Republic Regulation No 18 'Establishment of the Sääre nature conservation area and protection rules' of 1 March

Protected natural object	*Description of the area*
	2018. The area of the protected area is 551.4 ha, of which 12.7 ha are land and 538.7 ha are water. The conservation objective of the protected area is to protect: 1) the diversity of the biota of marine and coastal communities, nesting, migrating and wintering waterfowl, and protected species and their habitats; 2) habitat types listed in Annex I to Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (OJ L 206, 22.07.1992, p. 7-50–50). These are reefs (1170), annual vegetation of drift lines (1210), Boreal Baltic islets and small islands (1620) and Boreal Baltic coastal meadows (1630*); 3) species listed in Annex I to Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (OJ L 20, 26.01.2010, p. 7–25). These species are: the common tern (*Sterna hirundo*), Arctic tern (*Sterna paradisaea*), Caspian tern (*Sterna caspia*), sandwich tern (*Sterna sandvicensis*), little tern (*Sterna albifrons*) and smew (*Mergus albellus*); 4) the protected bird species the lesser black-backed gull (*Larus fuscus*) and its habitats; 5) the bird species the common eider (*Somateria mollissima*) and its habitats; 6) the protected animal species listed in Annex II to Council Directive 92/43/EEC and its habitats. This species is the grey seal (*Halichoerus grypus*); 7) the protected plant species the musk orchid (*Herminium monorchis*) and its habitats.
Vesitükimaa limited-conservation area (KLO2000343)	It was placed under protection by the Government of the Republic with Regulation No. 156 of 18 May 2007, amending Regulation No. 176 of 27 July 2006, 'Protection of limited-conservation area in Saare County'. The area of the limited-conservation area is 213.5 hectares, of which 205.4 ha are land and 8.1 ha are water. The conservation objective of the limited-conservation area is the protection of habitat types specified in Annex I to Council Directive 92/43/EEC: Boreal Baltic coastal meadows (1630*), Molinion caeruleae (6410), Fennoscandian deciduous swamp woods (9080*) and the bird species specified in Annex I to Council Directive 79/409/EEC and the habitats of migratory bird species not listed in Annex I. The species of birds whose habitats are protected are: common eider (*Somateria mollissima*), southern dunlin (*Calidris alpina schinzii*), lesser black-backed gull (*Larus fuscus*), Arctic tern (*Sterna paradisaea*), little tern (*Sterna albifrons*) and the barred warbler (*Sylvia nisoria*).
Jaandi limited-conservation area (KLO2000305)	It was placed under protection by the Government of the Republic with Regulation No. 156 of 18 May 2007, amending Regulation No. 176 of 27 July 2006, 'Protection of limited-conservation area in Saare County'. The area of the limited-conservation area is 14.5 ha, of which 13.6 ha are land and 1.9 ha are water. The conservation objective of the limited-conservation area is to protect the habitat types specified in Annex I to Council Directive 92/43/EEC: semi-natural dry grasslands and scrubland facies on calcareous substrates (6210*), Fennoscandian lowland species-rich dry to mesic grasslands (6270*), Nordic alvar (6280*), Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) (6510), Calcareous fens with *Cladium mariscus* (7210*), Alkaline fens (7230) and Fennoscandian wooded pastures (9070); and the bird species that belong to the protected category II: whooper swan (*Cygnus cygnus*); and the habitats of bird species that belong to the protected category III: red-necked grebei (*Podiceps grisegena*), western marsh-harrier (Circus aeruginosus), common moorhen (*Gallinula chloropus*) and the Eurasian crane (*Grus grus*).
Ohessaare landscape protection area (KLO1000552)	It was placed under protection by the Government of the Republic Regulation No 78 of 14 March 1996. The area of the protection area is 8.3 ha, of which 8,1 ha are land and 0.2 ha are water. The objective of the Ohessaare landscape protection area is to protect: 1) the outcrops and coastal communities of the bedrock of the Ohessaare Bank and protected species, as well as the preservation of landscape and semi-natural communities; 2) habitat types listed in Annex I to Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (OJ L 206, 22.07.1992, p. 7–50):vegetated sea cliffs of the Atlantic and Baltic Coasts (1230)3 and alvars (6280*);

Protected natural object	*Description of the area*
	3) the protected plant species hop trefoil (*Trifolium campestre*) and its habitats.
Kaunispe limited-conservation area (KLO2000314)	It was placed under protection by the Government of the Republic with Regulation No. 156 of 18 May 2007, amending Regulation No. 176 of 27 July 2006, 'Protection of limited-conservation area in Saare County'. The area of the limited-conservation area is 126.4 ha, of which 124.5 ha are land and 1.9 ha are water. The conservation objective of the limited-conservation area is the protection of habitat types specified in Annex I to Council Directive 92/43/EEC: coastal lagoons (1150*), Boreal Baltic coastal meadows (1630*), *Juniperus communis* formations (5130), semi-natural dry grasslands and scrubland facies on calcareous substrates (6210), Nordic alvar (6280*), Molinion caeruleae (6410), Fennoscandian wooded meadows (6530*) ja Calcareous fens with *Cladium mariscus* (7210*).
Lindmetsa landscape protection area (KLO1000571)	It was placed under protection by the Government of the Republic Regulation No 96 of 30 March 2007. The area of the protection area is 51.1 ha, of which 50,1 ha are land and 1 ha is water. The conservation objective is to protect: 1) one of the few wooded dune areas in Saaremaa; 2) habitat types listed in Annex I to Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. These habitat types are: Boreal Baltic coastal meadows (*1630), wooded dunes of the Atlantic, Continental and Boreal region (2180), Alkaline fens (7230), *Juniperus communis* formations on heaths or calcareous grasslands (5130), Western Taïga (9010*) and Fennoscandian wooded pastures (9070); 3) category III protected plant species, *Epipactis helleborine*, *Epipactis palustris a*nd *Gymnadenia conopsea*, and category III species of haplolepideous mosses, *Leucobryum glaucum,* and their habitats.
Lindmetsa limited-conservation area (KLO2000321)	It was placed under protection by the Government of the Republic with Regulation No. 156 of 18 May 2007, amending Regulation No. 176 of 27 July 2006, 'Protection of limited-conservation area in Saare County'. The area of the limited-conservation area is 33.8 ha, of which 33.5 ha are land and 0.3 ha are water. The conservation objective of the limited-conservation area is the protection of habitat types specified in Annex I to Council Directive 92/43/EEC: Boreal Baltic coastal meadows (1630*), wooded dunes of the Atlantic, Continental and Boreal region (2180), *Juniperus communis* formations (5130), Fennoscandian wooded meadows (6530*), alkaline fens (7230), Western Taïga (9010*) and Fennoscandian herb-rich forests with *Picea abies* (9050).
Extension of the offshore part of Vilsandi National Park	Designed protected area. Offshore staging area for the steller's eider *(Polysticta stelleri)*, long-tailed duck *(Clangula hyemalis)* and common eider *(Somateria mollissima)*[75].
Kolgi madaliku nature conservation area	Designed protected area. the objective for placing the natural object under protection[76]; Protect the following EU Habitats Directive habitat types: 1170 'Reefs' – to ensure the distribution of the habitat type and a favourable conservation status in the Estonian exclusive economic zone. Protection of the spawning and feeding areas of fish. Protection of an Important Bird Area.
Irbe madaliku nature conservation area	Designed protected area. the objective for placing the natural object under protection[77]; Protect the following EU Habitats Directive habitat types: 1170 'Reefs' – to ensure the distribution of the habitat type and a favourable conservation status in the Estonian exclusive economic zone.

75Renewal of Marine Important Bird Areas Estonian Ornithological Society, 2022

76 Ministry of the Environment Letter No 16-3/22/3326 of 18.07.2022

77 Ministry of the Environment Letter No 16-3/22/3326 of 18.07.2022

Protected natural object	*Description of the area*
	Protection of the spawning and feeding areas of fish. Protection of the habitat of the European bullhead (*Cottus gobio*). Protection of an Important Bird Area.

The Natura 2000 areas are covered in more detail in chapter 6 of the EIA programme, Natura preliminary assessment.

4.2. Social and economic environment

4.2.1. Settlement and employment

The proposed activity is entirely located in the marine area, with the nearest settlement on Saaremaa. According to the Population Register, as of 01.01.2024, there were 32,129 inhabitants in Saaremaa municipality, of which 12,632, or nearly 40%, live in Kuressaare. The average population density in the municipality is 11.1 inhabitants per km², but in sparsely populated areas, it is usually even lower – below 4 inhabitants per km² (see Figure 4-11).

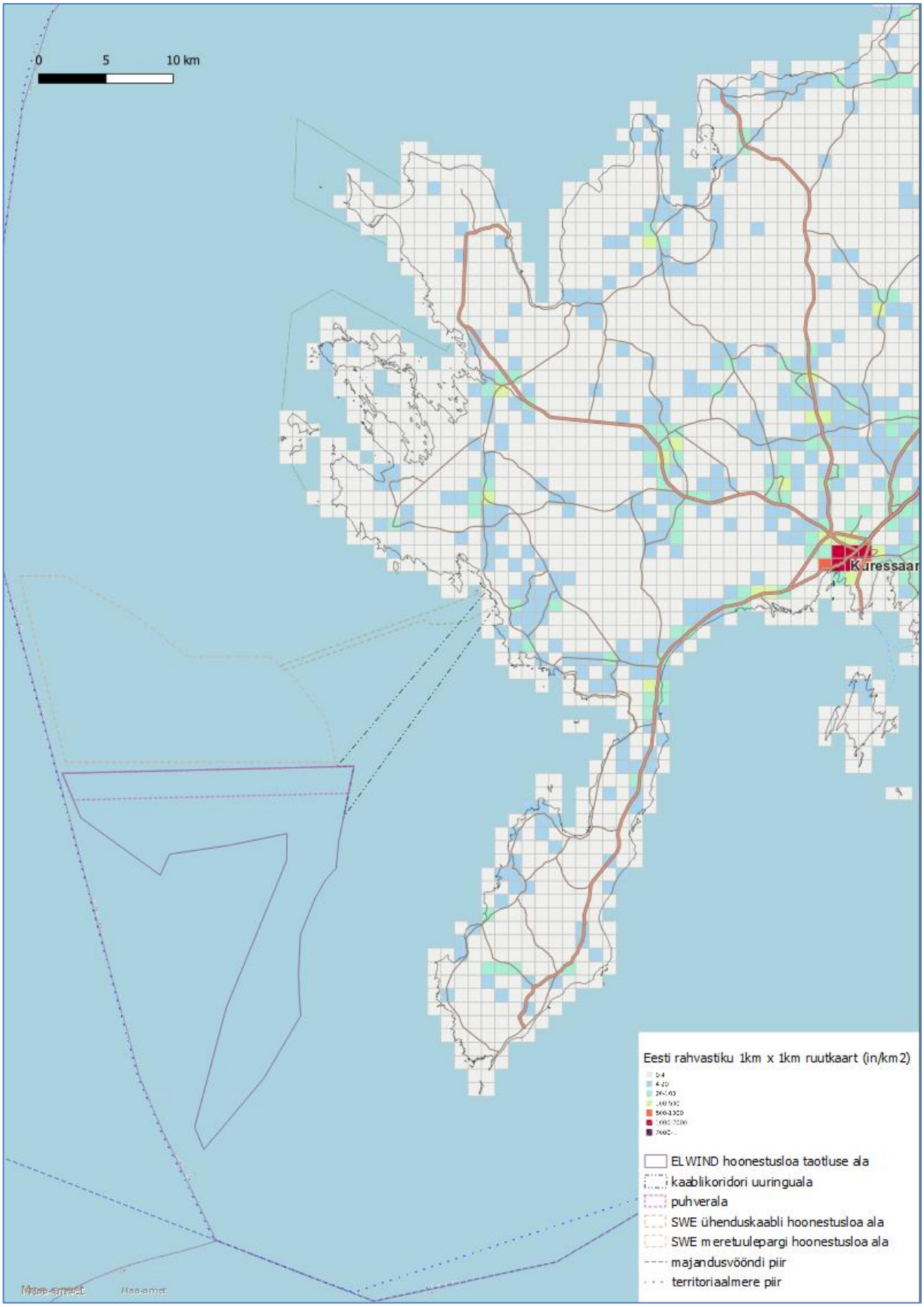

Figure 4-11. *Population density in the western part of Saaremaa municipality*

The trend of population change is negative. This is due to both negative migration balances and rate of natural increase (Figure 4-12).

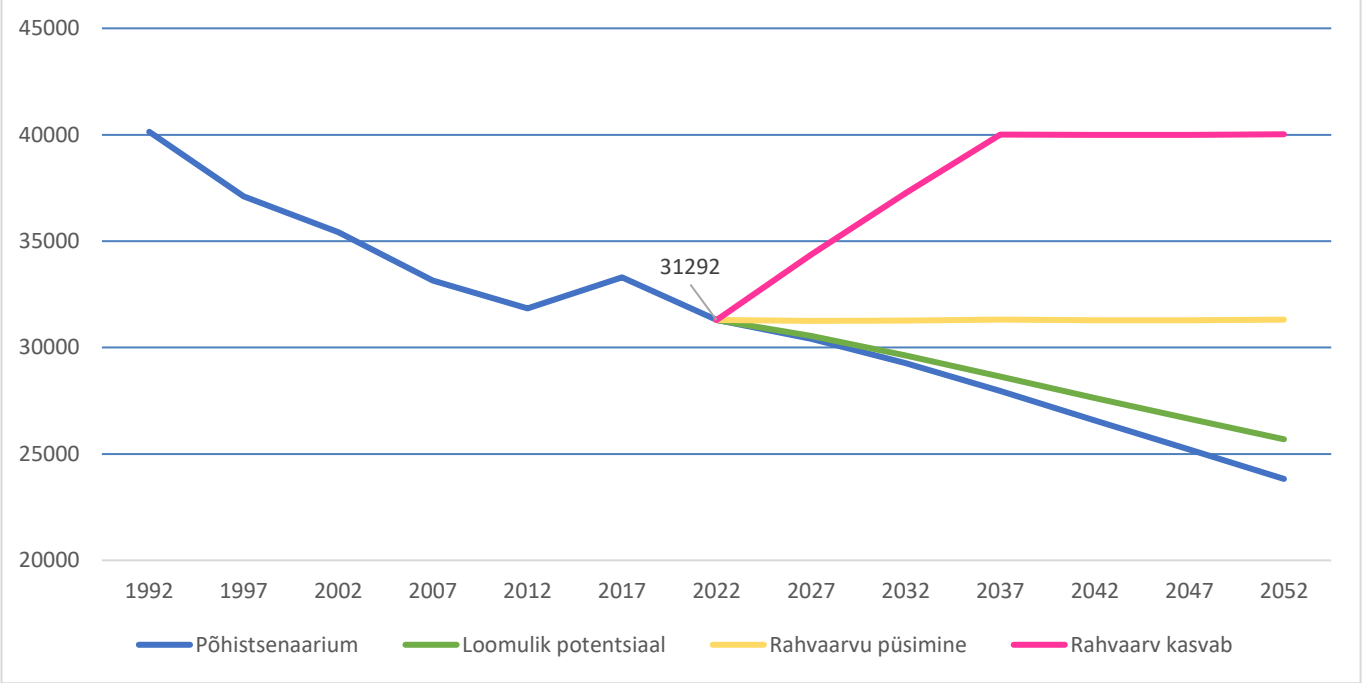

Figure 4-12. *Saaremaa population 1992–2022 and population forecast 2023–2052. Author: A. Tammur*[78]

In 2023, according to Statistics Estonia, 69.3% of the working-age population (ages 15-74) in Saare County were employed (compared to the Estonian average of 69.2%). The average monthly gross income of an employee in the fourth quarter of 2023 was €1,449 euros, even lower only in Valga County (while the average in Estonia was €1,904 and €2,121 in Harju County).

In terms of the number of employees, labour taxes and exports, the most important sector in Saaremaa Parish is manufacturing industries (see Table 4-4). Approximately a quarter of employees are engaged in manufacturing industries, followed by the public sector with about 20%.

Table 4-4. *Entrepreneurship and employment indicators in Saaremaa Rural Municipality in March 2024 according to the Estonian Tax and Customs Board*[79]

Field of activity	*Number of active enterprises*	*Number of enterprises with employees*	*Export (in euros)*	*Number of employees:*	*Declared labour taxes (in euros)*
Manufacturing	211	158	1,362,827	2,498	1,820,923
Public administration and defence compulsory social security			0	1640	1,346,584

78 *Population of and population forecast for Saaremaa 2022–2052. Prepared by Tammur, A. 2022*
https://www.saaremaavald.ee/documents/17113760/31485073/Saaremaa+rahvastik+ja+rahvastikuprognoos+2022%E2%80%932052.pdf/3ee0b626-de77-465d-ba78-8a1ecc676496

79 *https://www.emta.ee/eraklient/amet-uudised-ja-kontakt/uudised-pressiinfo-statistika/statistika-ja-avaandmed#ettevotluse-statistika-uldinfo*

Field of activity	*Number of active enterprises*	*Number of enterprises with employees*	*Export (in euros)*	*Number of employees:*	*Declared labour taxes (in euros)*
Wholesale and retail trade, repair of motor vehicles and motorcycles	290	188	177,334	1134	720,517
Construction	292	227	1939	774	437,998
Human health and social work activities	30	29	0	744	742,759
Accommodation and food service activities	111	72	288	687	327,911
Transportation and storage	85	62	0	563	363,715
Agriculture, forestry and fishing	188	116	10,323	516	336,906
Professional, scientific and technical activities	217	132	0	247	172,050
Education	20	15	10	225	172,282
Other service activities	80	68	0	188	76,880
Arts, entertainment and recreation	43	30	4358	128	64,926
Real estate activities	121	44	0	112	65,554
Administrative and support service activities	96	53	0	105	41,010
Information and communication	85	53	0	104	78,941
Electricity, gas, steam and air conditioning supply	22	8	0	49	41521
Water supply; sewerage, waste management and remediation activities	5	3	0	43	33,346
Mining and quarrying	5	3	0	18	9406
Financial and insurance activities	5	3	0	5	7202
total	1695	1106	1,557,079	9780	6,860,431

4.2.2. Local benefits

Under the Environmental Charges Act[80] a charge for compensation for environmental nuisance caused by a wind farm, ie a charge for the production of electricity from wind energy, is paid.

[80] *Environmental Charges Act, RT I, 09.08.2022, 1*

The charge for the production of electricity from wind energy of an offshore wind farm must be transferred to the local authority located in impact area of the offshore wind farm. The impact area of the offshore wind farm is Estonian local authority, which extends up to 20 kilometres from the centre of the tower of the wind turbine in the sea. In the case of the ELWIND wind farm, the only such local authority is Saaremaa Rural Municipality.

The charge rate for production of electricity from wind energy is 0.5 per cent of the multiple of the following two figures: 1) the amount of electricity produced by the wind power plant per quarter in megawatt-hours, but not less than 70 per cent of the rated capacity of the wind power plant multiplied by 1000; 2) the arithmetic mean power exchange price of the day-ahead market in the Estonian price area for the corresponding quarter.

Upon making the calculation on the basis of the Environmental Charges Act, the charge received by Saaremaa Rural Municipality for the production of electricity from wind energy would be, for example, in the case of an offshore wind farm with a capacity of 1,000 MW, which produces approximately 1 TWh of electricity per quarter at an average exchange price of 100 €/MWh, approximately 535,000 euros per quarter, or about 2 million euros per year. In addition to the charge paid to the local government for the production of electricity from wind energy, the operator of the offshore wind farm pays a superficies charge to the state budget.

In addition to the legal obligation to pay the charge, in the case of the ELWIND wind farm, it is possible to impose other obligations on the future developer in the terms and conditions of the auction of superficies rights to alleviate disturbances for local residents.

4.2.3. Fisheries

Fishing, which has historically been an important source of livelihood for coastal residents, occurs throughout Estonian marine areas, except in zones where fishing restrictions apply. Fishing in the Baltic Sea can be divided into trawling and coastal fishing. Coastal fishing at sea generally takes place within 12 nautical miles or up to the 20-meter isobath, and the fishing is serviced by local fishing ports and landing sites. According to the Republic of Estonia Government Regulation No. 65 Fishing Rules of 16.06.2016, trawling is only permitted in marine areas that are deeper than 20 metres.

Since the ELWIND offshore wind farm area is predominantly located in an area with depths of more than 20 m, there is no coastal fishing (Figure 4-13). The data from the Automatic Identification System (AIS) of ships indicates possible trawling in the southernmost part of the wind farm area and in the area west of the wind farm (Figure 4-13). The area of the wind farm is in fishing square 28-2, which covers the entire open part of the Baltic Sea west of Saaremaa up to the border of the exclusive economic zone. Compared to other trawling areas in the Estonian marine area, fishing in the fishing square 28-2 is modest, being almost three times smaller than in the Gulf of Riga (Table 4-5).

Table 4-5. *Commercial fishing under a fishing authorisation of fishing vessel (with trawlers) in the Baltic Sea in 2023*[81]

Fish species	*28-1 Gulf of Riga*	*28-2 Central Baltic Sea*	*29 Central Baltic Sea*	*32 Gulf of Finland*	*Tons in total*
European eelpout	12.098	-	-	-	12.098
European sprat	354.698	3,301.898	7,198.762	14,509.136	25,364.494
European smelt	51.303	-	-	-	51.303
Baltic herring	12,417.183	755.953	2,214.146	4,651.311	20,038.593
Fourhorn sculpin	13.235	-	-	-	13.235
Three-spined stickleback	4.404	-	-	0.276	4.680
Shorthorn sculpin	3.269	-	-	-	3.269
Summary	12,856.190	4,057.851	9,412.908	19,160.723	45,487.672

[81] https://pta.agri.ee/ettevotjale-tootjale-ja-turustajale/kutseline-kalapuuk/puugistatistika#item-7

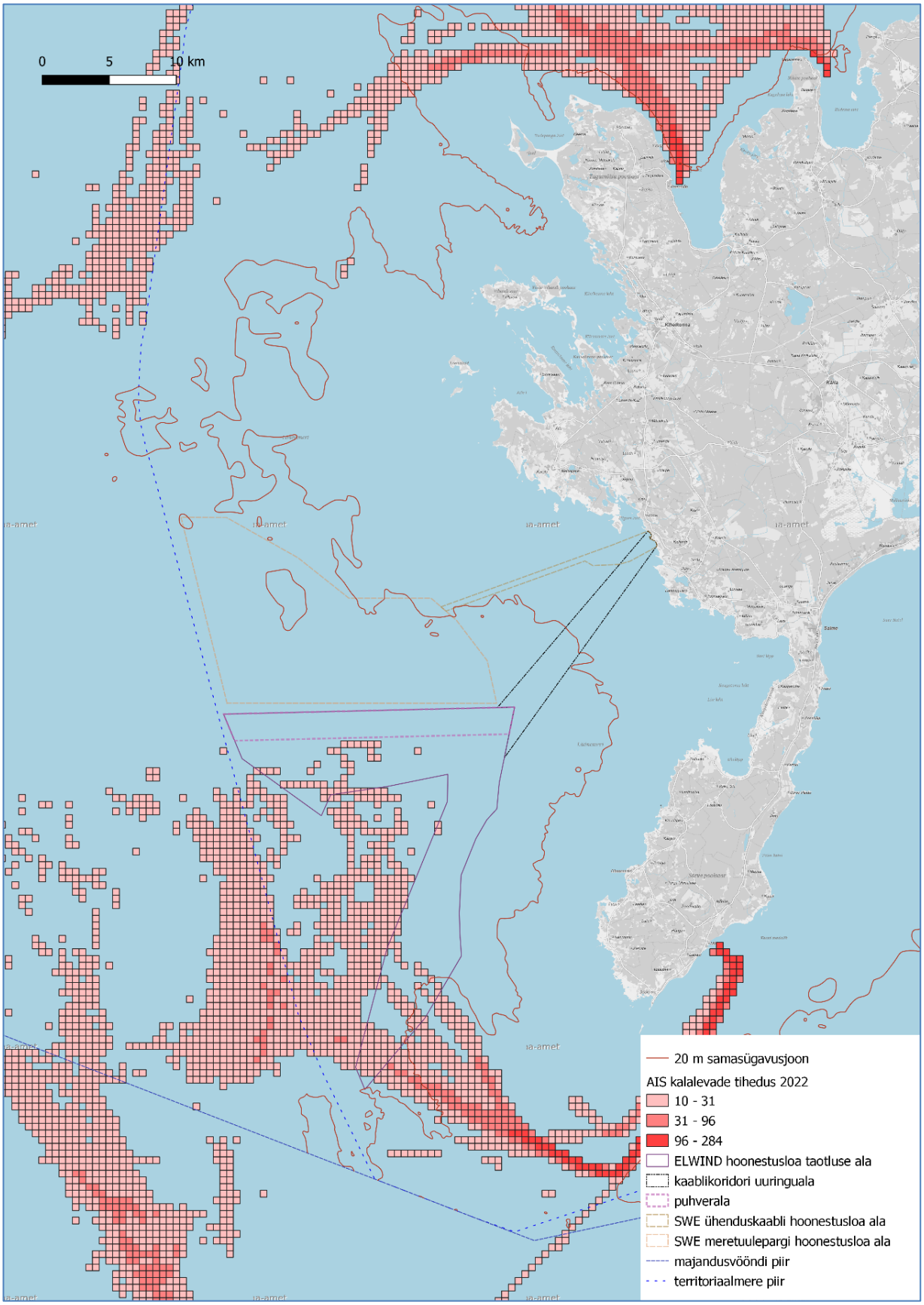

Figure 4-13. *Frequency of fishing vessels in 2022 according to AIS (number of fishing vessels that have passed 0.5 x 0.5 km square during the year)*

4.2.4. Water traffic

The vast majority of the area proposed for the offshore wind farm is not of significant importance for water traffic, but a shipping corridor passes through the southernmost spot of the area (Figure 4-14). These are mainly cargo ships sailing from the ports of the Gulf of Riga (Riga, Pärnu, etc) to the international shipping lane, and vice versa. The traffic of pleasure boats (yachts) in the marine area west of Saaremaa is known to be modest, probably due to the lack of suitable ports of refuge.

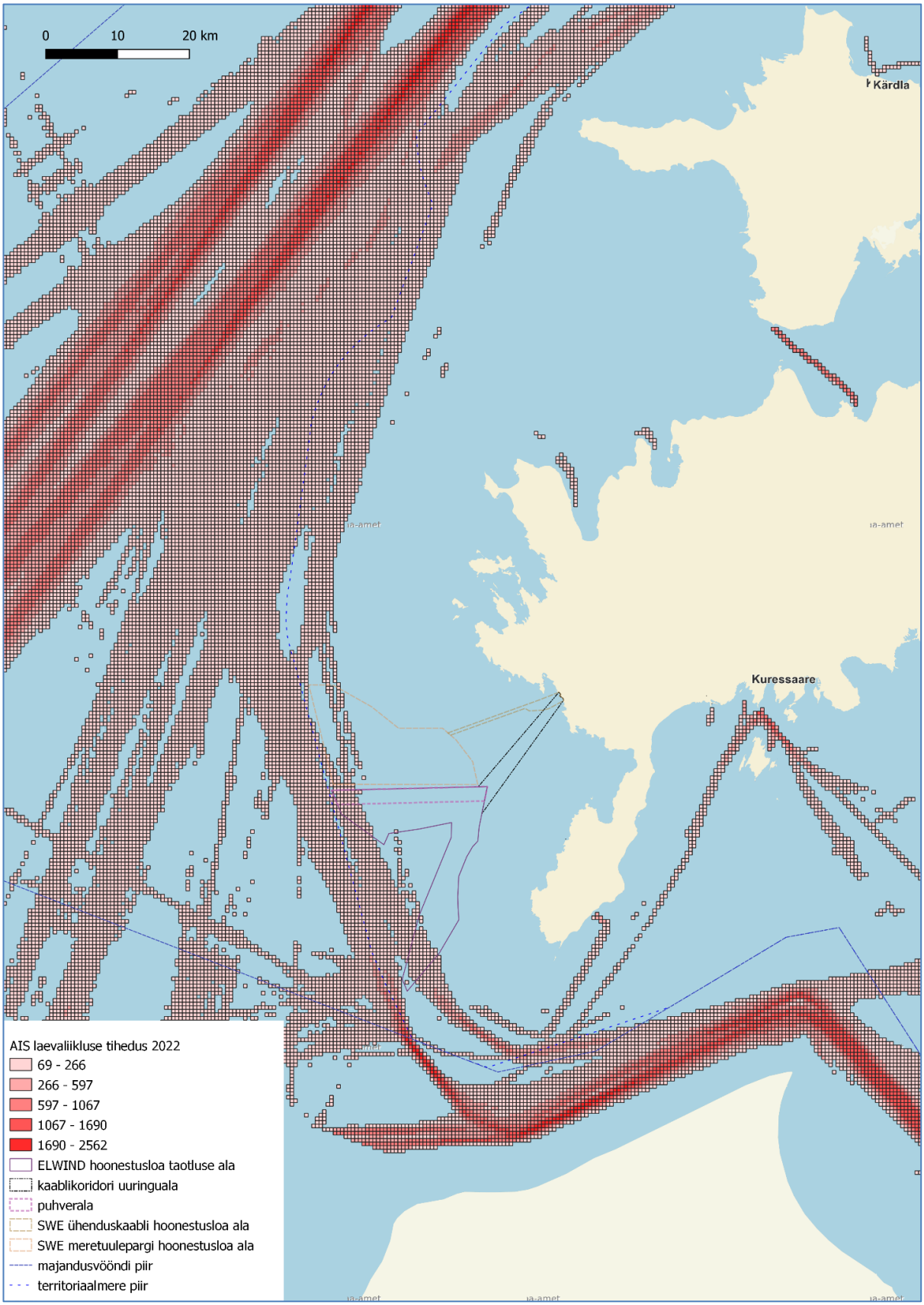

Figure 4-14. *Frequency of shipping in the area of the proposed wind farm and in the Baltic Sea, according to the AIS, in 2022 (the number of ships that passed 0.5 x 0.5 km square during the year)*

4.3. Underwater cultural heritage

The Estonian marine area contains shipwrecks registered as cultural monuments, as well as ones that lack cultural monument status. At the same time, all of the objects have a significant role in Estonian maritime cultural heritage. The Hydrographic Information System (HIS of the Estonian Transport Administration[82] shows no wreckage has been identified directly in the offshore wind farm area. The nearest wrecks are Nameless 78, Nameless-151, Nameless-606, and Nameless-603 (Fig. 4-15). None of the wrecks are cultural monuments and HIS does not provide more detailed information about their type, construction time, etc.

No underwater obstacles have also been identified in the area of the proposed offshore wind farm. The nearest obstacle is approximately 1,100 m from the southern boundary of the area at a depth of 38 m.

[82] *https://his.vta.ee:8443/HIS/Avalik?REQUEST=Main&WIDTH=1280&HEIGHT=551, külastatud 09.05.24*

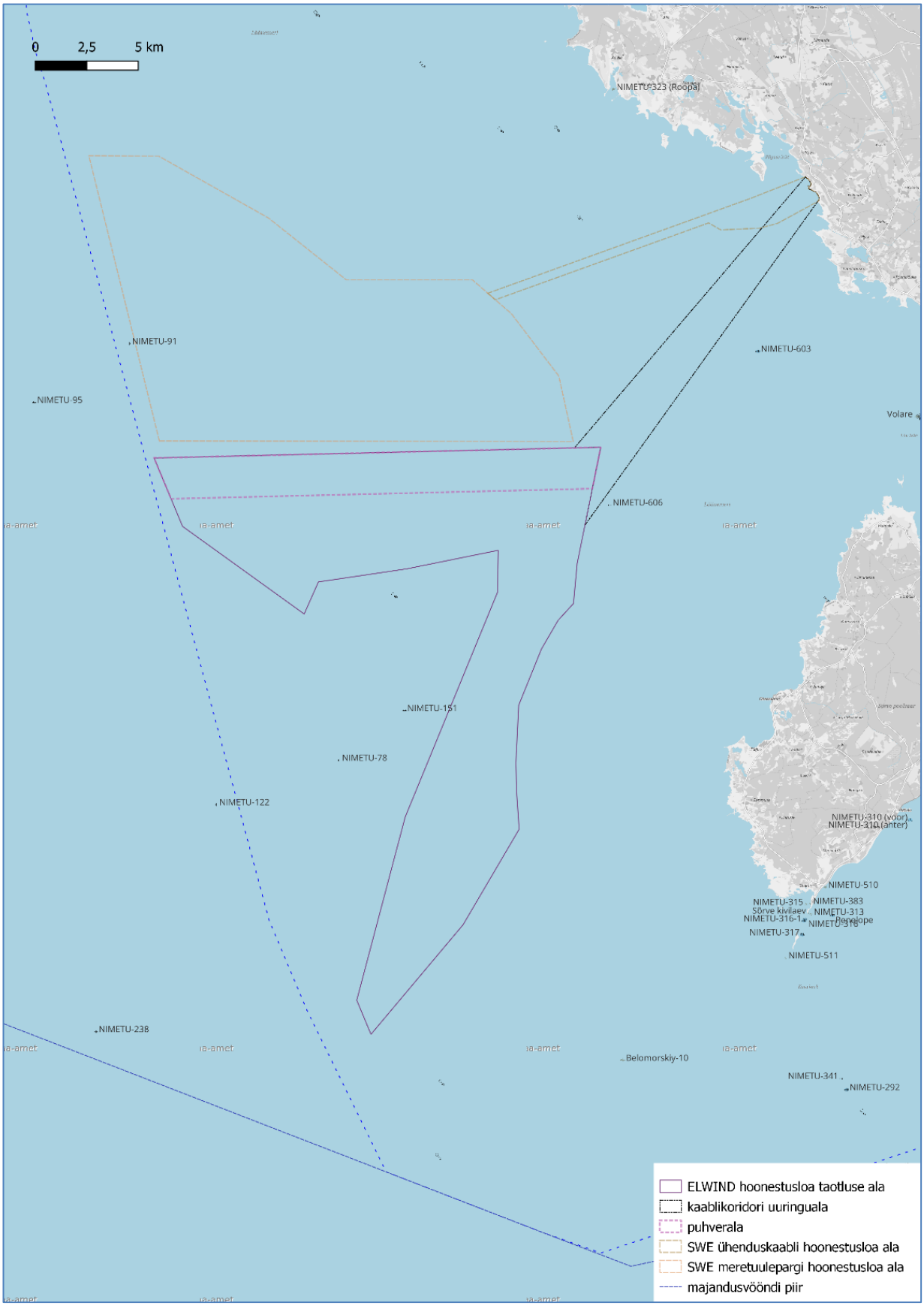

Figure 4-15. *Wrecks and obstacles identified in the area of the proposed offshore wind farm* (*Basemap Hydrographic database of the Estonian Transport Administration)*

5. Significant environmental impact expected to result from the proposed activity

5.1. Assessment methodology

In assessing environmental impact and preparing the report, the expert group proceeds from the Environmental Impact Assessment and Environmental Management System Act currently in force and its implementing acts and follows good practices for environmental impact assessment[83]. Valid environmental legal acts and the restrictions provided for therein are taken into consideration in carrying out the EIA.

The environmental impact assessment process has two phases: Preparation of the EIA programme; and carrying out the EIA and preparation of the report. The stages of the process arising from the Environmental Impact Assessment and Environmental Management System Act are set forth in Chapter 7.

The **EIA programme** (this document) is part of the planning stage, outlining the approach for conducting the environmental impact assessment, including a description of the proposed activity area, identification of anticipated significant impact areas, the schedule for the assessment, and the communication plan with the parties involved in the impact assessment process.

The EIA report is the final document that summarizes the whole process. The report is prepared taking into account the requirements of the Environmental Impact Assessment and Environmental Management System Act and the decision to initiate the EIA, as well as the environmental issues related to the documents concerning the offshore wind farm as a complete site (ie permits required for onshore civil engineering works / buildings, etc).

The purpose of the EIA is to assess and describe significant environmental impacts expected to result from the implementation of the proposed activity, analyse possibilities for avoiding and/or alleviating its impact and make a proposal for the selection of a more suitable alternative (including for size of area, volume and technological aspects). The alternatives covered are described in the EIA report. Environmental impact means potential, direct or indirect effect of a proposed activity on the environment, human health and well-being, cultural heritage or property.

Table 5-1 below presents the environmental elements impacted by the implementation of the proposed offshore wind farm and its related infrastructure, the sources of impact, the anticipated significant effects (with adjustments to the sizes of impact areas if necessary), and the methods used to predict these impacts, including the need for studies/expert assessments and their methodologies for impact assessment. The anticipated environmental impact is assessed in relation to the construction and operation of the offshore wind farm and submarine cable, while

83 Good practices for environmental impact assessment personnel. Estonian Environmental Impact Assessment Association (www.iaea.eu). Annex 1.

also evaluating the impact of turbine removal as a preliminary assessment, as far as current information allows.

The principle for impact assessment is that changes in the environment resulting from carrying out the proposed activities must be assessed. To do this, it is important to know the consequences (aspects) related to the activity that may lead to changes in environmental elements. The spatial extent of the environmental impact is additionally assessed in the area surrounding the proposed activity area – in so doing, it is assessed in regard to various impacts in differing spatial extent where a specific impact can be considered significant. Where possible and appropriate, this environmental impact assessment is also carried out with appropriate precision for the activities planned on land. For example, if possible, the impacts of the location and construction of the submarine cable at sea-land transition sites and its immediate vicinity will be assessed in order to determine for the developer the perspective of the network connection's functionality and fundamental locations of land-based activities. In this way, duplication of the same procedures, which is essentially unnecessary and unnecessarily burdensome for administrative organisation, is avoided.

The expected impact area comprises the wind farm development area and the submarine cable route area, ie the direct area of the proposed activity and its immediate surroundings. The size of the impact area depends on the specific impact factor (eg noise, disturbances during construction, visual impact, etc). The impact area also varies depending on the natural environment component affected (aquatic environment, seabed habitats, marine biota, etc).

Both a quantitative and qualitative (comparative) analytical method are used to assess environmental impact, according to which activities and alleviatory measures are analysed by each of the various environmental elements (e.g. conformity to a specific standard). If no goals or indicators exist for environmental elements, subjective experience-based (EIA expert group members' opinions and expert assessments) and objective assessments (results of studies etc) will be used.

The EIA methodology consists of comparing the forecasted environmental impacts (including alternative solutions) caused by proposed activity, with the limits established in legal acts and giving recommendations for implementing the optimum/best option. In the preparation of the EIA report, data sources are used, among other things, from the Map application of the Land Board and EELIS (Estonian Nature Information System – Environmental Register, Environmental Agency) data, specialized and scientific literature, previously collected research data, analogies, strategic documents and legal acts of the Republic of Estonia and other available (relevant) information that allows to ensure adequacy of conclusions. Consultation takes place with various relevant institutions, organizations and persons.

Additional studies and modelling will be performed in the course of the superficies licence and EIA, and expert opinions described in Table 5-1 will be prepared. Carrying out studies/expert assessments and dealing with the topics that arise can also take place in the context of other projects or activities (such as merger with other development projects, national study and monitoring etc.) and as an integrated part of the EIA (i.e., not as a standalone study). In carrying out various studies, cooperation between scientists and research groups takes place for creating interdisciplinary value added and achieving higher-quality research results.

As part of the EIA, a Natura assessment will be conducted, and this EIA will primarily rely on the guidance provided in Guidelines for carrying out *Natura assessment upon implementation of Article 6 (3) of the Habitats Directive in Estonia*[84]. Chapter 6 describes in more detail the process of Natura assessment and the methodology used.

The environmental impact assessment is a public process. All parties who feel that their interests may be impacted by the proposed activity can intervene in the EIA process and present reasoned recommendations, proposals and comments. At minimum, interested parties can participate in the public release of the EIA programme, the assessment process and the publication of the report. The decision-maker, developer and environmental impact assessment staff can be contacted with proposals, objections and questions.

5.2. Environmental elements impacted and studies conducted

The methods used to predict the impacts on each area of impact and all environmental elements (which may be affected by the proposed activity through impact sources) are described in Table 5-1.

The Consumer Protection and Technical Regulatory Authority's decision to initiate superficies licence proceedings and EIA (see Annex 1) provides for a number of studies and/or expert assessments. In this EIA programme, the list of studies stipulated in the decision to initiate has been fully considered, supplemented, and refined with the methodology and scope of studies and expert assessments to the extent known at the time of preparing this EIA programme.

Table 5-1. *The expected material impacts of the proposed activity, their forecasting and assessment methods and studies to be carried out*

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
1	**Impact on the natural environment**		
1.1.	Impact on the sea's hydrodynamics (including currents, waves).	The construction of the wind farm can impact the local wind, currents and wave regime, as well as the vertical mixing of water. This is expected to be an insignificant impact. The impacts are related to the offshore wind farm area and its immediate surroundings.	As the basis of the EIA assessment, **modelling of currents, waves and changes in wind conditions (including shadow-flicker) must be carried out.** The modelling is based on data from hydrometeorological surveys and models. Models of currents, waves and wind conditions are an input to other studies, such as the spread of suspended solids during construction

84 Kutsar, R.; Eschbaum, K. and Aunapuu, A. 2019. Instructions for carrying out Natura assessment in the implementation of Article 6(3) of the Habitats Directive in Estonia. Client: Estonian Environmental Boardhttps://www.envir.ee/sites/default/files/KKO/KMH/kemu_natura_hindamise_juhendi_uuendus_2020.pdf

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
			and the spread of oil spill in the event of an accident. The EIA report must assess the cumulative impact in conjunction with the SWE wind farm.
1.2.	Impact on seawater quality, including suspended solids	The impact of the offshore wind farm on seawater quality may primarily occur during the construction phase through the release of seabed sediments and suspended particles into the water column during the installation of turbine foundations and cables. The amount of suspended solids primarily depends on the composition of the seabed sediments, followed by the number, size, type, and installation technology of the foundations, as well as the length and installation technology of the submarine cables. The impact on seawater quality may also materialize upon release of nutrients and hazardous substances into the water column, if such compounds are present in the sediments in significant quantity. Seawater quality can also be impacted if a potential emergency situation occurs, which could lead to the risk of an oil spill. The risk of oil pollution exists during both the construction and operational phases of the wind farm. To prevent the occurrence of oil pollution, safety regulations must be followed during construction and maintenance work. The impacts relate to the area surrounding the offshore wind farm and the sea cables and its immediate surroundings.	Sea water quality in the wind energy development area No 2 as designated by the Estonian Maritime Spatial Plan has been studied previously by the Estonian Marine Institute as part of the 'Survey of seabed biota and habitats to assess the distribution of Natura and HELCOM habitat types and to elucidate the CO2 sequestration potential of the sea' (Estonian Marine Institute, University of Tartu, 2020) and during the EIA of the SWE offshore wind farm. Based on the same methodology a **survey of the state of sea water in the ELWIND wind farm area must be carried out.** In the course of the survey, the following parameters are evaluated: water transparency, oxygen concentration, chlorophyll concentration, total nitrogen, total phosphorus, nitrates, nitrite, ammonium, phosphates, silicon, CTD profiles. **In the proposed area of ELWIND, seabed soil samples must be taken, sediment integration must be determined and chemical analyses carried out** to check the content of heavy metals, petroleum products and nutrients.

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
			Based on the surveys and analyses carried out, the impact of construction activities on the quality of sea water is assessed, including whether and how much hazardous pollutants or substances causing eutrophication may be released during construction work, and **modelling the distribution of sediments and suspended solids released during construction work (and the spread of possible oil spills)**, see also clause 5.3).
1.3	Impact on habitats and biota on the seabed	The impact of the offshore wind farm on seabed habitats and biota may primarily occur due to the turbine foundations and submarine cables. During the construction phase, the biotic communities and habitats located directly under and in the immediate vicinity of the turbine foundations will be destroyed. Construction activity will impact the communities on the seabed above all through suspended solids and changes in water transparency. As a measure that will reduce and alleviate the impact, the turbine foundations must be installed where possible in places where there is no or little (valuable) seabed biota and habitats. The wind turbine foundation will be placed on the seabed, and the existing natural seabed in the seabed and foundation area (and if necessary, material placed for protecting it) will be transformed into an anthropogenic one. The significance and extent of the impact primarily depend on the number, dimensions, and type of foundations (for example, a gravity foundation for a similar turbine has a much larger seabed footprint than a monopile foundation) as well as the composition of the seabed sediments.	In the area of the proposed wind farm and cable corridors **a study of seabed biota and habitats must be carried out,** with the aim to map the distribution of seabed biota (phytobenthos and zoobenthos) within the proposed area (area of the offshore wind farm and undersea cables) and the distribution of seabed habitats and biotopes in the area (Annex I habitat types to the Habitats Directive, MSFD broad habitat types, HELCOM HUB biotopes, HELCOM Red List biotopes). The objective of the study is to gather *in situ* information on the range of benthic species and communities and habitats in the project area and use that information to describe (model) range of species, habitats and biotopes in the proposed area. Based on the results of the study, it will be possible to assess the impact of the specific technology and location choices for the turbine foundations on seabed communities and, if necessary, propose measures to minimise potential negative impacts. In the proposed area, seabed baseline measurements must be conducted using acoustic remote sensing (eg, with a multibeam sonar),

No	Impact field (i.e., environmental elements impacted)	Expected significant impacts (including area, sources of the impact)	Impact forecasting and assessment methods and description of the necessary studies
		A method frequently used for installing submarine cables on soft seabed substrates is burying the cable in bottom sediments using special equipment that will help to avoid potential damage (economic impact) and which also alleviates the materialization of environmental impacts (reduced transmission of electromagnetic radiation and heat around the cable). When burying the underwater cables under the seabed, the seabed is disturbed during construction, but since after the construction activities the seabed will remain in a situation similar to the one it was before, the initial situation will be restored in a few years. It is also possible to use directional drilling of cables under the seabed (especially in the sea-land zone of cables) for laying cables in areas sensitive in terms of nature conservation. This means that before reaching an area sensitive in terms of nature conservation, the cable is brought down to the seabed, and in this way negative impacts on the seabed biota can be avoided. Establishing a wind farm involves placing an artificial substrate throughout the entire water column, which creates an opportunity for various communities of sessile species to arise. Colonization of the free artificial substrate depends on very many different local environmental factors and it is not possible to transpose experience from other marine areas for assessing the impact of the specific wind farm. To assess the environmental impact of establishing and operating the wind farm, it is necessary to know the local peculiarities of the "reef effect" and assess the importance of the wind farm in promoting the spread of non-native species.	collecting both depth data and backscatter data. These measurements should be combined with semi-quantitative (coverage estimates using video systems or diving) and quantitative (biomass estimates) point observations. The EIA report must assess the cumulative impact in conjunction with the SWE wind farm.

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
		The impact area can be confined primarily to the area of the wind farm and cable corridors.	
1.4	Seabed, seabed sediments Coastal processes	The impact of the wind farm may be manifested in the storm wave regime and dynamics of sediments through changes in the seabed structure. It is not expected to be a significant impact: since the nature of the relief of the seabed will not be modified in the course of the construction for establishing the wind farms (lowering/raising the relief), no significant changes are expected in the hydrodynamic regime that could impact the nature of waves on the surface in the near-coastal area. In the course of construction of the foundations and embedding the cables in the seabed, the sediments will be moved and resuspension will take place. Its impact will be felt in a limited area and for a short term. The estimated volumes of dredging (including dumping or placement of solid materials) depend on both the number of turbines and their foundations, dimensions and the length, location of the submarine cables and the technology selected for installing them. Establishing a wind farm >10 km from the coast will not impact the nature of coastal processes, their intensification or abatement. In the zone near the coast, the material is carried forward by waves, lifting it into the water column and also carrying it along the coastline. Modelling of the SWE wind farm showed that the wind farm reduces wave heights by 1 to 2%. Thus, a wind farm located far from the	**A general geological, geophysical and geotechnical seabed survey must be carried out in the proposed area** to clarify the state of the seabed (mineral composition of sediments, sediment deposit, bedrock characteristics, etc). The EIA process will assess the impact associated with different types of foundations and, if necessary, develop environmental measures (including monitoring). As a summary, an expert assessment will be prepared for the EIA report based on previous studies, scientific literature and other studies conducted during this EIA process.

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
		coast will not be able to impact coastal processes. Also, in the case of connection cables in shallow water close to the shore, natural processes (waves and storms) have a much greater sediment-displacement impact than the one-time and short-term laying of cables.	
1.5.	Impact on fish populations	During construction of the offshore wind farm, ship traffic in the area will increase and the installation of offshore wind farm foundations and sea cables in the water environment will take place. Depending on the nature of the seabed, type of foundation and installation technology, the installation of the foundation will involve noise emissions and introduction of seabed sediments into the water column (resulting in suspended solids). Disturbance of the seabed sediments and noise topics are also important when it comes to installation of submarine cables. During operation, a positive impact from offshore wind farms has also frequently been noted. Foundations offer a habitat for marine life, which are a food source for various fish. The level of underwater marine noise from operating turbines and their impact on fish have not proved significant or negative based on the studies conducted on existing operating offshore wind farms. The impact during construction and operation can be avoided and significantly reduced through implementing suitable measures. Technical and organizational techniques that have been used include adapting the construction period to fish spawning, use of noise-mitigating measures when installing foundations (such as avoiding pile-driving or use of noise-dampening measures during foundation installation), embedding the	In order to assess the environmental impacts, the current state of the fish population of the proposed wind farm area must be ascertained: seasonal incidence, abundance, significance of the area as a spawning, migration or feeding area for different species. **Inventory of fish stocks and surveys of spring herring must be carried out** to ascertain the migration corridors of the Baltic herring in the area of the proposed activity. The results of the survey must be evaluated and compared with the results of other relevant fish population surveys in the open and coastal seas. Fish stocks inventory in the wind farm area should be carried out in spring and summer using a standardised sequence of nets in accordance with the requirements for international monitoring of coastal fish population (HELCOM, 2015). During the spring period, the survey focuses on possible spawning areas located in the survey area and fish migration corridors for spawning grounds. Mainly permanent fish populations are studied in the summer period when the fish are less migratory and use the area under survey for feeding. An inventory of fish stocks and spawning grounds must be carried out for two consecutive years in both spring and summer.

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
		submarine cables in the seabed sediments, etc. The impact area is expected to be confined directly to the area encompassed by the offshore wind farm and the area for laying an undersea cable.	The spring herring migration must be analysed in the context of a hydroacoustic study. The aim of the survey is to map the main migration routes of spring herring and to assess how much they overlap with the location of the planned offshore wind farm. Information on the location of the main migration corridors and their variability in the area is currently lacking and a survey is essential to assess the potential impact of large-scale facilities on herring migration. **To assess the impact of the electromagnetic field from connection cables, an expert assessment must be prepared in collaboration with fishery experts**, taking into account similar projects, studies conducted on those projects and existing data. In 2022 to 2024, it is planned to hold a project funded from the state budget that determines how noise impacts Baltic herring biology, above all migration and reproductive behaviour. The EIA report relies on this topic on the findings of the nationwide study. In the course of the EIA, the impact of noise and vibration during installation associated with different foundation types (and other technical solutions will be assessed and if necessary environmental measures (including monitoring) developed. The EIA report must assess the cumulative impact in conjunction with the SWE wind farm.
1.6	Impact on marine mammals (seals)	The main aspect of offshore wind farm development that may impact seals is	In order to assess the impacts of the proposed wind farm, it is necessary to collect and supplement the base

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
		underwater noise, above all from construction of the offshore wind farm. A disturbance for seals may also be a temporary change in seawater quality stemming from disturbing of marine sediments upon installing foundations and submarine cables. The quantity of suspended solids generated depends on the geology of the seabed, the foundation type used and the technological process of installation of the foundation and submarine cable. During the offshore wind farm park operating phase, a disturbance for seals may stem from regular ship traffic used for maintenance. The impact area is expected to be confined directly to the area encompassed by the offshore wind farm and its immediate surroundings.	data related to seals in order to be able to assess the existing situation before the construction of the wind farm and the future temporal and spatial impacts of the utlization of marine areas. For this **a survey on grey seals must be carried out** in the following parts: 1) Monitoring of seal abundance as point counts on important grey seal breeding areas located within the potential direct and indirect impact area of the proposed offshore wind farm: Vesitükimaa (Irbe Strait), Ooslamaa (Ariste Bay) and Innarahu (Vilsandi National Park). A point count must be carried out at Vesitükimaa and Innarahu to determine the number of grey seals calving separately. The main method is aerial photographs taken from a drone. The material collected complements national monitoring and habitat surveys with telemetric methods (see clause 2) and is necessary for assessing the impact of park areas. 2) Marine usage study using telemetry tags, with the goal of tagging up to 10 seals. The priorities are to catch grey seals at the Vesitükimaa breeding ground from the regularly populated location closest to the offshore wind farm area. The assessment is based on the entire spatial dataset of grey seals related to the west coast of Saaremaa. Field studies must cover at least one full year, since there are significant seasonal differences in seal locations and activity patterns. The EIA process will assess the installation noise impact associated

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
			with different types of foundations and, if necessary, develop environmental measures (including monitoring). As a summary, an expert assessment will be prepared for the EIA report based on previous studies, scientific literature and studies conducted during this EIA process. The EIA report must assess the cumulative impact in conjunction with the SWE wind farm.
1.7	Impact on avifauna	The potential impact of offshore wind farms on birds primarily is that birds are driven out of the preferred stopover sites, birds are killed in collisions with turbines and the barrier effect on bird nutrition. The impacts are related to the offshore wind farm area and its vicinity.	To identify the impacts on birds **a survey of both stopping/staging and overflying/migrating birds must be carried out according to the internationally used STUK4 methodology based on flight and radar-based censuses.** Observations of migratory birds . Observations must be made from a vessel at anchor at two different points in the research area. The observations must include visual and radar observations and night-time audio recording of the stopover birds. The surveys must be carried out in two years, both in spring and autumn. The minimum volume of visual and radar censuses of migratory birds is 100 days of observation over a two-year period. Censuses of waterfowl that make stopovers. To be conducted as a flight census. The census route must cover the proposed wind farm area along with its immediate surroundings to obtain comparative data. A total of 20 flight censuses must be conducted in two years. Considering the potential for significant year-to-year variation in the number of waterfowl making stopovers, censuses must be repeated over two years.

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
			As a summary, an expert assessment will be prepared for the EIA report based on previous studies, scientific literature and studies conducted during this EIA process. The cumulative impact in conjunction with the SWE wind farm is assessed.
1.8	Impact on bats	The impact of the offshore wind farm wind farm on bats may materialize if the offshore wind farm is located in a bat feeding area or migratory route. The best known scientific information was taken into account in the preparation of the Estonian Marine Spatial Plan and on the basis of this the expected bat migration areas at sea were identified, one of the places of concentration of bats is probably the tip of the Sõrve peninsula, from where the crossing of the Irbe Strait takes place. The impacts are related to the offshore wind farm area and its vicinity.	In order to assess the impacts of the proposed wind farm, it is necessary to collect additional information on bat data, and **conduct a Chiroptera survey**. As a result of the survey, potential bat movements in the area of the proposed offshore wind farm will be determined. To monitor the migration of bats, mainly automatic bat recorders are used. The survey methodology provides for bioacoustic data collection on the basis of stationary observation points at sea and on land. A minimum of 8 stationary bat recorders must be placed in the area of the offshore wind farm. Temporary buoys installed for the survey should be used for the installation of equipment since there are no permanent signs in the planning area. The placement of sea signs must be carried out in cooperation with the Estonian Transport Administration and the State Fleet (Riigilaevastik). Field work will cover spring and autumn bat migration periods, and stationary observation points will also be in operation in the summer period. In addition to observations at sea, data must be collected during the spring and autumn migration period at two coastal land observation points in Saaremaa. Comparing the

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
			dynamics of the relative abundance of bats migrating by land with those recorded above the sea, one can give an estimate of the presence of migration at sea. At least two land registrars must be used to assess synchronicity. As a summary, an expert assessment will be prepared for the EIA report based on previous studies, scientific literature and studies conducted during this EIA process. The EIA report must assess the cumulative impact in conjunction with the SWE wind farm.
1.9	Impact on protected natural objects	There are no protected natural objects in the proposed offshore wind farm area. A number of protected areas fall under the impact area of the proposed wind farm, so the conservation objectives of the protected areas may be affected. The impacts are related to the wind farm area and the location of the submarine cable and their immediate surroundings.	Analysis of map layers and expert assessment on the basis of previous studies, the Estonian Nature Information System (EELIS), inventories conducted, species protection action plans, scientific literature and studies carried out in the course of this EIA. The EIA report must assess the cumulative impact in conjunction with the SWE wind farm.
1.10	Impact on Natura 2000 areas – Natura assessment	The majority of the protected objects in the marine area are also internationally protected, being part of the Natura 2000 network of nature and/or bird areas. The possible special area of conservation and special protection area for birds in the Natura 2000 network within the impact area of the planned offshore wind farm and its cable corridors are set out in Chapter 6. The impact on Natura areas will be separately assessed in the relevant Natural assessment expressed as a separate chapter of the EIA report.	Analysis of map layers and expert assessment on the basis of previous studies, the Estonian Nature Information System (EELIS), inventories conducted, species protection action plans, scientific literature and studies carried out in the course of this EIA. A Natura assessment will be conducted for all conservation objectives of Natura 2000 area within the impact area. See Chapter 6 on the Natura preliminary assessment.

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
			The EIA report must assess the cumulative impact in conjunction with the SWE wind farm.
1.11	Impacts on the climate	The impact of wind farms on the climate can be considered at different levels. The impact of wind farms is positive, both globally and nationally, as the impact on the climate, due to reducing greenhouse gas emissions by replacing fossil energy sources with renewable ones, is positive. At the local level, participants at involvement meetings have suggested that wind farms can impact the local climate, especially winds and rainfall. The so-called shadow-flicker produced by the wind farm is modelled together with other hydro-meteorological indicators (see clause 1.1). The relationship between wind farms and precipitation has not been studied much in the world. The EIA provides an overview of the results of known and comparable scientific research.	An expert assessment will be compiled based on previous studies, scientific literature, professional literature and expert knowledge. This EIA does not analyse fundamental issues of climate change. The official position of the European Union and therefore also of the Republic of Estonia will used as the basis in the matter of the existence of climate change, the need to mitigate changes and adapt to changes. The EIA report must assess the cumulative impact in conjunction with the SWE wind farm.
2	**Impact on cultural heritage**		
2.1	Impact on objects under heritage conservation, including shipwrecks	According to HIS, no wreckage remains in the offshore wind farm area. The construction of an offshore wind farm is expected to have a direct physical impact on the wrecks: eg the activity may endanger the preservation or good condition of the wreck. This is expected to be an insignificant impact. An impact may also be manifested through potential destruction, damage or impeded access to cultural heritage and the spread of sediments on to heritage conservation assets. In order to mitigate the impact, the locations of the wind turbines must be chosen in such a way as to ensure the preservation of valuable shipwrecks and public access to them. The impact is directly related to the area of the wind farm and submarine cables	During the preparation of the EIA, the **presence of underwater objects must first be identified using sonar surveys**, including potential underwater objects of cultural value and cultural layers (at least in the vicinity of the proposed turbine foundations and possible cable corridors). Where possible, areas that do not coincide with potential objects of cultural value will be preferred for locations of turbine foundation and cable corridors. Prior to construction (during the design process), a separate underwater archaeological investigation is to be performed – if the planned construction activity

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
		(primarily the area directly under the specific structures).	(establishment of wind turbine foundations and cables) and/or their influence area coincides with objects with cultural value and/or cultural layer determined in advance, and could jeopardise the survival of the underwater cultural heritage (subsections 2–3 of § 32 of the Heritage Conservation Act, § 10 of the Minister of Culture regulation no. 25 of 15.05.2019). In the course of the underwater archaeological investigation, objects and cultural layer of cultural value will be documented and their condition and scope of their preservation will be assessed. Additionally, if necessary, the potential impacts (environmental pollution) resulting from changes in the condition of historically hazardous wrecks will be assessed. The information collected by sonar investigations will be used if possible in investigations by other disciplines: determining seabed habitats and initial identification of potential historical UXO (and other hazardous objects). Based on previous studies, scientific literature and studies carried out in the course of the present EIA, an expert assessment will be prepared.
3	**Social and economic environment, including impact on human health, well-being and assets**		
3.1	Noise (including infrasound, low-frequency sound) and vibration	The distance of the wind farm's closest wind turbines from the Sõrve peninsula is at least 10 km, due to which it is not foreseen that noise and vibration levels exceeding the limit values will spread to the nearest residential buildings. At involvement meetings, local residents have found that even if the limit values are not exceeded, noise, especially infrasound,	To assess noise during construction, operation and demolishing of the turbines, **modelling will be performed and a noise map will be compiled** on the basis of the Minister of the Environment regulation No 71 'Normal noise levels transmitted in ambient air and methods for measurement,

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
		can be disruptive for them, given the experience of ships moving internationally along the fairway. During the use of the wind farm, infrasound and low-frequency noise can be expected as well. Sounds with frequencies below 20 hertz (Hz) are called infrasound. Infrasound is not predominantly audible to the human ear. Low-frequency noise refers to sound waves with frequencies ranging from 10 to 200 hertz (Hz).	determination and assessment of noise level' of 16.12.2016. The impact of infrasound, low-frequent sound and vibration is described on the basis of scientific literature and previous studies, including a comparison of the characteristics and distribution of infrasound caused by ships and wind turbines. The noise study must include an assessment of the possible change in the value of real property due to noise. The EIA report must assess the cumulative impact in conjunction with the SWE wind farm.
3.2	Visual impact	It is not possible to establish an offshore wind farm that is not visible at sea. Large wind turbines are visible from the coasts of Lääne-Saaremaa and Sõrve peninsula, so the view with regard to the seascape has changed. The magnitude of the visual impact depends on the physical size of the offshore wind farm, location, spatial solution (e.g. positioning wind turbines in rows etc.) and technical solutions (e.g. the colour of the wind turbines and marking the turbines with lights). The extent of the impact is the wind farm's nearest coastal areas in Western Saaremaa and the Sõrve peninsula.	To determine the visual impact more objectively and to create additional information, a **visualisation of the offshore wind farm** from different points in Western Saaremaa and the Sõrve peninsula, as well as a visibility analysis (ZTV – Zone of Theoretical Visibility), must be performed. The EIA will assess the visual impact of the turbine colours (eg, whether colours other than white are preferred) and the restriction of the spread of aviation safety lights to the mainland. The assessment of visual impacts will rely on the guidelines and methodology developed in the course of the Estonian Maritime Spatial Plan. The requested area can be seen from the coastal sections defined in the Estonian Maritime Spatial Plan, where it is necessary to look for ways to leave an area free of wind turbines at the EIA level. The visual impact study

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
			must include an analysis of the possibility, location and extent of leaving areas free of wind turbines. The visual impact study must identify the potentially affected private homes and give an assessment of the change in views from private homes. The impact must be assessed primarily on the basis of private homes, where the impact is assessed on a larger than average scale, ie which, due to the views, may, among other things, have a possible impact on a possible change in the value of the property. Static 2D visualizations (per guidelines) from different viewpoints and assessment of the impacts on changes in the views will be prepared for the EIA report. In addition, the EIA report must describe and assess the cumulative impact of the proposed wind farm in conjunction with the SWE wind farm.
3.3	Impact on human health and well-being or property	<u>Impact on human health and well-being.</u> The impact of the planned wind farm on human health and welfare can be associated with potential noise and visual disturbance from the wind turbines, described in advance in 3.1 and 3.2 of the table. One of the negative expectations of people regarding wind farms is the possible decrease in the price of real estate due to possible noise disturbance and changes in views.	The assessment of possible changes in the value of real estate is derived from studies of noise and visual impact (see clauses 3.1 and 3.2).
3.4	Social and economic aspects – employment, fisheries, impact on	<u>Impact on economy and employment, including the fisheries sector</u>. The proposed offshore wind farm may have an impact on the fish population and thus on fisheries, both during the construction of the offshore wind farm and during	An expert assessment will be carried out, based on a fish population study to be prepared (see clause 1.5), scientific literature sources and previous research data. The data is combined with data gathered in the

No	Impact field (i.e., environmental elements impacted)	Expected significant impacts (including area, sources of the impact)	Impact forecasting and assessment methods and description of the necessary studies
	the local community, tourism, electricity supply.	operation. The territory of the proposed wind farm will overlap to a small extent with the existing trawling areas and thus may have an impact on the income of fishermen. The impact on fisheries during operation may lie in restrictions to be established on ship traffic in the offshore wind farm area. It is important to find opportunities for co-utilization in the same marine area for rational space-sharing. During the operation stage of the wind farm, a maintenance port is needed, the location of which is most likely in Saaremaa. Saaremaa Rural Municipality has carried out an initial survey to find a suitable location for the maintenance port, and further activities are planned for its development. The maintenance port brings additional jobs related to the maintenance of offshore wind farms (technicians, ship masters, etc) to the area. If we take an example of offshore wind farms in Denmark, 1 GW of offshore wind turbines creates approximately 60 to 100 jobs related directly to the maintenance port, plus indirect and concomitant jobs. <u>Impact on the local community.</u> <u>Impact on tourism.</u> There are no examples of the negative impact of offshore wind farms on tourism from the case studies conducted around the world, but rather they are seen as expanding tourism opportunities (new tourist attractions, increasing demand for services). <u>Power supply</u>. The proposed ELWIND wind farm will not directly affect the power supply to the islands. The strengthening of the electricity supply is carried out by the Estonian-Latvian fourth connection, for which a separate designated national spatial plan and a	course of focus group encounters and interviews with and surveys of stakeholders. Within the framework of the superficies licence and EIA process, additional cooperation takes place with various stakeholders and the Saaremaa Rural Municipality. Additional input will be obtained from proposals received during the publication of the EIA programme and from meetings with the local community. The EIA does not analyse in depth issues at the state level that have been raised at community meetings, such as: the state's renewable energy targets, state subsidies to wind farms, the price of the CFD model for the state, the country's energy balance, energy security, etc., on the grounds that they cannot be solved by a single wind farm from one developer. The EIA report must assess the cumulative impact in conjunction with the SWE wind farm.

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
		strategic assessment of its environmental impact have been initiated. It is expected that the impact area can be confined to the Saaremaa Rural Municipality.	
4	**Other aspects**		
4.1	Impact of historical underwater ordnance	This topic will be covered in the EIA as much as necessary.	Regarding the known locations and identification of historical underwater ordnance, cooperation will be carried out with the Ministry of Defence (including the Estonian Navy) during the superficies licence and EIA process.
4.2	Impact on navigation systems and impact on ship traffic and navigational safety	Use of the wind farm may have an impact on air and ship traffic as well and cooperation will take place with the Estonian Transport Administration and the Police and Border Guard to map and assess it. The presence of a wind farm can affect rescue and search operations.	**A navigational risk analysis must be carried out**, which addresses as relevant impacts topics such as the impact of the wind farm on shipping, including both during construction and operation, maritime communications and surveillance systems, AIS equipment, ship radars during search and rescue operations. The impact of the wind farm on shipping must be investigated in both free water and icy conditions. In addition, **an expert assessment / risk analysis of flight safety must be carried out**, which addresses the width of the potential air traffic corridor, taking into account the different possible weather events, aircraft types and speeds. The analyses are prepared in cooperation with the Estonian Transport Administration. The methodology will be introduced to the Estonian Transport Administration.

No	*Impact field (i.e., environmental elements impacted)*	*Expected significant impacts (including area, sources of the impact)*	*Impact forecasting and assessment methods and description of the necessary studies*
4.3	Potential emergency situations	Impact on seawater quality can also be altered in the event of a potential emergency situation, which could lead to the risk of an oil spill or release of elegas into the environment. The risk of oil pollution exists during both the construction and operational phases of the wind farm. To prevent the occurrence of oil pollution, safety regulations must be followed during construction and maintenance work.	**<u>Modelling of potential oil slick dispersion must be carried out.</u>** An expert assessment of the potential environmental impact of an oil spill and the necessary measures to prevent it will be provided.
4.4	Waste generation and the circular economy	Waste is generated during the construction of wind farms mainly in the building and demolition stages, and to a small extent also in the operation stage. The organisation of waste management during the construction stage of the wind farm is comparable to normal construction activities, where the generation of waste must be minimised as much as possible in order to reduce the environmental impact and, if possible, waste be recovered as much as possible. During both the construction and demolition phases, the maximum amount of waste must be recovered (or taken for recovery). The waste generated that is not suitable for recovery must be treated in accordance with the applicable procedure (Waste Act). In the operational stage, the waste consists mainly of the parts that are replaced and the lubricants and chemicals that are changed. More waste is generated during the demolition stage of the wind farm: technical equipment – electronic waste, wind turbine blades – fibre plastic and wind turbine tower – concrete and metal. On average, the life expectancy guaranteed by the manufacturer of modern wind turbines is 30 years. Modern wind turbines are predominantly easy to demolish, and a large part of their composition is recoverable. Upon demolishing wind turbines, it is important to separate the maximum possible amount of waste,	The EIA report provides a wind turbine life-cycle analysis (LCA).

No	Impact field (i.e., environmental elements impacted)	Expected significant impacts (including area, sources of the impact)	Impact forecasting and assessment methods and description of the necessary studies
		including metal, concrete, plastic and other composite materials, electronic equipment, hazardous waste. Waste management, especially at the construction stage, requires an environmental permit corresponding to the activity, including a water permit. If waste management is properly organised, it is not expected to have a significant environmental impact.	

5.3. Cumulative impact

Cumulative impacts refer to the combined effect of one or more activities that may manifest through an accumulation of similar impacts, where there may be many different activities and where a change occurring as a consequence of addition of activities is an important aspect[85]. The cumulative impact may appear if due to the spatial plan(s) and its proposed activities, a territorial or temporal overlap between impacts take place, resources are repeatedly removed or added, or the landscape is altered repeatedly[86].

In preparing the EIA report, it is possible when assessing cumulative impacts to consider similar projects or other planned projects that will lead to accumulation of similar impacts from multiple activities, which have by the time of the preparation of the EIA report have reached at least the same assessment stage – in other words, it is possible to consider the study data gathered and published regarding the other project.

The proposed ELWIND offshore wind farm area is located in wind energy development area No. 2 following the Estonian Maritime Spatial Plan. In the same area, the superficies licence and EIA process, including surveys, have been carried out in the SWE planned offshore wind farm and its connection cable area north of the ELWIND area (Figure 2-1). Applications for a superficies licence for other parts have also been submitted for wind energy development area No. 2 by various developers, but the superficies licence processes have not yet been initiated for them at the time of the preparation of this EIA programme. Therefore, when assessing the cumulative impacts, only the combined impact between the proposed activities in the area of the SWE offshore wind farm and the cable corridor can be assessed. It is not yet possible to take into account the cumulative impacts of other potential wind farm areas located in development area No 2, as there is no definitive knowledge (carried out environmental studies, impact assessments, etc) regarding their size, layout and technological solutions. Cumulative impacts cannot be

85 Peterson, K., Kutsar, R., Metspalu, P., Vahtrus, S. ja Kalle, H. 2017. Strategic Environmental Assessment Handbook. Ministry of Environment, 137 pp.

86 Cooper, L. M. 2004. Guidelines for Cumulative Effects Assessment in SEA of Plans. EPMG Occasional Paper 04/LMC/CEA. imperial College London.

assessed in the EIA report in regard to spatial plans and projects that are still in the superficies licence proceeding Initiation or EIA programme stage – i.e. where the realistic and feasible alternative solution and volume have not been clarified.

If, at the time of preparation of the EIA report for this offshore wind farm, other potential offshore wind farms planned for marine spatial planning development area 2 have reached a phase similar to the impact assessment and studies, the combined impact of these projects will be assessed, if possible, in order to avoid cumulative impacts in the marine area, including on marine biota, migration bottlenecks and/or obstacles.

The environmental impact assessment of each subsequent offshore wind farm planned in the same area must take into account the results of EIAs and studies carried out in the past.

6. Natura preliminary assessment

Natura 2000 is a Europe-wide network of protected areas that aims to ensure the conservation of rare or endangered animals, birds and plants, and their habitats, or, if necessary, to restore endangered species and habitats to a favourable status across Europe. Natura 2000 special areas of conservation and special protection areas for birds were formed based on Council of the European Union directives 92/43/EEC (known as Habitats Directive) and 2009/147/EC (known as the Birds Directive).

A Natura assessment will be conducted as part of the EIA. The Natura assessment is a procedural process carried out pursuant to Article 6 (3) and (4) of the Habitats Directive, 92/43/EEC. This work draws on European Commission guidance entitled "Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC"[87], to the "Instructions for carrying out a Natura assessment in regard to implementation of Article 6 (3) of the nature directive in Estonia"[88] and the guidance on "Wind energy developments and Natura 2000" (European Union, 2021)[89].

On the basis of the Environmental Impact Assessment and Environmental Management System Act and the Nature Conservation Act, a Natura assessment will take place as part of the proceedings on the environmental impact assessment. Pursuant to clause 2 of § 3 of the Environmental Impact Assessment and Environmental Management System Act, environmental impact is assessed an activity alone or in conjunction with other activities may potentially adversely impact the conservation objective of a Natura 2000 site. When it comes to Natura assessment, it is important that assessment is of the impact likely to materialize based solely on the conservation objectives of the area. The impacts of an activity are considered unfavourable if as a result of carrying out the activity, the state of Natura 2000 area(s') conservation objectives becomes worse or as a result of carrying out the activity it is not possible to achieve the protection objective.

The first stage in the Natura assessment is the preliminary Natura assessment, which is aimed at forecasting the likely impacts of the proposed activity, as a result of which it can be decided whether and to what extent it is necessary to progress to the full assessment stage. In the full assessment, a detailed assessment of the likely adverse impact on the Natura area is conducted and if necessary, alleviatory measures will be designed.

This preliminary assessment is prepared based on existing information. Existing materials are used regarding the Natura 2000 network area and conservation objectives (Natura area standard data form information, EELIS etc.).

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87 Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC'. Brussels, *28.9.2021*

88 Kutsar, R.; Eschbaum, K. and Aunapuu, A. 2019. Instructions for carrying out Natura assessment in the implementation of Article 6(3) of the Habitats Directive in Estonia. Client: Estonian Environmental Boardhttps://www.envir.ee/sites/default/files/KKO/KMH/kemu_natura_hindamise_juhendi_uuendus_2020.pdf

89 https://op.europa.eu/en/publication-detail/-/publication/2b08de80-5ad4-11eb-b59f-01aa75ed71a1

Linkage between proposed activity and protection management

The proposed activity is not associated with the protection management of any Natura 2000 network area and does not contribute directly or indirectly to achievement of the conservation objectives of the areas.

Information on the proposed activity

The proposed activity is the construction of an offshore wind farm with 20–100 turbines with a maximum tip height of 330 metres above sea level. The planned maximum capacity of one wind turbine is 10–25 MW and the nominal capacity of the planned offshore wind farm is 400–1000 MW.

The purpose, location, and detailed description of the proposed activity can be found in Chapter 2 of the EIA programme (see Figure 2-1).

Description of the Natura 2000 sites within the impact area of the proposed activity

The following Natura 2000 network sites are within the potential impact area of the proposed offshore wind farm and cable corridor: Irbes šaurums special protection area for birds in Latvia, Irbe Strait's special protection area for birds, Kaugatoma-Lõu special area of conservation, Kaugatoma-Lõu Bay special protection area for birds, Riksu Coast special area of conservation and special protection area for birds, Karala-Pilguse special area of conservation and special protection area for birds, Vilsandi special area of conservation and special protection area for birds, Tagamõisa special area of conservation and special protection area for birds, (see Figure 6-1).

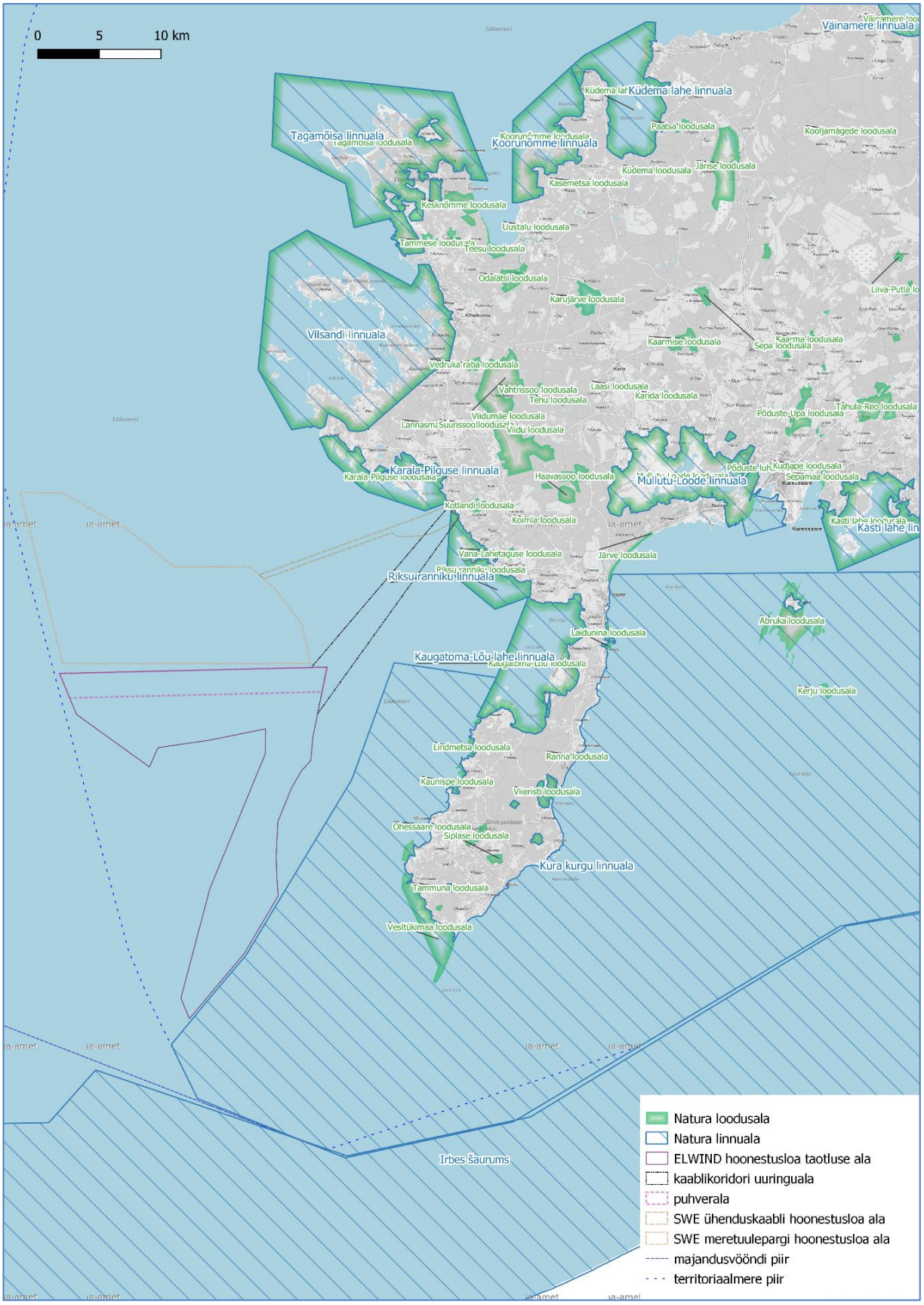

Figure 6-1. *Overview of Natura 2000 network areas in the impact area of the proposed wind farm area (Basis: Land Board and EELIS, 2024)*

A more detailed description of areas along with forecasting the expected impact for Natura 2000 conservation objectives is provided in Table 6-1.

Forecasting likely adverse impacts for Natura site(s)' conservation objectives

The following table, 6-1, sets out the protection objectives for the Natura areas and a forecast of the impact expected to be manifested.

Table 6-1. *Protection objectives for the Natura 2000 areas and forecasting the impact expected to be manifested.*

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	Results of the Natura preliminary assessment
Irbe Strait' s special protection area for birds	razorbill (*Alca torda*), northern pintail (*Anas acuta*), northern shoveler (*Anas clypeata*), common teal (*Anas crecca*), Eurasian wigeon (*Anas penelope*), mallard duck (*Anas platyrhynchos*), gadwall (*Anas strepera*), greylag goose (*Anser anser*), grey heron (*Ardea cinerea*), ruddy turnstone (*Arenaria interpres*), greater scaup (*Aythya marila*), brent goose (*Branta bernicla*), barnacle goose (*Branta leucopsis*), common goldeneye (*Bucephala clangula*), southern dunlin (*Calidris alpina schinzii*), redknot (*Calidris canutus*), little stint (*Calidris minuta*), black guillemot (*Cepphus grylle*), common ringed plover (*Charadrius hiaticula*), long-tailed duck (*Clangula hyemalis*), tundra swan (*Cygnus columbianus bewickii*), mute swan (*Cygnus olor*), red-throated loon (*Gavia stellata*), white-tailed eagle (*Haliaeetus albicilla*), lesser black-backed gull (*Larus fuscus*), bar-tailed godwit (*Limosa lapponica*), velvet scoter (*Melanitta fusca*), smew (*Mergus albellus*), goosander (*Mergus merganser*), red-breasted merganser (*Mergus serrator*), great cormorant (*Phalacrocorax carbo*), grey plover (*Pluvialis squatarola*), horned grebe (*Podiceps auritus*), great crested grebe (*Podiceps cristatus*), pied avocet (*Recurvirostra avosetta*), common eider (*Somateria mollissima*), Caspian tern (*Sterna caspia*) and spotted redshank (*Tringa erythropus*).	The area of the proposed offshore wind farm will not be directly within the Irbe Strait's special protection area for birds, but is located in its immediate vicinity (within 12 km the distance to the special protection area for birds is approximately 250 m). Therefore, disturbances during construction (noise, dispersion of suspended solids, etc) as well as effects during service-life (risk of collision) that may impact the species that are the conservation objective of the special protection area for birds may occur.	**As part of the EIA report, an appropriate Natura 2000 assessment must be conducted.**

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	Results of the Natura preliminary assessment
Kaugatoma-Lõu special area of conservation	The conservation objective is to protect the protected habitat types listed in Annex I to Council Directive 92/43/EEC: mudflats and sandflats not covered by seawater at low tide (1140), large shallow bays (1160), reefs (1170), annual vegetation of drift lines (1210), perennial vegetation of stony banks (1220), Boreal Baltic islets and small islands (1620), Boreal Baltic coastal meadows (*1630), *Juniperus communis* formations (5130), semi-natural dry grasslands on calcareous substrates (*important orchid sites – 6210), Fennoscandian lowland species-rich dry to mesic grasslands (*6270), Nordic alvar (*6280), Fennoscandian wooded meadows (*6530), alkaline fens (7230), calcareous rocky slopes (8210), Western Taïga (*9010) and Fennoscandian deciduous swamp woods (*9080); and the species listed in Annex II whose habitat is protected is the *Sisymbrium supinum*.	The proposed offshore wind farm area and the cable corridor survey area do not overlap with or are located in the Natura special area of conservation or its immediate vicinity (the cable corridor survey area is located approximately 9 km away), which is expected to exclude both direct and indirect impacts on the special area of conservation and its conservation objectives. No adverse impacts are expected.	**The special area of conservation is not located within the impact area of the proposed activity. Adverse impact on the special area of conservation is excluded.**

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	Results of the Natura preliminary assessment
Kaugatoma-Lõu special protection area for birds	common teal (*Anas crecca*), mallard (*Anas platyrhynchos*), greylag goose (*Anser anser*), barnacle goose (*Branta leucopsis*), southern dunlin (*Calidris alpina schinzii*), common ringed plover (*Charadrius hiaticula*), mute swan (*Cygnus olor*), lesser black-backed gull (*Larus fuscus*), smew (*Mergus albellus*), red-breasted merganser (*Mergus serrator*),common eider (*Somateria mollissima*), Caspian tern (*Sterna caspia*), Arctic tern (*Sterna paradisaea*), common redshank (*Tringa totanus*) and northern lapwing (*Vanellus vanellus*).	The proposed offshore wind farm area and the cable corridor survey area do not overlap with or are located in the immediate vicinity of the Kaugatoma-Lõu Bay special protection area for birds (the cable corridor survey area is located approximately 9 km away), which is expected to exclude direct impacts during construction on the special protection area for birds and its conservation objectives. The impact during service-life (collision risk) may also affect the species that are the conservation objective of the Kaugatoma-Lõu Bay special protection area for birds.	**As part of the EIA report, an appropriate Natura 2000 assessment must be conducted.**
Riksu coast special area of conservation	The conservation objectives are to protect the habitat types listed in Annex I to Council Directive 92/43/EEC: coastal lagoons (*1150), annual vegetation of drift lines (1210), perennial vegetation of stony banks (1220), Boreal Baltic islets and small islands (1620), Boreal Baltic coastal meadows (*1630), Boreal Baltic sandy beaches with perennial vegetation (1640), 'grey dunes' (fixed coastal dunes – *2130), *Juniperus communis* formations (5130), semi-natural dry grasslands on calcareous substrates (*important orchid sites – 6210), Nordic alvar (*6280), Molinion caeruleae (6410) and Fennoscandian wooded pastures (9070).	The survey area of the cable corridors of the proposed offshore wind farm is located approximately 1,200 m in the Riksu coast special area of conservation. The building of the planned cables connections in areas near the special area of conservation may in certain instances have temporary/indirect impacts, such as temporary impacts during construction on the special area of conservation's conservation objectives (suspended solids, etc). These are likely to be temporary and insignificant for the special area of conservation.	**An additional preliminary Natura assessment must be carried out as part of the EIA report. If it appears that the area's conservation objectives are likely to be adversely impacted, the appropriate Natura assessment must be continued, if necessary.**

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	Results of the Natura preliminary assessment
Riksu coast special protection area for birds	barnacle goose (*Branta leucopsis*), southern dunlin (*Calidris alpina schinzii*), mute swan (*Cygnus olor*), velvet scoter (*Melanitta fusca*), red-breasted merganser (*Mergus serrator*), ruff (*Philomachus pugnax*), common eider (*Somateria mollissima*) and common redshank (*Tringa totanus*).	The survey area of the cable corridors of the proposed offshore wind farm is located approximately 1,200 m in the Riksu coast special protection area for birds. The building of the wind farm's cables connections may in certain instances cause temporary/indirect impacts on the conservation objectives of the special protection area for birds (suspended solids, noise disturbance during construction, etc). This has probably a temporary and insignificant impact. The wind farm's impact during service-life (collision risk) may also have an adverse impact on the species that are the conservation objective of the Riksu coast special protection area for birds.	**As part of the EIA report, an appropriate Natura 2000 assessment must be conducted.**

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	Results of the Natura preliminary assessment
Karala-Pilguse special area of conservation	The conservation objective is to protect the protected habitat types listed in Annex I: coastal lagoons (*1150), annual vegetation of drift lines (1210), perennial vegetation of stony banks (1220), vegetated sea cliffs of the Atlantic and Baltic Coasts (1230), Boreal Baltic islets and small islands (1620), Boreal Baltic coastal meadows (*1630), Boreal Baltic sandy beaches with perennial vegetation (1640), 'white dunes' (shifting dunes along the shoreline – 2120), 'grey dunes' (fixed coastal dunes – *2130), *Juniperus communis* formations (5130), semi-natural dry grasslands on calcareous substrates (*important orchid sites – 6210), Nordic alvar (*6280), Molinion caeruleae (6410), Calcareous fens with *Cladium mariscus* (*7210), alkaline fens (7230), Western Taïga (*9010), Fennoscandian hemiboreal natural old broad-leaved deciduous forests (*9020) and Fennoscandian deciduous swamp woods (*9080); the species listed in Annex II whose habitat is protected is the *Cypripedium calceolus*.	The proposed offshore wind farm area and the cable corridors survey area do not overlap with the Karala-Pilguse special area of conservation, but is still located in its immediate vicinity. The building of the planned cables connections in areas near the special area of conservation may in certain instances have temporary/indirect impacts, such as temporary impacts during construction on the special area of conservation's conservation objectives (suspended solids, etc). These are likely to be temporary and insignificant for the special area of conservation.	**An additional preliminary Natura assessment must be carried out as part of the EIA report. If it appears that the area's conservation objectives are likely to be adversely impacted, the appropriate Natura assessment must be continued, if necessary.**

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	Results of the Natura preliminary assessment
Karala-Pilguse special protection area for birds	Northern shoveler (*Anas clypeata*), common teal (*Anas crecca*), Eurasian wigeon (*Anas penelope*), mallard (*Anas platyrhynchos*), barnacle goose (*Branta leucopsis*), common goldeneye (*Bucephala clangula*), mute swan (*Cygnus olor*), white-tailed eagle (*Haliaeetus albicilla*), pied avocet (*Recurvirostra avosetta*), common redshank (*Tringa totanus*) and northern lapwing (*Vanellus vanellus)*.	The proposed offshore wind farm area does not overlap with the Karala-Pilguse special protection area for birds and thus there will be no direct physical impact on the area's conservation objectives. However, the survey area of the cable corridors is located in its immediate vicinity, and the construction of cable connections near the Natura special protection area for birds may in some cases also have temporary/indirect impacts, eg temporary impacts during construction on the conservation objectives of the special protection area for birds (suspended solids, noise disturbances during construction, etc). This has probably a temporary and insignificant impact on the special protection area for birds. The wind farm's impact during service-life (collision risk) may also have an adverse impact on the species that are the conservation objective of the Riksu coast special protection area for birds.	**As part of the EIA report, an appropriate Natura assessment must be conducted.**

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	Results of the Natura preliminary assessment
Vilsandi special area of conservation	The protected habitat types are: sandbanks (*1110), mudflats and sandflats not covered by seawater at low tide (1140), coastal lagoons (*1150), large shallow bays (1160), annual vegetation of drift lines (1210), perennial vegetation of stony banks (1220), Salicornia and other annuals colonizing mud and sand (1310), Boreal Baltic islets and small islands (1620), Boreal Baltic coastal meadows (*1630), *Juniperus communis* formations (5130), Nordic alvar (*6280) Fennoscandian wooded meadows (*6530), springs and springfens (7160), calcareous fens with *Cladium mariscus* (*7210), alkaline fens (7230), limestone pavements (*8240), Western Taïga (*9010) and Fennoscandian hemiboreal natural old broad-leaved deciduous forests (*9020); and the species listed in Annex II whose habitat is protected are the grey seal (*Halichoerus grypus*), *Cypripedium calceolus*, *Liparis loeselii*, *Rhinanthus osiliensis*, *Sisymbrium supinum* and the European river lamprey (*Lampetra fluviatilis*).	No activities are planned in or near the special area of conservation. The wind farm and the cable corridors survey area are respectively 20 and 13 km from the special area of conservation. One of the conservation objectives of the Vilsandi special area of conservation is also the grey seal and the habitats of that species. The special area of conservation includes the grey seal breeding ground at Inna reef (Innarahu), which is located about 21 km from the planned wind farm. Given the wide-ranging movement of the grey seal and its potential sensitivity to noise, the impact cannot be completely ruled out.	**An additional preliminary Natura assessment will be carried out as part of the EIA report. If it appears that the area's conservation objectives are likely to be adversely impacted, the appropriate assessment will be continued.**

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	Results of the Natura preliminary assessment
Vilsandi special protection area for birds	Common teal (*Anas crecca),* mallard (*Anas platyrhynchos),* greylag goose *(Anser anser), greater scaup (Aythya marila), barnacle goose (Branta leucopsis),* common goldeneye *(Bucephala clangula),* common ringed plover *(Charadrius hiaticula),* mute swan *(Cygnus olor),* Eurasian crane *(Grus grus),* goosander *(Mergus merganser),* red-breasted merganser *(Mergus serrator),* steller's eider *(Polysticta stelleri),* common eider *(Somateria mollissima).*	No activities are planned in or near the special protection area for birds. The wind farm and the cable corridors survey area are within 20 and 13 km of the special area of conservation, respectively, which is expected to exclude direct impacts on the special protection area for birds and its conservation objectives during construction. The impact during service-life (collision risk) may also affect the species that are the conservation objective of the Vilsandi special protection area for birds.	**A full Natura assessment has to be carried out as part of the EIA report.**

Tagamõisa special area of conservation	The protected habitat types listed in Annex I are: coastal lagoons (*1150), reefs (1170), annual vegetation of drift lines (1210), perennial vegetation of stony banks (1220), vegetated sea cliffs of the Atlantic and Baltic Coasts (1230), Boreal Baltic coastal meadows (*1630), Boreal Baltic sandy beaches with perennial vegetation (1640), embryonic shifting dunes (2110), 'white dunes' (shifting dunes along the shoreline – 2120), 'grey dunes' (fixed coastal dunes – *2130), wooded dunes (2180), humid dune slacks (2190), hard oligo-mesotrophic waters with benthic vegetation of *Chara spp*. (3140*), Juniperus communis* formations (5130), semi-natural dry grasslands on calcareous substrates (*important orchid sites – 6210), Fennoscandian lowland species-rich dry to mesic grasslands (*6270), Nordic alvar (*6280), lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) (6510), Fennoscandian wooded meadows (*6530), transition mires and quaking bogs (7140), calcareous fens with Cladium mariscus (*7210), alkaline fens (7230), Western Taïga (*9010), Fennoscandian hemiboreal natural old broad-leaved deciduous forests (*9020), coniferous forests on, or connected to, glaciofluvial eskers (9060), Fennoscandian wooded pastures (9070) and Fennoscandian deciduous swamp woods (*9080); and the species listed in Annex II whose habitat is protected are the grey seal (*Halichoerus grypus*), *Cypripedium calceolus*, *Liparis loeselii* and *Sisymbrium supinum*.	No activities are planned in or near the special area of conservation. The wind farm is approximately 40 km from the special area of conservation. One of the conservation objectives of the Tagamõisa special area of conservation is also the grey seal and the habitats of that species. Given the wide-ranging movement of the grey seal and its potential sensitivity to noise, the impact cannot be completely ruled out.	**An additional preliminary Natura assessment will be carried out as part of the EIA report. If it appears that the area's conservation objectives are likely to be adversely impacted, the appropriate assessment will be continued.**
Tagamõisa special protection	razorbill *(Alca torda)*, common teal *(Anas crecca)*, mallard *(Anas platyrhynchos)*, greylag goose *(Anser anser)*, tawny pipit *(Anthus campestris)*, common goldeneye	No activities are planned in or near the special protection area for birds. The wind farm is at least 40 km from the special protection area for birds. The	**An additional preliminary Natura assessment will be carried out as part of the EIA report. If it**

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	Results of the Natura preliminary assessment
	(Bucephala clangula), purple sandpiper *(Calidris maritima),* black guillemot *(Cepphus grylle),* common ringed plover *(Charadrius hiaticula),* western marsh-harrier *(Circus aeruginosus),* long-tailed duck *(Clangula hyemalis),* tundra swan *(Cygnus columbianus bewickii),* mute swan *(Cygnus olor),* Eurasian crane *(Grus grus),* white-tailed eagle *(Haliaeetus albicilla),* smew *(Mergus albellus),* red-breasted merganser *(Mergus serrator),* red-necked grebe *(Podiceps grisegena),* steller's eider *(Polysticta stelleri)* and common eider *(Somateria mollissima).*	Tagamõisa special protection area for birds is not located within the impact area of the proposed activity, but impact during service-life (collision risk) may also have an indirect impact on the species that fall under the conservation objective of the Tagamõisa special protection area for birds.	**appears that the area's conservation objectives are likely to be adversely impacted, the appropriate assessment will be continued.**
Lindmetsa special area of conservation EE0040440	These protected habitat types are Boreal Baltic coastal meadows (*1630), wooded dunes of the Atlantic, Continental and Boreal region (2180), *Juniperus communis* formations on heaths or calcareous grasslands (5130), Fennoscandian wooded meadows (*6530), Alkaline fens (7230), Western Taïga (*9010), Fennoscandian herb-rich forests with Picea abies (9050) and Fennoscandian wooded pastures (9070);	The proposed offshore wind farm area and the cable corridor survey area do not overlap with or are located in the Natura special area of conservation or its immediate vicinity, which is expected to exclude both direct and indirect impacts on the special area of conservation and its conservation objectives. No adverse impacts are expected.	**The special area of conservation is not located within the impact area of the proposed activity. Adverse impact is excluded.**
Kaunispe special area of conservation EE0040420	The protected habitat types are: coastal lagoons (*1150), Boreal Baltic coastal meadows (*1630), *Juniperus communis* formations (5130), semi-natural dry grasslands on calcareous substrates (*important orchid sites – 6210), Nordic alvar (*6280), Molinion caeruleae (6410), Fennoscandian wooded meadows (*6530) and calcareous fens with *Cladium mariscus* (*7210);	The proposed offshore wind farm area and the cable corridor survey area do not overlap with or are located in the Natura special area of conservation or its immediate vicinity, which is expected to exclude both direct and indirect impacts on the special area of conservation and its conservation objectives. No adverse impacts are expected.	**The special area of conservation is not located within the impact area of the proposed activity. Adverse impact is excluded.**

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	Results of the Natura preliminary assessment
Ohessaare special area of conservation EE0040449	The habitat types under protection are vegetated sea cliffs of the Atlantic and Baltic Coasts (1230) and alvar (*6280)	The proposed offshore wind farm area and the cable corridor survey area do not overlap with or are located in the Natura special area of conservation or its immediate vicinity, which is expected to exclude both direct and indirect impacts on the special area of conservation and its conservation objectives. No adverse impacts are expected.	**The special area of conservation is not located within the impact area of the proposed activity. Adverse impact is excluded.**
Vesitükimaa special area of conservation EE0040490	The habitat types to be protected are reefs (1170), annual vegetation of drift lines (1210), perennial vegetation of stony banks (1220), salicornia and other annuals colonizing mud and sand (1310), Boreal Baltic islets and small islands (1620), Boreal Baltic coastal meadows (*1630), Boreal Baltic sandy beaches with perennial vegetation (1640), fixed coastal dunes with herbaceous vegetation ('grey dunes') (2130), Nordic alvar and precambrian calcareous flatrocks (*6280), Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) (6410), calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* (*7210) and Fennoscandian deciduous swamp woods (*9080);Species listed in Annex II, whose habitats are protected, include the grey seal (*Halichoerus grypus*) and marsh angelica (*Angelica palustris*).	No activities are planned in or near the special area of conservation. The wind farm is approximately 14 km from the special area of conservation. One of the conservation objectives of the Vesitükimaa special area of conservation is also the grey seal and the habitats of that species. Given the wide-ranging movement of the grey seal and its potential sensitivity to noise, the impact cannot be ruled out.	**An additional preliminary Natura assessment will be carried out as part of the EIA report. If it appears that the area's conservation objectives are likely to be adversely impacted, the appropriate assessment will be continued.**

Name of Natura area	*Protection objectives for the area*	*Forecasting impact*	Results of the Natura preliminary assessment
Irbes saurums special protection area for birds	Razorbill (*Alca torda*), mallard (*Anas platyrhynchos*), grey heron (*Ardea cinerea*), tufted duck (*Aythya fuligula*), greater scaup (*Aythya marila*), common goldeneye (*Bucephala clangula*), black guillemot (*Cepphus grylle*), long-tailed duck (*Clangula hyemalis*), whooper swan (*Cygnus cygnus*), mute swan (*Cygnus olor*), Arctic loon (Gavia arctica), red-throated loon (*Gavia stellata*), white-tailed eagle (*Haliaeetus albicilla*), European herring gull (*Larus argentatus*), mew gull (*Larus canus*), Great black-backed gull (*Larus marinus*), black-headed gull (*Larus ridibundus*), velvet scoter (*Melanitta fusca*), black scoter (*Melanitta nigra*), smew (*Mergus albellus*), goosander (*Mergus merganser*), red-breasted merganser (*Mergus serrator*), great cormorant (*Phalacrocorax carbo*), great crested grebe (*Podiceps cristatus*), Caspian tern (*Sterna caspia*), common tern (*Sterna hirundo*), sandwich tern (*Sterna sandvicensis*), Eurasian crane (*Grus grus*) and common shelduck (*Tadorna tadorna*).	The area of the proposed offshore wind farm will not be directly within the Irbes saurums special protection area for birds, but the special protection area is located 6 km south of it, bordering the Irbe Strait's special protection area for birds (this is essentially one large special protection area for birds). Therefore, disturbances during construction (noise, dispersion of suspended solids, etc) as well as effects during service-life (risk of collision) that may impact the species that are the conservation objective of the special protection area for birds may occur.	**A full Natura assessment has to be carried out as part of the EIA report.**

Result of Natura assessment and conclusions

The technical solution for the offshore wind farm will be clarified in the subsequent EIA process and in technical design development in cooperation with experts in the relevant field. The objective is to establish an offshore wind farm and related infrastructure such that it lacks an adverse impact on achieving the conservation objectives of the Natura areas.

An additional full Natura assessment will be carried out as part of the EIA in regard to the likely impacted Natura areas and their conservation objectives.

7. The environmental impact assessment process and timetable

The exact timeline of the EIA process is difficult to specify when preparing the EIA programme; therefore, the timings of activities provided in the schedule should be considered approximate. Further details on public involvement and the exact time of the public consultation on the EIA programme and report is given in accordance with legislation.

The stages of carrying out the EIA are given in the following table.

Table 7-1. *Stages in carrying out the EIA and expected timetable*

EIA stage	*Content of stage and duration*	*Expected term for carrying out the stage*[90]
Initiation of EIA		Consumer Protection and Technical Regulatory Authority decision No 1-7/24-102 of 28.03.2024.
Preparation of the EIA programme.	The EIA expert group will prepare the EIA programme.	May – June 2024
	The EIA programme will be submitted to the decision-maker.	July 2024
EIA programme publication and consultation of the authorities concerned.	The decision-maker checks the compliance of the EIA programme within 10 days.	August 2024
	The decision-maker provides notification within 14 days regarding the public display and public consultation.	August 2024
	The decision-maker organises a public display lasting at least 21 days and forwards the programme to the authorities concerned for their opinion.	September 2024
Transboundary involvement and publication	The neighbouring countries involved organise a national publication and submit the programme for the submission of views (30 days + 30 days).	September – October 2024
Publication of EIA programme	Public discussion of the EIA programme and an overview of received proposals will take place.	October 2024
Supplementation of the EIA programme and submission for verifying conformity to	Within 14 days of the public consultation, the decision-maker will review the proposals submitted during the publication and the views of the authorities concerned and give the developer its views on the possible need to supplement the EIA programme.	October 2024
	The EIA expert group will, on the basis of proposals and objections made regarding the EIA programme, make the	November 2024

90 The optimum duration of the stage arising from the Environmental Impact Assessment and Environmental Management System Act valid on the date on which the EIA was initiated is taken into account for each stage in the EIA process. As of 21.06.2024, a new version of the Environmental Impact Assessment and Environmental Management System Act (https://www.riigiteataja.ee/akt/111062024007?leiaKehtiv) entered into force, which shortened the various stages of the EIA procedure, which apply, among other things, to EIA proceedings initiated earlier; see the basis set out in subsection 15 of § 56 of the current Environmental Impact Assessment and Environmental Management System Act.

EIA stage	*Content of stage and duration*	*Expected term for carrying out the stage*[90]
the requirements	necessary corrections and addenda, clarify that the proposals and objections have been taken into consideration, or provide reasoning for why they were not considered, and respond to questions submitted.	
	The corrected EIA programme will be submitted to the decision-maker for verifying conformity to the requirements.	December 2024
Verification and declaration of the conformity of the EIA programme to the requirements	The decision-maker will, within 30 days, verify the conformity of the EIA programme, relevancy and sufficiency of the programme for assessing the environmental impact of the proposed activity. The decision-maker makes the decision to declare the EIA programme in conformity to the requirements.	December 2024 – January 2025
Carrying out studies and surveys		*In 2024–2026*
Preparation and proceedings of the EIA report	*Based on the EIA programme, the EIA expert group will prepare the EIA report.*	*In 2026–2027*
	The EIA report will be submitted to the decision-maker for further proceedings as provided for in the Environmental Impact Assessment and Environmental Management System Act.	

8. Parties to the EIA and composition of the expert group

The parties to the EIA process in accordance with the Environmental Impact Assessment and Environmental Management System Act are the developer, expert and decision-maker (table 8-1).

Table 8-1. *Parties to the EIA*

Decision-maker, processor of superficies licence	*Developer*	Preparer of the EIA programme
Consumer Protection and Technical Regulatory Authority A: Endla 10a, 10142 Tallinn	**Environmental Investment Centre** A: Narva mnt 7a, Tallinn 15172	**Roheplaan OÜ** A: Koidu 20, Tallinn 10316
Contact: Liina Roosimägi E: liina.roosimagi@ttja.ee P: +372 667 2004	Contact: Tõnn Tuvikene E: Tonn.Tuvikene@kik.ee	Contact: Riin Kutsar E: riin@roheplaan.ee

The EIA programme has been prepared under the leadership of the environmental consulting company Roheplaan OÜ in cooperation with other experts. The lead expert of the EIA is licensed EIA Riin Kutsar (EIA licence no. KMH0131). The expert group that prepared the EIA programme includes the members shown in Table 8-2.

Table 8-2. *Members of the expert group on the preparation of the EIA programme*

Member of the working group	*Field/competence*	*Authority*
Riin Kutsar	EIA Leading Expert (license KMH0131) Role: Process and team management, impact on natural environment, Natura assessment, assessment of the social and economic environment	Roheplaan OÜ
Agne Peetersoo	Environmental Expert. Role: drafting of general parts, impacts of the natural environment, assessment of the social and economic environment	Roheplaan OÜ
Georg Martin	Expert on benthic life and habitats. Role: Impact on phytobenthos, zoobenthos, marine water quality	Estonian Marine Institute, University of Tartu.
Redik Eschbaum	Fisheries expert. Role: Impact on fisheries and fishing, including spawning areas	Estonian Marine Institute, University of Tartu.

Member of the working group	*Field/competence*	*Authority*
Andrus Kuus	Avifauna expert Role: Impact on avifauna	Eesti Ornitoloogiaühing MTÜ
Mart Jüssi	Expert on seals. Role: Impact on seals	MTÜ Pro Mare
Rauno Kalda	Expert on bats. Role: Impact on bats	Elustik OÜ
Piret Toonpere	Noise and vibration expert. Role: noise, vibration	Lemme OÜ
Kerttu Ots	Landscape architect. Role: Visual impact assessment	RPS | Consulting UK & Ireland
Inga Zaitseva-Pärnaste	Maritime transport expert Role: impact of the wind farm on maritime traffic, marine communication and surveillance systems, AIS devices, and ship radars.	TalTech

The preparers of the EIA report and studies will be determined through future public procurement processes. he expert group for preparing the EIA report must cover at least the fields listed in Table 8-2.

9. Public engagement and overview of the publication of the EIA programme

9.1. Authorities concerned and stakeholders

Under legislation, publication of the EIA is in the remit and the task of the decision-maker. Parties to the proceedings, and information channels through which the notifications will presumably be sent out in the course of the EIA:

- *Ametlikud Teadaanded* (initiation, public display of programme and report, approval of programme and report).
- Newspaper (public display and discussion of programme and report).
- The public display and public discussion of the EIA programme and report are announced by letter pursuant to subsection 3 of § 16 of the Environmental Impact Assessment and Environmental Management System Act.

A list of the interested institutions and persons is provided in Table 9-1. The definition of authorities concerned was initially based on the specifications of the decision to initiate EIA and supplemented upon preparation of this programme. The list submitted is the proposal on the part of the EIA programme compiler regarding, at minimum, the parties to be notified by letter. The decision-maker makes the final decision on who is to be notified.

Table 9-1. *A list of the interested institutions and persons.*

Institution or person	*Reason for involving them in the proceedings*	*Notification form*
Ministry of Regional Affairs and Agriculture	Responsible for spatial planning in the country. Fisheries and aquaculture	Notified by email
Estonian Ministry of Climate	Energy sector Nature conservation Maritime policy, ports, water traffic.	Notified by email
Environmental Board	Manager of protected natural objects	Notified by email
Ministry of Defence	National Defence	Notified by email
Ministry of the Interior	Internal security	Notified by email
Estonian Transport Administration	Ports, waterways, port basins, anchorages and navigational markings; aviation safety	Notified by email

Institution or person	*Reason for involving them in the proceedings*	*Notification form*
National Heritage Board	Cultural assets, including underwater cultural heritage	Notified by email
Police and Border Guard Board	Border guard and security Organisation of maritime search and rescue operations, and the detection, containment, and elimination of marine pollution.	Notified by email
Estonian Environment Agency	Organizer of national environmental monitoring	Notified by email
Estonian veterinary and food board	Organization of professional fishing	Notified by email
Estonian Health Board	Health protection and safety	Notified by email
Saaremaa Municipality Government	Municipality within the impact area of the wind farm	Notified by email
Estonian Council of Environmental NGOs	Association of NGOs Promoting Environmental Protection	Notified by email
Eesti Kalurite Liit MTÜ Saarte Kalandus MTÜ	Fishermen's lobby groups	Notified by email
Area inhabitants	The proposed activity may impact inhabitants in the region	Notified through the newspaper and local media.

9.2. Notification and involvement of the public

The proposed ELWIND offshore wind farm and proposed activities related to it were introduced in the newspaper *Saarte Hääl* on 08.04.2024, in the Saaremaa municipality newspaper *Saaremaa Teataja* on 08.02.2024, on the local Kadi radio station on 03.04.2024, and at the community seminar *What Topics to Research in the Marine Area?* at Salme Community Hall on 02.05.2024.

9.3. Transboundary impact and transboundary involvement

Considering the size and location of the proposed wind farm, approximately 6 km from the maritime border of the Republic of Latvia, it may be an activity with potential transboundary impacts and therefore requires a transboundary environmental impact assessment.

Transboundary environmental impact may occur as follows:

- Possible adverse transboundary environmental impact on birdlife during the construction and operation of the offshore wind farm may arise from migration barriers as well as the loss of feeding and stopover sites.
- Possible adverse transboundary impacts on fish and seals during the construction phase of the proposed activities (mainly noise, etc).
- Possible adverse visual impact. The proposed offshore wind farm will be located *at the nearest point* at a distance of 6 km from the border of the Latvia territorial waters and 29 km from Latvia land area. This is not expected to be a significant impact.

The environmental impact assessment in a transboundary context is organised in accordance with procedure set forth in international agreements, the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo convention) and the Environmental Impact Assessment and Environmental Management System Act. The process of environmental impact assessment in a transboundary context and the involvement are managed by the Ministry of Climate; all relevant notification and feedback documents are provided in Annex 2 of this document.

On 02.02.2024, following the initiation of the superficies licence by the Consumer Protection and Technical Regulatory Authority and the EIA, the Ministry of Climate sent a notice to neighbouring countries (Latvia, Lithuania, Sweden, Finland) regarding the planned ELWIND offshore wind farm project in accordance with the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo).

Replies were received from Latvia, Lithuania, Sweden and Finland. Latvia and Sweden wish to participate in this EIA proceedings. Finland would like to receive further information before a final decision on participation is made, and they will also receive an EIA programme. Lithuania stated that they do not wish to participate in the transboundary involvement process, but would like feedback on the final decision of the EIA process.

A summary of the feedback given by neighbouring countries to the notification of initiation of the EIA is given in Table 9-2 and copies of the procedural letters are given in Annex 2.

Table 9-2. *Feedback from neighbouring countries on the assessment of potential transboundary environmental impacts following the initiation of the EIA programme*

Topic in need of attention	*EIA response*
LATVIA	
The Environment State Bureau announced that Latvia would like to participate in EIA and transboundary consultations as an impacted party.	The proposal will be taken into account.
The Ministry of Transport of the Republic of Latvia	
Take into account the areas reserved for shipping defined in the Latvian maritime spatial plan	The proposal will be taken into account.

Topic in need of attention	*EIA response*
The State Environmental Service	
It is also necessary to assess the impact of the project in the context of the Latvian maritime spatial plan.	The proposal will be taken into account.
Special attention must be paid to the impact on birds and bats (including the study of their migration routes), fish and marine animals (including the study of their feeding and spawning grounds).	In the course of the EIA, appropriate ornithological and *Chiroptera* (bat) studies will be carried out (see chapter 5.2). In the proposed offshore wind farm area (and reference area), the impact is assessed at the populations level.
Assess current practice in preventing pollution risks (eg with petroleum products) during the construction and operation of wind farms	The proposal has been taken into account. In the course of the EIA, the movement of an oil slick is modelled.
Assess the risks and consequences of the planned infrastructure, including in the event of malicious damage.	The planned infrastructure is cabling within the wind farm and a underwater cable connecting the wind farm to the transmission network, which is expected to be built covered with sediment, including to avoid possible risks. We note that the fourth connection between Estonian and Latvia is not part of this project and the EIA.
The Nature Conservation Agency of the Republic of Latvia	
Assess the impact on the Natura 2000 site 'Irbes šaurums' (LV0900300). Assess the impact on migrating and wintering birds in the area.	The proposal has been taken into account. Natura 2000 assessment is part of the EIA under Estonian law. In the course of the EIA, a study of the migratory and feeding areas of birds is carried out.
The proposed fourth connection between Latvia and Estonian would cross the Natura 2000 site 'Irbes šaurums' and the survey area of LIFE REEF project 'Research of marine protected habitats and determination of the necessary protection status in Latvian Exclusive Economic Zone'.	The fourth connection between Estonian and Latvia is not part of this project and is not covered by this EIA. The impacts of the connection are assessed, where appropriate, in separately initiated EIA and studies.
It is necessary to assess the possible cumulative effects of wind farms 'Liivi 1' and 'Liivi 2'.	The assessment of cumulative impacts is a standard part of the EIA. It is carried out at the level of accuracy prescribed in the EIA programme. The cumulative impacts with Liivi 1 and 2 wind farms can be assessed if the studies and impact assessments of Liivi 1 and 2 have been completed by the time of the completion of the EIA report of the Elwind wind farm.
The Ministry of Health of the Republic of Latvia	
The project has no impact on human health.	Noted.
The Ministry of Agriculture of the Republic of Latvia	
The project may affect the interests of Latvian fishermen, as they also fish in the waters of the	Within the framework of the EIA, appropriate surveys and studies are carried out by recognised

Topic in need of attention	*EIA response*
exclusive economic zone of the Republic of Estonian and exploit the same fish stocks. During the strategic environmental assessment process, it would be necessary to assess the impact of the establishment of offshore wind farms on marine habitats, fish migration and spawning grounds.	Estonian experts/institutions, including a survey of fish population and spawning grounds and a survey of marine habitats. See chapter 5.2 for more details.
The Kurzeme Planning Region	
The proposed wind farm could have a significant impact on navigation safety, shipping areas in the Baltic Sea, access to Latvian ports and potential risks of marine pollution associated with accidents or collisions between ships, which may have an impact on the Baltic Sea and its habitats.	The EIA addresses the impact on navigation systems, maritime communication systems, shipping, and air and maritime safety. An appropriately detailed risk assessment is part of the EIA.
The creation of a fourth connection between Estonian and Latvia may have an impact on Natura 2000 sites.	The fourth connection between Estonian and Latvia is not part of this project and is not covered by this EIA. The impacts of the connection are assessed, where appropriate, in separately initiated EIA and studies.
The Ministry of Defence of the Republic of Latvia	
Ministry of Defence of the Republic of Latvia states that "the offshore wind farm project "ELWIND (Estonia)" will not have a direct negative impact on the defence interests of the Republic of Latvia. At the same time, it has been established that the construction of the wind farm "ELWIND (Estonia)" has a foreseeable impact on the operation of the Maritime Observation system, affecting the performance of the tasks of the National Armed Forces".	The information has been considered, and the EIA process is being cooperated with both the Estonian and Latvian defense ministries.
LITHUANIA	
The Ministry of the Environment of the Republic of Lithuania stated that Lithuania does not intend to participate in the transboundary consultation process as an impacted party, but: • recommends that the cumulative impact of the offshore wind farm project and other wind farms planned for the Baltic Sea be assessed, as the Elwind project involves both the transmission of electricity to onshore networks and the connection between the Latvia and Estonian transmission networks, • recommends that special attention be paid to the assessment of the impact on migratory birds, • asks for information on the progress of the Elwind project and on solutions for	The fourth connection between Estonian and Latvia is not part of the proposed activity and is not covered by this EIA. The impacts of the connection are assessed, where appropriate, in separately initiated EIA and studies. The assessment of cumulative impacts is a standard part of the EIA. It is carried out at the level of accuracy prescribed in the EIA programme. The cumulative impacts with other wind farms can be assessed if their studies and impact assessments have been completed by the time of the completion of the EIA report of the Elwind wind farm.

Topic in need of attention	*EIA response*
connecting to the electricity networks, if known.	
SWEDEN	
Swedish Agency for Marine and Water Management (HaV) and the Swedish Maritime Administration	
The proposed project will not cause significant transboundary environmental impact for Sweden, and the country needs to continue participating in the process.	The proposal will be taken into account.
BirdLife Sverige	
Studies on both night and day migration of species, etc, are needed and the impact on them must be assessed cumulatively together with other wind farms in the Baltic Sea.	In the course of the EIA, appropriate ornithological studies will be carried out on the offshore wind farm area. The cumulative impacts with other wind farms can be assessed if their studies and impact assessments have been completed by the time of the completion of the EIA report of the Elwind wind farm.
Swedish Pelagic Federation Producer Organisation (SPF)	
The proposed project may have a negative impact on fish stocks, so cumulative impacts on underwater fauna need to be investigated.	Within the framework of the EIA, a survey of fish and spawning grounds, as well as seals, is carried out by recognised Estonian experts/institutions. The assessment of cumulative impacts is a standard part of the EIA. It is carried out at the level of accuracy prescribed in the EIA programme. The cumulative impacts with other wind farms can be assessed if their studies and impact assessments have been completed by the time of the completion of the EIA report of the Elwind wind farm.
The Swedish Meteorological and Hydrological Institute	
A cumulative impact with wind farms in marine areas of Sweden, Estonian, Latvia and other countries	The assessment of cumulative impacts is a standard part of the EIA. It is carried out at the level of accuracy prescribed in the EIA programme. The cumulative impacts with other wind farms can be assessed if their studies and impact assessments have been completed by the time of the completion of the EIA report of the Elwind wind farm.
The county administrative board of Gotland	
The project is located within the range of harbour porpoise in the Baltic Sea. In the Elwind project area, the probability of detecting porpoises is low, but not completely absent. In the absence of	So far, no porpoise has been detected in Estonian waters. With the project SAMBAH 1 (surveys 2011–2013), no porpoise were detected in Estonian waters. The porpoise detection study to

Topic in need of attention	*EIA response*
new studies, it is recommended to adhere to the precautionary principle. There is a need for a prior study of the presence of porpoises in the area.	be carried out under the SAMBAH 2 project from August 2024 to August 2025, also covers the marine area west of Saaremaa. If this project identifies the presence of porpoises in the waters of Saaremaa, the EIA will assess, among other things, the impact on porpoises.
Further analysis should be carried out of the potential impacts on seabirds in the Baltic Sea in general, as well as on seabirds using Sweden Natura 2000 sites such as the Hoburg Bank and Midsjöbankarna. The impacts on populations due to potential disturbances and habitat loss, collisions and barrier effects must be investigated, together with a risk assessment of oil and chemical spills.	In the course of the EIA, appropriate ornithological studies will be carried out on the offshore wind farm area and the impact on the bird population, including risks, will be assessed.
Collisions caused by shipping can cause major negative environmental impacts on Sweden coasts and damage marine life in the Baltic Sea, and proper safety protocols must be drawn up to mitigate the effects of accidents.	An appropriately detailed risk assessment is part of the EIA. Detailed safety guidelines are prepared for the period of construction and of operation, as they relate to the specific construction process and technical solution.
Assess cumulative impacts on migrating animals, winds and currents, together with planned offshore wind farms in the South Baltic Sea and large underwater noise in shipping lanes. It is important to assess the cumulative impacts of all activities that may affect the status of protected species and habitats.	The assessment of cumulative impacts is a standard part of the EIA. It is carried out at the level of accuracy prescribed in the EIA programme. The cumulative impacts with other wind farms or other projects can be assessed if their studies and impact assessments have been completed by the time of the completion of the EIA report of the Elwind wind farm.
FINLAND	
Decides on participation in the EIA process after the publication of the EIA programme.	Noted.

The environmental impact assessment in a transboundary context is organised in accordance with procedure set forth in international agreements, the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo convention) and the Environmental Impact Assessment and Environmental Management System Act. The process of environmental impact assessment in a transboundary context and the involvement are managed by the Ministry of Climate; all relevant notification and feedback documents are provided in Annex 2.

9.4. Publication and consultation of the authorities concerned

The chapter will be fleshed out after the EIA programme has been made public and after the authorities have been consulted.

Annexes

Annex 1. Application for superficies licence. Decision on initiation of superficies licence procedure and EIA (added as a separate file directory)

Annex 2. EIA transboundary notification and feedback (added as a separate file directory)

Annex 3. EIA initiation notification (added as a separate file directory)

Annex 4. EIA programme publication notices (added as a separate file directory)

Annex 5. Views of the authorities concerned and proposals received upon publication and their response letters regarding the EIA programme (to be added as a separate directory)

Annex 6. Materials of the public consultation of the EIA programme (added as a separate file directory)