

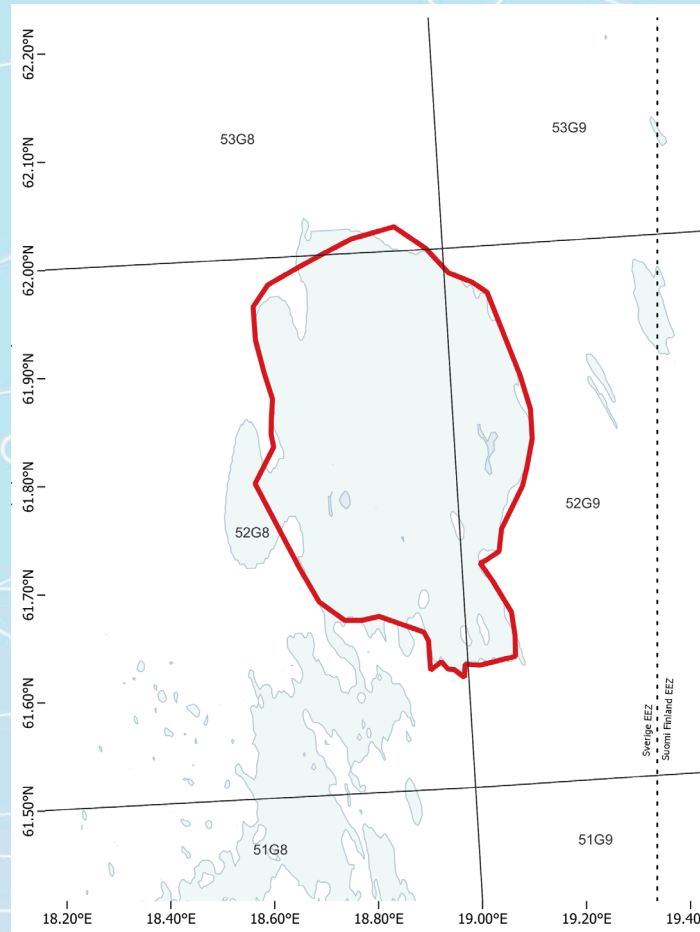
EYSTRASALT
OFFSHORE AB



Eystrasalt Offshore

Bilaga M11B: Eystrasalt Offshore wind farm -
Commercial fishing Questionnaire Results

Vatanen, S. & Helminen, J.



Eyrstrasalt Offshore wind farm - Commercial fishing Questionnaire Results



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Appendix 1. Questionnaire map.

Appendix 2. Questionnaire form in Swedish.

2. Material and methods

A questionnaire was used to document fishing in the project area and in its nearby areas (*i.e.*, in the assumed/possible impact area; hereafter: “the area of interest”; Appendix 1).

A questionnaire (Appendix 2) was sent to Finnish and Swedish fishing operators that had reported catches in 2017–2020 in at least one of the six nearest ICES statistical rectangles of the project area. These statistical rectangles (each approximately 55 x 55 km) were 51G8, 51G9, 52G8, 52G9, 53G8 and 53G9 (Figure 1).

The contact information of the fishing operators was ordered from the Finnish and Swedish fisheries authorities (Dnro KEHA/5887/2021). Based on the received register data, 20 Finnish and eight Swedish fishing operators had reported catches in at least one of the six ICES rectangles in those years.

The questionnaire was focused on the year 2021 and it was written in Finnish and Swedish.

The questionnaire was first mailed to all 28 fishing operators in December 2021. A reminder letter was sent in January 2022 to those who had not responded. If no response was received after the two rounds, the operators were contacted by phone and email.

The operators could respond using mail, email, and phone. Some of the fishing operators were contacted again using phone interviews, to detail their answers.

The questions in the questionnaire focused on fishing intensity and catches, fishing in the planned project area, and the importance of the area for herring reproduction. The fishing operators were also instructed to mark their fishing areas on a map. The full questionnaire in Swedish is included in the Appendix 2.

3. Responses

Finnish trawlers

A total of 10 fishing operators responded to the questionnaire (50 % of the whole population), of which six indicated they had been fishing (Table 1) in the area of interest (*i.e.*, in the area shown in the map in Appendix 1). Four operators said they do not fish in that area.

The rest of the fishing operators were not reached by mail, email, or phone. In the case of four fishing operators, only a secretary of the company was reached. The secretary had forwarded the questionnaires within the company but responses from these companies were never received.

The results in this report are based on the six trawlers who had responded and indicated fishing in the area.

Table 1. The number of Finnish trawlers who had reported catch, the number of responses, and the number of vessels that fish in the area.

| | |
|---|----------|
| Population (the number of trawlers who had reported catch in the ICES rectangles) | 20 |
| Responses | 10 |
| Number of vessels that fish in the area of interest | 6 |

Swedish trawlers

Only one Swedish fishing operator responded to the questionnaire and indicated fishing in the area of interest. In addition, Malin Skog from Swedish Pelagic Federation (SPF) was interviewed on February 15th 2022. SPF represents all Swedish >12 m pelagic fishing vessels that fish in the area (Table 2). Malin Skog reported that six trawlers have interest on fishing in the area.

The results in this report regarding Swedish trawlers are mainly based on the interview.

Table 2. The number of Swedish trawlers who had reported catch, number of responses, and the number of vessels that fish in the area.

| | |
|---|----------|
| Population (the number of trawlers who had reported catch in the ICES rectangles) | 8 |
| Responses, combined in one interview | 8 |
| Number of vessels that fish in the area of interest | 4 |
| Number of vessels that have plans to fish in the area of interest | 2 |

4. Results

4.1 Finnish trawlers

The six fishing vessels that had reported fishing in the area of interest were owned by four different owners. These vessels had fished in the area of interest and also elsewhere in the Bothnian Sea in 2018–2021.

A total of 55 employees worked in the four fishing companies (14 per company, on average), and 43 of those employees worked at a trawler (7 per vessel). The annual sales of the companies in 2018–2021 was approximately 8–9 million euros (approximately 2 million per company, on average).

The home ports and landing locations of the Finnish trawlers were Kaskinen (Kaskö), Uusikaupunki (Nystad), and Pori (Björneborg) (Figure 2). In addition, two trawlers had landed their catch also in Norrsundet, Sweden. A typical fishing trip was 3–4 days and the travel from harbor to the trawling locations was approximately 5–8 hours.

Five of the trawlers reported that they spend 10–25 % of their fishing time in the area of interest. For one trawler, however, the area of interest was the most important fishing location, and they reported spending 70 % of their fishing time there.

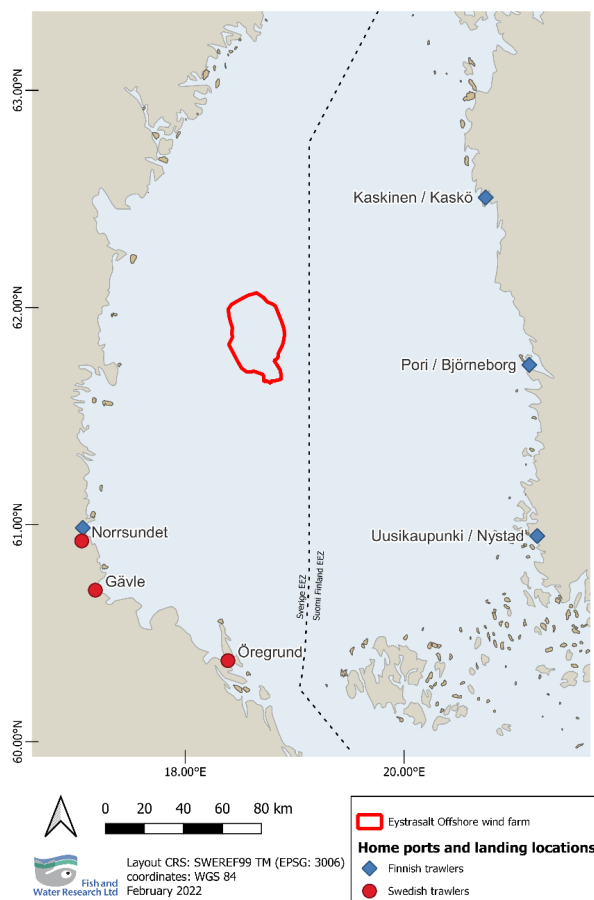


Figure 2. The home ports and landing locations of the Finnish and Swedish trawlers in the Bothnian Sea.

Fishing and catch data were reported by four fishing companies that represented six vessels. The following information is based on the responses of the four companies.

Fishing effort and trawl types

The fishing in the area was bottom trawling, midwater trawling, and trawling near the surface. In practice, bottom trawling is used during the daytime when the fish are near the bottom. Bottom trawling is used when the water depth is from 50 m up until more than 100 m. The trawler that fishes the area of interest the most said the bottom trawling locations are at 65–90 m depths.

The herring move to midwater at night and the trawlers typically switch to midwater trawling, sometimes also to trawling near the surface. Midwater trawling is possible also at shallower areas (water depth approximately 40 m and deeper), because the bottom type does not influence fishing as much.

In total, there were 327 bottom trawling, 148 midwater trawling, and 20 near surface trawling fishing unit effort (the number of fishing days times the number of trawls) reported in the area of interest in 2021.

Bottom trawling was used between the months of August and May, and the most active months were between September and March (Table 3). Midwater trawling was used in similar months, although it was used much less than bottom trawling in March and April, and it was not used in May.

Trawling near the surface was only used in October and November.

Most of the trawlers reported that the most important months were all months between September and May, and for one trawler the most important time was from October to December.

Table 3. The monthly trawl unit effort (the number of fishing days times the number of trawls) in 2021 based on the Finnish trawler responses.

| Trawl type | Month | | | | | | | | | | | | Total |
|--------------|-------|----|----|----|----|---|---|---|----|----|----|----|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| Near Surface | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 0 | 20 |
| Midwater | 25 | 25 | 5 | 5 | 0 | 0 | 0 | 3 | 15 | 25 | 25 | 20 | 148 |
| Bottom | 35 | 45 | 30 | 25 | 15 | 0 | 0 | 7 | 30 | 40 | 50 | 50 | 327 |

Fishing areas

Most of the trawl fishing areas were located on the west and east side of the project area. Some trawling was also reported in the project area and on the sides of the project area (Figure 3).

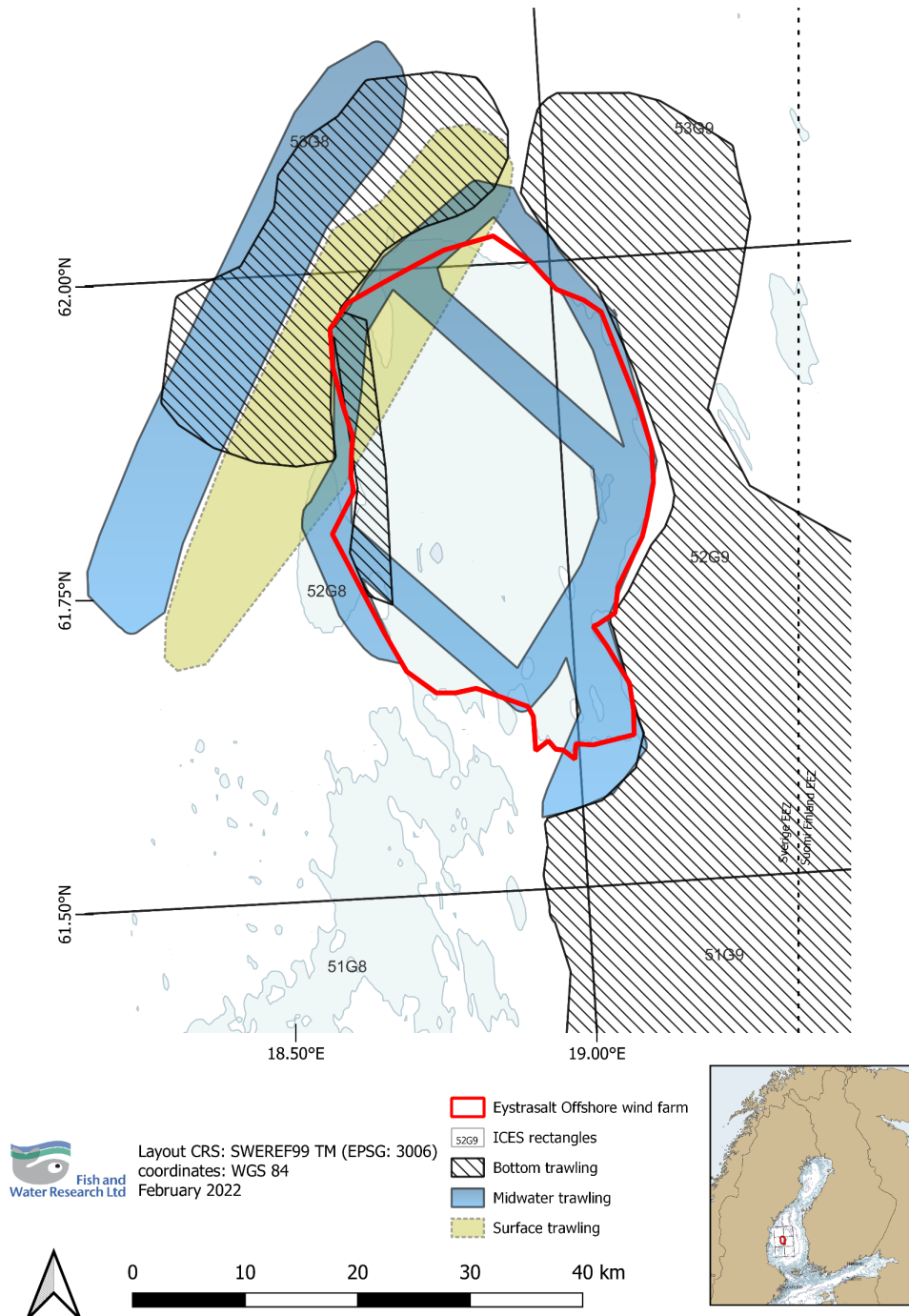


Figure 3. The reported fishing locations of Finnish trawlers based on the questionnaire responses, separately for bottom trawling, midwater trawling, and trawling near the surface.

Catch

The reported catch from the project area of interest was almost only herring and the share of sprat was very small (Table 4). The trawlers that responded to the questionnaire reported a total catch of approximately 9 000 000 kg. Most of the fish were caught between the months of September and May (Table 4). Sprat were caught in the same months as herring.

Table 4. The catch by the Finnish trawlers (in tonnes) in the area of interest based on the questionnaire responses.

| | month | | | | | | | | | | | | Total |
|---------|-------|------|-----|-----|------|---|---|-----|-----|-----|-----|-----|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| herring | 1100 | 1200 | 900 | 500 | 1000 | 0 | 0 | 100 | 500 | 600 | 600 | 100 | 9200 |
| sprat | 15 | 15 | 20 | 30 | 70 | 0 | 0 | 5 | 5 | 10 | 10 | 5 | 191 |

The fishing operators reported that the average size of herring in the area of interest is larger than elsewhere in the Bothnian Sea. The area is mostly used for catching herring for human consumption that has a higher value than herring that is used as animal feed. Because of this, the area is considered important and irreplaceable by the Finnish fishing operators.

Other fish species were reported as bycatch. These species were three-spined stickleback (*Gasterosteus aculeatus*, SWE:“storspigg”, FIN:“kolmipiikki”) or other sticklebacks, fourhorn sculpin (*Myoxocephalus quadricornis*, SWE:“hornsimpa”, FIN:“härkäsimppu”) and other sculpins, smelt (*Osmerus eperlanus*, SWE:“nors”, FIN:“kuore”), Atlantic mackerel (*Scomber scombrus*, SWE:“makrill”, FIN:“makrilli”), Atlantic cod (*Gadus morhua*, SWE:“torsk”, FIN:“turska”) and Atlantic salmon (*Salmo salar*, SWE:“lax”, FIN:“lohi”).

Other notes

When asked about the importance of the area of interest for fishing, all Finnish trawlers reported that the area is important due to the large size of herring in the area. The largest (average size) herring in the Bothnian Sea are caught near the planned project area. The large herring can be used for human consumption and therefore has a higher value than herring that is used as animal feed (Table 5). As an example, one of the fishing operators mentioned that the price of herring used for fillets is approximately 0.8 € / kg.

The responders state that because the value of the area for fishing is based on the large average size of the herring, other areas of similar importance do not exist. There are no other areas, where the average size would be as large. One of the trawlers also reported they will be targeting more large herring in the future, as they will be focusing on providing more herring for human consumption.

Table 5. The monthly average price (euros/kg) of herring used for human consumption and for industrial use in 2020 on the Finnish coast. (Data from Natural Resources Institute Finland statistical services, 16.2.2022)

| Use | Month | | | | | | | | | | |
|-------------------|-------|------|------|------|------|------|------|------|------|------|--|
| | 1 | 2 | 3 | 4 | 5 | 8 | 9 | 10 | 11 | 12 | |
| Human consumption | 0,30 | 0,34 | 0,36 | 0,31 | 0,25 | - | 0,77 | 0,44 | 0,39 | 0,37 | |
| Industrial use | 0,18 | 0,18 | 0,18 | 0,18 | 0,19 | 0,19 | 0,19 | 0,17 | 0,19 | 0,19 | |

The planned project area was also reported to be an important spawning area for herring. Two trawlers responded to this question, and both assessed the importance of the area for reproduction of herring as “very high”. The area of interest was mentioned as a good, shallow area for herring spawning and the large size of herring was also thought to indicate the importance of the area for herring reproduction.

Two responders also gave their overall opinion of the Eystrasalt wind farm. Both reported a negative opinion and mentioned the importance of the area for trawl fishing and for herring reproduction. They are afraid that building of the wind farm would put both (fishing and herring reproduction) at risk.

All of the responders indicated that building of the wind farm would greatly impact trawl fishing. The impacts to trawl fishing were especially related to the importance of the area for herring reproduction. They state that herring reproduction would be in danger, especially during the building phase of the wind farm. Some of the operators mentioned that the fishing locations are directly in the planned project area, and some mentioned that traveling in the area will become very difficult

The impact of the wind farm to the travel routes of the fishing operators was estimated very high by three operators and small by one operator. The responders mentioned that the travel time to fishing areas will increase approximately by two hours if it is not possible to travel through the project area.

The operators were also worried that the power cables between the wind farm and mainland will be placed in their bottom trawling areas.

4.2 Swedish trawlers

The four trawlers that had fished in the area of interest all belonged to different owners. In addition, two vessels have plans to fish in the area in the future. A total of 40–50 employees work in the six vessels.

The home ports in the Bothnian Sea are Gävle, Norrsundet, and Öregrund (Figure 2). They also have home ports south of the Gulf of Bothnia (in Stockholm and near Gothenburg). The vessels land their catch mainly in the Norrsundet harbor. Sometimes they also land their catch in Finland, Estonia, Latvia, and Denmark.

Fishing effort and trawl types

Exact catches or fishing times of the trawlers in the research area of interest were not reported. Two of the trawlers fish in the Bothnian Sea throughout the year while four of the trawlers also have quota in other areas (e.g., in the Main Baltic Sea) and thus they only fish in the Bothnian Sea periodically.

Typically, the most important time for fishing in the area is in the winter, but the timing of fishing varies for many reasons. The one vessel that responded to the questionnaire reported autumn and winter as the most important seasons.

Fishing areas

In the area of interest, the reported fishing locations were the south-southeastern and western side of the project area (Figure 4).

Overall, Swedish trawlers do not currently use the area of interest very much for fishing, but they see it as a potential location in the future.

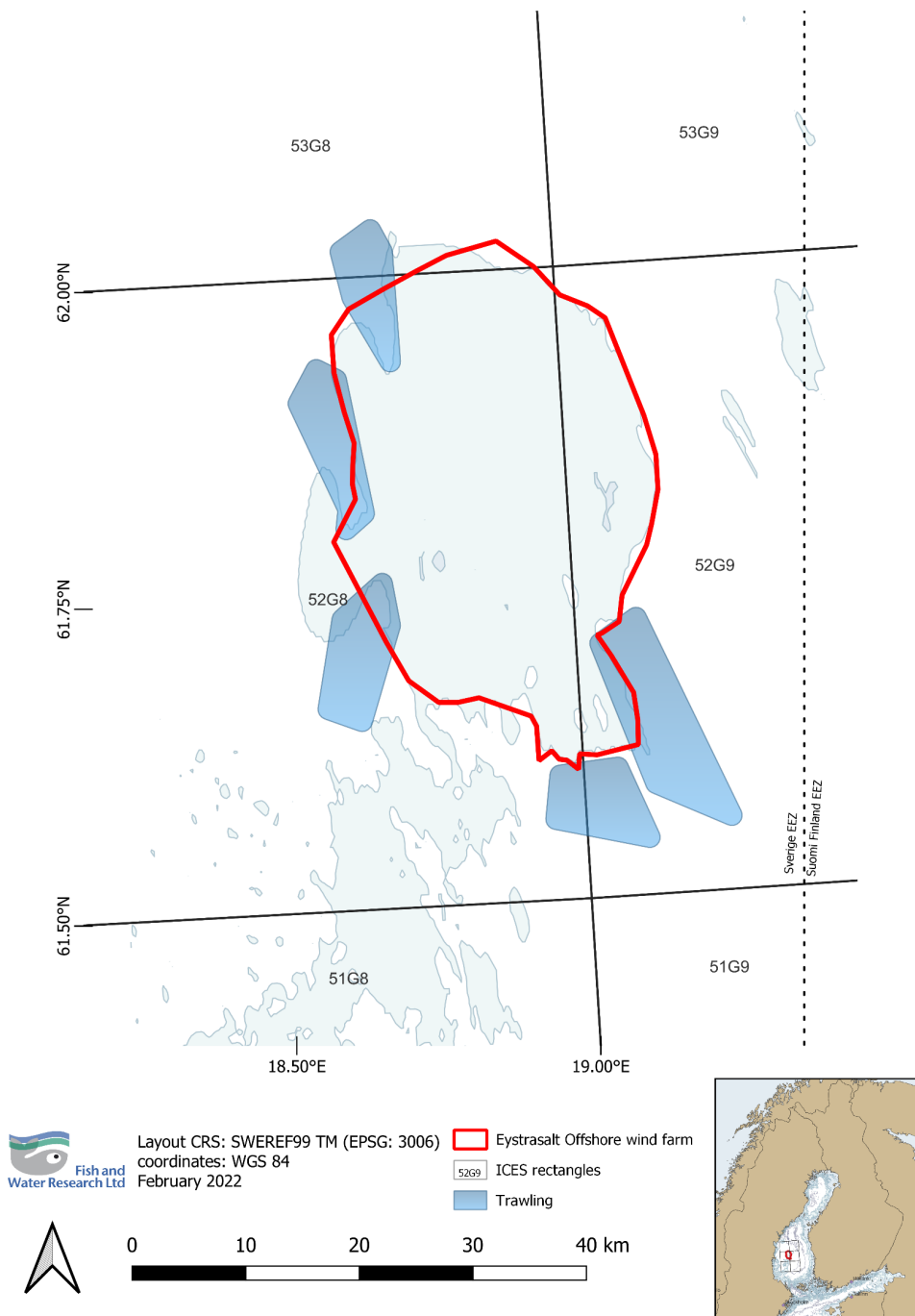


Figure 4. The reported fishing locations of Swedish trawlers based on the questionnaire responses.

Other notes from the responses

The importance of the area of interest as a spawning area of herring was highlighted. This was mentioned for both spring and autumn spawning herring, but especially for the autumn spawning herring; it was mentioned that the autumn spawning herring may spawn further from the coast than spring spawning herring.

In the responses, the importance of the area for herring spawning was estimated to be so large that it controls the whole herring population in the Bothnian Sea, and that way also impacts all fishing in the Bothnian Sea.

The Swedish trawlers had a negative opinion about the project. This was especially because of the importance of the area for herring reproduction. The importance of the area for fishing was also mentioned; all other fishing areas are already being used and therefore building a wind farm will decrease the overall size of the available fishing areas.

The one trawler that responded directly to the questionnaire suggested building the wind farm outside of the fishing areas (*i.e.*, as a smaller area than the current plan). In addition, they suggested, that if the wind farm is to be built, it should be built to as shallow areas as possible (less than 40 m water depth).

The fishing operators find it difficult that multiple wind farms are currently, and at the same time, planned in many shallow locations offshore.

5. Summary

Eystrasalt Offshore AB is planning an offshore wind farm in the Eystrasalt bank in the Swedish EEZ. The distance from the project area to the EEZ of Finland is 13 km. The distance to the Finnish coast is approximately 100 km and the distance to the Swedish coast is approximately 60 km. The planned area is 949 km² and the water depth in the area varies between 12 m and 62 m.

This report is part of the EIA-process. To support the impact assessment of the wind farm, trawl fishing in and near the area by the Finnish and Swedish fishing operators is documented.

A questionnaire was used to document commercial fishing in the area. The questionnaire was sent to all Finnish and Swedish trawlers who had reported catches in at least one of the six nearest ICES rectangles 51G8, 51G9, 52G8, 52G9, 53G8, and 53G9 in 2017–2020. The questionnaire was focused on the year 2021 and it was written in Finnish and Swedish.

The contact information of the fishing operators was received from the fisheries authorities' registers. Based on the register information, 20 Finnish and eight Swedish trawlers had reported catches in at least one of the six ICES rectangles.

The questionnaire was mailed, and the fishing operators were also contacted by email and phone, if they had not responded to mail. Additional questions were asked on phone from those fishing operators that fish in the area, and an interview was held with the Swedish Pelagic Federation that represents all the Swedish trawlers.

Based on the questionnaire, at least six Finnish trawlers fish in the project area or in its nearby areas (*i.e.*, "the area of interest"). One of the Finnish trawlers reported that they get 70 % of their catch in the areas near the planned project area. The other Finnish trawlers use the area 10–25 % of the time.

Six Swedish trawlers also reported interest in the area. In the current state, however, the area is used much more by the Finnish trawlers than the Swedish trawlers.

A total of 55 employees worked in the Finnish fishing companies that had combined sales of 8–9 million euros. Between 40 and 50 employees work in the Swedish fishing companies.

Bottom trawling, midwater trawling, and trawling near the surface were all used in the area of interest. In practice, bottom trawling is used in the daytime when the fish are near the bottom. Bottom trawling is used at depths from 50 m to over 100 m. At night, herring move to midwater, and the trawlers switch to midwater trawling and may also target locations closer to the project area.

The area is used for fishing between the months of August and May. Little fishing was reported in the planned project area, but the most important fishing areas are on the west and east side of the project area (Finnish trawlers) and west and south-southeast side of the project area (Swedish trawlers).

Almost all of the catch in the area of interest was herring, but a small amount of sprat was also reported. The total catch of the Finnish trawlers that responded was approximately 9 000 000 kg. The information of the catches of Swedish trawlers could not be collected using a questionnaire.

The Finnish trawlers reported that the importance of the Eystrasalt area for fishing is due to the large size of herring in the area. The area is used mostly for catching large herring for human consumption that has a higher value than smaller herring that is used for animal feed. The area is therefore considered important and irreplaceable by the Finnish fishing operators.

The trawlers reported the project area as an important spawning habitat for herring. The Eystrasalt bank was estimated to be so important for herring spawning that it controls the whole herring population of the Bothnian Sea. Through that mechanism, it also controls fishing success in the Bothnian Sea.

The overall opinion of the trawlers on the Eystrasalt wind farm was negative. The reasons were related to the importance of the area to trawl fishing and spawning success of herring, and they are afraid both of them are in danger if the wind farm is built. Further, they assume that building of the wind farm will complicate traveling in the area and are worried about that the power cables will be placed in their bottom trawling areas.

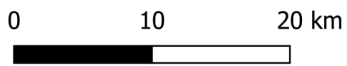
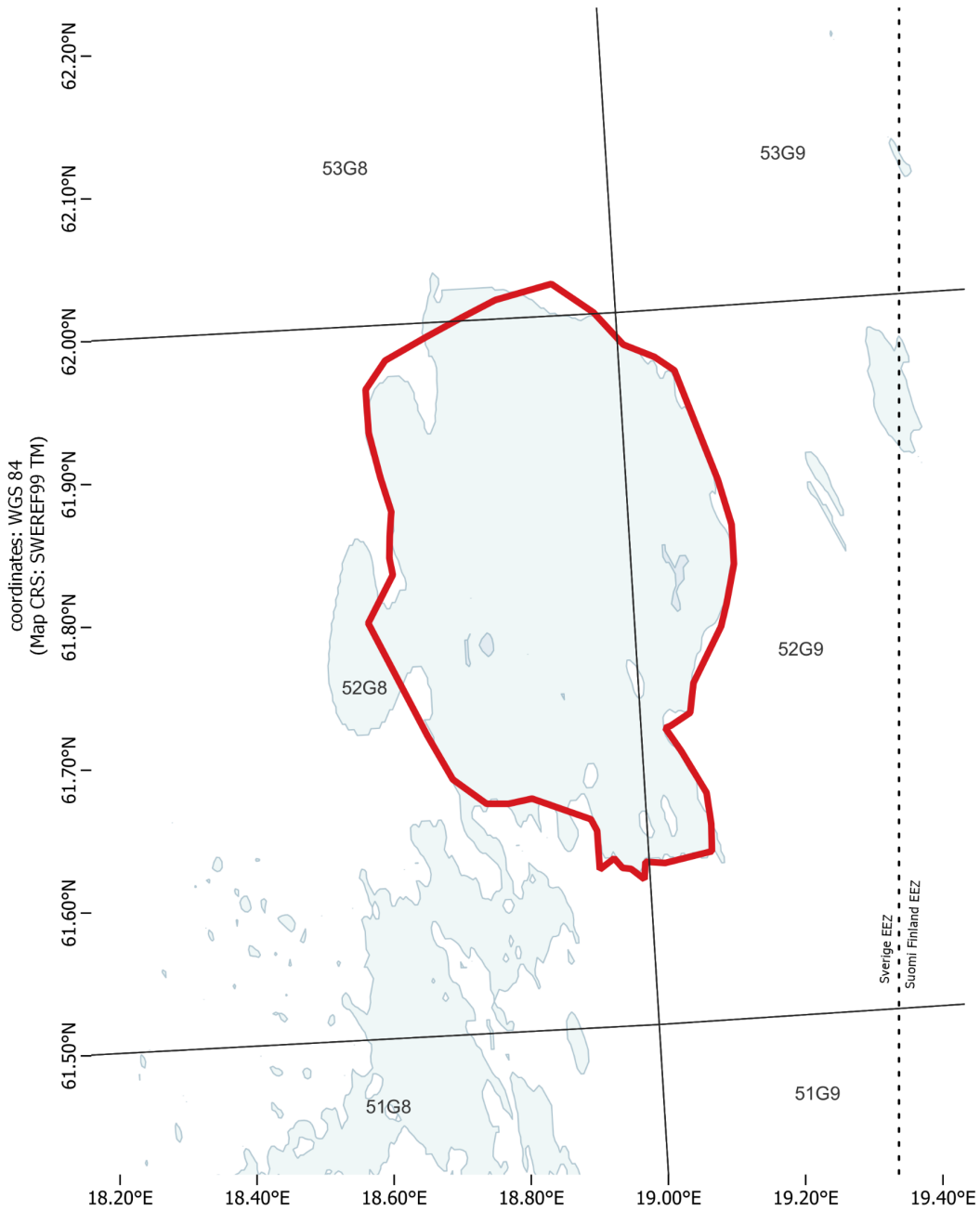
6. Conclusions

- The planned Eystrasalt windfarm project area and especially the deeper areas just outside the borderlines of the project area are important for trawlers.
- The area is used mainly for bottom and midwater trawling in the autumn, winter, and spring.
- The importance of the area for trawlers is especially related to the large sized herring that is found in the area and is used for human consumption. The value of such herring is considerably higher than of the herring that is used for animal feed.
- Currently, the area is used much more by the Finnish trawlers than the Swedish trawlers. The Swedish trawlers, however, see great potential in the area.
- The fishing operators report that the planned project area is an important spawning habitat for herring.
- The overall opinion of the trawlers on the Eystrasalt wind farm was negative.

7. Literature

Helminen, J. & Vatanen, S. 2022. Eystrasalt Offshore wind farm – Commercial fishing catches and trawl locations using Vessel Monitoring System (VMS) data. Fish and Water Research no. 331. 30 p. + 1 appendix.

Appendix 1. Questionnaire map.



Eyrasalt Offshore Wind Farm
 ICES rectangles

Merkitse tiedustelualueen troolilinjat troolausmuodoittain karttaan seuraavasti:
 Märk ut era tråningslinjer enligt redskap (bragd) på kartan enligt följande:

| | | | | | |
|-----|---------------------------|---|---------------------------|-----|----------------------------------|
| o⇔o | pintatrootli flyt-trål | ⇔ | pohjatrooli bottentrål | X⇔X | välivesitrootli midvattentrål |
|-----|---------------------------|---|---------------------------|-----|----------------------------------|



Appendix 2. Questionnaire form in Swedish

Trålningsenkät rörande Eystrasalt Offshores omgivning

FISKARE ELLER FISKEFÖTERAG (trålare)

1. Namn/fartygets namn _____

Adress _____ Telefon _____

E-post _____

2. Fiskade ni inom det berörda området under år 2018–2021 (se bifogad karta) och/eller annanstans i Bottenhavet? Kryssa för korrekt alternativ.

| | Trålfiske inom området | Trålfiske annanstans i Bottenhavet | Jag fiskade inte med trål i Bottenhavet | Annat fiske inom området |
|---------|------------------------|------------------------------------|---|--------------------------|
| År 2018 | | | | |
| År 2019 | | | | |
| År 2020 | | | | |
| År 2021 | | | | |

Om ni inte utförde kommersiellt fiske inom det berörda området under åren 2018-2021 behöver ni inte fylla i blanketten ytterligare. Vänligen returnera blanketten i vilket fall i det bifogade kuvertet eller meddela oss om saken antingen via SMS (+358-50-3138330) eller epost: (sauli.vatanen@kalajavesitutkimus.fi).

DELTAGARE I FISKET OCH OMSÄTTNING

3. Hur många personer arbetar inom ert företag och hur många personer arbetar på trålaren (trålarens besättning)?

| Antal personer som arbetar på företaget | Antal personer som arbetar på trålaren (besättningen) |
|---|---|
| | |

4. Ert trålfiskes (ert företags) omsättning i svenska kronor (SEK).

| | Ert trålfiskes omsättning i SEK (allt trålfiske) | Hur stor andel uppskattar ni att omsättningen av trålfisket på det undersökta området utgör av ert företags (ert trålfiskes) totala omsättning (i %)? |
|---------|--|---|
| År 2018 | | |
| År 2019 | | |
| År 2020 | | |
| År 2021 | | |

FÅNGSTPLATSER PÅ OMRÅDET (området är det på den bifogade kartan utmärkta området)

5. Märk ut era trålningslinjer enligt redskap (bragd) på kartan enligt följande:

o⇔o flyt-trål

|⇔| bottentrål

X⇔X midvattentrål

6. Trålarens hemmahamn: _____

Var lossar ni fångsten från trålaren: _____

FISKE INOM DET OVANNÄMNDNA OMRÅDET PER MÅNAD ÅR 2021

7. Uppge antalet fångstdygn (d) inom området per månad i tabellen nedan.

| | m å n a d | | | | | | | | | | | |
|---------------|-----------|----|----|----|----|----|----|----|----|----|----|----|
| | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| Flyt-trål | | | | | | | | | | | | |
| Midvattentrål | | | | | | | | | | | | |
| Bottentrål | | | | | | | | | | | | |

FÅNGST

8. Skriv in er **fångst (ton) per art och månad år 2021** i tabellen nedan. Uppskatta årsfångsten om ni inte har tillgång till fångstuppgifter per månad.

| | månad | | | | | | | | | | | | Årsfångst |
|-----------|-------|----|----|----|----|----|----|----|----|----|----|----|-----------|
| | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | |
| Strömning | | | | | | | | | | | | | |
| Skarpsill | | | | | | | | | | | | | |

9. Vilka andra fiskarter (bifångsten) får ni med trål inom området?

10. Vilken är den viktigaste tidpunkten för trålfiske inom området?

11. Vad har det berörda området för betydelse för ert trålfiske? Finns alternativa områden som kan användas för trålfiske tillgängliga?

12. Har ni sett spår av tunnor eller annat skräp på havsbotten då ni trålat inom området? Om ni har det, sätt kryss på den bifogade kartan och berätta vad ni observerat här under.

13. Hur uppskattar ni att ert fiske kommer utvecklas de kommande fem åren (kryssa för)

- Fisket förblir oförändrat
 Fisket förändras, hur?

14. Hur förhåller ni er till projektet Eystrasalt Offshore (kryssa för)?

- Positivt
 Neutralt
 Negativt

Motivera ert förhållande till projektet:

15. Har ni erfarenhet av hur andra vindkraftparker till havs påverkar trålfisket och omgivningens fiskstammar, eller har ni hört om andra trålfiskares erfarenheter?

16. Hur stor betydelse tror ni att projektområdet har som fortplantningsområde för strömming och andra fiskarter enligt skalan 1 – 5 (1 = ingen betydelse, 2 = liten betydelse, 3 måttlig betydelse, 4 stor betydelse och 5 = mycket stor betydelse). Motivera ert svar.
