Institut für Seefischerei (TI-SF)

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Report
Cruise SO 838 of FRV „SOLEA“
22.07. – 31.07.2024

Chief scientist: Dr. Vanessa Stelzenmüller

Objectives

- Participation in the German Small-Scale Bottom Trawl Survey (GSBTS) to monitor the fish fauna in 5 out of 12 small areas (boxes),
- Investigation of the hydrographical conditions within the boxes (vertical distribution of temperature, salinity and turbidity).
- Monitoring brown crab (*Cancer pagurus)* in the vicinity of selected offshore wind parks located in the German EEZ

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Verteiler:

Schiffsführung FFS „Solea“ „Walther Herwig III“
BA für Landwirtschaft und Ernährung (BLE) Fischereiforschung
BM für Ernährung und Landwirtschaft (BMEL), Ref. 614
BA für Seeschifffahrt und Hydrographie (BSH), Hamburg
Deutscher Angelfischerverband e.V.
Deutsche Fischfang-Union, Cuxhaven
Deutscher Fischereiverband Hamburg
Doggerbank Seefischerei GmbH, Bremerhaven
Erzeugergemeinschaft der Deutschen Krabbenfischer GmbH
Euro-Baltic Mukran
GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel
Kutter- und Küstenfisch Sassnitz
LA für Landwirtschaft, Lebensmittels. und Fischerei (LALLF)
LFA für Landwirtschaft und Fischerei MV (LFA)
Landesverband der Kutter- u. Küstenfischer MV e.V.
Leibniz-Institut für Ostseeforschung Warnemünde
Thünen-Institut - Institut für Fischereiökologie
Thünen-Institut - Institut für Seefischerei
Thünen-Institut - Institut für Ostseefischerei
Thünen-Institut - Pressestelle
Thünen-Institut - Präsidialbüro
Thünen-Institut - Reiseplanung Forschungsschiffe, Dr. Rohlf
Fahrtteilnehmer*innen

1. Narrative

GSBTS 2024 was originally scheduled to run from 22.07.2024 - 11.08.2024. FRV “Solea” left Cuxhaven on the 22.07.2023 and started the scientific program on the 23.07.2024 with three trawls conducted within Box E before a severe winch damage prevented the continuation the trawled fishery (see Fig.1.1). These massive technical problems prevented the continued use of trawl gear and the whole cruise programme focused therefore only on passive fishing with pots targeting brown crab (*Cancer pagurus*). On the following day crab pots were set and after 24 h collected. Hence, pot fishing was continued between the 24.07.2024 and the 31.07.2024. In total, 26 pot stations have been sampled. FRV "Solea" had to be taken to the shipyard and therefore returned to the port of Cuxhaven on 31.07.2024.

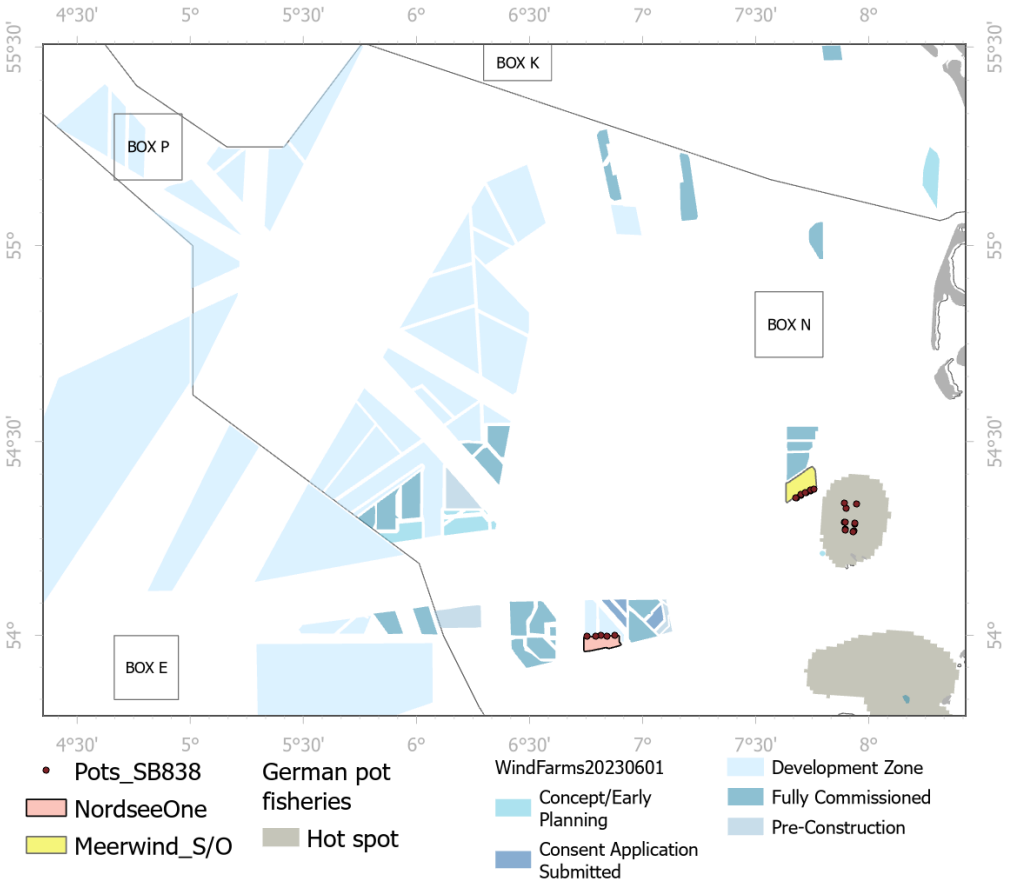

Figure 1.1. Locations of set crab pots (red dots) of SO838 from 22.07 - 31.07.2024. The pink polygons marks the borders of the offshore windfarms “North Sea One“ and the yellow polygon indicates the borders of the windfarm Meerwind Süd/Ost”.

2. Results

2.1. Monitoring of brown crabs in the vicinity of two offshore wind parks

A total of 26 pot chains (with 5 pots each) were set and retrieved on five days (Table 2.1.1) catching 368 brown crab (133 females and 235 males) and 15 lobster (Homarus vulgaris; 6 females and 9 males). The total soaking time of the pots ranged between 1244 min and 1633 min, with an average of 1440 min (24h) (Table 2.1.2). The minimum, mean and maximum carapace lengths of crabs were 68.5 mm, 146.2 mm and 198.5 mm, respectively (Figure 2.1.1).
Catches of brown crab were highest within the sampled German pot fisheries hot spot and the southern border of OWP “Meerwind Süd/Ost”, followed by comparatively low catches along the northern border of the OWP North Sea One (Figure 2.2.2). The same general pattern can be observed for lobster. The brown crab cpue ranged between 1.4 kg and 17.5 kg per station (comprising five pots each) (Table 2.1.2).
All brown crabs were marked by attaching a plastic tag to the carapax. However, none of the tagged individuals were reported to have been caught by commercial fishing vessels and none of the tagged individuals were recaptured during the survey.

Table 2.1.1. Overview on pot fishing operations during SO838.

Set date	# stations	mean depth [m]	mean soaktime [min]
2024-07-24	6	24.75	1569
2024-07-25	5	24.64	1293
2024-07-28	5	29.9	1482
2024-07-29	5	24.58	1446
2024-07-30	5	24.52	1399

Table 2.1.2. Summary of brown crab catches during SO838.

station_date	total cpue [g·24h^{-1}]	mean cpue [g·24h^{-1}]	# total number	mean carapax width [mm]
5_20240724	8880.5	592.0	15	157.2
6_20240724	16183.1	415.0	39	142.7
7_20240724	10883.3	473.2	23	149.5
8_20240724	9360.9	468.0	20	148.2
9_20240724	10354.2	493.1	21	152.8
10_20240724	8188.5	409.4	20	147.0
11_20240725	15444.2	468.0	33	146.0
12_20240725	5994.2	666.0	9	155.8
13_20240725	13591.5	590.9	23	151.8
14_20240725	8540.2	474.5	18	140.9
15_20240725	17541.6	626.5	28	152.2
16_20240728	3131.0	391.4	8	144.9
17_20240728	1753.6	250.5	7	125.8
18_20240728	2366.1	591.5	4	164.8
19_20240728	4363.2	436.3	10	140.0
20_20240728	811.7	405.9	2	143.0
21_20240729	4897.5	612.2	8	145.3
22_20240729	2295.1	382.5	6	131.0
23_20240729	4854.3	441.3	11	139.8
24_20240729	2907.4	484.6	6	144.3
25_20240729	2845.3	355.7	8	133.3
26_20240730	6135.7	511.3	12	149.6
27_20240730	1378.5	344.6	4	126.5
28_20240730	5526.7	425.1	13	138.4
29_20240730	3825.5	478.2	8	144.6
30_20240730	5970.2	497.5	12	145.0

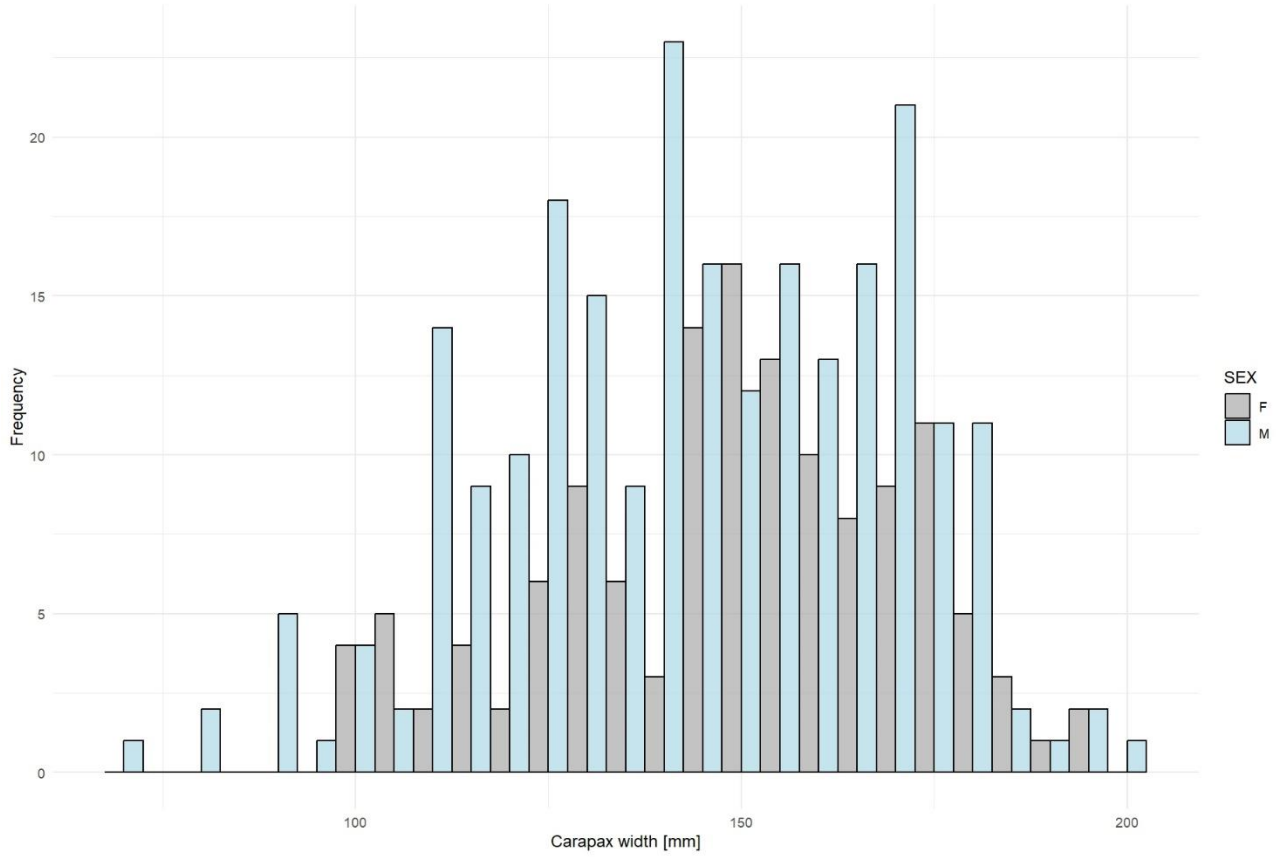

Figure 2.2.1. Length-frequencies of female (N=133) and male (235) brown crabs caught during SO838.

The average mean carapace width of brown crab was 149.5 mm (± 22.7 mm S.D.) for females and 144.25 mm (± 25.01 mm S.D.) for males (Figure 2.2.1). The average weight of females was 446.58 g (± 188.8 g S.D.) and the average weight of males was 499.25 g (± 258.6 g S.D.). The lightest individual was a male and weighed 54 g with a carapace width of 68.5 mm. The heaviest individual was also a male weighing 1,406 g with a carapace width of 197 mm.
At any given carapace width males were generally heavier than females and also the observed size and weight range was higher for males than for females (Figure 2.2.3).

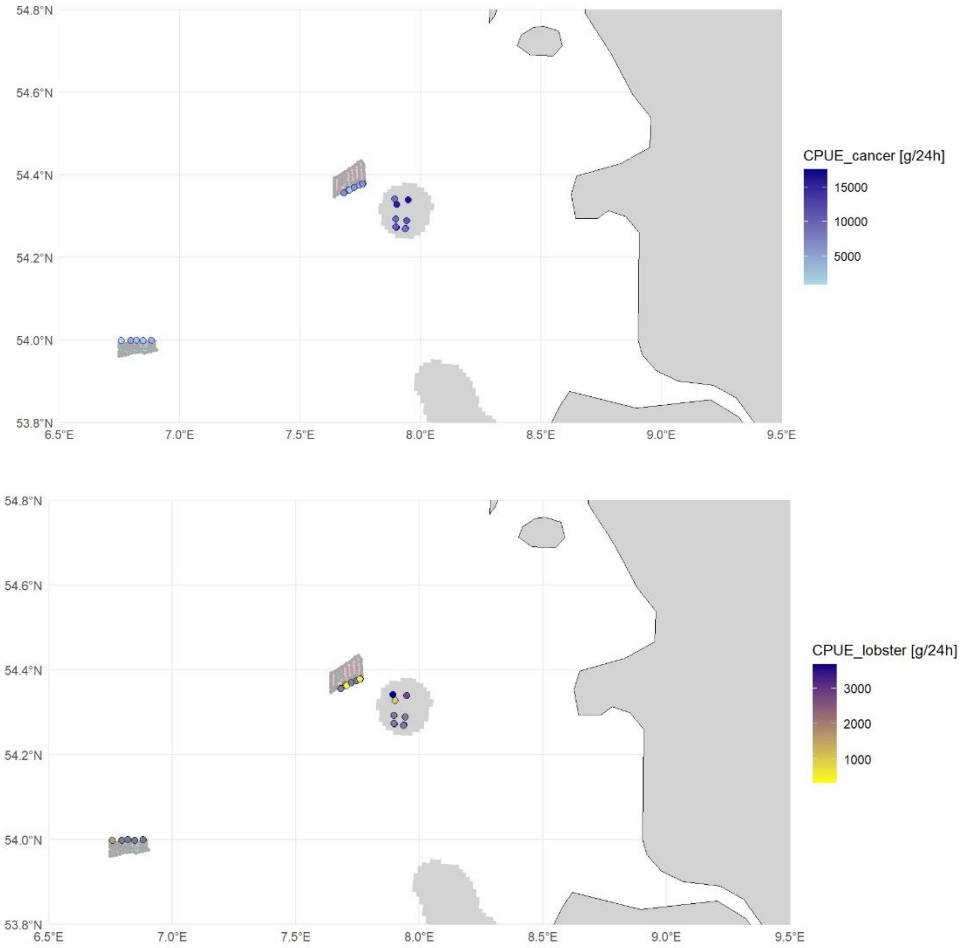

Figure 2.2.2. Distribution of brown crab (top) and lobster (bottom) catch-per-unit-effort (CPUE; kg) along the offshore windfarms “Meerwind Süd/Ost” and North Sea One as well within the German pot fisheries hot spot.

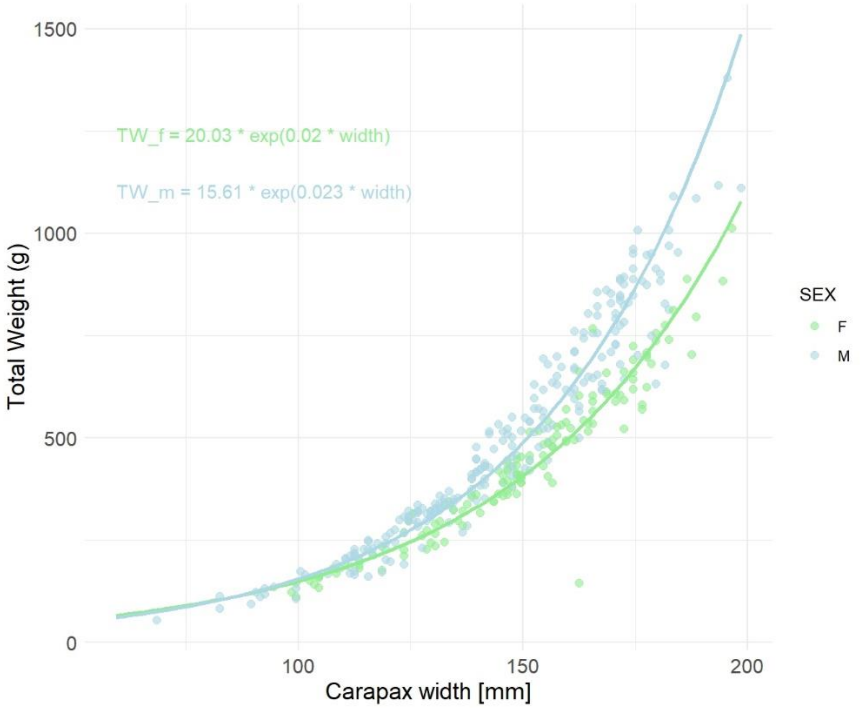

Figure 2.2.3. Carapax width-weight relationships for male and female brown crab.

Personnel

Name	Role	Affiliation
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Dr. Torsten Schulze (2nd PT)	Fisheries biology	TI - SF
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Noah Schön	Fisheries biology	TI - SF

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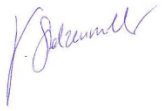

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