Draft of the final environmental investigation framework for the investigation programme of the protected species benthos, fish, seabirds and resting birds, marine mammals and migratory birds of the OWP project “N-11.2“ and “N-12.3” during the baseline survey (as at 3 February 2025)*

*This document has been machine-translated into English. In case of differences between the German and the English version of the document, the German version shall be authoritative.

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By e-mail to:

BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

Rostock office

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Ladies and Gentlemen,

I am enclosing the final draft of the ecological investigation framework for the joint cluster monitoring of the wind farm projects "N-11.2" and "N-12.3" (wind farm cluster "N-11_N-12 II") from the beginning of 2025 to the beginning of 2027. This is based on the standard "Investigation of the impacts of offshore wind turbines on the marine environment (StUK4)" (Federal Maritime and Hydrographic Agency 2013) for planning approval procedures in accordance with the Wind Sea Act.

The final scope of the draft is issued on the basis of the current legal situation, in particular the current status of the Wind Energy at Sea Act. Accordingly, an environmental impact assessment must be carried out. I would like to draw attention to the legislative process currently underway regarding the Offshore Wind Energy Act, among other things, which could lead to changes in the legal situation.

1. Introduction

If different projects are operated in a natural spatial and temporal context, the StUK 4 (Federal Maritime and Hydrographic Agency 2013) stipulates that the investigations should be carried out jointly by the projects (cluster investigation). For the benthos, the investigations must be carried out individually in the respective project areas. The reference areas can be used jointly by several project sponsors.

The "N-11_N-12 II" wind farm cluster is located in an area in which only a few environmental investigations have taken place to date as part of the preliminary area investigation in accordance with StUK4.

As the projects "N-11.2" and "N-12.3" are located in the immediate vicinity of each other, there is a significant overlap of the study areas due to the requirements of the StUK4. In order to avoid annual multiple investigations in an identical investigation area

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In order to avoid the risk of a cluster study, a joint investigation programme is planned between the neighbouring wind farms.

The overall concept pursues the following objectives, among others:

1. Avoidance of overlapping survey areas of neighbouring projects with simultaneous coverage of the required survey areas; avoidance of multiple aerial surveys of the same survey area.

2. At the same time, by equalising the study areas, it is possible to extend the study area in order to obtain information on the large-scale occurrence and distribution of birds and marine mammals.

3. Gaining a standardised, comprehensive data basis for the assessment of impact forecasts with regard to nature conservation aspects of species and European site protection.

4. Saving of resources, utilisation of synergy effects.

5. Minimisation of environmental impact.

According to StUK4 (Federal Maritime and Hydrographic Agency 2013), a baseline survey must be carried out over two consecutive, complete years to determine the status quo as a basis for construction and operational phase monitoring. A year comprises twelve calendar months, including the month in which the investigations began.

Insofar as marine environmental data and information determined to be usable in the context of reimbursement procedures, these are likely to be taken into account in addition for the status description and assessment. Section 10.1 para. 3 sentence 3 StUK4 remains unaffected.

2. Scope of the study in relation to the protected assets

In the following, the size and location of the areas to be investigated for the protected goods as well as the temporal and quantitative scope of the investigations during the baseline survey are designated.

Unless otherwise specifically regulated below, the investigations must be carried out in accordance with StUK4.

In general, the designation of the positions of the investigation sites and the timing of the investigations must be agreed with the Federal Maritime and Hydrographic Agency.

A spatial overview of the surveys of the protected species will be added in the final scope. A preliminary overview of the mobile protected goods (seabirds, resting birds and marine mammals) can be in Figure 1 and Figure 2. For the mobile protected species, it is assumed that the cluster monitoring of cluster N-11_N-12 II (sites N-11.2 and N-12.3) will be carried out together with cluster N-11_N-12 I (sites N-11.1, N-12.1, N-12.2) in order to the above-mentioned objectives of the overall concept. If there are more than 2 years between the end of the baseline survey and the start of construction, the baseline survey must be updated in accordance with StUK4.

2.1 Additions and deviations from StUK4

The equipment and vehicles required to carry out the tests must be kept in an operational condition during the test period. In addition to functional reliability, this also includes compliance with regulatory requirements for operation and commissioning as well as all actual conditions that could prevent the proper performance of the investigation in the specified form. Please start your planning and process design in good time so that operational readiness is guaranteed on the first day of the investigation.

If investigations or investigation units are not feasible, a deviation application must be submitted in advance. Please refer to the respective chapters for information on deviations specific to protected assets. Deviation requests must be technically justified and labelled as deviation requests (e.g. with the help of a heading "Deviation request for the requirement/designation [name and bullet point XY] from [date]"). The non-performance of inspections due to weather conditions must be communicated on the same day at the latest. This also applies to unexpected technical failures. The notification must be accompanied by a specific proposal for rescheduling the inspection or inspection unit to obtain Federal Maritime and Hydrographic Agency approval. The Federal Maritime and Hydrographic Agency will then make a final decision on how to proceed.

As this is a cluster monitoring programme, adjustments are made to the investigations in accordance with StUK4 in order to adequately cover the large-scale areas in question. The objectives can be found in Chapter 1. The details for the protected goods are designated below.

Resting birds
Due to the close proximity to important seabird distribution areas, the study area is extended and two additional flight surveys (12 in total) are to be carried out. The details can be found in section 2.3.

Fish
The current scientific findings and the results of the site-orientated OWP studies for fish in accordance with StUK show that the majority of OWPs have positive or no effects on fish. Based on the current state of knowledge, it can therefore be ruled out with the necessary certainty that the construction and operation of projects "N-11.2" and "N-12.3" will have a significant impact on fish. A significant gain in knowledge would not expected from the investigations in accordance with StUK 4, so that no investigations in accordance with StUK 4 are ordered.
To describe and assess the status of the fish in areas N- 11 and N-12, the freely accessible results of the surrounding preliminary area surveys should be used (e.g. via the PINTA portal). Suitable DATRAS data should be added. The geological and hydro- graphical conditions of the areas should be taken into account when using the external data basis and should match as far as possible. Should new results reveal a significant impairment of the fish as a protected resource, the right to issue orders for investigations is reserved.

2.2 Benthos and biotopes

The project area "N-11.2" has a size of approx. 156 km², the project area "N-12.3" has a size of approx. 80 km².
Two reference areas must be designated by the project developers to ensure comparability with the geological and hydrographic conditions of the project areas.
With a size of approx. 90 km², reference area 3 is located to the west of the projects, while reference area 2 is 146.0 km² to the south. The designation of reference area 3 takes into account the location of areas N-12.4, N-12.5 and N-12.6 from the 2025 site development plan. Reference area 2 corresponds to the reference area "South" of cluster N_11_12_I and should be used jointly. The natural boundary conditions in the reference areas (location, flow conditions, water depth, sediment composition and size) largely correspond to those of the project areas. The details can be found in Table 1.

The benthos surveys are to be carried out during the baseline survey in spring and autumn 2025 and in autumn 2026.
The investigations in the project and reference areas must carried out within a narrow time window. The sampling interval must not exceed two weeks.
According to StUK 4, the seasons for the North Sea are defined as follows: Spring 01.03. to 15.05 / Autumn 15.08. to 15.11.

Table 1: Geographical location of the study areas for the benthos conservation area (coordinates of the corner points, decimal degrees, WGS 84).

	Key points	East longitude °E	North latitude °N
Project area "N-11.2"	A	6,261600	54,970183
	B	6,274267	54,853100
	C	6,490783	54,756417
	D	6,500267	54,789083
	E	6,500267	54,830517
Project area "N-12.3"	A	6,072083	54,929633
	B	6,233417	55,085117
	C	6,247083	54,959900
Reference area 3	A	6,107315	55,288185
	B	5,998178	55,181691
	C	5,917398	55,227537
	D	6,006878	55,321301
Reference area 2	A	6,446533	54,599702
	B	6,29156	54,651281
	C	6,266176	54,650916
	D	6,264806	54,661358
	E	5,985007	54,756647
	F	5,95445	54,726797
	G	6,437572	54,563396

Analyses of the infauna

The infauna is analysed at 20 stations per project and reference area. When designating the stations in the project and reference areas, the

Reference areas should be based on the available information on sediment quality (e.g. Laurer et. al. 2014). Three parallel samples are to be taken per station. The details can be found in Table 2.

Table 2: Geographical positions of the van Veen-Greifer stations for the infauna surveys in the project and reference areas (decimal degrees, WGS84).

	Station	East longitude °E	North latitude °N
Project area "N-11.2"	1	6,280309	54,941862
	2	6,320348	54,915113
	3	6,361603	54,891833
	4	6,402922	54,866812
	5	6,444773	54,844381
	6	6,486578	54,821934
	7	6,491171	54,796119
	8	6,450142	54,818583
	9	6,407518	54,841863
	10	6,362687	54,863786
	11	6,320166	54,884015
	12	6,278720	54,909869
	13	6,281823	54,874957
	14	6,319869	54,854642
	15	6,332447	54,834190
	16	6,367561	54,834957
	17	6,380855	54,814516
	18	6,413159	54,812186
	19	6,454785	54,792338
	20	6,486644	54,772706
Project area "N-12.3"	1	6,226421	55,070635
	2	6,200307	55,045852
	3	6,175066	55,019789
	4	6,137630	54,986091
	5	6,115903	54,964415
	6	6,093389	54,943580
	7	6,228634	55,049524
	8	6,207695	55,026156
	9	6,175740	54,999506
	10	6,145694	54,967710
	11	6,121757	54,945551
	12	6,229045	55,032691
	13	6,208264	55,007167
	14	6,178875	54,976258
	15	6,155937	54,950243
	Station	**East longitude °E**	**North latitude °N**
	16	6,231283	55,011149

	17	6,203673	54,986764
	18	6,233696	54,987019
	19	6,204662	54,961739
	20	6,233591	54,966719
Reference area 3	1	6,013428	55,306584
	2	5,995374	55,289861
	3	5,969910	55,266940
	4	5,950770	55,247678
	5	5,931630	55,228664
	6	6,038838	55,301443
	7	6,015000	55,279824
	8	5,984676	55,251527
	9	5,963179	55,228702
	10	6,057534	55,286116
	11	6,039414	55,270150
	12	6,020677	55,250909
	13	5,996059	55,228515
	14	5,977533	55,212779
	15	6,088382	55,284352
	16	6,070361	55,266889
	17	6,053119	55,250946
	18	6,033416	55,232936
	19	6,009258	55,210305
	20	5,993263	55,195886
Reference area 2	1	5,987581	54,740476
	2	5,994056	54,717561
	3	6,036897	54,723972
	4	6,040054	54,702156
	5	6,083829	54,708234
	6	6,092895	54,684422
	7	6,132329	54,691938
	8	6,140512	54,668409
	9	6,180070	54,675865
	10	6,188612	54,652200
	11	6,229678	54,659129
	12	6,238730	54,635277
	13	6,277415	54,642992
	14	6,279216	54,621581
	15	6,324255	54,627128
	16	6,332158	54,603636
	Station	**East longitude °E**	**North latitude °N**
	17	6,376047	54,609550

	18	6,393094	54,582933
	19	6,433725	54,589930
	20	6,437678	54,567753

Investigations of the epifauna

The epifauna is analysed at 10 stations per project and reference area using a tree trawl (width: 2 m). The details can be found in Table 3.

Table 3 Geographical positions of the start and end points of the epifauna hauls in the project and reference areas (decimal degrees, WGS 84).

	Station	Starting point		End point	
		Northern latitude	Eastern longitude	Northern latitude	Eastern longitude
Project area "N-11.2"	1	6,280896	54,941413	6,285876	54,937955
	2	6,36199	54,891633	6,367479	54,888446
	3	6,445229	54,844056	6,450402	54,8407
	4	6,320655	54,883738	6,325933	54,880435
	5	6,408244	54,84157	6,414243	54,838709
	6	6,490867	54,796308	6,485195	54,79938
	7	6,281851	54,875457	6,281411	54,879941
	8	6,32012	54,854485	6,325212	54,851087
	9	6,381351	54,814377	6,387445	54,811586
	10	6,486699	54,772447	6,485483	54,768011
Project area "N-12.3"	1	6,225947	55,070317	6,222728	55,066223
	2	6,228019	55,033002	6,220221	55,03267
	3	6,230572	55,010731	6,224439	55,007947
	4	6,233543	54,967599	6,233234	54,972087
	5	6,199452	55,045483	6,196573	55,041307
	6	6,176219	54,999995	6,181554	55,003276
	7	6,179377	54,976716	6,185769	54,974136
	8	6,137622	54,985533	6,135569	54,981199
	9	6,154769	54,950647	6,147253	54,951854
	10	6,093787	54,943905	6,101497	54,943215
Reference area 3	1	6,038161	55,302298	6,030335	55,302784
	2	6,08742	55,284843	6,081019	55,287456
	3	5,995577	55,289334	5,998399	55,285142
	4	6,038822	55,269736	6,032232	55,267284
	5	6,071314	55,267833	6,074894	55,271833
	6	6,033876	55,233511	6,036743	55,237693
	7	5,983995	55,251936	5,977039	55,254028
	8	5,996075	55,22822	5,99039	55,225119
	9	5,992295	55,196556	5,991739	55,201035
	10	5,931965	55,228974	5,937272	55,232286

Reference area 2	1	5,988022	54,740329	5,994743	54,738082
	4	6,040305	54,702072	6,047016	54,699821
	5	6,084174	54,708118	6,090884	54,705865
	7	6,132528	54,691871	6,139233	54,689616
	8	6,140762	54,668324	6,147463	54,666068
	11	6,22993	54,659044	6,236624	54,656783
	12	6,239047	54,63517	6,245736	54,632909
	15	6,324409	54,627076	6,331093	54,624809
	17	6,369105	54,611917	6,375784	54,609648
	20	6,438044	54,567628	6,444712	54,565355

Investigations of the sediment and biotope structure and their dynamics with side-scan sonar (SSS)

SSS investigations and ground truthing at the seabed surface are to be carried out in connection with the geological investigations for the exploration of the foundations of the wind turbines and cable routes.

The investigations must be carried out in the project areas and must take into account at least the scope of the "Subsoil" standard (see Table 4 and Table 10, Federal Maritime and Hydrographic Agency 2014).
The results of the investigations carried out as part of geological monitoring must be used for the ecological assessment of the sediment and biotope structure and its dynamics.

If suspected areas of biotopes according to §30 BNatSchG are identified, these must also be sampled in accordance with the current mapping guidelines of the Federal Agency for Nature Conservation (BfN).

In addition, if heterogeneous biotope structures are identified, underwater video recordings must be used during the entire campaign for the baseline survey. According to StUK4, 5 video transects of approx. 15 min. duration at a drift speed of max. 1 kn in the project areas are to be carried out. The geographical positioning of the transect must be recorded. The video surveys are to be with a camera (in accordance with DIN EN 16260, survey type "site investigation"), whereby the station number, GPS data, date and water depth are to be superimposed on the image.

Notes:

- *The approval authority points out that, according to StUK4 (Federal Maritime and Hydrographic Agency 2013), the processing of benthological samples must be standardised and documented in accordance with ISO/DIS 16665. According to ISO/DIS 16665 (p. 23, Section 9), it is recommended to create a reference and voucher specimen collection of all specific taxa for the purpose of quality assurance and quality control. In order to be able to check the accuracy of the identification of some benthic species, the approval authority reserves the right to request specimens and have these checked by external experts at the client's expense***.***
- *The World Register of Marine Species (WoRMS) internet database is to be used as a taxonomic reference.*
- *Each animal should always be identified to species level. If this is not possible, the reasons for this must be stated.*
- *For the taxonomic treatment of all specimens, the current identification literature must be used.*
- *The influence of the neighbouring offshore wind farms and the associated pre-load must be taken into account when presenting and discussing the results.*

2.3 Aircraft-based surveys of resting birds & marine mammals

The aerial digital surveys for resting birds and marine mammals are carried out jointly. During the baseline survey, a total of twelve digital aerial surveys are to be carried out per year, in the months of January to December. The aerial surveys of the baseline survey are expected to be required over two years, probably starting from the beginning of 2025. It is assumed that the cluster monitoring will be carried out together with cluster N_11_12_I. The study area will be adapted to the corresponding cluster size in the second year of the study.

The size of the entire study area is approx. 4691 km² and 3622 km² in the second year. The details can be found in Table 4, Table 6, Figure 1 and Figure 2.

Table 4: Geographical location of the study area in the first year of the aerial survey of resting birds and marine mammals (coordinates of the corner points, decimal degrees, WGS 84).

	East longitude °E	North latitude °N
Study area Key points	6.47701705	55.23202172
	6.53574881	55.16162149
	6.54143865	55.08982734
	6.67089608	55.02118708
	6.77345679	54.95176841
	6.80563628	54.77269826
	6.75998049	54.55758279
	6.30401245	54.45784451
	5.72900399	54.65433459
	5.66448604	54.88474818
	5.77829087	55.03158838
	5.85169411	55.10590374
	5.92886679	55.18028593
	6.02471687	55.21919989

According to StUK 4, the site surveyed should cover 10% of the study area. Transects T1 to T21 are 4 km apart and run in an east-west direction. The total length of the transects is approx. 1183 km. The start and end points of the flight transects are shown in Table 5 and Figure 3.

Table 5: Geographical positions of the start and end points of the flight transects for recording resting birds and marine mammals (decimal degrees, WGS 84) in the first year of the study.

Tran-sect	Start		End	
	East longitude °E	North latitude °N	East longitude °E	North latitude °N
T1	6.02471687	55.21919989	6.47701705	55.23202172
T2	6.50802746	55.19686798	5.92886679	55.18028593
Tran-sect	**Start**		**End**	
	East longitude	North latitude	East longitude	North latitude

	°E	°N	°E	°N
T3	5.89024496	55.14310060	6.53574881	55.16162149
T4	6.53859677	55.12572457	5.85169411	55.10590374
T5	5.81495890	55.06875126	6.54143865	55.08982734
T6	6.60702427	55.05554548	5.77829087	55.03158838
T7	5.74959671	54.99467306	6.67089608	55.02118708
T8	6.72301676	54.98650861	5.72095417	54.95775147
T9	5.69236307	54.92082365	6.77345679	54.95176841
T10	6.77980775	54.91586550	5.66448604	54.88474818
T11	5.67454497	54.84901233	6.78624654	54.88010458
T12	6.79267839	54.84431344	5.68456939	54.81333034
T13	5.69456914	54.77766766	6.79910033	54.80850871
T14	6.80563628	54.77269826	5.70474563	54.74130423
T15	5.71467290	54.70576264	6.79826692	54.73837812
T16	6.79057014	54.70220571	5.72461139	54.67011279
T17	5.78289065	54.63611883	6.78288618	54.66603278
T18	6.77526992	54.62986120	5.87944959	54.60337606
T19	5.97584960	54.57055610	6.76761075	54.59368388
T20	6.75998049	54.55758279	6.07229453	54.53758943
T21	6.16817046	54.50468662	6.57077994	54.51646348

Table 6: Geographical location of the study area in the second year of the aerial survey of resting birds and marine mammals (coordinates of the corner points, decimal degrees, WGS 84).

	East longitude °E	North latitude °N
Study area Key points	6.47864441	55.23205537
	6.53737338	55.16165434
	6.54143865	55.08982734
	6.67251512	55.02121807
	6.77345745	54.95175899
	6.79090498	54.70221432
	6.76106059	54.62949305
	6.60459991	54.59010628
	6.30086702	54.58066779
	6.14998363	54.64805205
	6.02309484	54.71602523
	5.83314486	54.78208285
	5.77381292	54.85219616
	5.76362051	54.95914507
	5.77829087	55.03158838
	5.85169411	55.10590374

According to StUK 4, the site surveyed should cover 10% of the study area. Transects T1 to T19 are km apart and run in an east-west direction. The total length of the transects is approx. 933 km. The start and end points of flight transects are shown in Table 5 and Figure 4.

Table 7: Geographical positions of the start and end points of the flight transects for recording resting birds and marine mammals (decimal degrees, WGS 84) in the second year of the study.

Tran-sect	Start		End	
	East longitude °E	North latitude °N	East longitude °E	North latitude °N
T1	6.02471687	55.21919989	6.47701705	55.23202172
T2	6.50802746	55.19686798	5.92886679	55.18028593
T3	5.89024496	55.14310060	6.53574881	55.16162149
T4	6.53859677	55.12572457	5.85169411	55.10590374
T5	5.81495890	55.06875126	6.54143865	55.08982734
T6	6.60702427	55.05554548	5.77829087	55.03158838
T7	5.77094971	54.99536695	6.67089608	55.02118708
T8	6.72301676	54.98650861	5.76200612	54.95909261
T9	5.76704658	54.92327211	6.77345679	54.95176841
T10	6.77446445	54.91574092	5.76876943	54.88809366
T11	5.77220188	54.85215331	6.77850651	54.87992342
T12	6.78102055	54.84404033	5.80350572	54.81714277
T13	5.83153651	54.78204082	6.78353016	54.80814409
T14	6.78603588	54.77222704	5.92978929	54.74853832
T15	6.02148882	54.71598575	6.78841004	54.73812528
T16	6.79090498	54.70221432	6.08657115	54.68206726
T17	6.14838011	54.64801428	6.77596978	54.66585436
T18	6.76106059	54.62949305	6.22546213	54.61439551
T19	6.29926595	54.58063205	6.60466114	54.58934924

Notes:

- *Due to the increasing volume of air traffic in the study area, it is expressly recommended that the aircraft used for the ecological studies be equipped with a TCAS (Traffic Alert Collision Avoidance System).*
- *For the purpose of quality assurance and quality control, the Federal Maritime and Hydrographic Agency reserves the right to request individual sequences (photo/video material) of a flight and, if necessary, to have these checked by external experts at the expense of the client.*
- *The raw data of the digital investigations (photo/video material) must be stored for ten years. The backup of the data must also be guaranteed in the event of a change of project owner.*
- *There must be at least 7 days between surveys. If a survey has to be postponed due weather conditions or military exercises, it must be carried out as soon as possible. Postponements must be notified by the 7th of the following month.*

possible without notifying the Federal Maritime and Hydrographic Agency. The interval to the next survey in the same month must not be less than 7 days. To ensure that the survey is as evenly distributed as possible throughout the year, a time interval of at least 14 days should be aimed for, especially in the summer months, or, if possible, the flights should always be carried out in the middle of the month. Any other deviations must be agreed with the Federal Maritime and Hydrographic Agency in advance. Flights completely cancelled in a survey month must be made up for in consultation with the Federal Maritime and Hydrographic Agency. All deviations from the survey framework, including shortened transects, must be described in detail in the expert reports.

- *Between March and April as well as August and September, a total of 3 flights are to be carried out, in May - July and October one flight each. In the periods November - December and January - February, one flight must be carried out in the middle of each period. The minimum interval between flights within this period should be 6 weeks.*

2.4 Ship-based surveys of resting birds & marine mammals

The ship-based survey for resting birds and marine mammals is carried out jointly. During the baseline survey, 12 counts per year are to be carried out in the months of January - December.
The ship-based investigations of the baseline survey are expected to be required over two years, probably starting at the beginning of 2025. It is assumed that the cluster monitoring will be carried out together with the N_11_12_I cluster. The study area will be adjusted to the corresponding cluster size in the second year of the study.

Due to the lack of a suitable reference area, the total area is enlarged. The size of the study area is approx. 1488 km² or 696 km². The details can be found in Table 8, Table 10, 1 and Figure 2.

Table 8: Geographical location of the study area for the ship-based survey of resting birds and marine mammals (coordinates of the corner points, decimal degrees, WGS 84) in the first year of the study.

	East longitude °E	North latitude °N
Study area Key points	6.17400112	55.09813326
	6.28909282	55.10158882
	6.29727718	55.07484576
	6.30815747	54.99421220
	6.52792070	54.86557152
	6.56054464	54.83948816
	6.56248813	54.81255915
	6.56213823	54.78556714
	6.55569369	54.76158662
	6.50874713	54.60121602
	6.43672995	54.57823643
	5.86769696	54.77063347
	5.86666758	54.80084021

Transects T1 to T20 are 3 kilometres apart and run in an east-west direction. The total length of the transects approx. 500 km. The start and end points of the ship transects are shown in Table 9 and Figure 5.

Table 9: Geographical positions of the start and end points of the ship transects for recording resting birds and marine mammals (decimal degrees, WGS 84) in the first year of the study.

Tran-sect	Start		End	
	East longitude °E	North latitude °N	East longitude °E	North latitude °N
T1	6.39724861	54.59203686	6.48574118	54.59456087
T2	6.51510013	54.62236752	6.32363374	54.61687359
T3	6.24993016	54.64166438	6.52309984	54.64957388
T4	6.53110972	54.67677971	6.17613788	54.66640912
T5	6.10225689	54.69110769	6.53912977	54.70398500
T6	6.54716004	54.73118977	6.02828720	54.71575997
T7	5.95422882	54.74036583	6.55520055	54.75839399
T8	6.56213823	54.78556714	5.88425846	54.76506330
T9	5.86772993	54.79150700	6.56248813	54.81255915
T10	6.56054464	54.83948816	5.88587737	54.81909864
T11	5.91451553	54.84703116	6.52792070	54.86557152
T12	6.48408028	54.89133279	5.94319285	54.87495730
T13	5.97190941	54.90287704	6.44018383	54.91707754
T14	6.39623128	54.94280572	6.00066529	54.93079036
T15	6.02948046	54.95869786	6.35222252	54.96851728
T16	6.30815747	54.99421220	6.05830522	54.98659795
T17	6.08716958	55.01449155	6.30306503	55.02104697
T18	6.30017335	55.04794648	6.11607362	55.04237865
T19	6.14501744	55.07025923	6.29727718	55.07484576
T20	6.28909282	55.10158882	6.17400112	55.09813326

Table 10: Geographical location of the study area for the ship-based survey of resting birds and marine mammals (coordinates of the corner points, decimal degrees, WGS 84) in the second year of the study.

	East longitude °E	North latitude °N
Study area Key points	6.28909282	55.10158882
	6.29727718	55.07484576
	6.30815747	54.99421220
	6.52792070	54.86557152
	6.56054464	54.83948816
	6.56213823	54.78556714
	6.55569369	54.76158662
	6.53440471	54.73083721

	6.45162025	54.72851628
	6.22676772	54.82987193
	6.21150819	54.85639676
	6.20855887	54.88329380
	6.02726333	54.90465021
	6.00973618	54.93108039
	6.02948046	54.95869786
	6.17400112	55.09813326

Transects T1 to T15 are 3 kilom in an east-west direction. The total length of the transects The start and end points of the ship transects are shown in 6.

Table 11: Geographical positions of the start and end points of the ship transects for recording resting birds and marine mammals (decimal degrees, WGS 84) in the second year of the study.

Tran-sect	Start		End	
	East longitude °E	North latitude °N	East longitude °E	North latitude °N
T1	6.53440471	54.73083721	6.45162025	54.72851628
T2	6.39497744	54.75388013	6.55436268	54.75837094
T3	6.56213823	54.78556714	6.33826410	54.77921662
T4	6.28148018	54.80452568	6.56248813	54.81255915
T5	6.56054464	54.83948816	6.22676772	54.82987193
T6	6.21150819	54.85639676	6.52792070	54.86557152
T7	6.48408028	54.89133279	6.20855887	54.88329380
T8	6.02726333	54.90465021	6.44018383	54.91707754
T9	6.39623128	54.94280572	6.00973618	54.93108039
T10	6.02948046	54.95869786	6.35222252	54.96851728
T11	6.05830522	54.98659795	6.30815747	54.99421220
T12	6.08716958	55.01449155	6.30306503	55.02104697
T13	6.30017335	55.04794648	6.11607362	55.04237865
T14	6.14501744	55.07025923	6.29727718	55.07484576
T15	6.28909282	55.10158882	6.17400112	55.09813326

2.5 Investigations into bird migration

According to StUK4, at least 50 survey days per year must be scheduled for the detection of migratory birds using radar and plan migration monitoring. Of these, at least 900 hours must be analysable. Survey days comprise a full 24 hours. If possible, the surveys should be carried out over consecutive 24-hour cycles. Within the main train periods, the examination frequency is 7 days/month (not in one block).
As part of the present study, migratory bird surveys will be carried out using radar and visual observations as well as caller surveys from at least one anchored ship in spring and autumn at fixed positions. The specific implementation is to be agreed between the TdV, expert consultants and the Federal Maritime and Hydrographic Agency. The details of the monitoring will be agreed by the end of autumn 2024 at the latest so that the scope can be finalised by the Federal Maritime and Hydrographic Agency at an early stage.
Details of the anchor points can be found in Table 12 and Figure 7.

Table 12 Geographical positions of the anchor points for the bird migration survey (WGS 84).

	East longitude °E	North latitude °N
Anchorage	6.264991	54.866799

The bird migration surveys are to be carried out in spring and autumn 2025 and 2026. The main migration periods to be observed are March to May and mid-July to November.
The use of a vertical radar from the ship is to be provided for the radar investigations.
In addition to radar monitoring, visual observations must be carried out during the day and flight calls recorded at night.
The visual observations must be carried out from the same anchor positions as the radar observations.

Meteorological data as well as the GPS position and heading of the anchored vessel and the number of wind farm-associated vessels during the construction phase must also be recorded every 30 minutes.

2.6 Studies on the habitat utilisation of marine mammals

The habitat utilisation of harbour porpoises is recorded using acoustic click detectors, known as PODs. A total of four stations (N4, S7, in or near the project area and S13, BU1 as reference stations) are to be operated in parallel with the digital survey for an expected period of two years. Due to the discontinuation of CPODs as a common model and a transition to FPOD as the state of the art, all stations are to be equipped with two FPODs and one CPOD and the data are to be compared in the evaluation in order to document a transition between two methods and ensure data continuity. After one year of comparative FPOD/CPOD measurements, the project sponsor will evaluate whether the amount of data collected so far is sufficient to ensure a statistically valid comparison of the devices and a transfer function can be determined. It is assumed that sites N-11.2 and N-12.3 are analysed together with the sites of cluster N_11_12_I and the stations are divided accordingly.
Details of the POD stations can be found in Table 13.

Table 13: Geographical centre positions of the POD stations for investigating the habitat use of harbour porpoises (decimal degrees, WGS 84).

	East longitude °E	North latitude °N
POD Station N4	6.3502	55.0871
POD Station S7	6.2678	54.8448
POD Station BU1	7.7858	55.0668
POD Station S13	7.9252	54.6808

2.7 Investigation of hydro noise emissions and immissions

A separate measurement concept for recording background noise must be agreed with the Federal Maritime and Hydrographic Agency. The designation of the background noise measurements is separate from the current scope. A concept for measuring background noise must be submitted to the Federal Maritime and Hydrographic Agency 6 months before the start of construction.

3. General overview of monitoring

A preliminary overview of the mobile protected species (seabirds, resting birds and marine mammals) can be found in Figure 1.

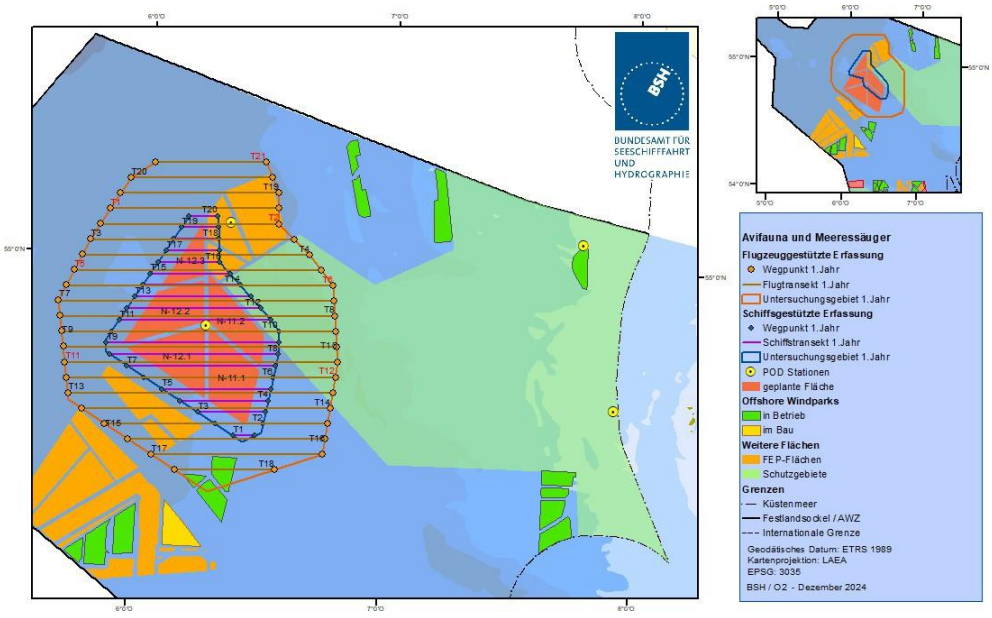

Figure 1: Spatial overview of the cluster study area N- 11_N-12_II for the airborne (brown) and ship-based (blue) studies, as well as the POD stations (yellow) in the first year of the study

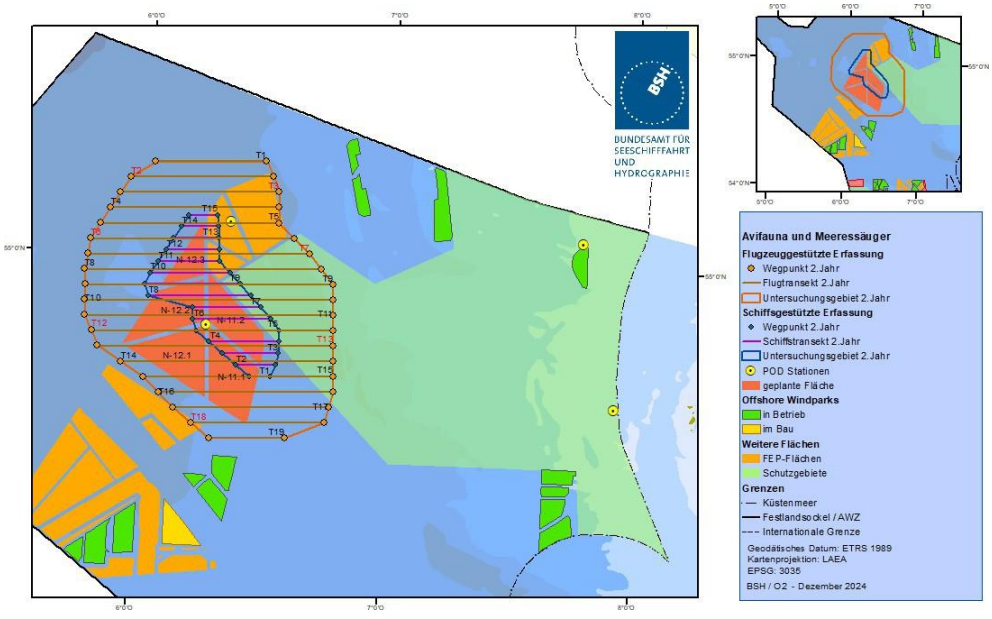

Figure 2: Spatial overview of the cluster study area N- 11_N-12_II for the airborne (brown) and ship-based (blue) studies, as well as the POD stations (yellow) in the second year of the study

4. Submission of documents and data

The results of the investigations must be submitted to the Federal Maritime and Hydrographic Agency annually in the form of comprehensible reports four months after end of each annual cycle. The results must include documentation of the condition and the development of the changes.

The raw data from the investigations must be submitted to the Federal Maritime and Hydrographic Agency as soon as the quality-checked data for the preparation of the interim report is available, at the latest two months before submission of the respective report. The current data formats of the Federal Maritime and Hydrographic Agency are to be used for this purpose.

Information on how to submit documents can be in the circular dated 23 February 2021. Acoustic data from the habitat utilisation survey using CPOD and FPOD must be uploaded to the Federal Maritime and Hydrographic Agency's specialist information system "MarinEARS". The Excel tables of the environmental assessment must be uploaded to MARLIN.

Organisational questions on environmental monitoring can be addressed to Ms Ruge (StUK-monitoring@bsh.de).

Raw data and survey documents must be kept by the licence holder in full and in the original in a suitable form and made available to the Federal Maritime and Hydrographic Agency in full or in part on request.

Yours sincerely, By order of

Steffen Bleich Isabella
Kratzer

FEDERAL MARITIME AND HYDROGRAPHIC AGENCY (2013). Standard Un-
Investigation of the impact of offshore wind turbines on the marine environment. Federal Maritime and Hydrographic Agency, Hamburg and Rostock, 86 p.

FEDERAL MARITIME AND HYDROGRAPHIC AGENCY (2014): Standard for subsoil exploration Minimum requirements for subsoil exploration and investigation for offshore wind turbines, offshore stations and power cables 2nd update dated 05 February 2014.