

Masterplan Wind – Seabirds Cruise Report August 2010

Steve CV Geelhoed & Guido O Keijl

Report number C111/10



IMARES Wageningen UR

(IMARES - institute for Marine Resources & Ecosystem Studies) Report number~

Client:

Paul Boers
Rijkswaterstaat Waterdienst
Postbus 17
8200 AA LELYSTAD

Publication Date:

14 September 2010

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Summary

Geelhoed SCV & Keijl GO 2010.

Masterplan Wind – Seabirds. Cruise Report August 2010.

IMARES Report C111/10, 25 pp.

This cruise report provides an overview of the fifth survey in a series of seabirds at sea surveys that will be carried out in 2010 and 2011 over the Dutch Continental Shelf (DCS) of the North Sea and adjoining waters. This fifth survey in the series was carried out in August 2010. Two seabird observers joined a cruise that was aimed at surveying plankton, by taking plankton samples at more or less hourly intervals. In between the plankton stations, the ship steamed full speed (speed ranging from 10-12 knots) and seabirds were surveyed during all daylight hours while the ship was steaming.

The sailed route was more or less the same as the two previous surveys. Due to repairs on the ship the survey started later and the route had to be adjusted in order to get ashore on time. Furthermore, the use of a slower ship resulted in different windows of daylight for the seabird observers and hence, the coverage between this survey and the previous ones differs.

Weather conditions were generally moderate to poor. During the week, a total of 590 counting bouts of on average almost 5 minutes each were conducted. These stretched over a total of 971.1 km and covered, at a strip width of 300 m, a total survey area of 291.3 km² (Table 1) A total of 3722 birds, 6 marine mammals (all Harbour Porpoises), 22 balloons and 1 set-net flag were recorded (Table 3). Weather conditions were moderate to poor and had an negative impact on the probability to detect seabirds and porpoises in particular.

1 Introduction

This cruise report presents the seabird and marine mammal data collected during the fifth “fish eggs and fish larvae” survey, in a series of 12 monthly surveys from April 2010 till March 2011. These surveys cover the entire Dutch Continental Shelf (DCS); the first two surveys also covered waters south and west of the DCS. The grid with sampling stations for the “fish eggs and fish larvae” survey was adjusted after these surveys in order to focus more on the DCS; eg the westernmost stations were shifted to the east. The primary research topic during all cruises is plankton research (fish eggs and fish larvae), but the vessel conducting these surveys is an excellent platform for additional research on other vulnerable biota, such as seabirds. The plankton work is carried out 24 h per day, i.e. also at night. Seabirds can only be surveyed during daylight, so the aim of the project is to survey seabirds during all daylight hours. Coverage of the area is therefore less than 100% as the survey ship continues working during the night.

Since the Arca, our regular survey vessel, had been appointed for another job we surveyed with the Zirfaea instead. This ship’s speed is lower than the Arca’s, so the survey would last longer. Combined with a delay in departure -due to repairs of the ship- and time constraints of one bird observer who had to be back on Sunday morning, the sampling station grid had to be adjusted during the week. Although the route sailed was almost the same as during the previous two surveys, the use of a slower ship resulted in different windows of daylight for the seabird observers and hence, our coverage between this survey and the previous ones differs.

Unfortunately this ship turned out to be less suited for bird surveys than the Arca, because the observation box did not fit in the centre of the roof of the ship’s bridge, and was placed on the portside. Various obstacles rendered observations on the starboard side impossible. Thus all transects had to be counted on the portside, even when observation conditions on starboard were better. In all likelihood, this resulted in lower detection rates of animals.

2 Aim of the project and methods used

The aim of the project is to provide seabirds at sea data for as much of the DCS as possible, at a high level of observational detail. The data collected during these surveys are to be compared with aerial survey data, collected for the Masterplan Wind by Bureau Waardenburg and a long-term set of earlier aerial data collected by Rijkswaterstaat. During the shipboard surveys, seabirds and marine mammals are surveyed using standard ESAS ship-based survey techniques (fully described in the first cruise report in this series, see Leopold et al. 2010).

3 Results

3.1 Narrative

16-08-2010

Boarding the Zirfaea in the afternoon, but, due to repairs, the ship did not depart until the 17th.

17-08-2010

Departure Scheveningen on the Zirfaea at 7.00 hrs after a delay of ca 24 hours. South in coastal waters into Northern Belgium, afterwards heading west into the Channel and subsequently north through the southern central North Sea. With a seastate of 5 Beaufort for most of the day moderate observation conditions. Counting period: 7.50- 20.26 hrs. Low densities of gulls and terns, and one feeding/searching group of Gannets. Several Great and Arctic Skuas. A southbound Ruff is worth mentioning. Three Harbour Porpoises were sighted.

18-08-2010

Central North Sea through British waters north towards and across northwestern Dogger Bank. Moderate observation conditions, with a seastate of 3-4 Beaufort. Counting period: 7.12-20.02 hrs.

Lesser Black-backed Gulls and other coastal species were virtually absent. In deeper area south of Dogger Bank, flocks of Kittiwakes on the water and increasing densities of Guillemot. Just one father-chick combination of Guillemot. No Razorbills, no Harbour porpoises.

19-08-2010

Poor observation conditions in the morning, due to a combination of seastate 5 Beaufort and glare. In the afternoon conditions improved with a decreasing seastate and absence of glare. Counting period: 7.19-20.27 hrs.

Common Guillemots were concentrated around the Cleaver Bank and the Brown Ridge. In the same area several fishing vessels with scavenging Gannets, Fulmars, Black-backed Gulls and Kittiwakes. A few Harbour Porpoises were seen in this area as well. The southern North Sea was virtually devoid of birds and mammals.

20-08-2010

North to Dogger Bank. Moderate to poor observation conditions, with seastate 3 increasing to 6 Beaufort in the afternoon. Counting period: 7.17-20.18 hrs. Several fishing vessels along the southern leg of the transect, with scavenging gulls and 1 Sooty Shearwater in the wake. Patchily distributed Guillemots, with higher densities on the southern flank of Dogger bank. No Harbour Porpoises.

21-08-2010

North of the Wadden Isles westward bound and subsequently NNW passing the Frisian Front, west and back south again. Counting period: 7.42-20.14 hrs. Counting conditions were moderate to poor with a seastate of 4-5 Beaufort. On the NNW bound leg of the transect dozens of (Common) Terns and Kittiwakes were feeding on small prey at the sea surface. No Harbour Porpoises.

22-08-2010

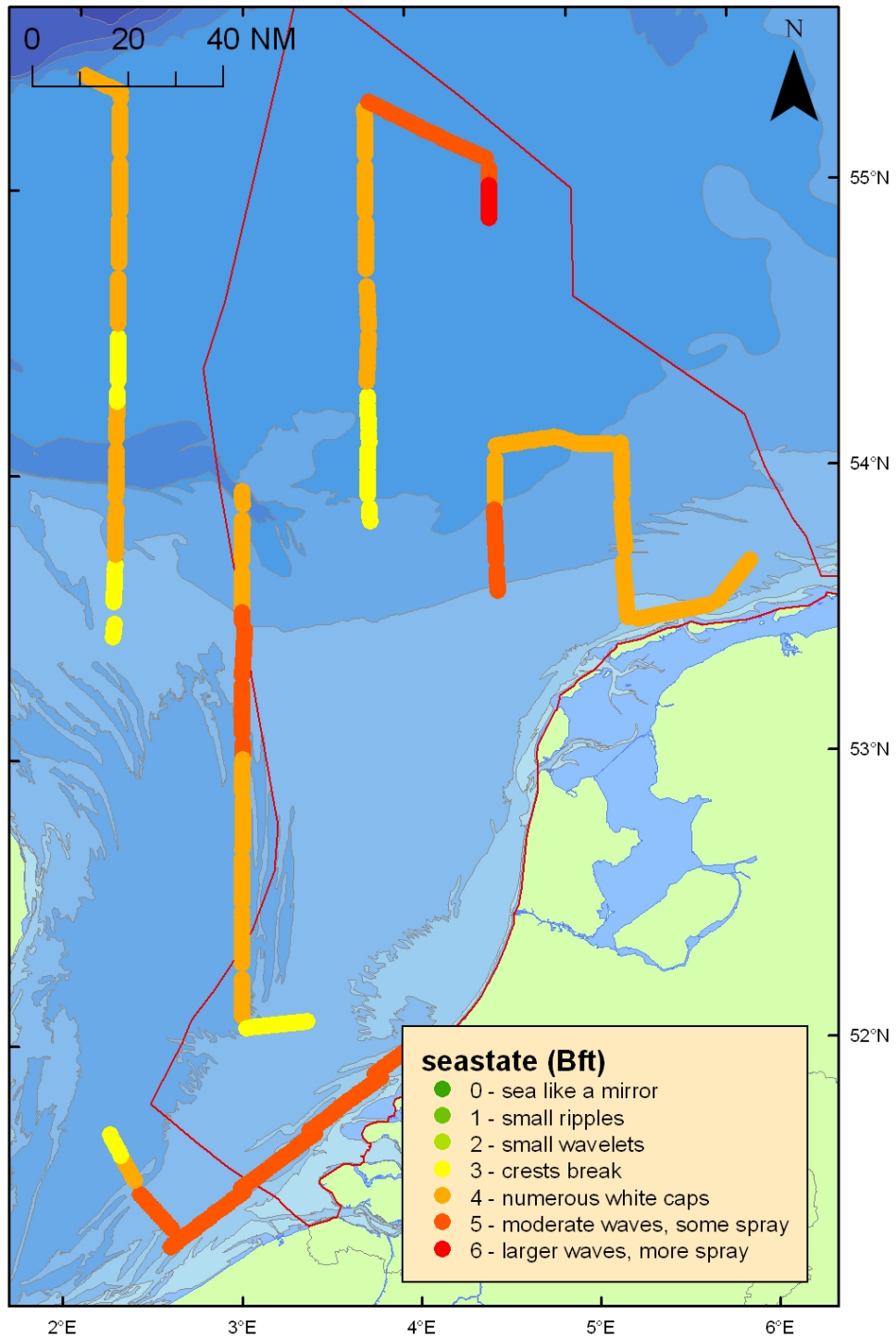
Arrival in Schevingen at 7.00 hrs.

During the week, a total of 590 counting bouts of on average almost 5 minutes each were conducted. These stretched over a total of 971.1 km and covered, at a strip width of 300 m, a total survey area of 291.3 km² (Table 1) A total of 3722 birds, 6 marine mammals (all Harbour Porpoises), 22 balloons and 1 set-net flag were recorded (Table 3). Weather conditions were moderate to poor and had a negative impact on the probability to detect seabirds and porpoises in particular.

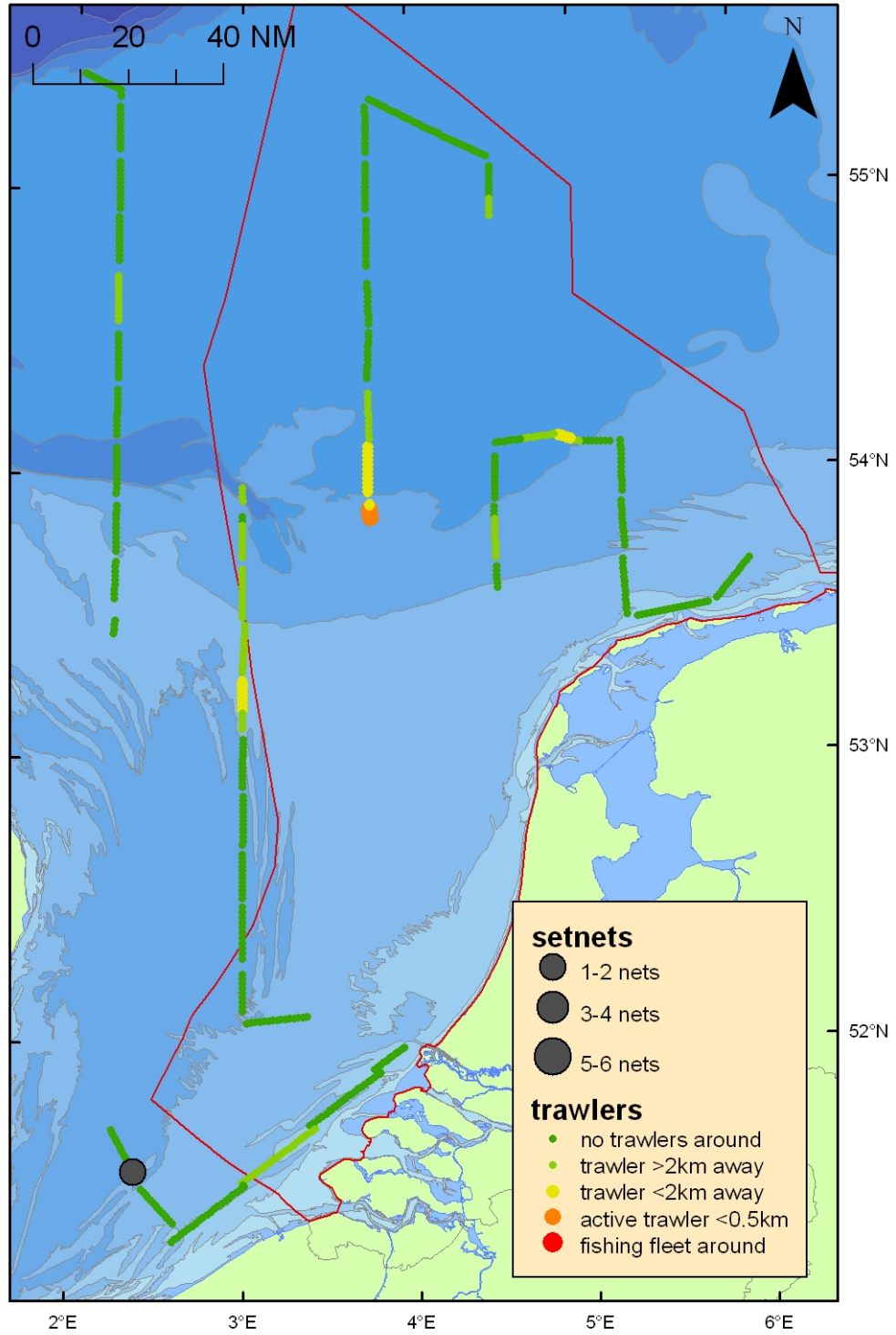
Overleaf, the surveyed tracks are plotted against the seastates encountered along the route (first map), and the presence of active fishing and set-net flags (second map).

Table 1. Total survey effort per seastate.

Seastate (Beaufort)	Surveyed area (km ²)	Surveyed distance (km)
0	-	-
1	-	-
2	-	-
3	37.3	124.3
4	164.8	549.4
5	85.3	284.3
6	3.9	13.1
	291.3	971.1



Effort and seastates. Seabirds and marine mammals were surveyed along the plotted routes. Beaufort seastates along the survey route are presented.



Floating matter. Active trawlers seen during the survey and presence of set-nets.

3.2 Detection probabilities

Detection probabilities are reviewed here for objects that were seen mostly on or in the water (as opposed to in flight): auks and Harbour Porpoises. Auks are normally rather hard to detect on the water as they often occur in small groups and are dark-backed, which makes them hard to spot under less sunny conditions and at greater distances. Auks dive at the approach of the vessel. Harbour Porpoises are supposedly even harder to detect, as they live mostly under water (they only surface to breath, as opposed to auks that only dive to feed: “surfacers” versus “divers”). Porpoises near the track line are often disturbed by the approaching vessel and might flee away suddenly, with a conspicuous splash, known as “rooster tail”. Animals at greater perpendicular distances are less prone to disturbance and are more often missed.

Only Guillemots were seen in sufficient numbers to produce a detection curve (Table 2), in order to estimate the number of missed animals. The survey conditions in August were mostly moderate to poor, and thus worse than during the previous surveys. The percentage of missed Guillemots is higher than in May (41%), June (35%) and July (42%) indeed, but the percentages are not dramatically different.

Table 2. Numbers of sightings (irrespective of group size) of Guillemots, in relation to perpendicular distances during the entire August survey.

	Band	Guillemot
Observed	A	85
	B	57
	C	56
	D	18
Missed	C	86
	D	124
	Total	210
	Percentage	49

Table 3. Summary of all birds, mammals and other items recorded during the counts.

Species	Soort		17-8	18-8	19-8	20-8	21-8	Total
	Tellingen zonder vogels	Counts with no birds	42	42	41	37	54	216
Northern Fulmar	Noordse Stormvogel	<i>Fulmarus glacialis</i>	4	61	46	91	2	204
Manx Shearwater	Noordse Pijlstormvogel	<i>Puffinus puffinus</i>		1				1
Sooty Shearwater	Grauwe Pijlstormvogel	<i>Puffinus griseus</i>			3			3
Northern Gannet	Jan-van-gent	<i>Sula bassana</i>	113	72	99	29	14	327
Cormorant	Aalscholver	<i>Phalacrocorax carbo</i>	9					9
Black Scoter	Zwarte Zeeëend	<i>Melanitta nigra</i>	1		2			3
Oystercatcher	Scholekster	<i>Haematopus ostralegus</i>	3					3
Ruff	Kemphaan	<i>Philomachus pugnax</i>	1					1
Ruddy Turnstone	Steenloper	<i>Arenaria interpres</i>		1				1
Arctic Skua	Kleine Jager	<i>Stercorarius parasiticus</i>	2	1		1		4
Great Skua	Grote Jager	<i>Stercorarius skua</i>	6	3	5	4		18
Common Gull	Stormmeeuw	<i>Larus canus</i>	1		1			2
Lesser Black-backed Gull	Kleine Mantelmeeuw	<i>Larus fuscus</i>	52	12	34	310	202	610
Greater Black-backed Gull	Grote Mantelmeeuw	<i>Larus marinus</i>	4	156	35	34		229
Large gull species	Gr. Meeuw spec	<i>Larus sp</i>	25	50				75
Kittiwake	Drieteenmeeuw	<i>Rissa tridactyla</i>	6	339	856	41	341	1583
Sandwich Tern	Grote Stern	<i>Sterna sandvicensis</i>	23				21	44
Common Tern	Visdief	<i>Sterna hirundo</i>	22	1	5	1	90	119
Arctic Tern	Noordse Stern	<i>Sterna paradisaea</i>	1		3	9	4	17
Common/Arctic Tern	Visdief / Noordse Stern	<i>S. hirundo / paradisaea</i>				28	20	48
Black Tern	Zwarte Stern	<i>Chlidonias niger</i>	1					1
Common Guillemot	Zeekoet	<i>Uria aalge</i>		112	122	147	35	416
Razorbill	Alk	<i>Alca torda</i>			2			2
Swift	Gierzwaluw	<i>Apus apus</i>			1			1
Willow Warbler	Fitis	<i>Phylloscopus trochilus</i>		1				1
Harbour Porpoise	Bruinvis	<i>Phocoena phocoena</i>	3		3			6
Set net	staand want		1					1
Balloon	Ballon			2	3	11	4	20
Foil balloon	folie-ballon				1	1		2
Total birds	Totaal vogels		243	632	1380	704	763	3722
Total marine mammals	Totaal zeezoogdieren		3	0	3	0	0	6

3.3 Distributions

On the distribution maps on the next pages, the margin of the Dutch Continental Shelf (DCS) is indicated by a red line and on-effort (=sailing while surveying seabirds and marine mammals) indicated by grey dots. Depth contours are represented in blue shades.

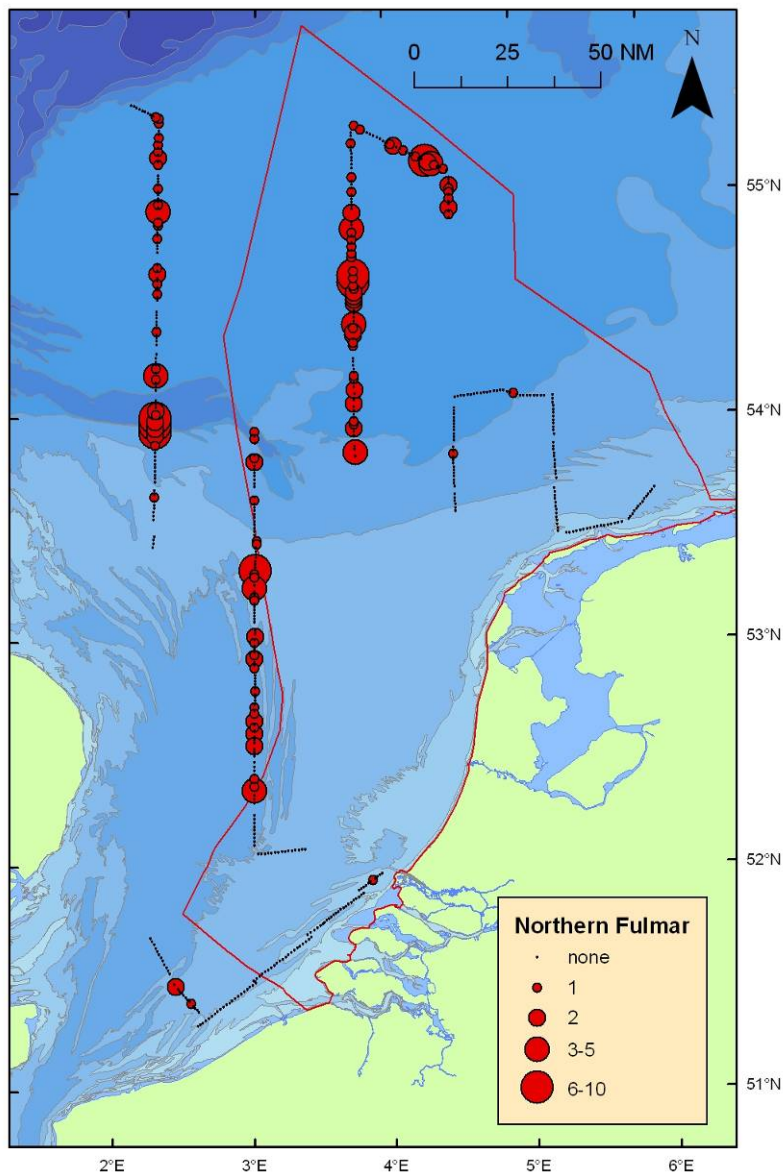
1. Rare birds

During the previous surveys several bird species were seen in sufficient numbers to warrant a distribution map in the cruise report. For several species the breeding season just has ended in August, and their migration to the wintering grounds e.g. the North Sea has not started yet. Under these circumstances, distribution maps are only useful for a limited number of species.

Records worth mentioning are a Manx Shearwater on 18th and 3 Sooty Shearwaters on the 19th, and a single Black Tern on 18th. Furthermore, there was some off-shore migration of waders (Oystercatcher, Ruff and Ruddy Turnstone) and landbirds (Swift and Willow Warbler).

2. Northern Fulmar

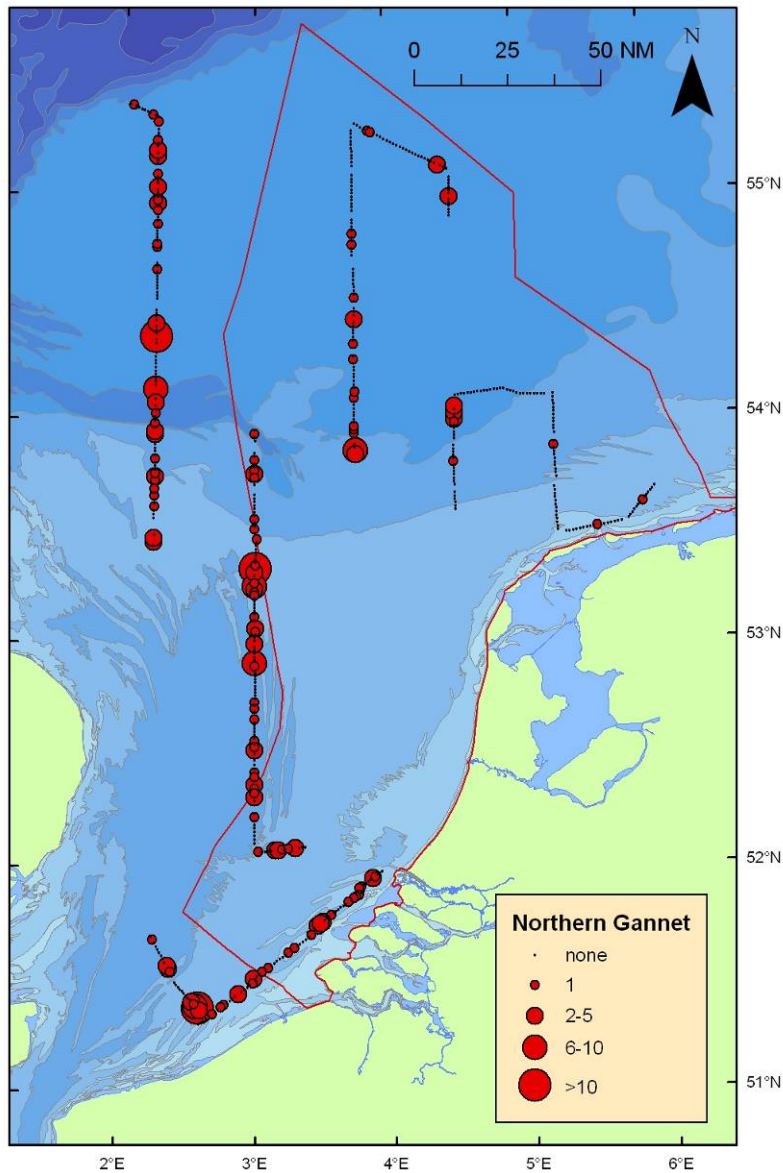
Fulmars were wide-spread, occurring everywhere but close to the coastline. Further offshore the waters north of the Wadden Isles were almost devoid of birds. Overall densities were low, but increased towards the west. All birds belonged to the light colour-phase. Moulting birds constituted 41% of all birds (n = 112).



Northern Fulmar

3. Northern Gannet

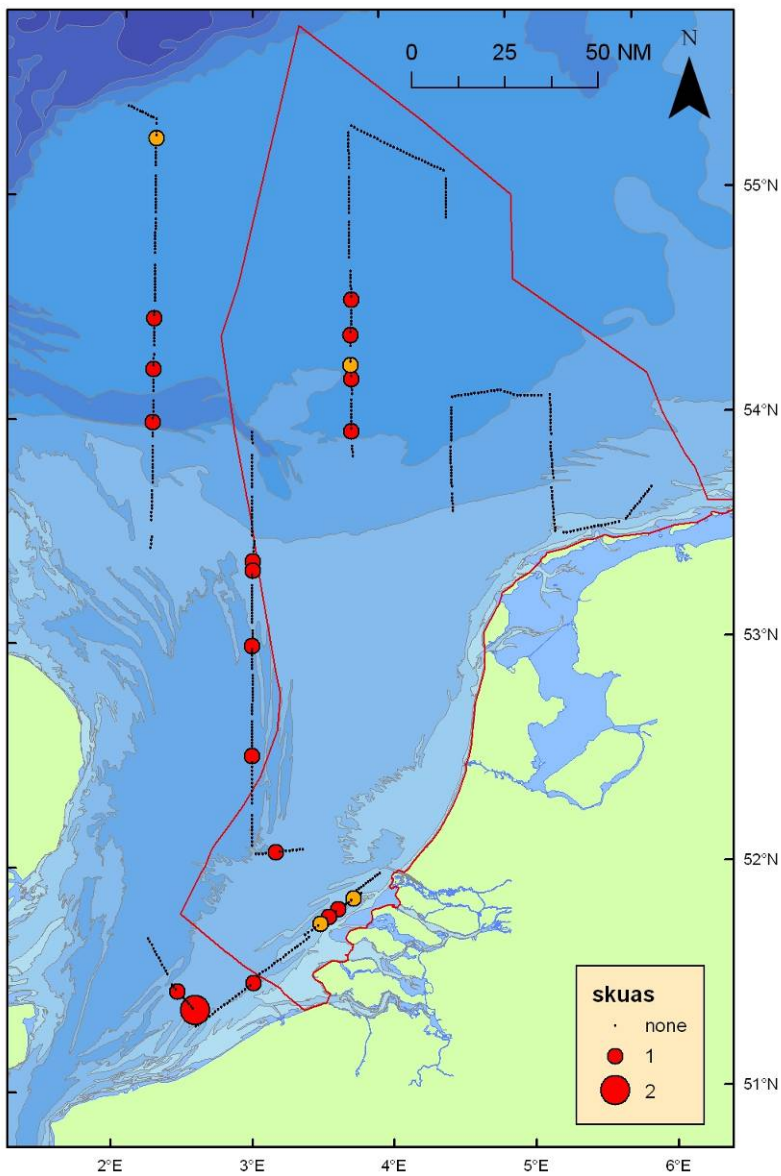
Gannets showed no clear distribution pattern other than that numbers were relatively low in the northern part of the DCS. Gannets were mostly seen as singles or in small groups. One group of ca 65 individuals was encountered 17 August in Belgian waters in the southern part of the survey area. Most were seen flying, apparently searching for prey, or diving for prey. No associations with Harbour Porpoises were observed. Contrary to the survey in July juveniles were seen throughout the area.



Northern Gannet

4. Skuas

Skuas were scarce, but evenly distributed over the area, with the exception of the eastern and northern part of the DCS where they were absent. Great Skuas were predominantly present near bird concentrations around fishing vessels.



Skuas
Arctic Skua (orange)
and Great Skua (red)

5. Lesser Black-backed Gull

Lesser Black-backed Gulls were found throughout the study area, with the highest numbers in the coastal waters near the mainland coast, particularly in the wake of trawlers.

The number of flying Lesser Black-backed Gulls was low ($n = 33$), but most birds were seen in the lower altitude classes (Table 4); very few were noticed higher than 25 m asl.

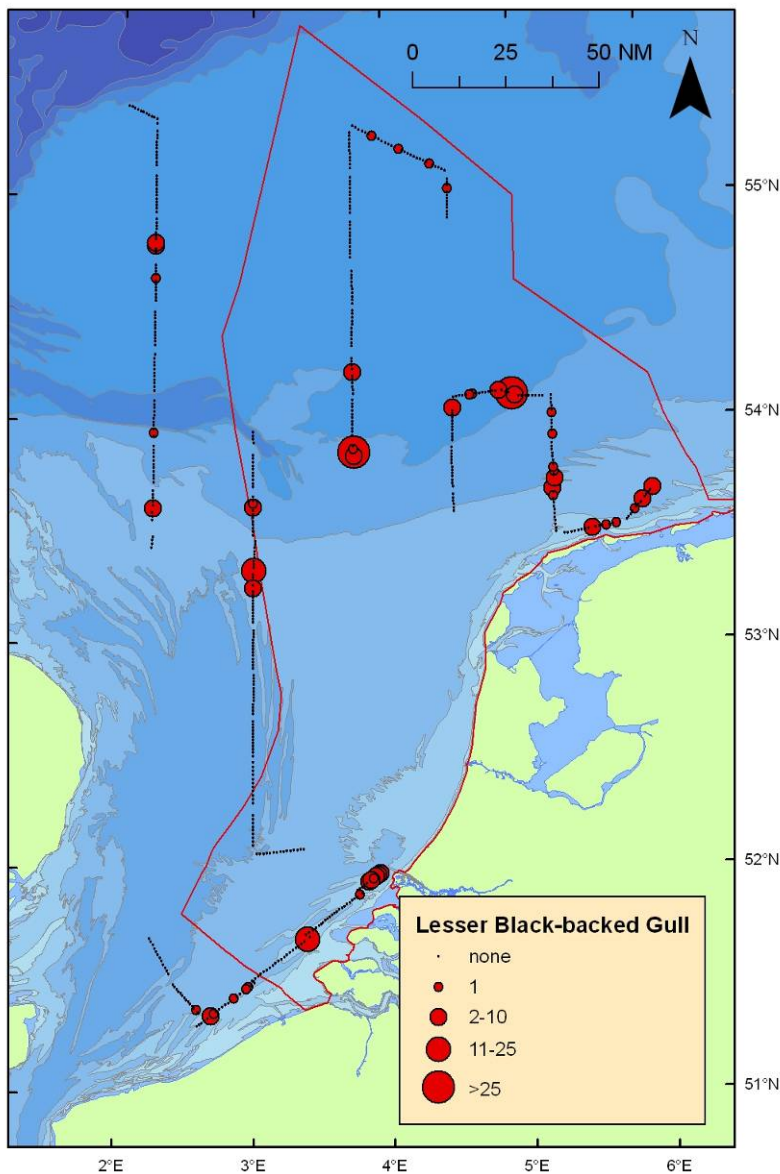


Table 4. Distribution of flying heights in Lesser Black-backed Gulls

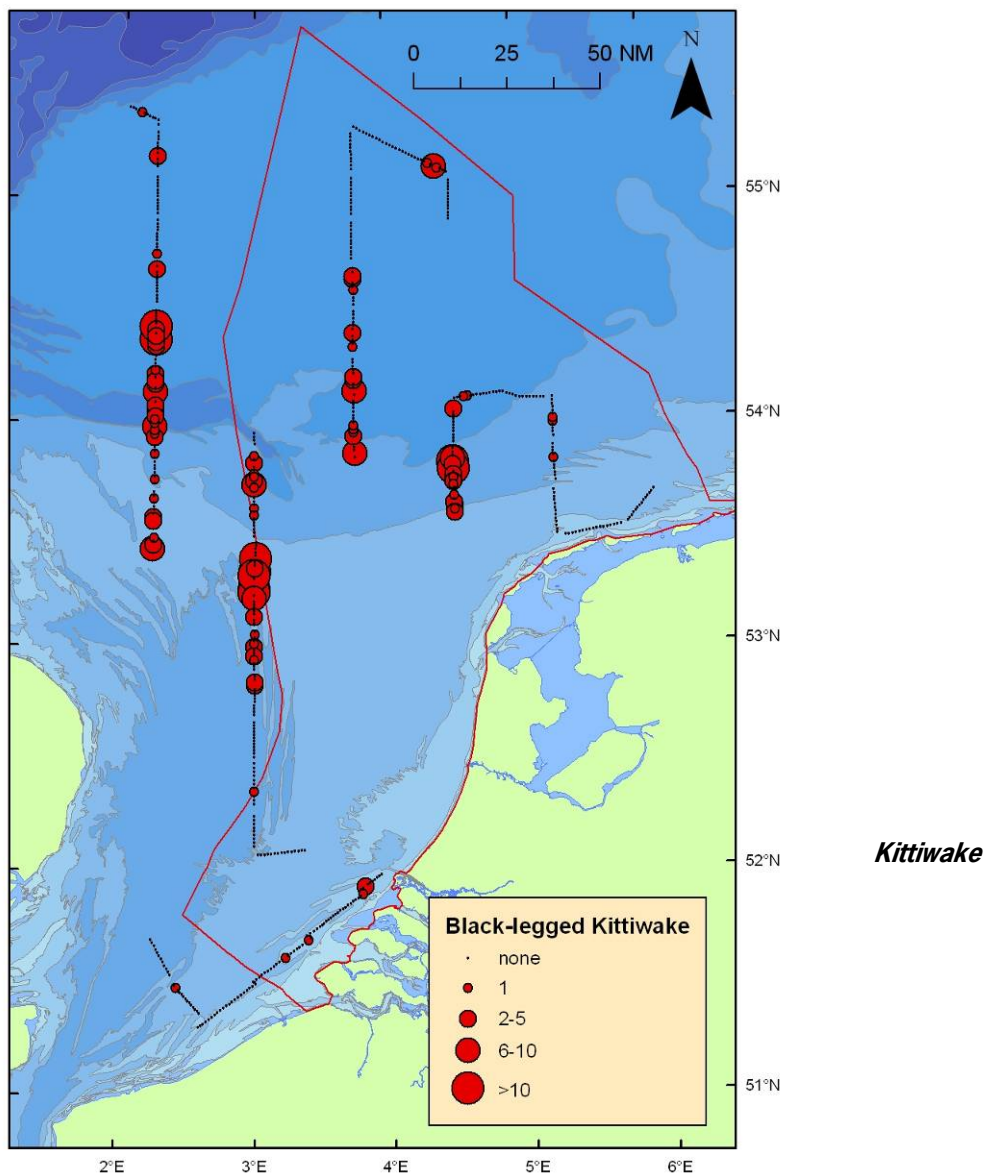
Altitude Class	Altitude range (m asl)	N
1	0-2	2
2	2-10	15
3	10-25	11
4	25-50	1
5	50-100	3
6	100-200	1
7	> 200	-

Lesser Black-backed Gull

6. Black-legged Kittiwake

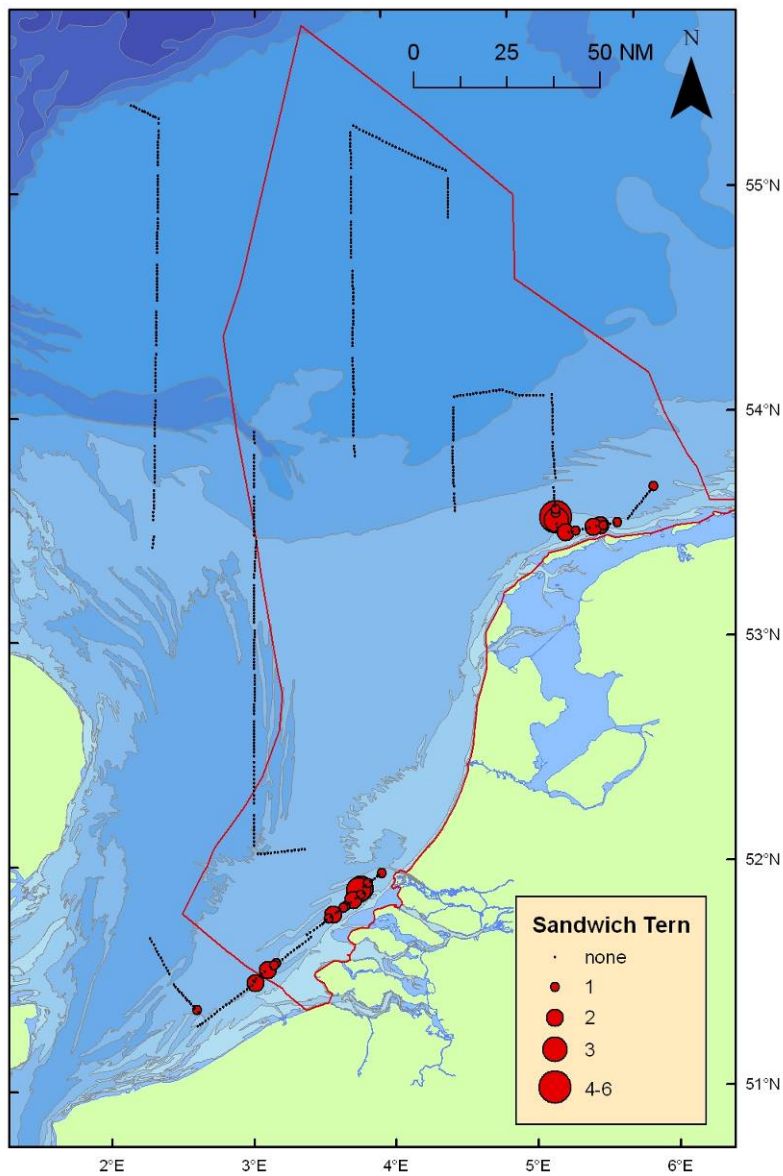
The highest densities were found in the northwest of the study area, just south of the (western) Dogger Bank. Kittiwakes were virtually absent from the southern and eastern part of the DCS. Contrary to previous surveys no associations with Common Guillemots were present. Feeding Kittiwakes were seen dipping and surface seizing throughout the entire area, notably north of the Wadden Isles. Most Kittiwakes were adults in breeding plumage (78%, n = 269), the remainder was immature.

Due to the adjusted sampling grid for the fish larvae the offshore platform K15-FC-1 in Dutch waters, where a new breeding colony of Kittiwakes was discovered during the previous surveys, could not be checked for fledged juveniles.



7. Sandwich Tern

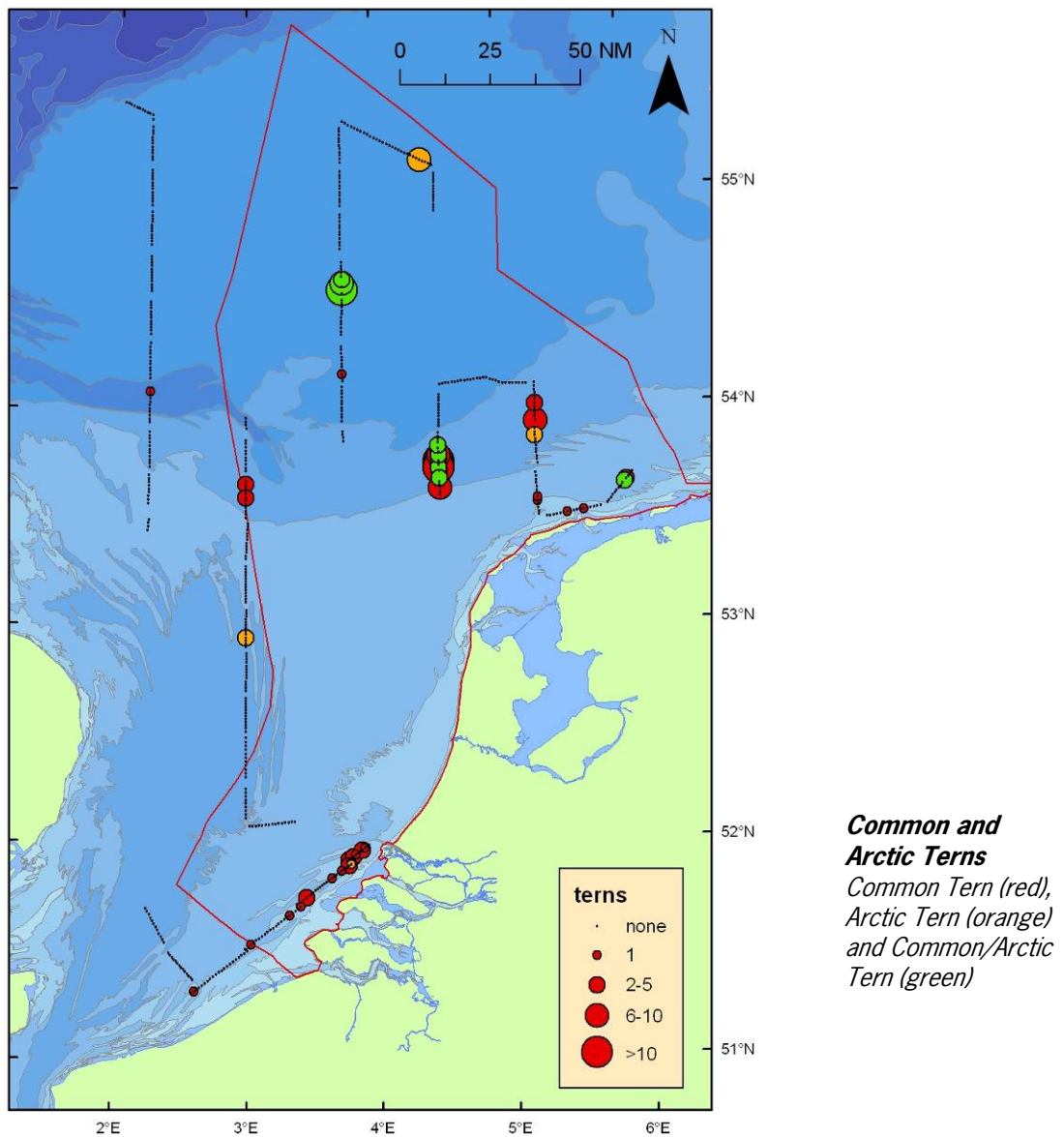
Sandwich Terns were scarce and more or less restricted to the coastal waters north of the Wadden Isles, and the southwestern part of Dutch and Belgian waters. In contrast to the previous surveys a small number fledged juveniles was seen (30%, $n = 20$).



Sandwich Tern

8. Common and Arctic Terns

Common and Arctic Terns were seen in the entire DCS, with higher numbers in the coastal zone and the northern part of the DCS. North of the Wadden Isles and on the Dogger Bank dozens of feeding individuals were seen further offshore.



9. Common Guillemot

Guillemot distribution ranged across the entire northern DCS, but numbers in the eastern part were lower than further west. The coastal zone and the southern parts of the study area were devoid of birds. Concentrations of Guillemots were observed north of the Brown Ridge, in the Botney Cut and Cleaverbank area, along the edges of the Dogger Bank and to a smaller extent at the Frisian Front.

Since the chicks were almost impossible to distinguish from winter plumage birds the number of father-chick combinations ($n = 42$) was lower than during the previous surveys. The adults accompanying chicks were mostly in transition (84%, $n = 32$) or winter plumage (16%). Overall winter plumage birds were more common (62%, $n = 195$), with only 1% summer plumage birds (Table 5).

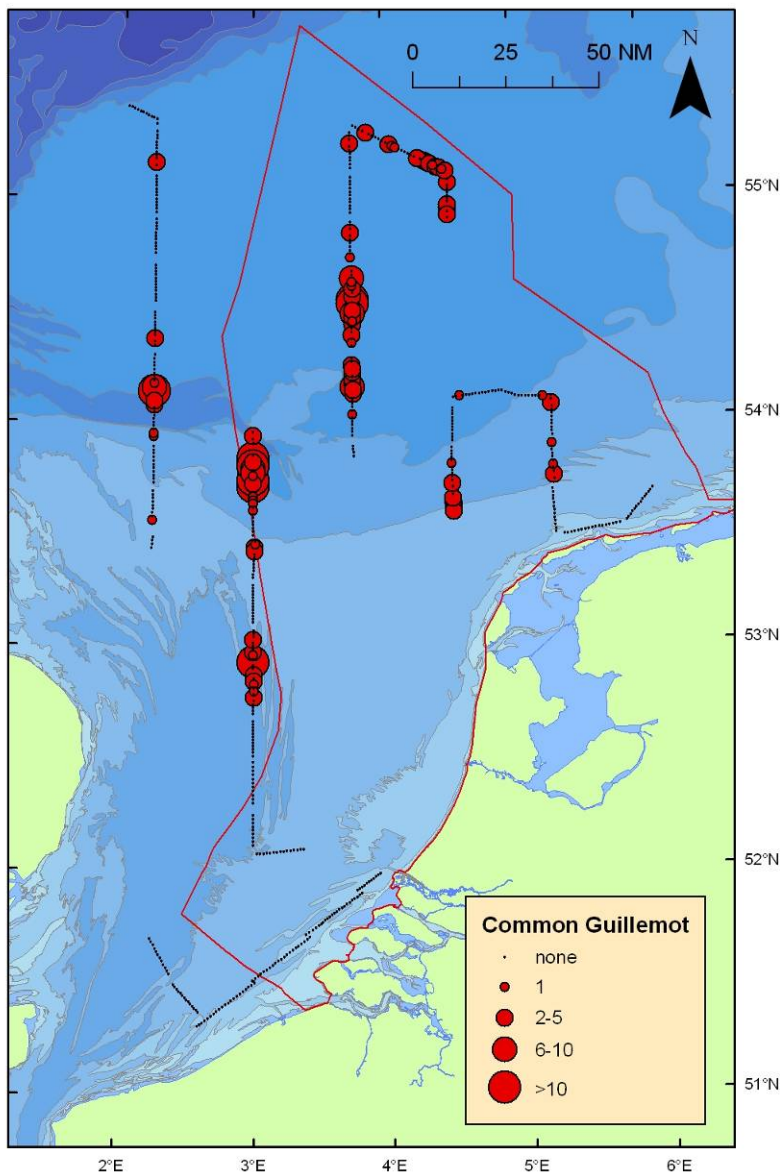


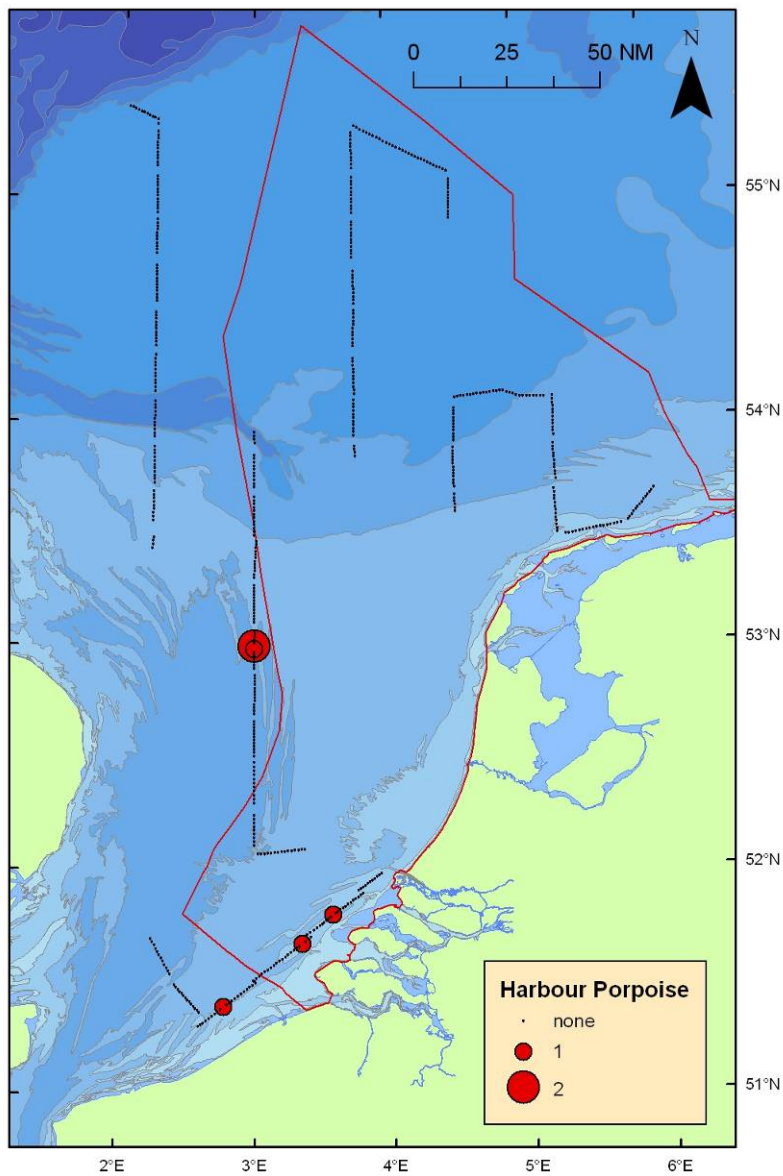
Table 5. Plumages of Common Guillemots at sea during the August 2010 survey. Chicks are not included.

Plumage	N	%
Full breeding	2	1
Transition	72	37
Full winter	121	62
Total	195	

Common Guillemot

10. Harbour Porpoise

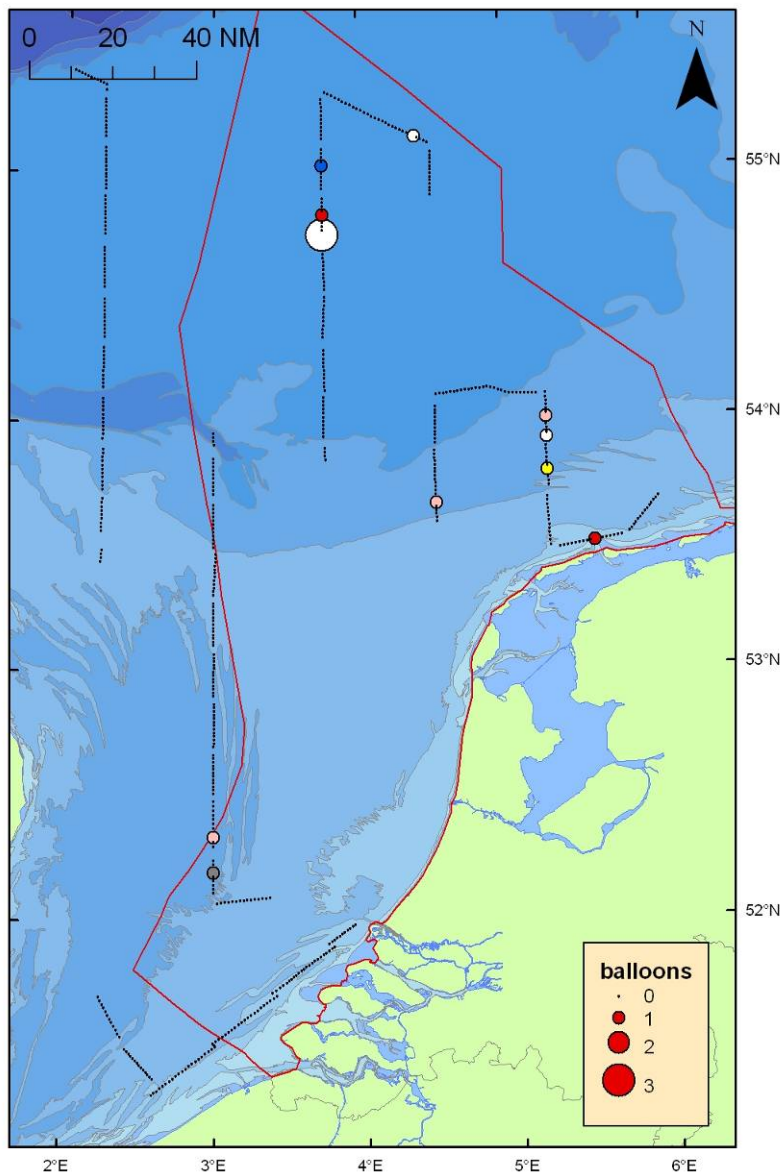
Harbour Porpoises were scarce, or at least rarely spotted, with only six observed animals. Observation conditions for this species were predominantly poor or at best moderate though. The observations of porpoises were made in seastate 4 and 5.



Harbour Porpoise

11. Balloons

A smaller number of balloons was seen than during the previous surveys with offshore winds from the United Kingdom. Before and during the survey winds were predominantly northerly, probably blowing most balloons out of the study area. Mostly offshore, 22 balloons were seen, of various shapes and colours. One set of balloons could be linked to the United Kingdom, since it had a text from Chiquito Mexican grill, a chain of restaurants spread all over the UK.



Balloons

The colour gives the (main) colour of the balloons.

Conclusions

This fifth survey was less successful than the previous ones. Weather conditions were mostly moderate to poor, making it hard(er) to obtain good estimates of distributions and densities of target animals, including species that are often hard to survey, such as Harbour Porpoises and Common Guillemots.

Harbour Porpoises were almost absent, but Guillemots were concentrated north of the Brown Ridge, in the Botney Cut and Cleaverbank area, along the edges of the Dogger Bank and to a smaller extent the Frisian Front.

Overall, bird densities were generally rather low. Kittiwakes were one of the few exceptions, and showed highest densities in the northwest of the study area, just south of the (western) Dogger Bank. Lesser Black-backed Gulls were found throughout the study area, with the highest numbers in the coastal waters near the mainland coast, particularly in the wake of trawlers.

4 Acknowledgements

We like to thank Rijkswaterstaat for the opportunity of conducting these surveys, that will add substantially to our knowledge of the occurrence of seabirds on the DCS and adjoining waters. Despite the constraints for observations working on board of the Zirfaea was a pleasant experience, due to the good working conditions supported by the captain and crew of the Zirfaea, by the RWS meetleider and by our fellow IMARES scientists.

5 Quality Guarantee

IMARES utilises an ISO 9001:2000 certified quality management system (certificate number: 08602-2004-AQ-ROT-RvA). This certificate is valid until 15 March 2010. The organisation has been certified since 27 February 2001. The certification was issued by DNV Certification B.V. Furthermore, the chemical laboratory of the Environmental Division has NEN-AND-ISO/IEC 17025:2005 accreditation for test laboratories with number L097. This accreditation is valid until 27 March 2013 and was first issued on 27 March 1997. Accreditation was granted by the Council for Accreditation.

6 References

Leopold M.F., Verdaat H. & van Bemmelen R. 2010. Masterplan Wind – Seabirds. Cruise Report April 2010. IMARES Report C054/10.

Justification

Rapport C111/10
Project Number: 430.25015.02

The scientific quality of this report has been peer reviewed by the a colleague scientist and the head of the department of IMARES.

Approved: Drs. M.F. Leopold

Signature:



Date: 14 September 2010

Approved: Drs. J. Asjes
Head of Fish Department

Signature:

Date: 14 September 2010

Number of copies: e-version only
Number of pages 25
Number of tables: 5
Number of maps/graphs: 12