1 PRIEDAS

Poveikio aplinkai vertinimo programos tvirtinimo raštas

APLINKOS APSAUGOS AGENTŪRA

Biudžetinė įstaiga, A. Juozapavičiaus g. 9, LT-09311 Vilnius, tel.8 70662008, el. p. aaa@gamta.lt, http://aaa.lrv.lt.
Duomenys kaupiami ir saugomi Juridinių asmenų registre, kodas 188784898

VšĮ Pajūrio tyrimų ir planavimo institutui
el. p. info@corpi.lt

2022-04- Nr. (30.2)-A4E-
Į 2022-04-12 Nr. S22-049

DĖL POVEIKIO APLINKAI VERTINIMO PROGRAMOS TVIRTINIMO

Išnagrinėjome poveikio aplinkai vertinimo dokumentų rengėjo VšĮ Pajūrio tyrimų ir planavimo instituto parengtą Energetikos ministerijos planuojamos ūkinės veiklos (toliau – PŪV) – iki 700 MW įrengtosios galios jūrinių vėjo elektrinių parko įrengimo ir eksploatacijos Lietuvos jūrinėje teritorijoje poveikio aplinkai vertinimo programą (toliau – PAV programa), suinteresuotos visuomenės pasiūlymų įvertinimą ir poveikio aplinkai vertinimo subjektų išvadas.

Palangos miesto savivaldybės administracija 2021-12-01 raštu Nr. (4.21.E) D3-3911 pritarė PAV programai. Klaipėdos rajono savivaldybės administracija 2021-11-10 raštu Nr. (5.1.28 E) A5-5106 nurodė poveikio aplinkai vertinimo ataskaitoje (toliau – PAV ataskaita) pateikti informaciją apie II pasaulinio karo metu nuskandintų cheminių ginklų galimas vietas Baltijos jūroje ir įvertinti PŪV teritoriją šiuo atžvilgiu bei PAV ataskaitoje numatyti atlikti Baltijos jūros dugno tyrimus PŪV teritorijoje dėl galimo teritorijos užteršimo cheminiais ginklais ir minomis. Klaipėdos miesto savivaldybės administracija 2021-11-09 raštu Nr. (4.36E)-R2-2863 pritarė PAV programai. Nacionalinio visuomenės sveikatos centro prie Sveikatos apsaugos ministerijos Klaipėdos departamentas 2021-11-04 raštu Nr. (3-11 14.3.2 Mr)2-129991 pritarė PAV programai. Priešgaisrinės apsaugos ir gelbėjimo departamento prie Vidaus reikalų ministerijos Klaipėdos apskrities priešgaisrinė gelbėjimo valdyba 2021-11-09 raštu Nr. 9.4-3-2754 pritarė PAV programai. Kultūros paveldo departamento prie Kultūros ministerijos Klaipėdos skyrius 2021-10-29 raštu Nr. (9.38-Kl)2Kl-1183 pritarė PAV programai.

Aplinkos apsaugos agentūros (toliau – Agentūra) 2021-12-31 raštu Nr. (30.2)-A4E-15520 į poveikio aplinkai vertinimo procesą poveikio aplinkai vertinimo subjekto teisėmis pakviestos valstybės institucijos: VĮ Klaipėdos valstybinio jūrų uosto direkcija 2022-01-06 raštu Nr. UD-9.1.4E-38 pastabų PAV programai neturėjo; Neringos savivaldybės administracija 2022-01-11 raštu Nr. V15-73 pritarė PAV programai; Lietuvos geologijos tarnyba bei Žuvininkystės tarnyba prie Žemės ūkio ministerijos išvadų dėl papildytos PAV programos per nustatytą terminą nepateikė, todėl vadovaujantis Planuojamos ūkinės veiklos poveikio aplinkai vertinimo įstatymo (toliau – PAV įstatymas) 8 straipsnio 7 dalimi laikoma, kad PAV programai pritarė; Valstybinė saugomų teritorijų tarnyba prie Aplinkos ministerijos 2022-04-08 raštu Nr. (4)-V3-567 pritarė PAV programai.

Agentūra 2021-10-25 raštu Nr. (30.2)-A4E-12206 kreipėsi į Aplinkos ministeriją dėl tarpvalstybinio poveikio aplinkai vertinimo procedūrų taikymo PŪV. Aplinkos ministerija 2021-11-05 raštu Nr. (10)-D8(E)-6898 konstatavo, kad PŪV privaloma atlikti tarpvalstybinio poveikio aplinkai vertinimo procedūras. Aplinkos ministerija, vadovaudamasi Espo konvencijos 3 straipsniu, 2021-12-09 raštais Nr. (10)-D8(E)-7691 ir Nr. (10)-D8(E)-7692 apie Lietuvoje PŪV notifikavo Lenkiją, Latviją, Estiją, Suomiją, Švediją, Daniją ir Vokietiją, o 2021-12-17 raštu Nr. (10)-D8(E)-7954, vadovaudamasi Helsinkio konvencijos dėl Baltijos jūros baseino jūrinės aplinkos apsaugos 7 straipsniu – Helsinkio konvencijos sekretoriatą, Lenkiją, Latviją, Estiją, Suomiją, Švediją, Daniją, Vokietiją ir Rusiją. Aplinkos ministerija 2022-02-10 d. raštu Nr. (10)-D8(E)-801 ir 2022-03-08 raštu Nr. (10)-D8(E)-1271 informavo, kad Latvija, Danija, Švedija, Suomija išreiškė norą dalyvauti tarpvalstybinio poveikio aplinkai vertinimo procedūrose ir pateikė pastabas ir pasiūlymus. Estija informavo, kad tarpvalstybinio poveikio aplinkai vertinimo procedūrose nedalyvaus, tačiau pateikė pasiūlymų ir išreiškė pageidavimą gauti poveikio aplinkai vertinimo dokumentus, nurodydama, kad toks pasikeitimas informacija ir dokumentais svarbus vertinant suminį vėjo elektrinių projektų, vystomų Baltijos jūroje, poveikį aplinkai. Vokietija į notifikaciją neatsakė. Lenkija paprašė, kad PŪV PAV ataskaita būtų pateikta popieriniu ir elektroniniu formatu. PAV ataskaitoje bus įvertinti poveikį patiriančių valstybių pasiūlymai.

Išnagrinėję ir įvertinę Jūsų parengtą PAV programą ir remdamiesi poveikio aplinkai vertinimo subjektų išvadomis, vadovaudamiesi PAV įstatymo 8 straipsnio 9 dalimi, šią PAV programą tvirtiname. Jūrinis vėjo elektrinių parkas ir jo jungtis su sausumoje esančiu elektros perdavimo tinklu ir susijusia infrastruktūra (toliau – Jungtis) yra neatsiejamos PŪV dalys. Atsižvelgiant į tai, kad šiuo metu nėra žinoma jūrinio vėjo elektrinių parko Jungties koridoriaus vieta, nustačius jo vietą, PAV įstatymo nustatyta tvarka Jungties įrengimui bus atliekama atranka dėl poveikio aplinkai vertinimo.

Rengiant PAV ataskaitą būtina vadovautis Planuojamos ūkinės veiklos poveikio aplinkai vertinimo tvarkos aprašo, patvirtinto Lietuvos Respublikos aplinkos ministro 2017 m. spalio 31 d. įsakymu Nr. D1-885 ,,Dėl planuojamos ūkinės veiklos poveikio aplinkai vertinimo tvarkos aprašo patvirtinimo“, nuostatomis. Taip pat PAV ataskaitoje prašome vadovautis Lietuvos Respublikos bendruoju planu, patvirtintu Lietuvos Respublikos Vyriausybės 2021 m. rugsėjo 29 d. nutarimu Nr. 789 „Dėl Lietuvos Respublikos teritorijos bendrojo plano patvirtinimo“.

Šį atsakymą Jūs turite teisę apskųsti Agentūrai (A. Juozapavičiaus g. 9, Vilnius 09311) Viešojo administravimo įstatymo nustatyta tvarka per vieną mėnesį nuo jo įteikimo dienos arba Seimo kontrolieriui dėl valstybės tarnautojų piktnaudžiavimo, biurokratizmo ar kitaip pažeidžiamų žmogaus teisių ir laisvių viešojo administravimo srityje per vienerius metus nuo šio atsakymo įteikimo dienos (Gedimino g. 56, 01110 Vilnius) Seimo kontrolierių įstatymo nustatyta tvarka.

Direktorė Milda Račienė

Skirmantė Stankevičienė, tel. 8 620 85561, el. p. skirmante.stankeviciene@gamta.lt
Laima Prudnikovienė, tel. 8 665 55456, el. p. laima.prudnikoviene@gamta.lt

DETALŪS METADUOMENYS	
Dokumento sudarytojas (-ai)	Aplinkos apsaugos agentūra, A. Juozapavičiaus g. 9, LT-09311 Vilnius
Dokumento pavadinimas (antraštė)	Dėl poveikio aplinkai vertinimo programos tvirtinimo (iki 700 MW įrengtosios galios jūrinių vėjo elektrinių parko įrengimo ir eksploatacijos Lietuvos jūrinėje teritorijoje poveikio aplinkai vertinimo programa)
Dokumento registracijos data ir numeris	2022-04-29 Nr. (30.2)-A4E-4964
Dokumento specifikacijos identifikavimo žymuo	ADOC-V1.0, GEDOC
Parašo paskirtis	Pasirašymas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	MILDA RAČIENĖ, Direktorė
Parašo sukūrimo data ir laikas	2022-04-28 17:20:11
Parašo formatas	Parašas, pažymėtas laiko žyma
Laiko žymoje nurodytas laikas	2022-04-28 17:21:28
Informacija apie sertifikavimo paslaugų teikėją	ADIC CA-A
Sertifikato galiojimo laikas	2021-09-21 - 2024-09-20
Parašo paskirtis	Registravimas
Parašą sukūrusio asmens vardas, pavardė ir pareigos	Danguolė Petravičienė, Vyriausioji specialistė
Parašo sukūrimo data ir laikas	2022-04-29 08:23:09
Parašo formatas	Trumpalaikis skaitmeninis parašas, kuriame taip pat saugoma sertifikato informacija
Laiko žymoje nurodytas laikas	
Informacija apie sertifikavimo paslaugų teikėją	RCSC IssuingCA
Sertifikato galiojimo laikas	2021-01-07 - 2023-01-07
Pagrindinio dokumento priedų skaičius	0
Pagrindinio dokumento pridedamų dokumentų skaičius	0
Programinės įrangos, kuria naudojantis sudarytas elektroninis dokumentas, pavadinimas	Elektroninė dokumentų valdymo sistema VDVIS, versija v. 3.04.02
El. dokumento įvykius aprašantys metaduomenys	
Informacija apie elektroninio dokumento ir elektroninio (-ių) parašo (-ų) tikrinimą (tikrinimo data)	El. dokumentas atitinka specifikacijos keliamus reikalavimus. Visi dokumente esantys elektroniniai parašai galioja. Tikrinimo data: 2022-04-29 08:24:15
Elektroninio dokumento nuorašo atspausdinimo data ir ją atspausdinęs darbuotojas	2022-04-29 atspausdino Danguolė Petravičienė
Paieškos nuoroda	

2 PRIEDAS

Poveikio aplinkai vertinimo rengėjų kvalifikaciją patvirtinantys dokumentai

KODAS: 7108

KLAIPĖDOS UNIVERSITETAS

AUKŠTOJO MOKSLO

DIPLOMAS

AM Nr.000528

Klaipėdos universiteto rektorius ir Jūrų technikos fakulteto dekanas patvirtina, kad

Rosita KISELIOVAITĖ - MILERIENĖ

asmens kodas:

2000 metais baigė studijas pagal Jūros aplinkosaugos inžinerijos studijų programą ir jai suteiktas aplinkosaugos inžinerijos
M A G I S T R O kvalifikacinis laipsnis.

Klaipėdos universiteto rektorius
prof. habil. dr. S. Vaitekūnas

Jūrų technikos fakulteto dekanas
doc. dr. A. Masiulis

LIETUVOS RESPUBLIKA * KLAIPĖDOS UNIVERSITETAS

Klaipėda, 2000 m. birželio 26 d.

Registracijos Nr. TD-1110

"GARSŲ PASAULIS"- 98

VDTAT

LIETUVOS RESPUBLIKA

DAKTARO DIPLOMAS

DA011296

DAKTARAS

Nerijus
BLAŽAUSKAS

FIZINIAI MOKSLAI

LIETUVOS RESPUBLIKOS ŠVIETIMO IR MOKSLO MINISTERIJA

Vilnius
Valstybinės registracijos Nr. 018814
2003 m. sausio 17 d.

Vilniaus universitetas,
Geologijos institutas

Nerijui
BLAŽAUSKUI

suteikė daktaro mokslo laipsnį
už geologijos darbą
„Paviršinių prieledyninių fliuvioglacialinių
nuogulų sedimentacijos rekonstrukcija
(Rytų Lietuvos pavyzdžiu)",
apgintą 2002 m. lapkričio 26 d.

Doktorantūros studijų komiteto pirmininkas
prof. habil. dr. A. Jurgaitis

Komiteto nariai:

habil. dr. V. Baltrūnas | *prof. habil. dr. A. Česnulevičius*

prof. habil. dr. O. Pustelnikovas | *doc. dr. P. Šinkūnas*

Vilniaus universiteto rektorius
prof. habil. dr. B. Juodka

KLAIPĖDOS UNIVERSITETAS

DAKTARO Diplomas

KUD Nr. 000093

Klaipėdos universiteto kodas 211951150
Diplomo kodas 8108

Sergej SUZDALEV

2015 m. lapkričio 26 d. apgynė biomedicinos mokslų srities ekologijos ir aplinkotyros mokslo krypties darbą „Pavojingųjų medžiagų pasiskirstymas ir geocheminės anomalijos labai pakeisto vandens telkinio dugno nuosėdose" ir jam suteiktas daktaro mokslo laipsnis.

Klaipėdos universiteto rektorius — *prof. habil. dr. Eimutis Juzeliūnas*

Mokslo krypties tarybos pirmininkas — *doc. dr. Zita Rasuolė Gasiūnaitė*

A.V.

LIETUVOS RESPUBLIKA KLAIPĖDOS UNIVERSITETAS

Registracijos Nr. 50-88
Išdavimo data 2015 m. lapkričio 30 d.

2014 UAB „GRAFIJA" 01232

DIPLOMAS

Э № 239865

Šis diplomas išduotas Gražulevičiui Gediminui, Broniaus

pažymėti, kad jis 1969 metais įstojo į Vilniaus Valstybinį V. Kapsuko universitetą

ir 1974 metais baigė šio universiteto

biologijos (zoologijos)

specialybės visą kursą.

Valstybinės egzaminų komisijos 1974 m. birželio 17 d. nutarimu Gražulevičiui G. B. pripažinta biologo, biologijos ir chemijos dėstytojo

kvalifikacija.

Valstybinės egzaminų komisijos Pirmininkas

Rektorius

Sekretorius

Vilnius 1974 m. liepos 1 d.

Registracijos Nr. 280

Литовский яз.

ДИПЛОМ

Э № 239865

Настоящий диплом выдан Гражулявичюс Гедиминас, Бронюс

в том, что он в 1969 году поступил

в Вильнюсский Государственный университет им. В. Капсукаса

и в 1974 году окончил полный курс

названного университета

по специальности

биология (зоология)

Решением Государственной экзаменационной комиссии от „17“ июня 1974 г.

Гражулявичюс Г. Б.

присвоена квалификация биолога, преподавателя биологии и химии.

Председатель Государственной экзаменационной комиссии

Ректор

Секретарь

М. П.

Город Вильнюс 1 июля 1974 г.

Регистрационный № 280

Московская типография Гознака. 1970.

Nr 8720/H
(numer dyplomu)

J. Seweryn
podpis

UNIWERSYTET
MIKOŁAJA KOPERNIKA W TORUNIU

DYPLOM

Iwona, Małgorzata Seweryn

urodzona dnia [illegible] maja [illegible]

w Gdyni

odbyła studia wyższe magisterskie - dzienne na Wydziale Humanistycznym

w zakresie archeologii /specj. podwodna + konserwacja zab. archeolog./

z wynikiem bardzo dobrym

i po spełnieniu wymogów określonych obowiązującymi przepisami uzyskała

w dniu 28 kwietnia 1992 roku

tytuł magistra archeologii

REKTOR
m. p.
DZIEKAN

Toruń, dnia 4 maja 1992 r.

Kodas 7212

LIETUVOS
VETERINARIJOS AKADEMIJA

AUKŠTOJO MOKSLO DIPLOMAS

VS Nr. 000349

Julius Morkūnas
(a. k.

2009 metais baigė veterinarinės medicinos studijų krypties veterinarinės medicinos universitetinių vientisųjų studijų programą (kodas 60112B101), ir jam suteikta veterinarijos gydytojo kvalifikacija.

LIETUVOS VETERINARIJOS AKADEMIJA Nr. 1 LIETUVOS RESPUBLIKA

Rektorius Henrikas Žilinskas

Registracijos Nr. 5571
Išdavimo data 2009 02 27

Lietuvos veterinarijos akademijos kodas 111950777
Diplomo kodas 7212
Spausdinimo data 2009 02 23

2005 UAB „GRAFIJA" 00

KLAIPĖDOS UNIVERSITETAS

MAGISTRO DIPLOMAS

MKU Nr. 001147

Viačeslav Jurkin

(asmens kodas)

2010 metais baigė jūrų hidrologijos magistrantūros studijų programą (kodas 62406P103) ir jam suteiktas geografijos m a g i s t r o kvalifikacinis laipsnis.

LIETUVOS RESPUBLIKA KLAIPĖDOS UNIVERSITETAS

Rektorius prof. habil. dr. Vladas Žulkus

Registracijos Nr. 37GD-2100

Klaipėda, 2010-06-16

Spausdinimo data 2010-06-16

Diplomo kodas 7108

Universiteto kodas 211951150

2009 UAB „GRAFIJA" 00588

ESRI

hereby certifies that

Viačeslav Jurkin

has successfully completed

Introduction to ArcGIS II

24 Hours of Classroom Instruction

Presented this 29th day of June, 2007

Vaidotas Krušinskas, Instructor

Jack Dangermond, President

ESRI®

Certificate No. C07150

РЭСПУБЛІКА БЕЛАРУСЬ
ДЫПЛОМ

А № 0241906

Гэты дыплом выдадзены Лісіменку Аляксандру Іванавічу

у тым, што ён у 1997 годзе паступіў у Беларускі дзяржаўны універсітэт

і ў 2002 годзе скончыў поўны курс названага універсітэта

па спецыяльнасці радыёфізіка

Рашэннем Дзяржаўнай экзаменацыйнай камісіі

ад «14» чэрвеня 2002 года, пратакол № 1 Лісіменку А. І.

прысвоена кваліфікацыя радыёфізік

Старшыня Дзяржаўнай экзаменацыйнай камісіі /подпіс/

Рэктар /подпіс/

Сакратар /подпіс/

Горад Мінск «21» чэрвеня 2002 года.

Рэгістрацыйны № 0327-Ч

РЕСПУБЛИКА БЕЛАРУСЬ
ДИПЛОМ

А № 0241906

Настоящий диплом выдан Лисименко Александру Ивановичу

в том, что он в 1997 году поступил в Белорусский государственный университет

и в 2002 году окончил полный курс названного университета

по специальности радиофизика

Решением Государственной экзаменационной комиссии

от «14» июня 2002 года, протокол № 1 Лисименко А. И.

присвоена квалификация радиофизик

Председатель Государственной экзаменационной комиссии /подпись/

Ректор /подпись/

Секретарь /подпись/

Город Минск «21» июня 2002 года.

Регистрационный № 0327-Ч

УП "МПФ" Гознака. Зак. 1365-01

Odpis

RZECZPOSPOLITA POLSKA

POLSKA AKADEMIA NAUK
INSTYTUT OCEANOLOGII W SOPOCIE

DYPLOM

Aliaksandr Lisimenka

urodzony dnia .... r. w Mińsku (Białoruś)
na podstawie przedstawionej rozprawy doktorskiej
"Wykorzystanie szumów morza do identyfikacji warstw rozpraszających i wybranych parametrów hydrometeorologicznych w obszarze Bałtyku"
oraz po złożeniu wymaganych egzaminów uzyskał stopień naukowy

DOKTORA

nauk o Ziemi
w zakresie oceanologii
nadany uchwałą Rady Naukowej
Instytutu Oceanologii PAN w Sopocie

z dnia 10 grudnia 2007 r.

Promotor w przewodzie doktorskim: prof. dr hab. Zygmunt Klusek
Recenzenci w przewodzie doktorskim:
dr hab. prof. AMW Grażyna Grelowska z Akademii Marynarki Wojennej w Gdyni
prof. dr hab. inż. Roman Salamon z Politechniki Gdańskiej

25 stycznia 2008 r.

POLSKA AKADEMIA NAUK INSTYTUT OCEANOLOGII W SOPOCIE

PRZEWODNICZĄCY RADY

prof. dr hab. Jerzy Dera

mp.

DYREKTOR PLACÓWKI NAUKOWEJ

prof. dr hab. inż. Stanisław Massel

Nr 27

NUORAŠAS

VILNIAUS UNIVERSITETAS

DIPLOMAS

V Nr. 95219

Vilniaus universiteto Rektorius prof. habil. dr. Rolandas Pavilionis ir *Gamtos mokslų fakulteto dekanas doc. habil. dr. Jonas Naujalis* patvirtina:

Sabina Solovjova

gimęs (-usi) 19__ m. ________ mėn. __ d. *Klaipėdoje*,

19*90* metais įstojo į Vilniaus universitetą ir 19*97* metais baigė *biologijos* studijų programą ir jam (jai) suteikiama *biologo, biologijos dėstytojo* kvalifikacija.

Rektorius

Dekanas

Vilnius, 19*97* m. *birželio* mėn. *25* d.

Registracijos Nr. *615*

Žr. kt. pusę

LIETUVOS RESPUBLIKA

DAKTARO

DIPLOMAS

DA010968

DAKTARĖ

Giedrė

GODIENĖ

FIZINIAI MOKSLAI

LIETUVOS RESPUBLIKOS ŠVIETIMO IR MOKSLO MINISTERIJA

Vilnius
Valstybinės registracijos Nr. 018183
2001 m. spalio 31 d.

Vilniaus universitetas,
Geografijos institutas

Giedrei
GODIENEI

suteikė daktaro mokslo laipsnį
už geografijos darbą
„Užstatymo intensyvumo kaitos dėsningumai
urbanizuotame kraštovaizdyje
(Lietuvos miestų pavyzdžiu)",
apgintą 2001 m. spalio 11 d.

Doktorantūros studijų komiteto pirmininkas
prof. habil. dr. P. Kavaliauskas
Komiteto nariai:

prof. habil. dr.
V. Dvareckas

prof. habil. dr.
J. Vanagas

prof. habil. dr.
V. Valenta

dr.
M. Jankauskaitė

VILNIAUS UNIVERSITETAS * LIETUVOS RESPUBLIKA

Vilniaus universiteto l.e. rektoriaus pareigas
prof. habil. dr. B. Juodka

KLAIPĖDOS UNIVERSITETAS

MAGISTRO
DIPLOMAS

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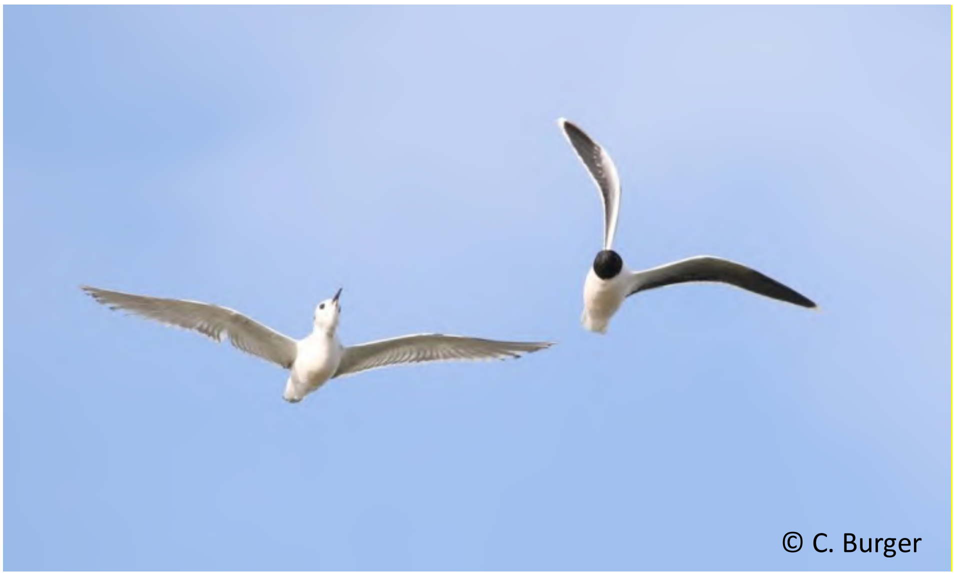

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1 INTRODUCTION

On behalf of PI Coastal Research and Planning Institute (CORPI), BioConsult SH conducted digital aerial surveys and vessel-based surveys between September 2021 and September 2022 on resting/local birds, using data collection and analysis methods comparable to Germany. The goal was to determine the abundance and spatial distribution of resting seabirds in an area within the exclusive economic zone (EEZ) of Lithuania, where the development of a wind farm (OWF) is planned. In this report, the results of the first year of surveys, including 6 digital aerial surveys and 7 ship-based surveys are presented.

1.1 Description of the project area

The planned wind farm area is located around 29 km west of the coast of Lithuania (Figure 1.1). It is bordering the Special Protection Area (SPA) "Klaipėdos–Ventspilio plynaukštė", which extends to the east of the planned OWF area. Relevant bird species in this SPA are Red-throated Diver, Long-tailed Duck, Velvet Scoter, Common Guillemot and Razorbill.

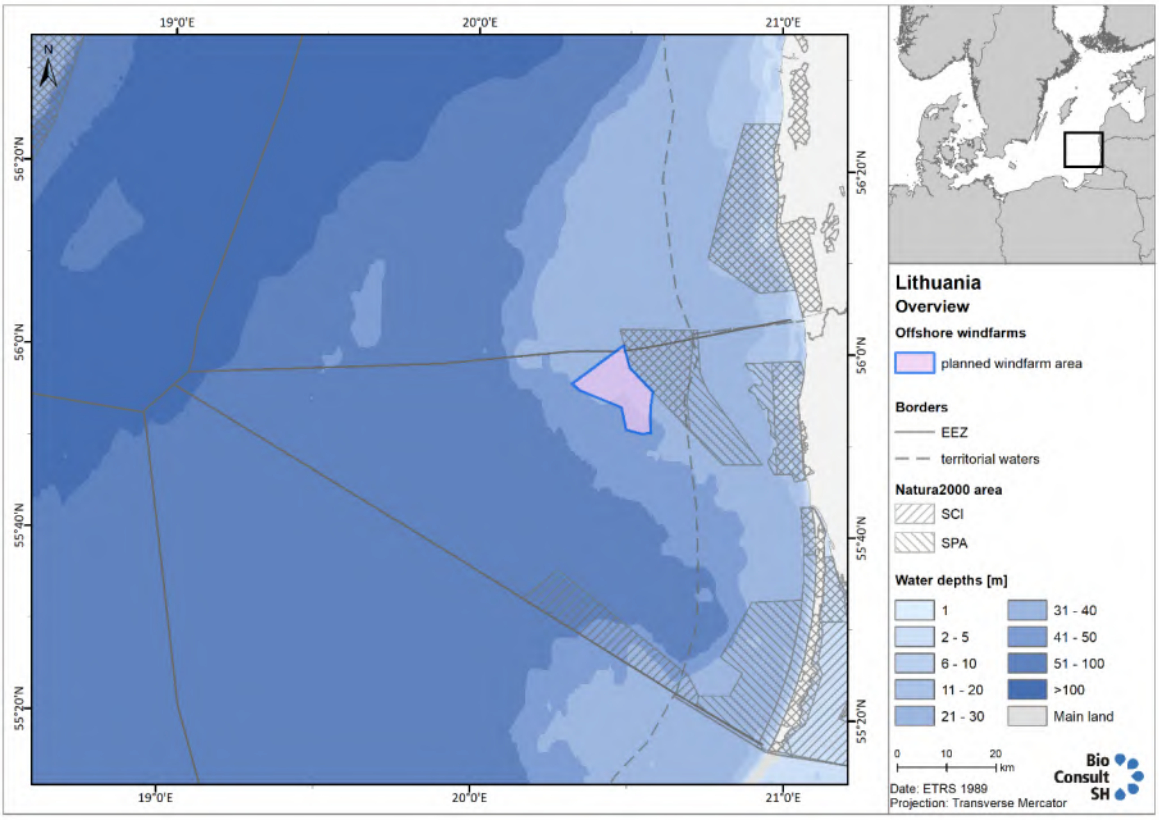

Figure 1.1 Overview of the study area in Lithuania.

2 METHODS

2.1 234Aerial surveys using digital videos

2.1.1 Description of the survey transects

This report uses seabird abundances and distributions obtained from a total of 6 airplane-based digital surveys conducted between November 2021 and April 2022. The survey area is referred to as the study site and corresponds to the area covered by the transects.

The transect design includes 13 transects with transect lengths of 39 km and 4 shorter transects in between, to cover the planned wind farm area, with a transect lengths of 19.07 km. In total, a transect length of 583.28 km is reached. The long transects run parallel to each other and are separated by 4 km, the shorter transects are located in between at a distance of 2 km. The area covered by the transect design is 2,340 km² (Table 2.1, Table 2.2, Figure 2.1).

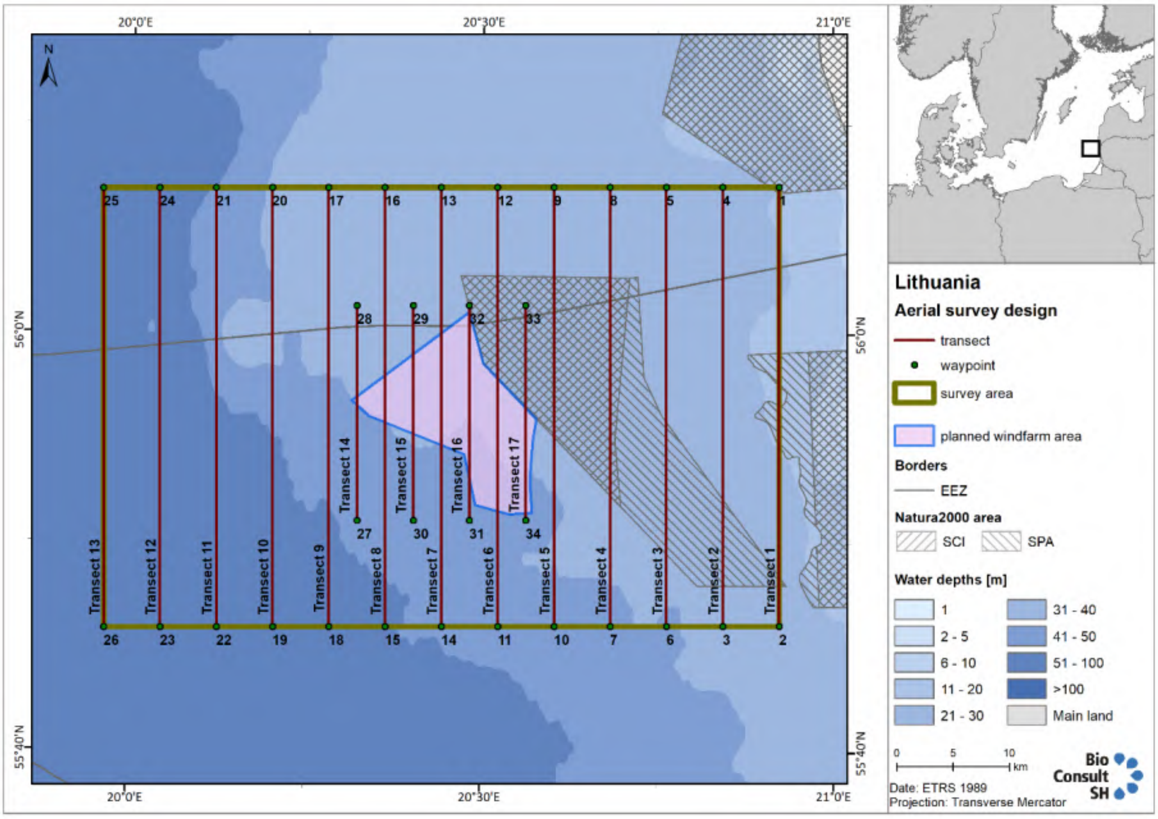

Figure 2.1 Aerial survey transect design for the survey area, including the planned wind farm area (outlined in light pink).

Table 2.1 Geographical coordinates and length of aerial survey transects in the study area

Transect	Waypoint	Latitude	Longitude
1	1	56° 7.099' N	20° 55.360' E
1	2	55° 46.074' N	20° 55.401' E
2	3	55° 46.069' N	20° 50.620' E
2	4	56° 7.094' N	20° 50.535' E
3	5	56° 7.086' N	20° 45.710' E
3	6	55° 46.061' N	20° 45.838' E
4	7	55° 46.051' N	20° 41.057' E
4	8	56° 7.075' N	20° 40.885' E
5	9	56° 7.061' N	20° 36.060' E
5	10	55° 46.037' N	20° 36.275' E
6	11	55° 46.020' N	20° 31.494' E
6	12	56° 7.044' N	20° 31.236' E
7	13	56° 7.024' N	20° 26.411' E
7	14	55° 46.000' N	20° 26.713' E
8	15	55° 45.977' N	20° 21.932' E
8	16	56° 7.001' N	20° 21.587' E
9	17	56° 6.974' N	20° 16.762' E
9	18	55° 45.951' N	20° 17.151' E
10	19	55° 45.921' N	20° 12.370' E
10	20	56° 6.944' N	20° 11.938' E
11	21	56° 6.911' N	20° 7.114' E
11	22	55° 45.889' N	20° 7.589' E
12	23	55° 45.853' N	20° 2.809' E
12	24	56° 6.875' N	20° 2.290' E
13	25	56° 6.836' N	19° 57.464' E
13	26	55° 45.815' N	19° 58.026' E
14	27	55° 51.056' N	20° 19.453' E
14	28	56° 1.336' N	20° 19.274' E
15	29	56° 1.361' N	20° 24.086' E
15	30	55° 51.080' N	20° 24.245' E

Transect	Waypoint	Latitude	Longitude
16	31	55° 51.102' N	20° 29.036' E
16	32	56° 1.382' N	20° 28.899' E
17	33	56° 1.401' N	20° 33.712' E
17	34	55° 51.121' N	20° 33.828' E

Table 2.2 Overview of the digital aerial surveys carried out in the study area between November 2021 and February 2022.

Date of the aerial survey	Distance (km)	Effort (km²)	Coverage (%)
09.11.2021	572.05	310.81	13.3
17.12.2021	564.33	306.57	13.1
12.02.2022	573.1	304.31	13.0
27.02.2022	571.65	297.51	12.7
11.03.2022	571.06	310.22	13.3
12.04.2022	571.31	310.4	13.3
Sum	Total: 3,423.5	Total: 1,839.8	Average: 13.1

2.1.2 Data collection

The recording of resting birds was performed using the digital video technology developed by the company HiDef (http://hidef.bioconsult-sh.de), explained in detail in WEIß et al. (2016), and summarized in the following paragraphs.

A twin-engined, high-wing propeller-driven aircraft (Partenavia P 68) was used for the acquisition of digital videos. This aircraft is equipped with four high-resolution video camera systems which take approximately seven images per second and can achieve a resolution of two cm at sea surface. Since the camera system is not directed vertically downwards (depending on the sun position, it can be slightly inclined or even set against the flight direction), interferences arising from solar reflections (glare) can be effectively reduced. The external cameras (indicated by A and D, Figure 2.2) cover a strip of 143 m width while the internal ones cover a width of 129 m each, resulting in 544 m effectively covered. There is however about 20 m distance between each strip to avoid double counting of individuals detected by the cameras. Thus, the total recorded strip of 544 m is distributed over a width of 604 m (see Figure 2.2).

The aircraft flew at a mean speed of approx. 220 km/h (120 knots) at an altitude of 549 m. A GPS device (Garmin GPSMap 296) records the position every second which permits to geographically assign a location to the images and the birds registered on them. The collected data were stored on mobile hard disks for subsequent review and analysis.

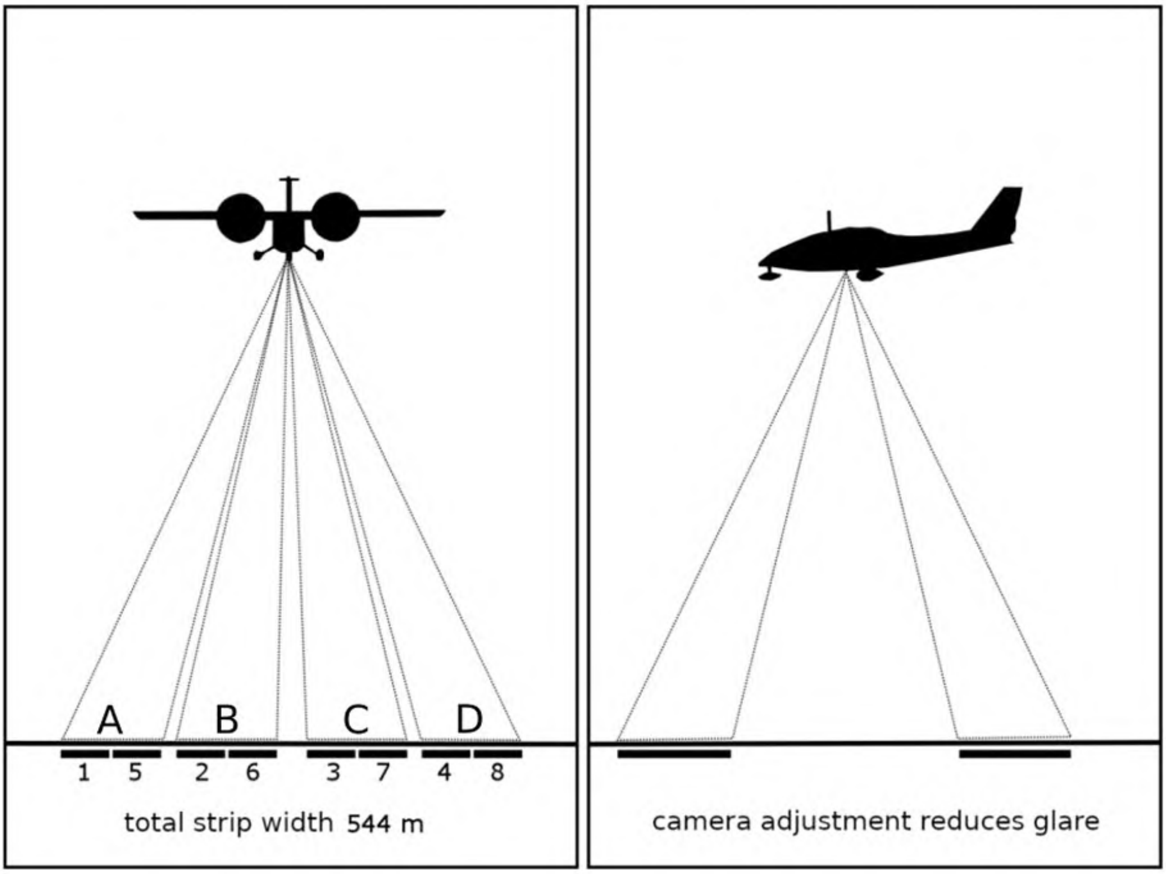

Figure 2.2 *The HiDef Camera-System. The four cameras (A to D) cover an effective strip width of 544 m of the sea surface at a flight altitude of 549 m (left: frontal view; right: side view). The numbering indicates the camera images as they are used in the evaluation (the images from each camera are divided into two halves).*

2.1.3 Data processing

To facilitate the detection of objects, the video sequences taken from each camera were split into two halves so that each half of the picture fitted the width of a large monitor. The video files were then processed, using an image capture and management software (StreamPix) for analysis. First, the images were examined and all the detected objects (birds, mammals, ships, etc.) were marked and pre-sorted for subsequent identification. To guarantee a consistently high quality, 20% of each film was randomly selected and processed again by another reviewer. If both reviewers agreed over 90% of the cases in that film, any discrepancy was rechecked, and the film approved for the next analysis step. If not, the film was reanalysed from scratch. Sections of the footage that could not be assessed due to backlight or the presence of clouds were not considered for further analysis.

The next step involved the identification of the previously marked objects (birds). This was done by experienced observers. Often birds can be identified on the images to species level. Because of the strong similarities between some species (e.g., common guillemot and razorbill, common and Arctic tern, and red-throated and black-throated diver), it is not always possible to identify the individuals to species level. However, it is usually possible to identify individuals as belonging to a species group formed by two (or few) closely related species. In addition to the identification, other information such as position, age, behaviour (swimming or flying) and flight direction were determined whenever possible. Environmental parameters (air turbidity, sea state, solar reflection, and water turbidity) were recorded every 500 images (approx. 4 km). In a second step for quality control, 20% of the objects identified were re-assessed by a second reviewer. All discrepancies between the first and second identification process were checked again by a third expert. If there was agreement by at least 90%, the data collected was released for further analysis. If agreement was lower than 90%, systematic errors (e.g., problems in determining specific species groups) were corrected and all objects viewed in the film concerned were re-identified.

2.1.4 Data analysis

All detected resting birds were either assigned a species or species group category (see below). Among these, relevant species/species groups were defined based on the frequency of occurrence in the survey area and the importance of the area as habitat for species according to reference literature. A list of all recorded species and their abundances is provided in the appendix A.1.

The individuals not identified to species level in the aerial surveys were initially grouped into a larger taxonomic group of very similar species. Examples of these are common guillemot/razorbill and unidentified divers (red-throated and black-throated diver). These “two species” species groups include a large proportion of the resting birds not identified to species level. Other resting birds, that could not be assigned to any of the previously mentioned or other two-species group, are in most cases identified to family level.

2.1.5 Calculation of densities

Densities (ind./km²) were calculated for all relevant resting bird species and species groups. To calculate densities the number of detected individuals of each species/taxon in each survey is divided by the area covered by the transects (“effort”). As the effect of the aircraft on any flight behaviour of the birds is negligible, no correction factors are applied to the abundances of species from aerial surveys. Therefore, it is assumed that all individuals are captured by the images.

The spatial distribution was determined for all surveys together or seasonally according to the species-specific classification by Garthe et al. (2007) and displayed using grid density maps. In short, a grid was laid over the survey area with its grid cells aligned with the EEA grid (EEA 2019). The individual cells consist of rectangles with edge lengths of 4 km. In total, a grid of 101 cells was created for the SHP01 survey area. Also, pinpoint-maps for individual surveys were produced and can be found in the Appendix.

2.2 Ship-based surveys

This report uses seabird abundances and distributions obtained from a total of 7 ship-based surveys conducted between September 2021 and September 2022.

The transect design includes 6 transects with transect lengths of 25.9 km. In total, a transect length of 155 km is reached. The transects run parallel to each other and are separated by 4 km. The area covered by the transect design is 533 km² (*Figure 2.3*).

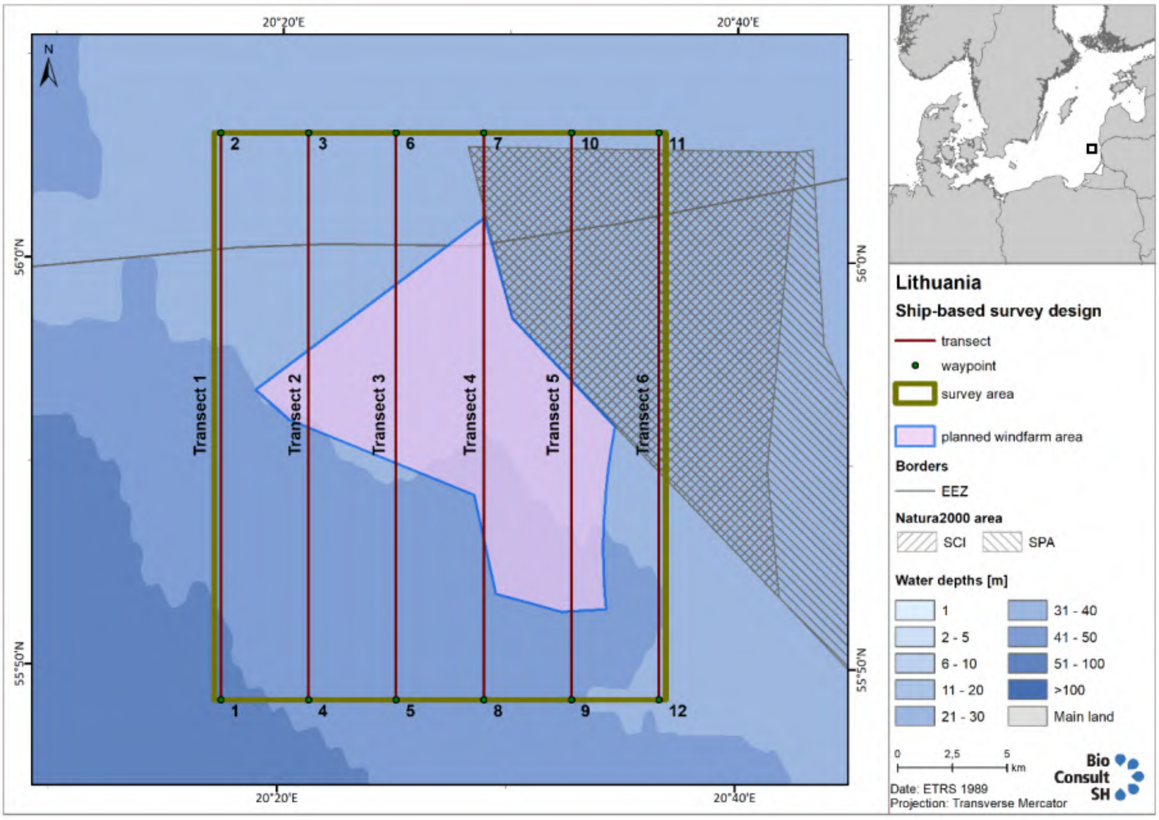

Figure 2.3 Transect design for ship-based resting bird monitoring from November 2021 to February 2022. The total study area covers 533 km².

Table 2.3 Geographical coordinates and length of ship transects in the study area

Transect	Waypoint	Latitude	Longitude
1	1	55° 49.16' N	20° 17.53' E
1	2	56° 03.10' N	20° 17.27' E
2	3	56° 03.12' N	20° 21.12' E
2	4	55° 49.18' N	20° 21.36' E
3	5	55° 49.20' N	20° 25.19' E
3	6	56° 03.14' N	20° 24.98' E
4	7	56° 03.16' N	20° 28.83' E
4	8	55° 49.22' N	20° 29.02' E
5	9	55° 49.23' N	20° 32.85' E
5	10	56° 03.17' N	20° 32.68' E
6	11	56° 03.19' N	20° 36.54' E
6	12	55° 49.25' N	20° 36.68' E

Unfavourable sea state conditions or poor visibility meant that on occasion individual sections of the survey area could not be recorded or were excluded from the evaluation. The transect distance recorded and the degree of coverage of the survey area per sailing are shown in Table 2.4.

Table 2.4 Overview of the seven ship-based surveys carried out in the study area between September 2021 and September 2022.

Survey	Distance [km] covered	Effort [km²]	Ship	% Coverage
28.09.2021	107.7	64.62	Baltic Explorer	12.1
09.10.2021	141.0	84.6	Baltic Explorer	15.9
05.05.2022	132.3	79.38	Baltic Explorer	14.9
23.06.2022	163.5	98.1	Lilian	18.4
21.07.2022	160.2	96.12	Lilian	18.0
28.08.2022	164.4	98.64	Lilian	18.5
18.09.2022	165.0	99.0	Lilian	18.6

2.2.1 Detection methodology

The surveys were performed closely on the basis of the methodology used in the European Seabird-at-Sea programme (GARTHE & HÜPPOP 1996, 2000) and the BSH guidelines of StUK4 (BSH 2013). The censuses were performed on board the ships *Baltic Explorer* (Utility Vessel, length 45.6 m)) and *Lilian (Ex Coast Guard Ship, length 27 m)*.

Ships were sailing at a speed of between 7.5 and 10 knots. Two observers on each of the port and starboard sides recorded all swimming and flying birds in a 300 m wide transect parallel to the keel line of the ship. The boundary of the transect area to the stern of the ship was formed by a line perpendicular to the keel from the viewpoint of the observers.

In addition to the species affiliation, further information such as age, sex, moulting condition, behaviour, association with other species or ships, flight altitude and flight direction of the birds observed were determined where possible. In addition, the distance to the keel line was estimated for all swimming individuals or assigned to a distance category from A to E (Table 2.5); flying birds are always assigned the code F.

Table 2.5 Distance classes for swimming birds.

Distance range (m)	Band (ESAS-Code)
0 – 50	A
51 – 100	B
101 – 200	C
201 – 300	D
> 300	E

For flying birds, the so-called snapshot method was used. Here, birds are considered to be "in the transect" only if they are flying over the section to either side of the ship at the moment of the snapshot. The section of the transect that is deemed valid for snapshot acquisition is determined by the width of the transect (300 m perpendicular to the direction of travel) and the distance between the front and the rear ends of the route that is travelled within a defined time unit. At ten knots, this is approx. 300 m in one minute. At ship speeds between eight and twelve knots, snapshots are performed every full minute in accordance with StUK4. The distance to the front of the snapshot site is then approx. 250 m at eight knots and about 370 m at twelve knots. Thus, a transect area of 300 m (to the side) x 300 m (to the front) is usually recorded on both sides of the ship. All flying birds outside this site and those that are not flying within the 300 m for the full minute are treated as outside the transect. This method of data collection for flying birds prevents frequent and particularly fast flying birds from being overestimated in terms of quantity or being counted multiple times (GARTHE & HÜPPOP 1996).

Some species/species groups are characterized by the fact that they sometimes take flight while still far ahead of the ship (up to over 1 km) and are therefore often missed by the naked eye. For example, divers, common scoters, and grebes have high flight distances (BELLEBAUM et al. 2006; SCHWEMMER et al. 2011). In order to collect data on these species nevertheless, an area within the range 500 to 2500 m (in the direction of travel) was scanned with binoculars by one person of the observation team from the bow of the ship (the "bow observer"). As the distance from the observer increases, the error in distance estimation also increases, and therefore it is often not possible to make the precise distance estimations perpendicular to the keel line (see above) that are required. The birds that take flight while far ahead of the ship were classified as either "inside" or "outside" the transect area, because the actual densities of individuals might otherwise be significantly underestimated. However, even with continuous observation with binoculars, many divers and scoters would only be spotted in flight ahead of the ship. In such cases it is not certain whether the birds took flight as a result of disturbance by the ship or if they were in fact flying across the survey area.

In addition to the data collection of the birds within the transect, all birds that were spatially and/or temporally outside the transect were also recorded. In this way, less common species that might otherwise not be recorded can also be taken into account. However, the results of these censuses are not included in the calculations of monthly and seasonal densities, but they are included in the list of species in the annex A.1.

2.2.2 Assessment methodology

The number of swimming individuals recorded in the ship-based transect surveys was corrected for data collection errors (see Table 2.6). The most frequent resting bird species and species groups densities (ind./km²) were calculated. For this purpose, the number of all birds counted within the transect per species/species group (taking into account the correction factors for swimming/diving birds, see below) was divided by the respective area total for the respective survey.

To show the spatial distribution of resting birds, the survey area was covered with grid of cells with a 4 x 4 km side length. The annex additionally contains pinpoint maps of sightings (A.2, A.3).

2.2.3 Correction factors

Because swimming birds are more easily overlooked by the observer with increasing distance, the individual numbers recorded are adjusted with a correction factor (GARTHE et al. 2007, 2009). Only the numbers of swimming and diving individuals are corrected (GARTHE et al. 2007) and not those of flying birds. The factors used for correcting the population densities are shown in Table 2.6.

Table 2.6 Correction factors for swimming/diving birds according to values from the literature (GARTHE et al. 2007, 2009) as well as the correction factors used for the calculation of the densities. For Long-tailed Duck, no correction factor was applied.

Correction factors	Correction factors used for the calculations
Divers	**1.7**
Little Gull	**1.7**
Common Gull	**1.7**
Lesser black-backed Gull	**1.6**
Herring Gull	**1.7**
Common Guillemot	**2.1**
Razorbill	**2.0**

3 RESULTS

3.1 Species composition and abundance

As already described in the methods, the two survey methods covered different periods respectively and are not comparable, but complementary. The number of resting birds recorded by each type of survey is summarised in Table 3.1. Few species dominate the communities in each case.

Table 3.1 Bird counts and percentages of all resting bird species during the digital aerial surveys and the ship-based transect surveys in the survey area between September 2021 and September 2022. Number of individuals for the ship-based surveys include only those counted within the transect area. In the results section, species that represent at least 0.5% of abundance in any of the survey methods are further described.

Species		**Aerial Surveys**		**Ship-based surveys**	
		N° ind.	**%**	**N° Ind. (WT)**	**%**
Red-throated Diver	*Gavia stellata*	576	4.1	12	0.3
Black-throated Diver	*Gavia arctica*	33	0.2	27	0.6
Unidentified diver	*Gavia sp.*	58	0.4	15	0.4
Great Crested Grebe	*Podiceps cristatus*	5	0	-	
Slavonian Grebe	*Podiceps auritus*	1	0	-	
Red-necked/Great Crested Grebe	*Podiceps grisegena/Podiceps cristatus*	4	0	-	
Slavonian / Black-necked Grebe	*Podiceps auritus/Podiceps cristatus*	1	0	-	
Great Cormorant	*Phalacrocorax carbo*	12	0.1	5	0.1
King Eider	*Somateria spectabilis*	1	0		
Long-tailed Duck	*Clangula hyemalis*	2,859	20.4	28	0.7
Common Scoter	*Melanitta nigra*	26	0.2	3	0.1
Velvet Scoter	*Melanitta fusca*	7,763	55.3	-	
Common/Velvet Scoter	*Melanitta nigra/M. fusca*	103	0.7	-	
Little Gull	*Hydrocoloeus minutus*	625	4.4	3,307	77.3
Black-headed Gull	*Chroicocephalus ridibundus*	11	0.1	4	0.1
Unidentified small gull		13	0.1	-	
Common Gull	*Larus canus*	108	0.8	221	5.2
Lesser Black-backed Gull	*Larus fuscus*	4	0	36	0.8
Herring Gull	*Larus argentatus*	288	2.0	350	8.2
Common/Herring Gull	*Larus canus/L. argentatus*	2	0	-	

Species		Aerial Surveys		Ship-based surveys	
		N° ind.	**%**	**N° Ind. (WT)**	**%**
Great Black-backed Gull	*Larus marinus*	5	0	1	0
Unidentified large gull	*Larus (magnus) sp.*	7	0.05	-	
Black-legged Kittiwake	*Rissa tridactyla*	3	0	-	
Unidentified gull	*Larus sp.*	10	0.1	-	
Sandwich Tern	*Thalasseus sandvicensis*	1	0	-	
Common Tern	*Sterna hirundo*	-		0	0
Arctic Tern	*Sterna paradisae*	-		9	0.2
Unidentified tern	*Sterna sp.*	-		1	0
Unidentified tern/gull		2	0	-	
Common Guillemot	*Uria aalge*	762	5.4	191	4.5
Razorbill	*Alca torda*	521	3.7	65	1.5
Common Guillemot/ Razorbill	*Uria aalge/Alca torda*	228	1.6	-	
Black Guillemot	*Cepphus grylle*	2	0	-	
Unidentified auk	*Alcidae*	5	0	1	0
Total		**14,039**	**100**	**4,276**	**100**

The following table shows the density of the most common species and groups in each of the months surveyed by the two methods.

Table 3.2 Monthly mean densities (ind./km²) of selected species/species groups recorded in the survey area during digital aerial surveys from November 2021 to April 2022 The densities from February represent the combined densities of both surveys from that month. The indication "0" means that no individual of this species was found in that month.

Survey Method	**Digital aerial surveys**					
Species/Species-group	**Nov 21**	**Dec 21**	**Feb 22**	**Mar 22**	**Apr 22**	**Max**
Red-throated Diver	0.02	0.05	0.42	**0.57**	0.41	**0.57**
Black-throated Diver	0	0	0.02	0.01	**0.06**	**0.06**
Long-tailed Duck	0.35	1.27	**2.76**	1.83	0.43	**2.76**
Common Scoter	0	0.01	0	0.01	**0.07**	**0.07**
Velvet Scoter	0.91	**9.21**	7.25	0.89	0.05	**9.21**
Little Gull	**0.86**	0.61	0.16	0.07	0.17	**0.86**
Black-headed Gull	0	<0.01	0	0	**0.03**	**0.03**
Common Gull	**0.11**	0.09	0.03	0.05	0.05	**0.11**
Lesser Black-backed Gull	0	0	0	0	**0.01**	**0.01**
Great Black-backed Gull	0	0.01	0	0	**0.01**	**0.01**
Herring Gull	**0.22**	0.19	0.11	0.19	0.13	**0.22**
Common-/ Arctic Tern	0	0	0	0	0	**0**
Common Guillemot	0.47	0.60	0.2	0.27	**0.73**	**0.73**
Razorbill	0.47	0.18	0.21	**0.54**	0.07	**0.54**
Divers	0.04	0.06	0.46	**0.64**	0.53	**0.64**
Ducks	**0.10**	0	0.01	0	0.02	**0.10**
Gulls	**0.34**	0.29	0.14	0.24	0.20	**0.34**
Auks	**1.05**	0.84	0.57	0.95	0.97	**1.05**
No. of surveys	**1**	**1**	**2**	**1**	**1**	

Table 3.3 Monthly mean densities (ind./km²) of selected species/species groups recorded in the survey area during the ship-based transect surveys between Sep 2021 and Sep 2022 (there were no ship-based transect surveys between Nov 2021 and April 2022). The indication "0" means that no individual of this species was found in that month.

Survey Method	**Ship-based transect surveys**							
Species/Species-group	**Sep 21**	**Oct 21**	**May 22**	**Jun 22**	**Jul 22**	**Aug 22**	**Sep 22**	**Max.**
Red-throated Diver	0.03	0.03	**0.15**	0	0	0	0.01	**0.15**
Black-throated Diver	0.05	0.09	**0.23**	0	0	0	0.08	**0.23**
Long-tailed Duck	0.02	0	**0.34**	0	0	0	0	**0.34**
Common Scoter	0	0	**0.04**	0	0	0	0	**0.04**
Velvet Scoter	0	0	0	0	0	0	0	**0**
Little Gull	0.11	1.11	0.07	0.09	**36.1**	16.4	1.51	**36.1**
Black-headed Gull	0	0	0	0	**0.06**	0	0	**0.06**
Common Gull	0.05	0.42	0.02	0.01	**2.11**	0.90	0.10	**2.11**
Lesser Black-backed Gull	0	0	0.26	0	0	0.01	**0.29**	**0.29**
Great Black-backed Gull	0	0	0	0	0	**0.02**	0	**0.02**
Herring Gull	0.42	0.43	0.13	0.05	1.60	**1.85**	1.05	**1.85**
Common-/ Arctic Tern	0	0.02	0	0	0	0.04	**0.07**	**0.07**
Common Guillemot	0.03	0.95	0.33	0	0.09	1.13	**1.67**	**1.67**
Razorbill	0.12	**1.28**	0.13	0	0	0	0	**1.28**
Divers	0.08	0.12	**0.57**	0	0	0	0.09	**0.57**
Ducks	0.02	0	**0.38**	0	0	0	0	**0.38**
Gulls	0.47	0.85	0.41	0.06	**3.71**	2.78	1.44	**3.71**
Auks	0.16	**2.23**	0.46	0	0.09	1.13	1.67	**2.23**
No. of surveys	**1**	**1**	**1**	**1**	**1**	**1**	**1**	

3.1.1 Digital aerial surveys

A total of six surveys were conducted between November 2021 and April 2022 (see Table 2.2). During this period, 15,711 birds belonging to 29 species were recorded, of which 14,039 were resting birds (Table 3.1). There were 433 resting birds which could not be identified to species level (only 3.1% of the total). Nonetheless, resting birds could be classified into 20 species.

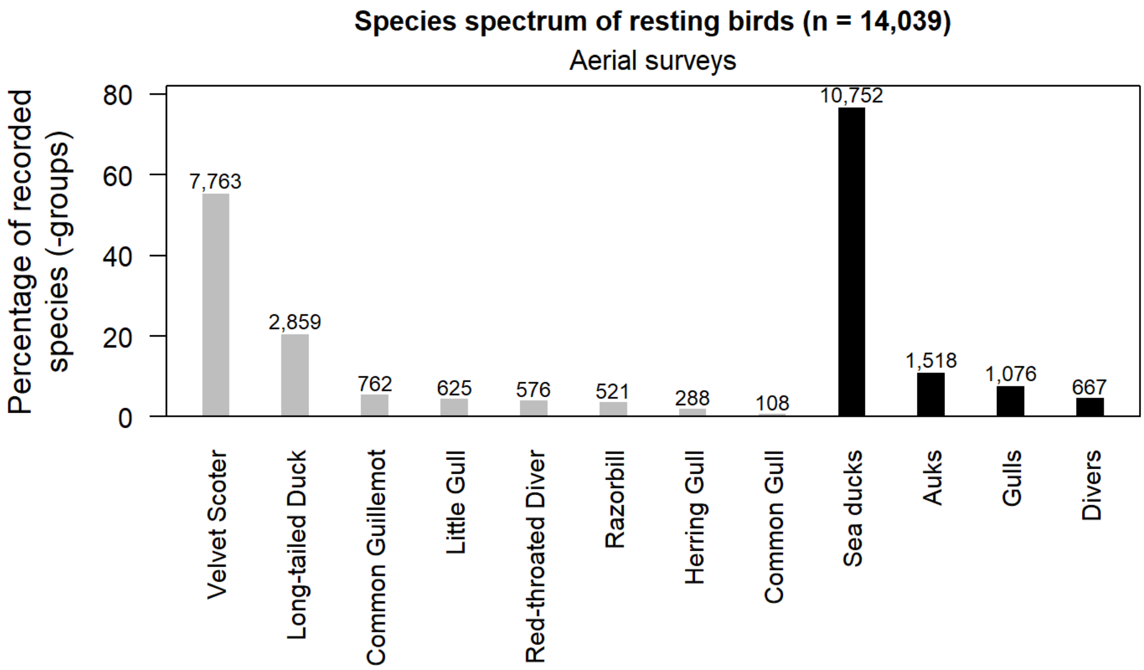

Figure 3.1 *Percentage of the most common species or species groups representing at least 0.5% of the total number of resting birds recorded during aerial surveys in the survey area between November 2021 and April 2022 (number of individuals shown above each bar). Species are depicted in grey, species groups in black.*

Sea ducks dominated the resting bird community making up 76.6% of the total. Auks and gulls followed representing 10.1% and 7.7% respectively. Divers (mainly Red-throated Divers) contributed 4.7% to the sum of birds observed in the survey period (Figure 3.1). In terms of species, two species made up over 75% of the total. Velvet Scoters were the most recorded species with 55.3% of the total number of birds while Long-tailed Ducks contributed 20.4% (Figure 3.1). All other species, including Little Gulls, Common Guillemots and Razorbills contributed each less than 6% of the total (see Table 3.1).

3.1.2 Ship-based surveys

In the seven ship-based transect surveys conducted between September 2021 and September 2022 (November to April not covered) a total of 5,206 birds were observed belonging to 26 species. In total, 5,162 resting birds were observed, 4,276 of which occurred within the transect area and are used for further analysis here (Table 3.1). These birds correspond to 14 species (within the transect area) and only 17 of these resting birds could not be assigned to any species or species group and remained as unidentified (0.4%).

As with the aerial surveys, there was a strong dominance of one species, in this case the Little Gull, which contributed with 86.7% to the total number of birds. Other gulls, such as the Herring Gull and the Common Gull, made up less than 9% respectively and Common Guillemots and Razorbills made up less than 5% each (Figure 3.2). In contrast to the aerial surveys, sea ducks were not abundant here. Other species represented less than 1% (Lesser Black-backed Gull, Long-tailed Duck and Black-throated Diver). Overall, gulls made up 91.6% of the total number of birds observed, whereas auks, divers and sea ducks represented only 6.0%, 1.3% and 0.7% of the whole, respectively.

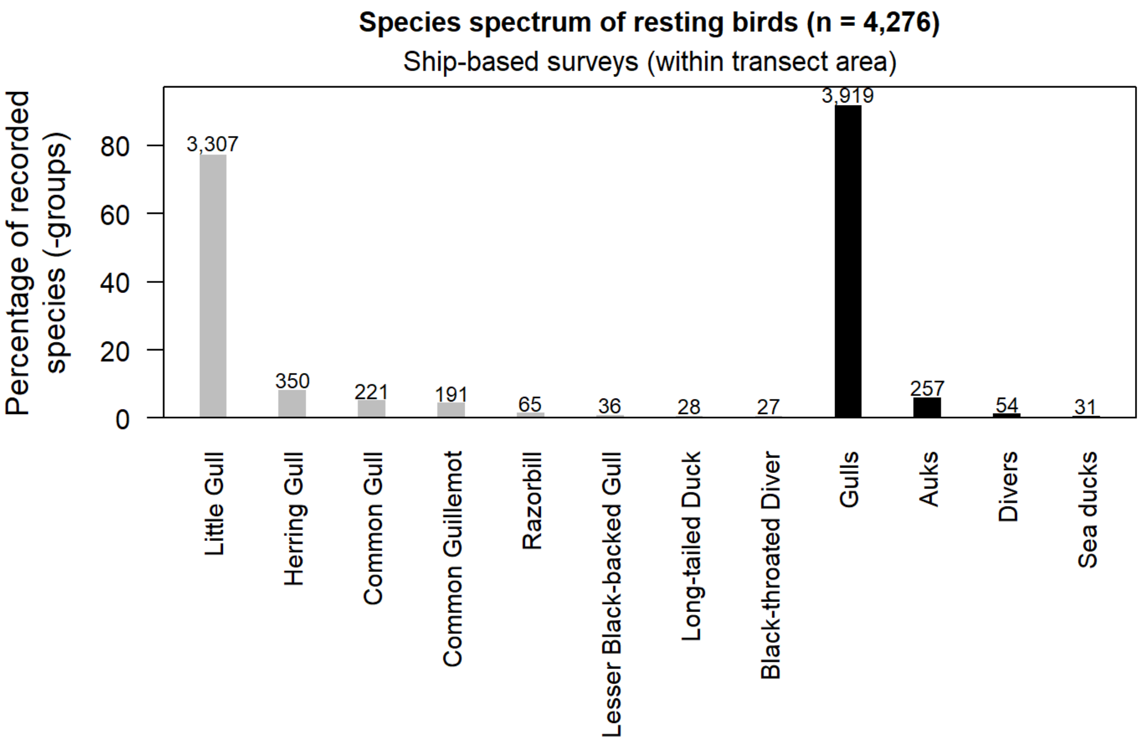

Figure 3.2 *Percentage of the most common species or species groups representing at least 0.5% of the total number of resting birds recorded during ship-based transect surveys in the survey area within the transect area between September 2021 and September 2022 (period between November 2021 and April 2022, not surveyed, number of individuals shown above each bar). Species are depicted in grey, species groups in black.*

3.2 Frequency and distribution of most common species

In this chapter, all waterbird species that represented at least 0.5% of the total number of birds surveyed by the two different methods are further described. Each species description is followed by a distribution map of four seasons covered during the surveys for each survey method and a graph showing how their densities vary across the months. In addition, a full list of maps of all surveys can be found in the appendix for these species. The species' ranges and population sizes are obtained from the most recent available data (AEWA CSR 8) of species factsheets from Wetlands International (http://wpe.wetlands.org, accessed on 05.10.2022). Their conservation status is based on Birdlife International (2017), IUCN Red List Europe (http://www.iucnredlist.org, accessed 10.10.2022) and Annex I of the EU Bird Directive (EUROPEAN UNION 2010).

All pinpoint maps can be found in the Appendix A.2 and A.3.

3.2.1 Red-throated Diver

Red-throated Diver – *Gavia stellata*	**LI: Rudakaklis naras**
Biogeographic population: NW Europe (win)	
Breeding range: Arctic and boreal W Eurasia, Greenland	
Non-breeding range: NW Europe	
Population size: 210,000 – 340,000	
1% value: 3,000	
Conservation status:	EU Birds Directive, Annex I: listed EU SPEC Category: SPEC 3 IUCN Red List Category, Global & Europe: Least Concern
Trend: DEC?	Trend quality: Reasonable
Key food: fish	

As the name indicates divers are strongly linked to aquatic environments where they dive to obtain their food, which mainly consists of fish. Of the five species of divers existing in the world, two of them commonly occur in the North and Baltic Sea (HEMMER 2020). All divers are migratory, breeding near northern freshwater lakes and spending the winter season at sea. In this section, we concentrate on the most common diver observed during the surveys, the Red-throated Diver. These divers are distributed across the Arctic, occupying boreal areas in Europa, Asia and North America. The population that occurs in the survey area is the Northwest European population. According to the most recent estimates by Wetlands International, the population size of this population ranges between 210,000 and 340,000 and may be declining.

Two important wintering areas are the Irbe Strait and the Gulf of Riga. Skov and colleagues (2011) mention that largest concentrations of both species of divers are found in the area extending from the Irbe Strait along the coasts of Lithuania, Latvia and Estonia up into the Pomeranian Bay. The Pomeranian Bay is also considered an important wintering area in the Baltic Sea, probably because of its suitability as a spawning, nursery and feeding ground for many fish species. Zanders (*Sander lucioperca*) and herrings (Clupeidae spp.) constitute most of the consumed biomass of Red-throated Divers in winter and spring in the Baltic Sea (GUSE et al. 2009).

At the global scale, Red-throated Divers are not considered endangered, however, divers in general are considered among the most vulnerable seabird species to many anthropogenic factors, and the species is included in the Annex I of European Union (EU) Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds, EUROPEAN UNION 2010) and in the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (UNEP/AEWA SECRETARIAT 2019).

Among the main threats that affect divers are oil spills, bycatch in fish nets and habitat degradation (MENDEL et al. 2008a). Moreover, both ship traffic and offshore wind farms exert negative effects on divers and the birds show strong avoidance behaviour towards offshore wind farms (DIERSCHKE et al. 2016; HEINÄNEN et al. 2020).

Density and distribution of Red-throated Divers in the survey area

During the six digital aerial surveys between November 2021 and April 2022, a total of 576 Red-throated Divers were recorded whereas during the seven ship-based transect surveys between September 2021 and September 2022 (excluding the months between Nov 2021 until April 22) only 12 individuals were observed within the transect area (Table 3.1). During aerial surveys, also 58 unidentified divers were observed (8.7% of all divers), and during ship surveys 15 unidentified divers (27.8% of all divers). This rather high percentage during ship surveys is not considered here for species-specific density estimations and thus, densities will be somewhat underestimated.

For Red-throated Divers, a maximum monthly density of 0.57 ind./km² was recorded in March 2022 during the aerial surveys. The maximum density of Red-throated Divers during the ship-based transect surveys was observed in May 2022 at 0.15 ind./km² (**Fehler! Verweisquelle konnte nicht gefunden werden.**, Figure 3.3).

Spatially, the distribution of Red-throated Divers from the digital aerial surveys shows that they were present in most of the surveyed area at very low densities (< 0.5 ind./km²) during winter. In spring, however higher densities were observed, but mainly towards the east of the study area. Nonetheless, grid cells with densities ranging between 2 and 5 ind./km² were observed at the border of the planned OWF in spring.

The ship-based surveys showed the highest densities during spring, especially towards the southwest of the survey area but outside the planned wind farm. In fact, the highest density (between 2 and 5 ind./km²) was observed only within a single grid cell in spring 2022. Red-throated Divers were only present at low densities in autumn 2021 and autumn 2022, but their densities were low and limited to a few grid cells outside the planned OWF.

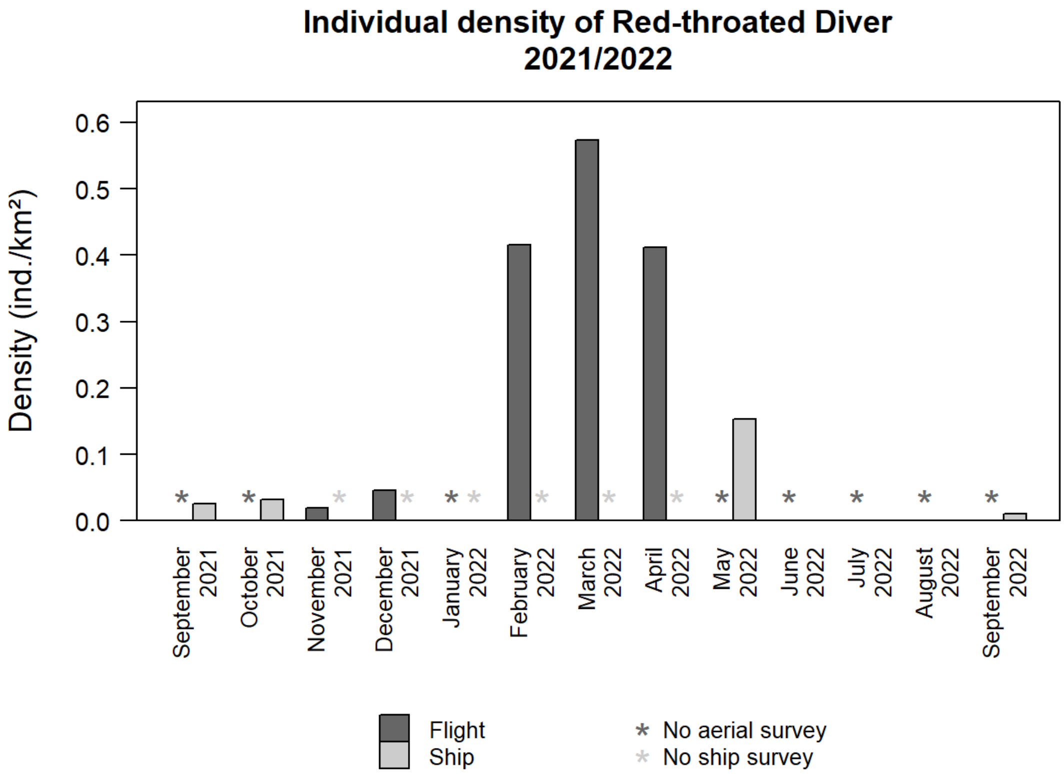

Figure 3.3 Monthly densities of Red-throated Divers during aerial and ship-based transect surveys in the survey area between September 2021 and September 2022.

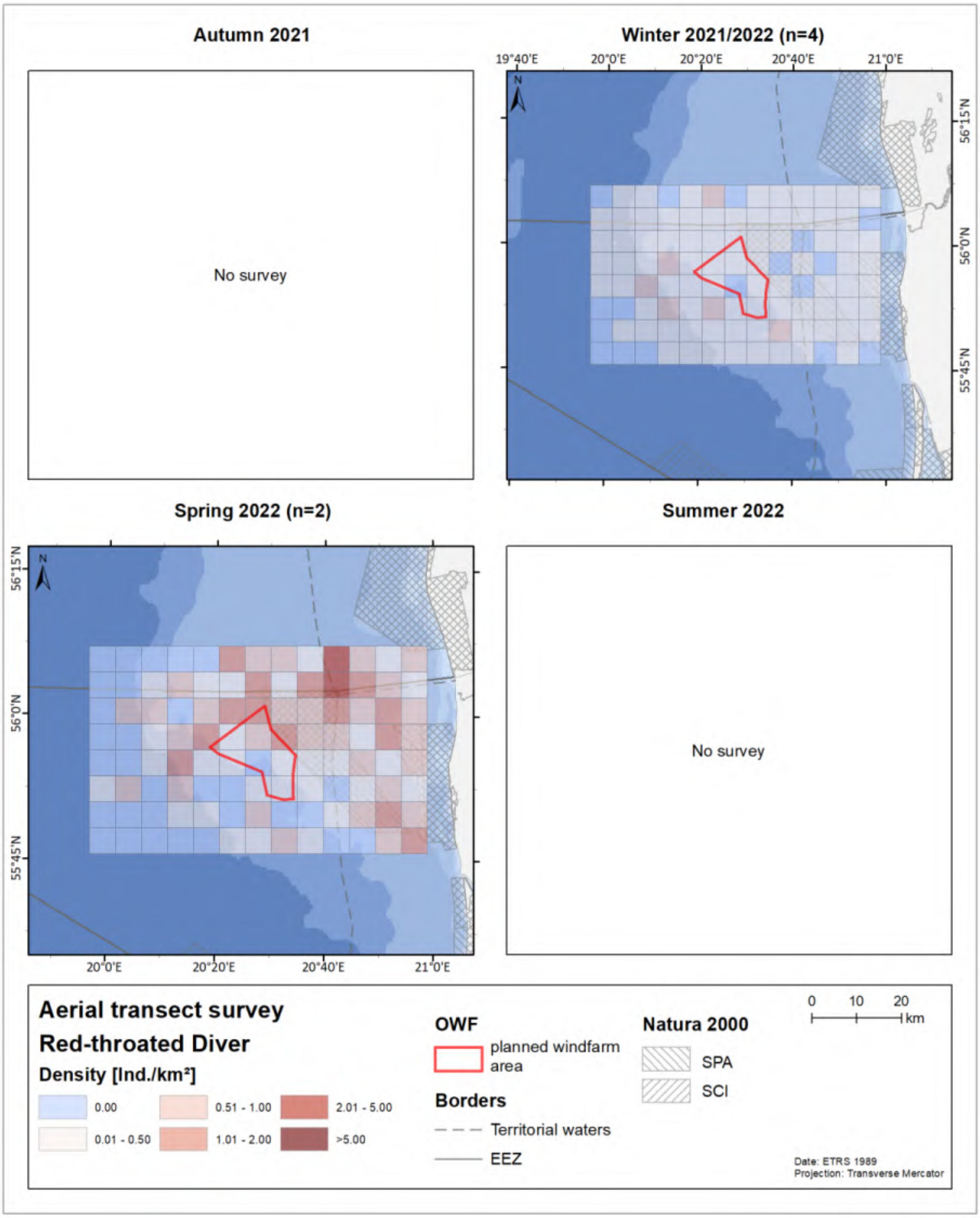

Figure 3.4 Distribution of Red-throated Divers in the survey area per season during the digital aerial surveys between November 2021 and April 2022.

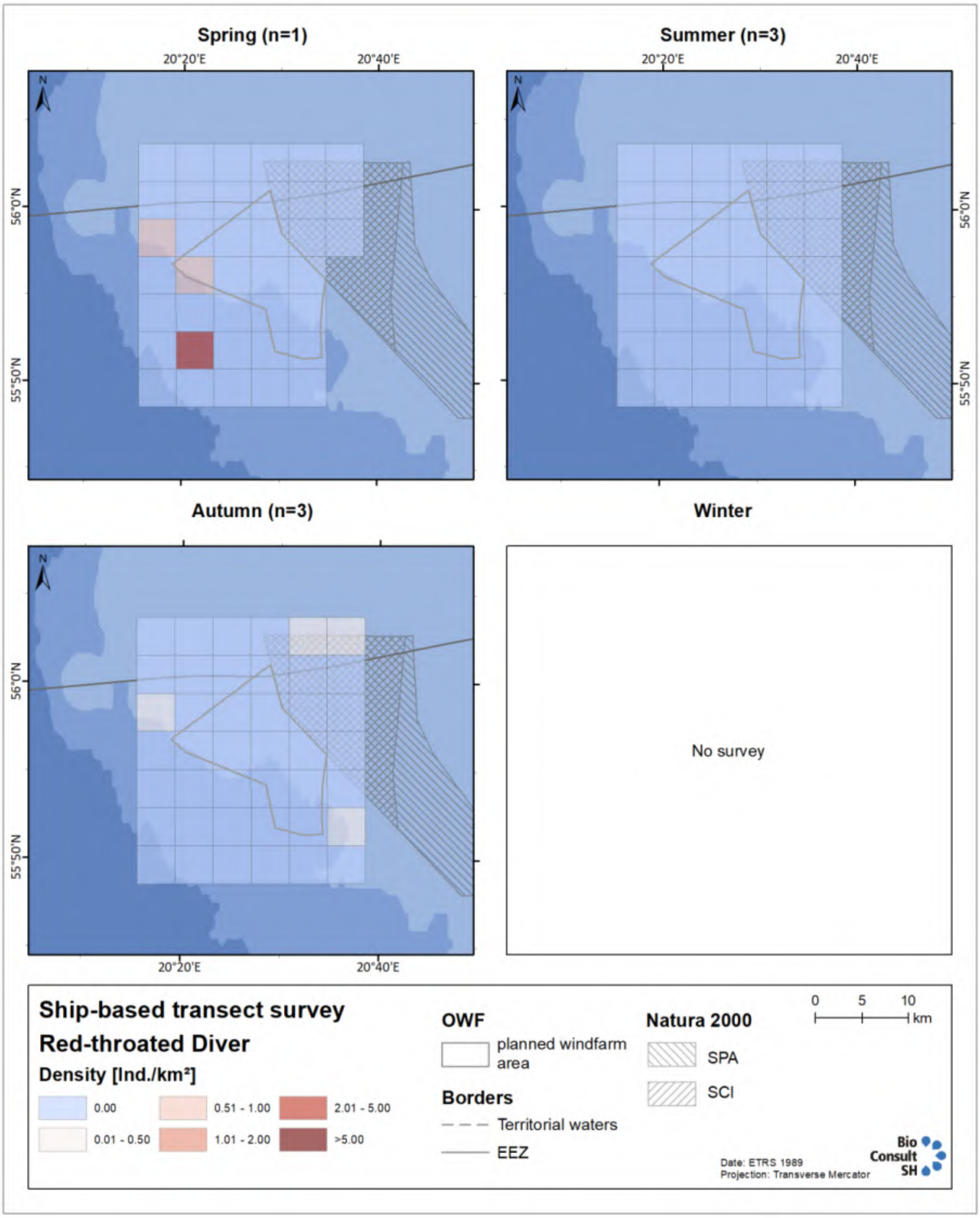

Figure 3.5 Distribution of Red-throated Divers in the survey area per season during the ship-based transect surveys between September 2021 and September 2022.

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3.2.2 Black-throated Diver

Black-throated Diver – *Gavia arctica*	**LI: Juodakaklis naras**
Biogeographic population: Northern Europe & Western Siberia/Europe	
Breeding range: N Europe & W Siberia	
Non-breeding range: Coastal NW Europe, Mediterranean, Black & Caspian Seas	
Population size: 390,000 - 590,000	
1% value: 4,800	
Conservation status:	EU Birds Directive, Annex I: listed EU SPEC Category: SPEC 3 IUCN Red List Category, Global & Europe: LC
Trend: DEC?	Trend quality: Poor
Key food: fish	

The Black-throated Divers (also known as Arctic Divers/Loons) are also breeding in the Arctic and boreal zone and are distributed from Northwest Europe to Northeast Siberia and Northwest Alaska. There are two subspecies recognized, the nominate subspecies is estimated to range between 390,00 to 590,000 individuals, and the population is apparently decreasing. Black-throated Divers, as the other diver species occurring in the region, are a sensitive species and affected by many anthropogenic factors.

Density and distribution of Black-throated Divers in the survey area

Similar numbers of Black-throated Divers were registered during the ship surveys (27 individuals, within the transect area) as during the digital aerial surveys (33 individuals, Table 3.1). The densities were higher during the ship surveys than during the digital aerial surveys. This species of divers was only present in the last aerial surveys (Feb-Apr), with small densities ranging between 0.01 and 0.06 ind./km² (max in April 2022). The monthly densities of Black-throated Divers during ship-based transect surveys were larger and ranged from 0.05 (in September 2021) to 0.23 ind./km² in May 2022 (**Fehler! Verweisquelle konnte nicht gefunden werden.**, Figure 3.6).

During the aerial surveys, Black-throated Divers were present in low densities and scattered across the survey area, but with no specific patterns (Figure 3.7). In spring, a few Black-throated Divers were also observed just outside of the planned wind farm. During the ship-based transect surveys, higher densities were recorded especially in spring. In this season, these divers were mainly distributed towards the east of the survey area, closer to the coast, coinciding with the presence of shallower waters. Two grid cells showed high densities (between 2 and 5 ind./km²), one of these grid cells was located in the centre of the area of the planned wind farm. During autumn, the distribution was more scattered, densities ranged between 0.5 and 2 ind./km², but Black-throated Divers were not spotted within the area of the planned OWF (Figure 3.8).

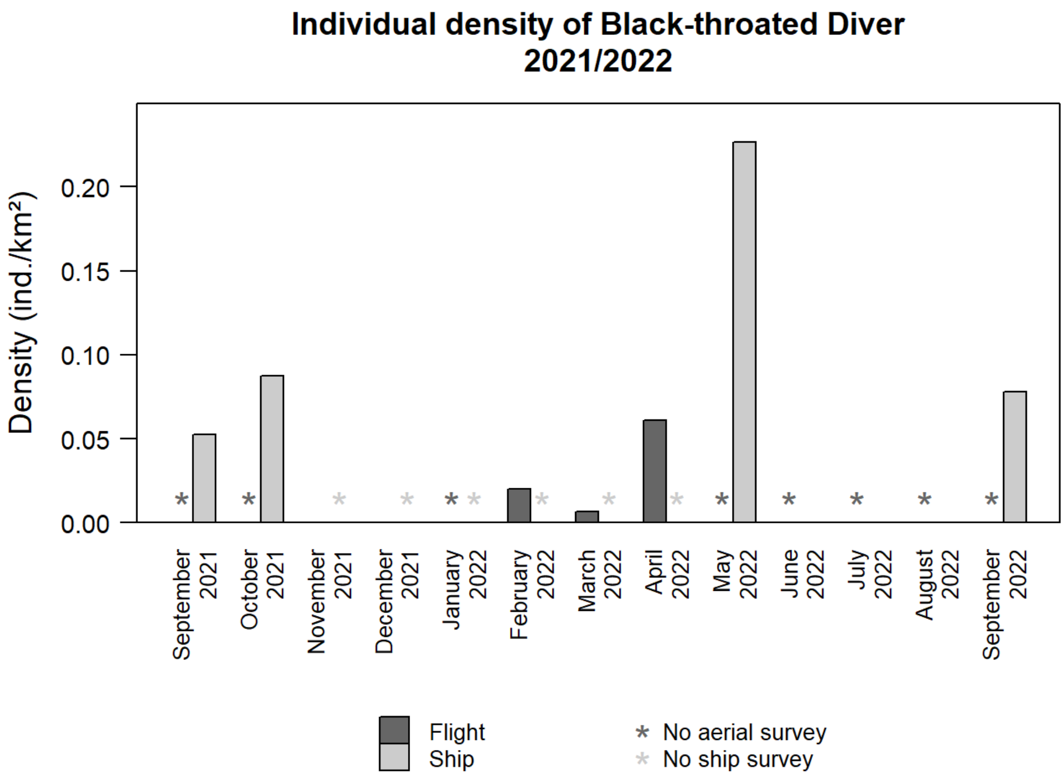

Figure 3.6 *Monthly densities of Black-throated Divers during aerial and ship-based transect surveys in the survey area between September 2021 and September 2022.*

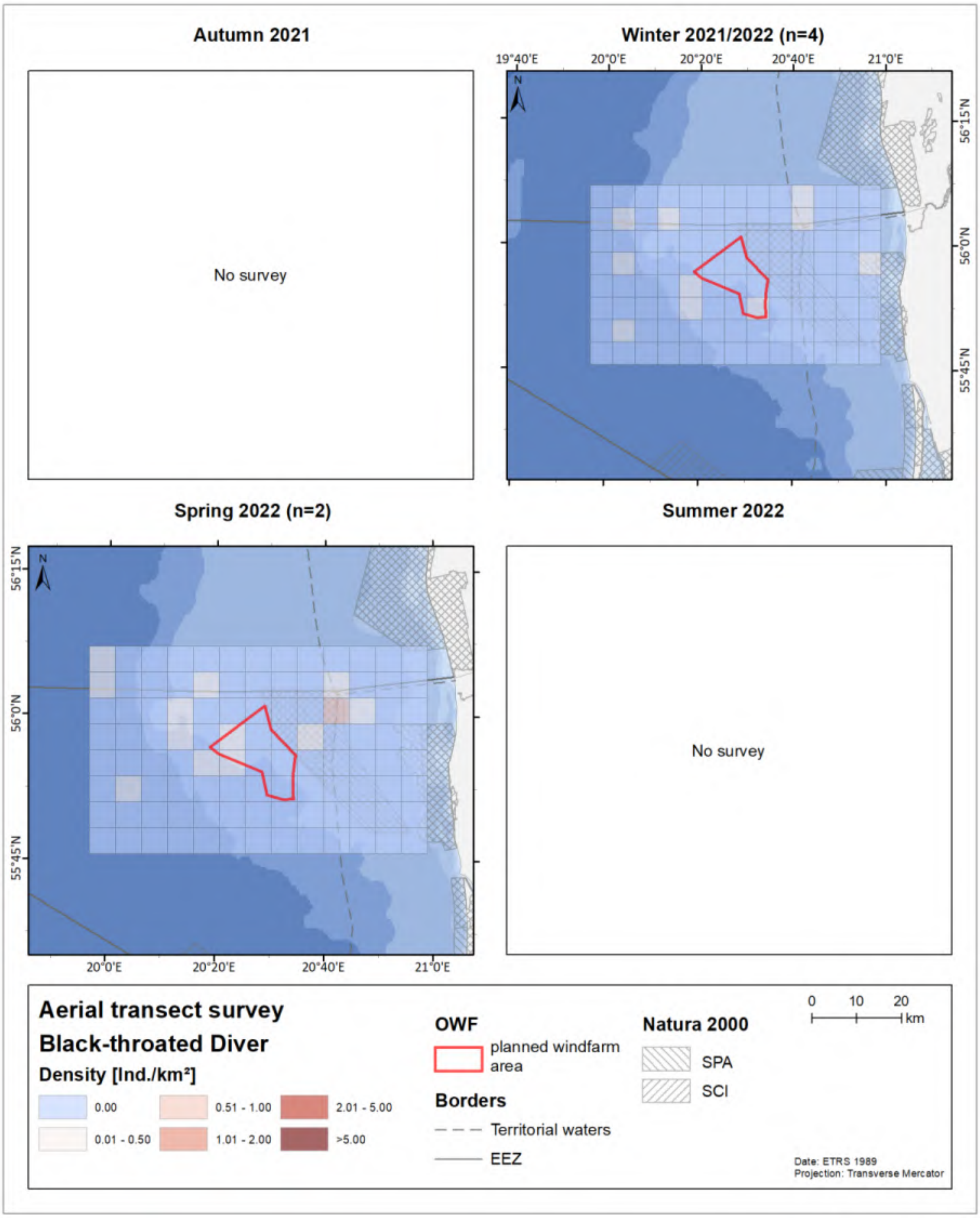

Figure 3.7 Distribution of Black-throated Divers in the survey area per season during the digital aerial surveys between November 2021 and April 2022.

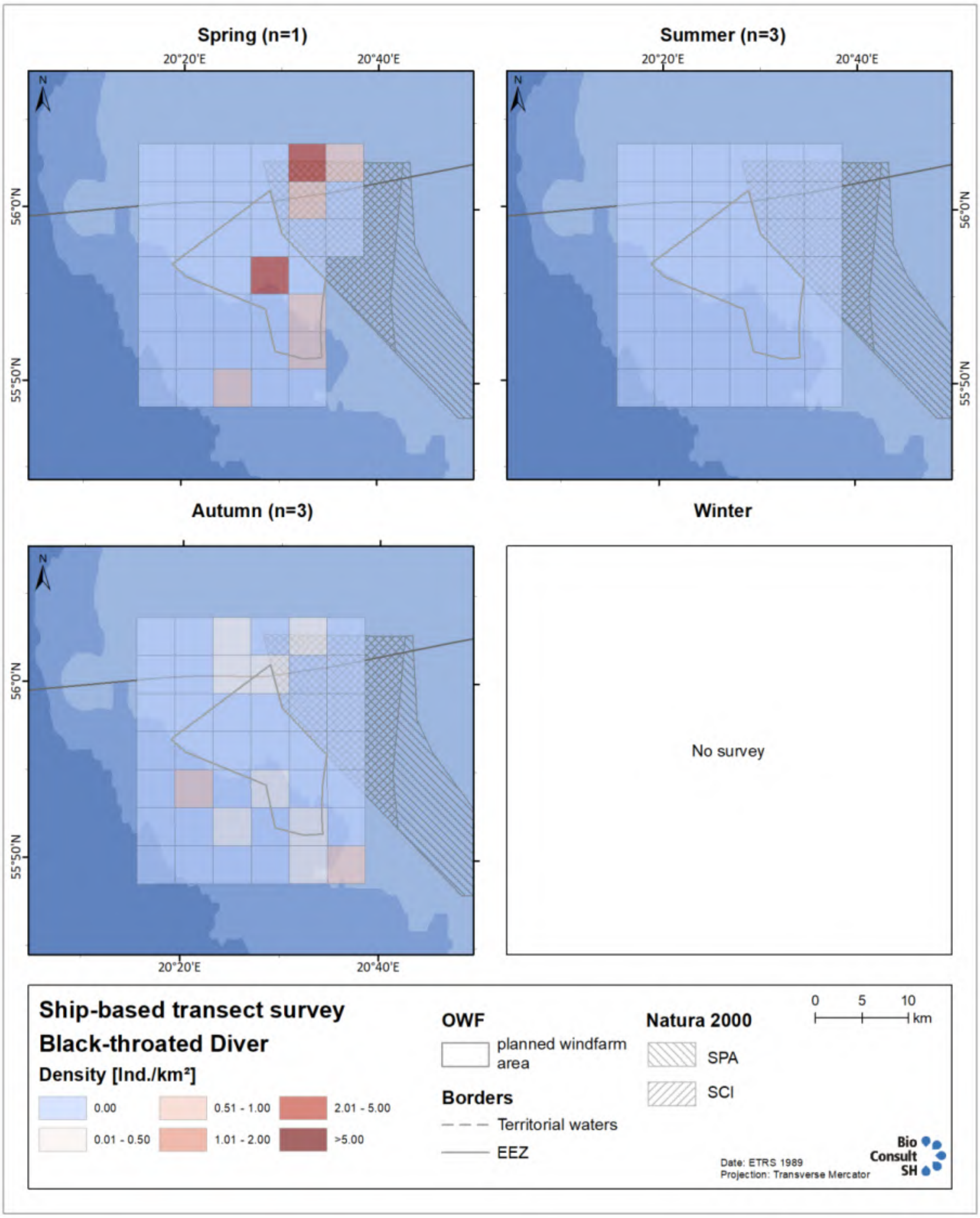

Figure 3.8 Distribution of Black-throated Divers in the survey area per season during the ship-based transect surveys between September 2021 and September 2022.

3.2.3 Long-tailed Duck

Long-tailed Duck: – *Clangula hyemalis*	LI: Ledine antis
Biogeographic population: Western Siberia/North Europe	
Breeding range: W Siberia, N Europe	
Wintering / core non-breeding range: N Atlantic, Baltic, N Seas, C European Lakes	
Population size: 1,600,000	
1% value: 16,000	
Conservation status:	EU Birds Directive, Annex I: not listed EU SPEC Category: SPEC 1 IUCN Red List Category: VU (Global), LC (Europe)
Trend: STA?	Trend quality: Reasonable
Key food: mollusks, crustaceans and small fish	

Long-tailed Ducks are the most common duck species in the tundra zones and were the second most common species during the digital aerial surveys. They have a circumpolar distribution and breed in Arctic Eurasia and North America. Whereas no subspecies are recognized, Wetlands International recognizes four large populations. Almost two decades ago the world population was estimated at 6.2 – 6.75 million of individuals, currently this number has almost halved. The population breeding in Europe and occurring in the survey area has a size estimated at 1.6 million with a stable trend, preceded however by long periods of decreasing trend. The Baltic Sea holds about 90% of the birds wintering in Europe and three areas here are of particular importance: The Gulf of Riga/Irbe Strait, Hoburgs and Midsjö Banks and the Pomeranian Bay (DURINCK et al. 1994). Long-tailed Ducks are mainly found wintering in waters at depths of 10-35 m. The migration to the wintering grounds in the Baltic Sea starts in September/October and continues until December with a peak in November. Return movements to breeding areas start in March and by late May most birds have headed towards the White Sea (SKOV et al. 2011). They are opportunistic feeders and consume a wide range of resources including benthic macrofauna. In the Baltic, stomach analyses have shown that their diet includes bivalves such as *Ceratoderma* spp, *Mya arenaria*, *Mytilus edulis* and *Macoma baltica* and small fish and crustaceans or polychaetes. They dive to find their food at depths in the range of 20-30 m (MENDEL et al. 2008a). Long-tailed Ducks have been reported to partly avoid OWF (DIERSCHKE et al. 2016) and are somewhat sensitive to ship traffic (FLIESSBACH et al. 2019a).

Density and distribution of Long-tailed Ducks in the survey area

Large numbers of Long-tailed Ducks were observed during the aerial surveys (2,859 individuals) whereas during the ship-based surveys only 28 individuals were spotted (Table 3.1). During the aerial surveys, the largest densities of these ducks were observed in February 2022 with 2.76 ind./km², and the lowest in November 2021 (0.35 ind./km²). During the ship surveys however, they were less common and were only observed in two months: 0.02 ind./km² in September 2021 and 0.34 ind/km² in May 2022 (**Fehler! Verweisquelle konnte nicht gefunden werden.**, Figure 3.9).

The distribution of Long-tailed Ducks was concentrated towards the north-eastern part of the survey area, during both survey methods and in aerial surveys, some of these grid cells with very high densities (> 20 ind./km²) were overlapping with the eastern border of the planned wind farm. Densities were larger and the ducks were thus present in many more grid cells during the aerial surveys, even within the area of the planned wind farm (< 5 ind./km²). Nonetheless, their distribution mainly coincides with the location of the Natura2000 area and shallower waters.

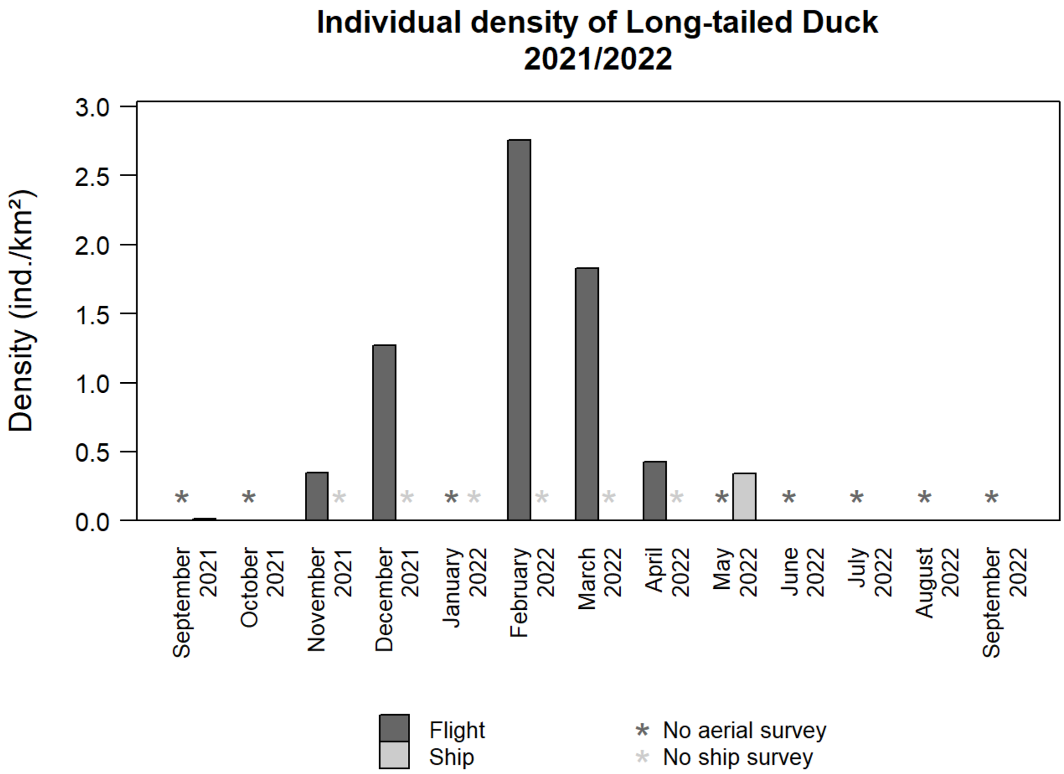

Figure 3.9 Monthly densities of Long-tailed Ducks during aerial and ship-based transect surveys in the survey area between September 2021 and September 2022.

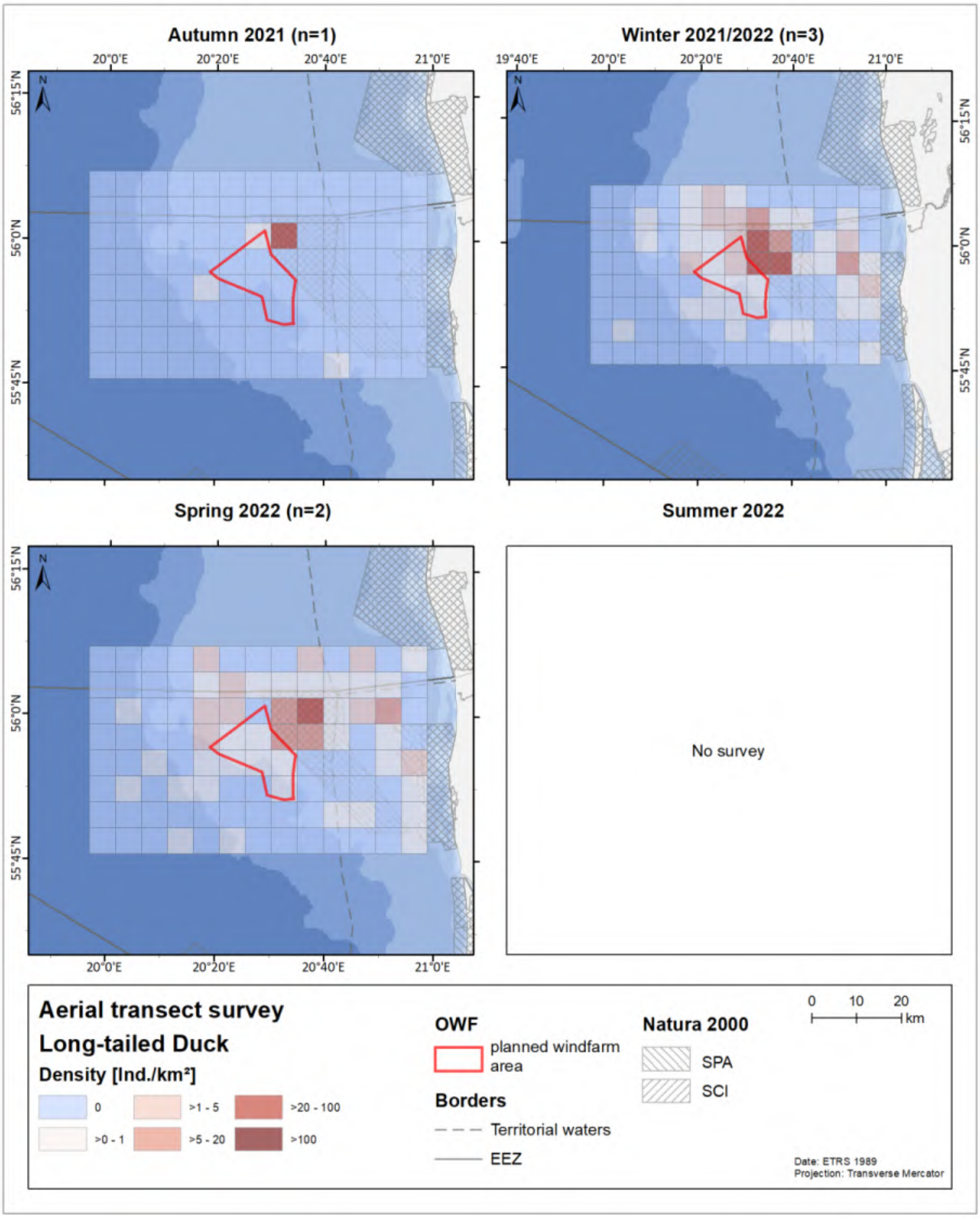

Figure 3.10 Distribution of Long-tailed Ducks in the survey area per season during the digital aerial surveys between November 2021 and April 2022.

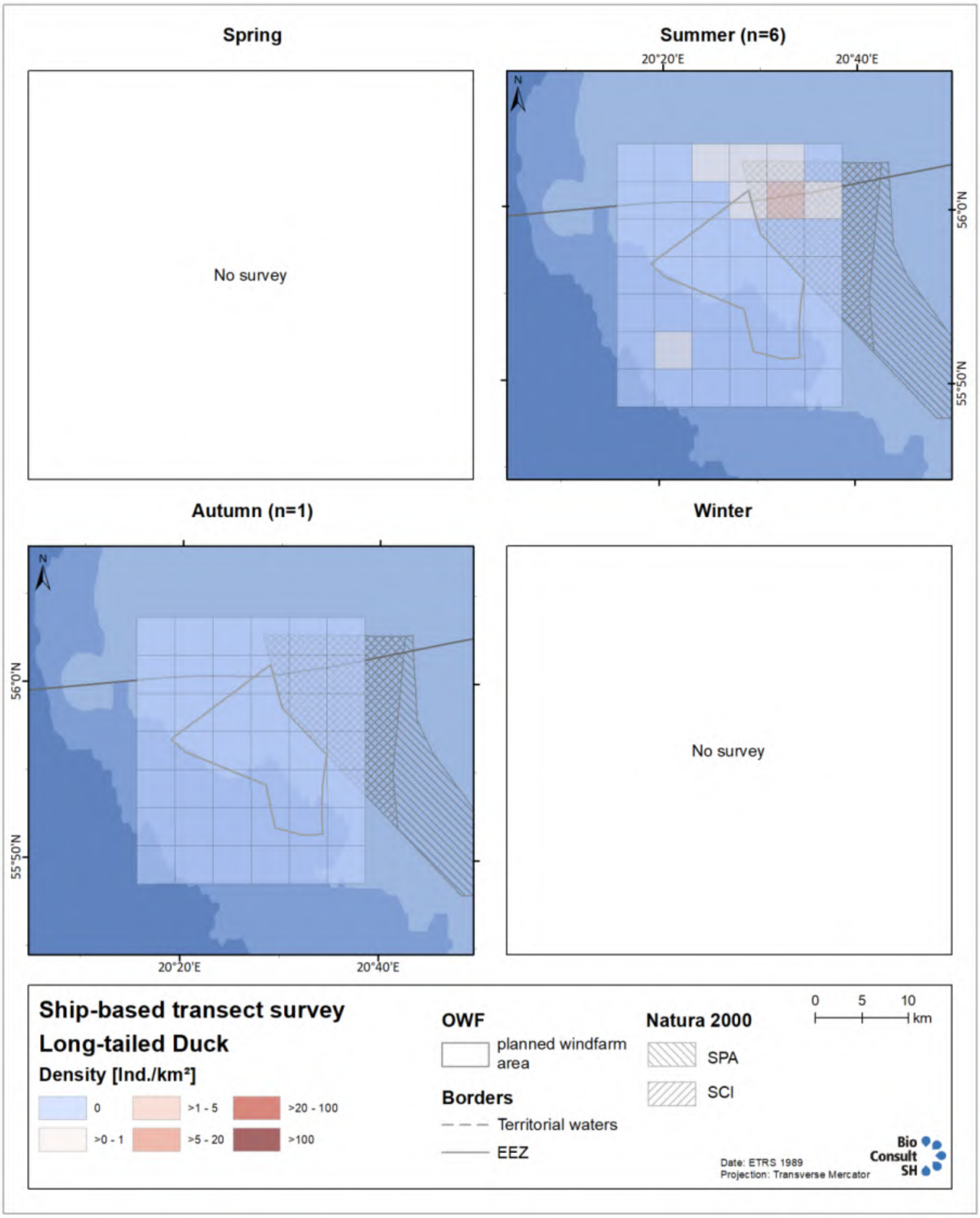

Figure 3.11 Distribution of Long-tailed Ducks in the survey area per season during the ship-based transect surveys between September 2021 and September 2022.

3.2.4 Velvet Scoter

Velvet Scoter – *Melanitta fusca*	**LI: Paprastoji nuodegule**
Biogeographic population: Western Siberia & Northern Europe/NW Europe	
Breeding range: W Siberia, N Europe	
Wintering / core non-breeding range: Baltic, W Europe	
Population size: 220,000 – 410,000	
1% value: 3,000	
Conservation status:	EU Birds Directive, Annex I: not listed EU SPEC Category: SPEC 1 IUCN Red List Category: VU (Global & Europe)
Trend: INC?	Trend quality: Reasonable
Key food: mollusks, crustaceans	

The European population of Velvet Scoters is estimated to range between 220,000 to 410,000 with a tendency to increase. They are not listed in any category of conservation.

Velvet Scoters mainly breed in northern parts of Fennoscandia and western Russia, and to a lesser extent along the Baltic Sea coast of Sweden, Finland, Russia and Estonia (MENDEL et al. 2008a). Durinck et al (1994) mentioned that about 93% of the European population was wintering in the Baltic Sea. Birds start the migration to their wintering areas in September and migrate back to their breeding grounds around March, but the last birds may leave the wintering areas only in May (MENDEL et al. 2008a).

Velvet Scoters are thought to prefer waters with depths below 20 m. Often, the larger abundances are found in shallow waters (5-10 m of depth). Nonetheless, they tend to be more common in deeper waters (20-30 m) than the two other common species: Common Scoters and Long-tailed Ducks. Velvet Scoters feed mainly on mussels, but fish, polychaetes and crustaceans also make up part of their diet (MENDEL et al. 2008a).

Not much is known about the response of Velvet Scoters to OWF, but some weak avoidance can be expected, similar to the closely related Common Scoter (DIERSCHKE et al. 2016). Also, Velvet Scoters are sensitive to ship traffic, but less so than Common Scoters (FLIESSBACH et al. 2019a).

Density and distribution of Velvet Scoters in the survey area

Velvet Scoters were only present during the aerial surveys which took place in autumn 2021 and winter 2021/2022. A total of 7,763 Velvet Scoters were then recorded over the four surveys and it was the most common species. The densities were highest in December 2021 with 9.21 ind./km², in February 2022 they were still high at 7.25 ind./km² and were lowest in April 2022 (0.05 ind./km², **Fehler! Verweisquelle konnte nicht gefunden werden.**, Figure 3.12).

Spatially, Velvet Scoters were also concentrated towards the eastern part of the survey area coinciding with shallower waters. Only in autumn 2021, one grid cell with a density between 1 and 5 ind./km² was observed on the western edge of the survey area. The higher (very large) densities (> 20 ind./km²) were all observed in the east, and most of them within the SPA and SCI protected areas. In winter 2021/2022 when the largest densities occurred, Velvet Scoters were observed also within the limits of the planned OWF at high densities whereas in spring 2022 when the densities decreased, they also occurred within the area of the planned OWF but at lower densities (Figure 3.13).

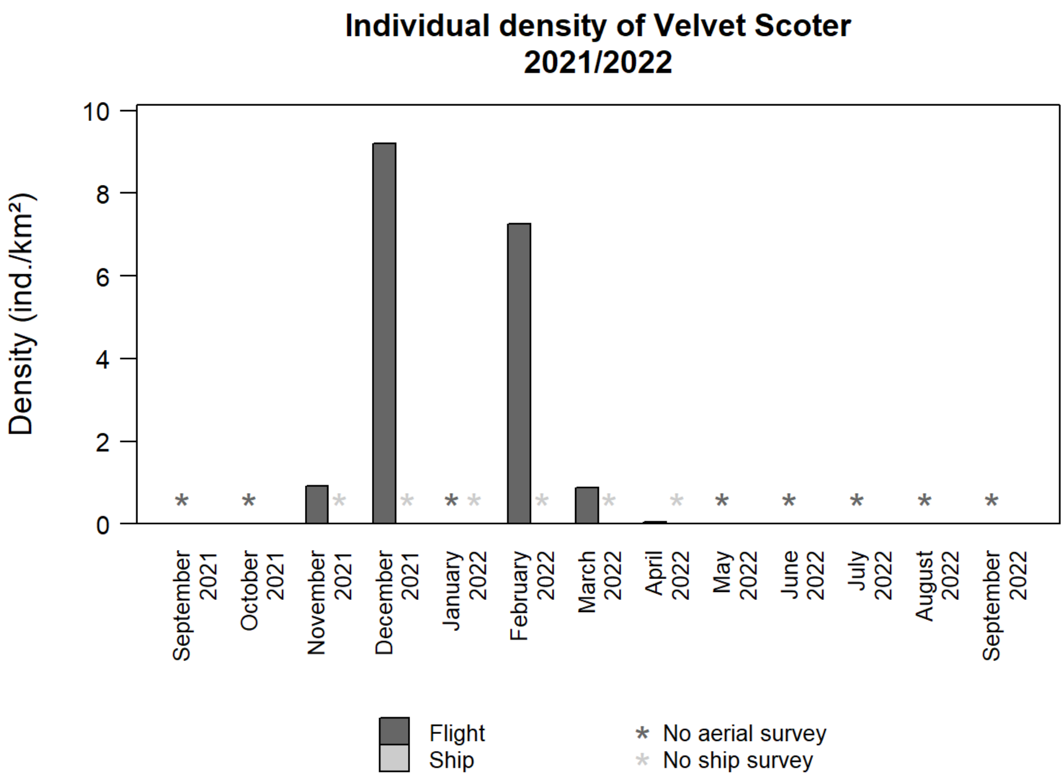

Figure 3.12 *Monthly densities of Velvet Scoters during aerial and ship-based transect surveys in the survey area between September 2021 and September 2022.*

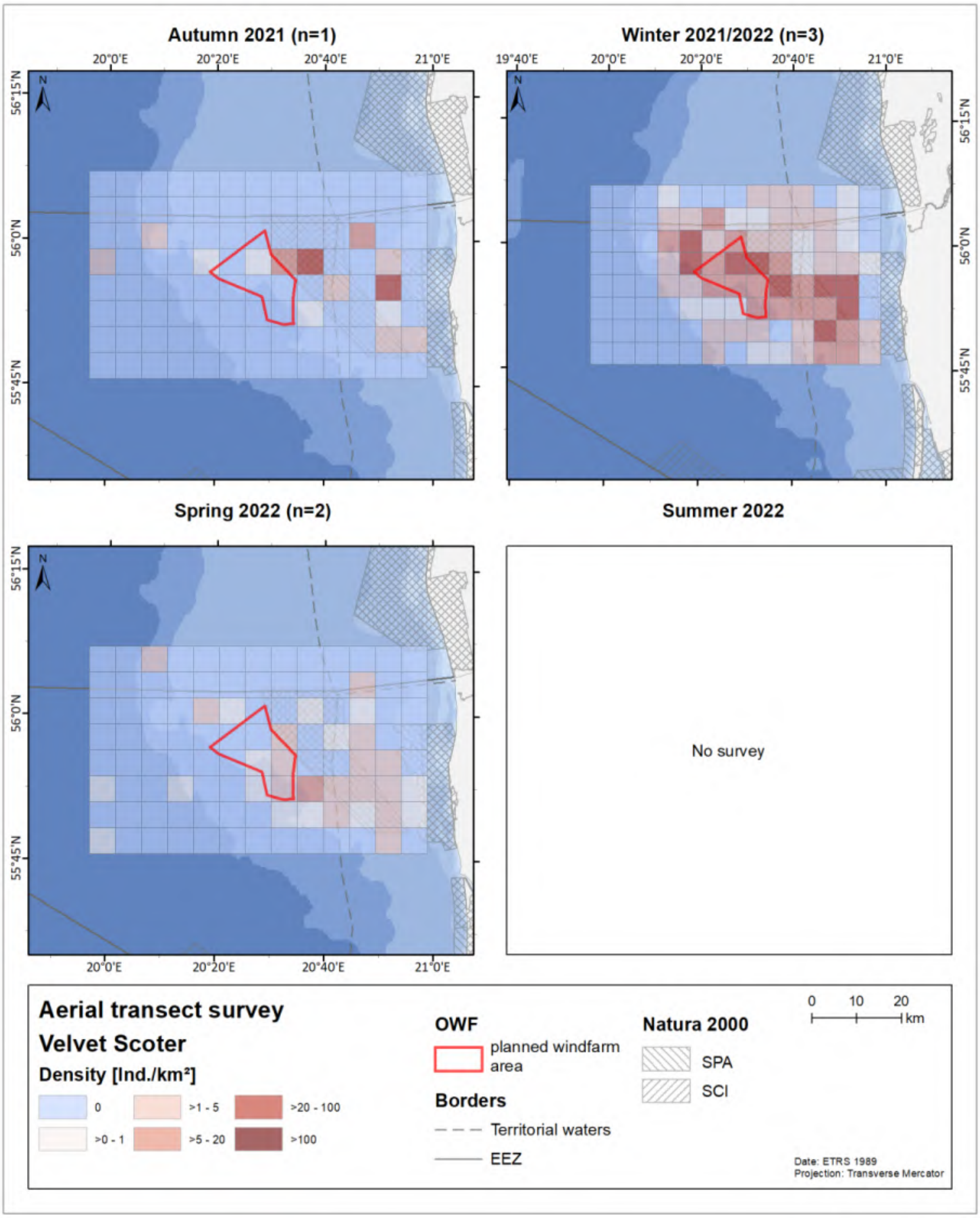

Figure 3.13 Distribution of Velvet Scoters in the survey area per season during the digital aerial surveys between November 2021 and April 2022.

3.2.5 Little Gull

Little Gull – *Hydrocoloeus minutus*	**LI: Mažasis kiras**
Biogeographic population: Central & E Europe & W Mediterranean	
Breeding range: N Scandinavia, Baltic States, W Russia, Belarus, Ukraine	
Wintering / core non-breeding range: W Europe, NW Africa	
Population size: 96,000 – 180,000	
1% value: 1,300	
Conservation status:	EU Birds Directive, Annex I: listed EU SPEC Category: SPEC 3 IUCN Red List Category, Global & Europe:LC
Trend: DEC	Trend quality: Reasonable
Key food: mostly insects, some crustaceans, mollusk and small fish	

Little Gulls are distributed in Europe, west Asia and North America. The population that occurs in the survey area is the Central European population breeding in North Scandinavia to the Baltic Sea and Belarus and west Russia. Little Gulls are migratory, and their wintering grounds extend to west Europe and Northwest Africa (MENDEL et al. 2008a). Within the Baltic, the main wintering areas are the Gulf of Riga, the Irbe Strait, the southwestern part of the Baltic among others (DURINCK et al. 1994). In late July and August, Little Gulls arrive from their breeding grounds to the coast of Lithuania, Latvia and Poland to moult (DURINCK et al. 1994). Little Gulls occur mainly at water depths ranging between 20 and 50 m, but they may also occur at much deeper waters (up to 100 m, DURINCK et al. 1994). Their diet mainly consists of insects and small fish. The European population is estimated at 96,000 to 180,000 individuals with a decreasing trend. Little Gulls are reported to be weakly affected by OWF, showing some avoidance behaviour (DIERSCHKE et al. 2016).

Density and distribution of Little Gulls in the survey area

Little Gulls were the most commonly recorded species during the ship-based surveys. A total of 3,307 individuals were observed during the seven ship-based surveys within the transect area, while during the aerial surveys, 625 individuals were recorded. During ship surveys, Little Gulls were mainly observed in autumn, especially during 2022. The highest density was observed in July 2022 (36.1 ind/km²) and the lowest density in September 2022 with 1.51 ind./km². The maximum density in 2021 (October) was 1.11 ind/km². Little Gulls were recorded during all surveys (during aerial and ship-based surveys), but at very varying densities. Densities of ship-based surveys during May and June 2022 were very low, below 0.1 ind./km². During the aerial surveys, the highest density was observed in November 2021 at 0.86 ind./km².

Spatially, Little Gulls preferred the offshore areas. During the aerial surveys, the highest densities (grid cells of up to 5.0 ind./km²) were observed to the west of the planned OWF both in winter and spring. Within the limits of the planned OWF there were sightings of Little Gulls, but the densities were lower (up to 0.5 ind./km²). The main difference between winter and spring was that during the former the distribution of Little Gulls was more widespread. During the ship-based surveys in autumn, Little Gulls occurred at very high densities throughout the study area. High densities were also observed within the limits of the planned OWF. In July 2022 when the highest densities occurred, Little Gulls were present over all the survey area with no defined pattern and at large densities (> 5. Ind./km², A.3.4).

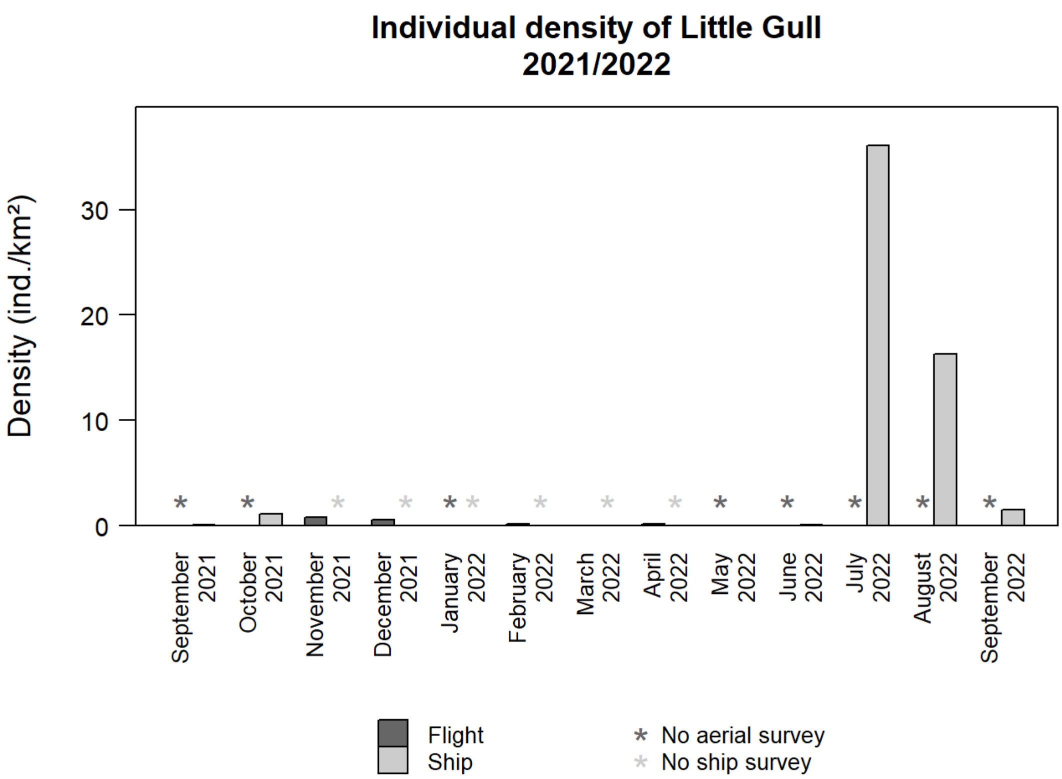

Figure 3.14 Monthly densities of Little Gulls during aerial and ship-based transect surveys in the survey area between September 2021 and September 2022.

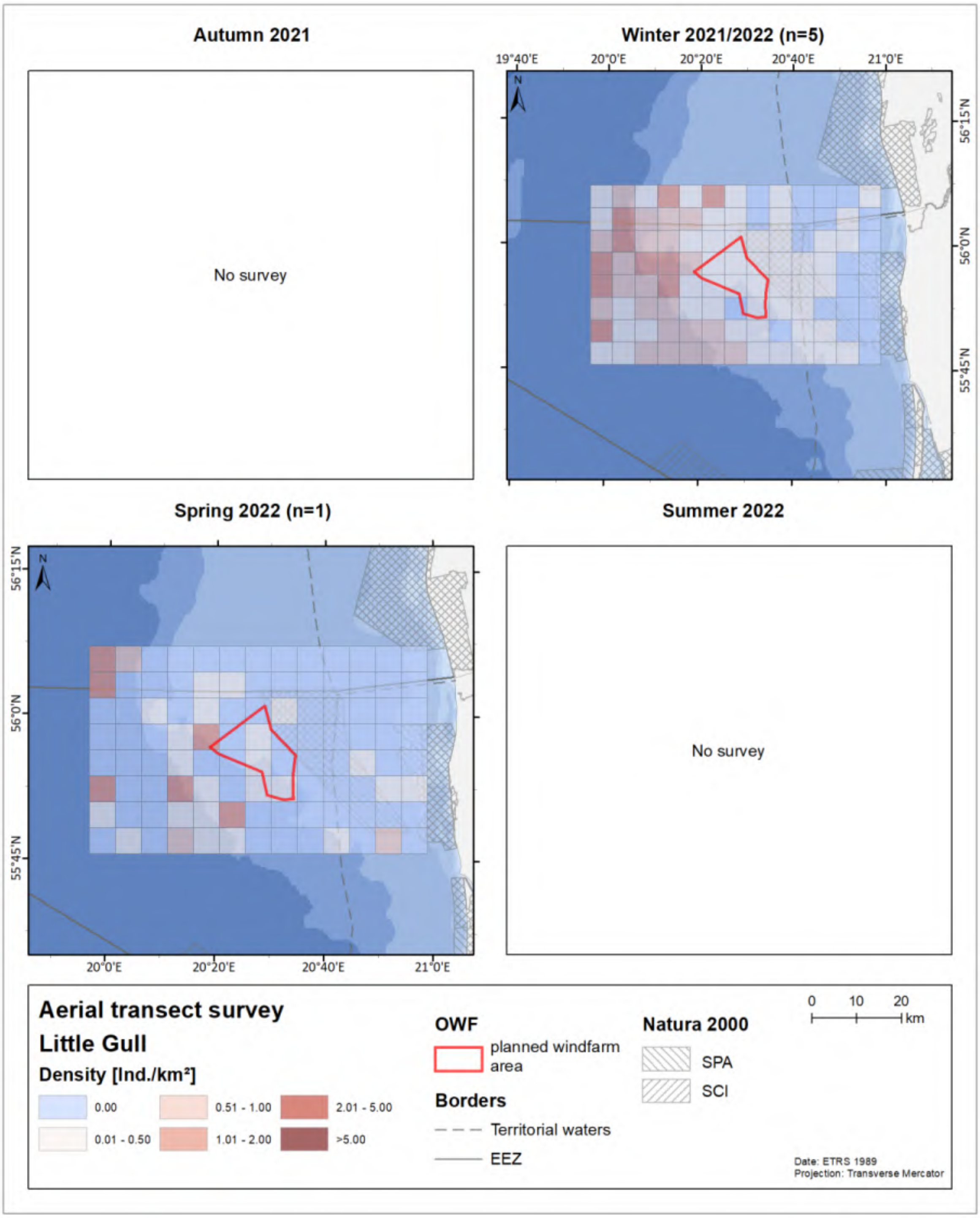

Figure 3.15 Distribution of Little Gulls in the survey area during the digital aerial surveys between November 2021 and April 2022.

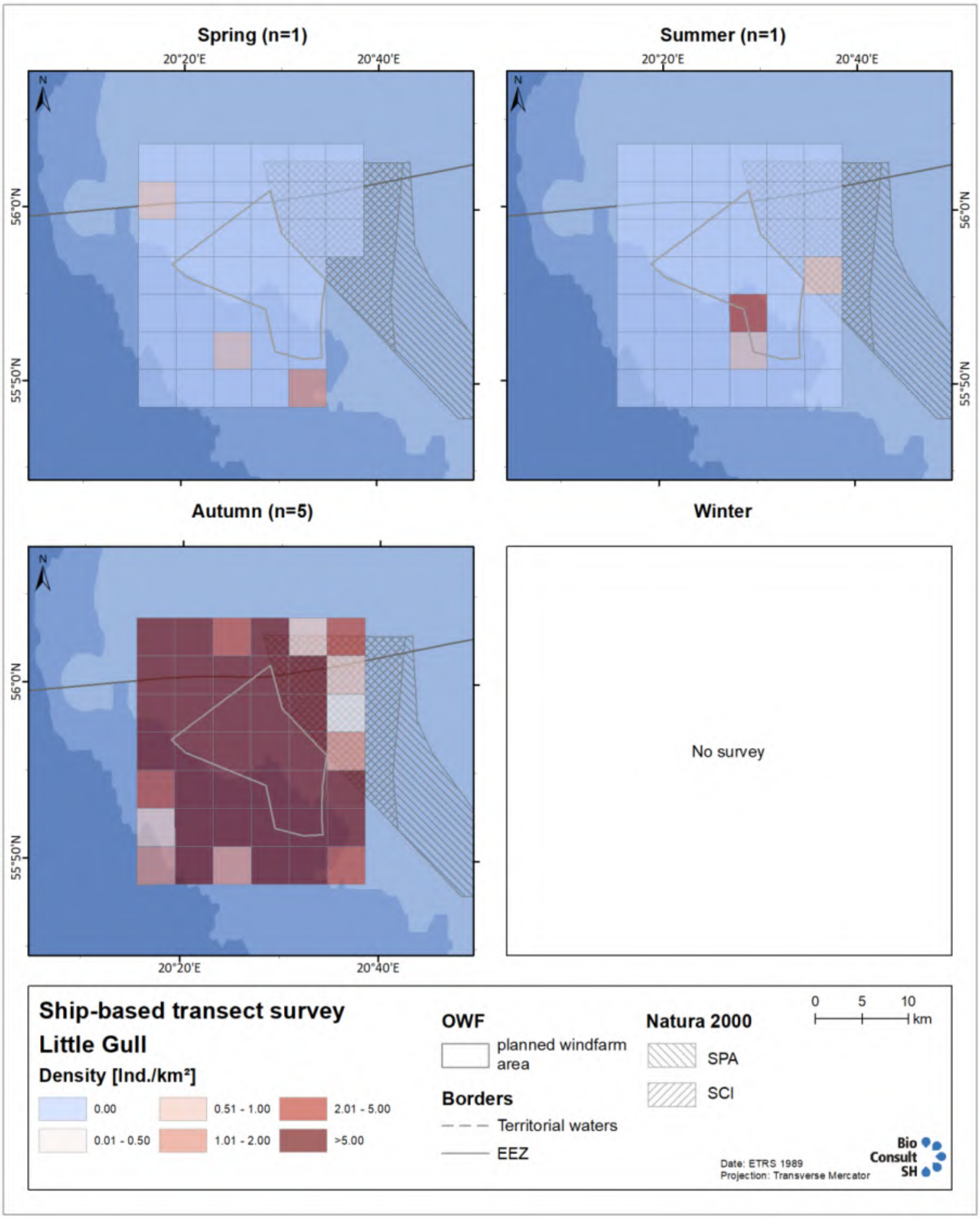

Figure 3.16 Distribution of Little Gulls in the survey area per season during the ship-based transect surveys between September 2021 and September 2022.

3.2.6 Common Gull

Common Gull – *Larus canus*	**LI: Paprastasis kiras**
Biogeographic population: *canus*, NW & C Europe/Atlantic coast & Mediterranean *heinei,* NE Europe & Western Siberia/Black Sea &Caspian	
Breeding range: *canus*: Iceland, Ireland, UK, eastwards to White Sea *heinei:* NW Russia, West and Central Siberia E to R. Lena	
Wintering / core non-breeding range: *canus*: Europe to N Africa; *heinei*: SE Europe, Black & Caspian Seas	
Population size: *canus*: 1,400,000 - 2,000,000	*heinei*: 2,200,000 – 3,500,000
1% value: *canus*: 16,400	*heinei:* 16,400
Conservation status:	EU Birds Directive, Annex I: not listed EU SPEC Category: Non-SPEC^{E} IUCN Red List Category: LC (Global & Europe)
Trend: DEC?/DEC?	Trend quality: Reasonable/Reasonable
Key food: opportunistic	

The Common Gull is a medium-sized gull that breeds in the Palearctic, from Eurasia to western North America. The species has four subspecies and two of them may occur in the survey area. The nominate form: *canus* breeds from Iceland to Fennoscandia and winters from Central Europe to North Africa. The subspecies *L. c. heinei* breeds from Northeast Europe and Western and Central Siberia and winters in Northwest Russia down to the Black Sea and the Caspian area. Durinck and colleagues (1994) mention that less than 4% of the *canus* subspecies winters offshore in the Baltic Sea and that high densities are often only recorded around the Gulf of Riga and to the north and northwest coast of Bornholm. They are generalist feeders with a large variety of food prey from terrestrial and marine ecosystems (Mendel et al. 2008a). They are also ship-followers and feed on fish discards. The sizes of the European populations of both relevant subspecies are summarized in the reference chart above these lines. Despite being relatively numerous both subspecies are showing potential declining trends.

Density and distribution of Common Gulls in the survey area

A total of 108 Common Gulls were recorded over the six aerial surveys. The highest density was recorded in November 2021 with 0.11 ind./km². During ship-based surveys, the highest density was recorded in July 2022 with 2.11 ind./km² (**Fehler! Verweisquelle konnte nicht gefunden werden.**, Figure 3.17).

Spatially, Common Gulls were distributed quite evenly across the aerial survey area, without any local concentrations (Figure 3.18). During ship surveys, individuals were distributed across the whole survey area in autumn, but with varying densities (Figure 3.19).

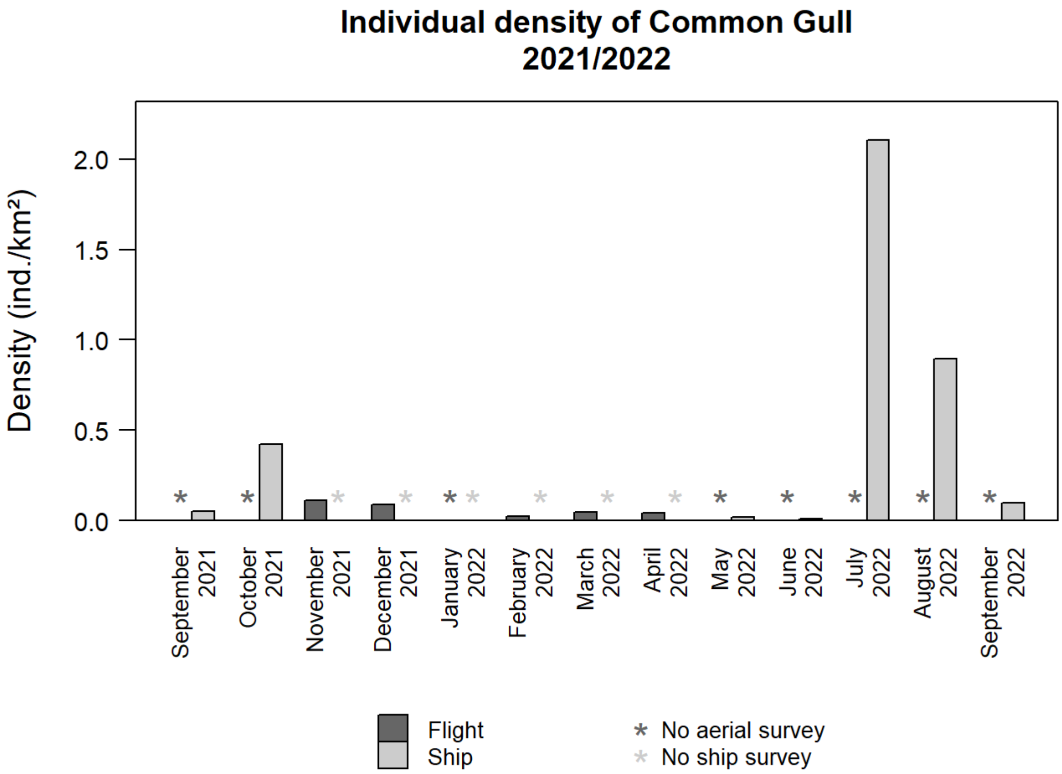

Figure 3.17 Monthly densities of Common Gulls during aerial and ship-based transect surveys in the survey area between September 2021 and September 2022.

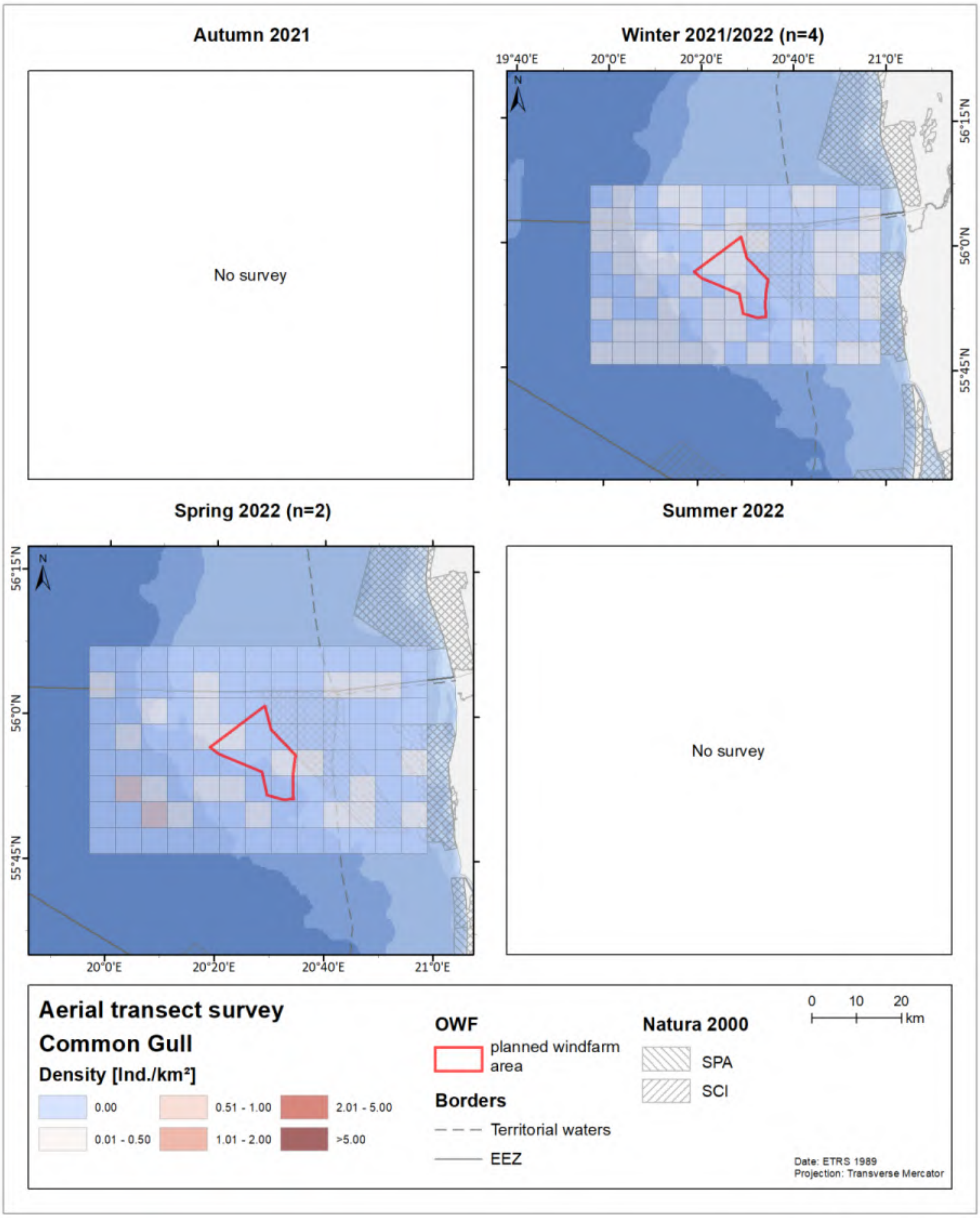

Figure 3.18 Distribution of Common Gulls in the survey area during the digital aerial surveys between November 2021 and April 2022.

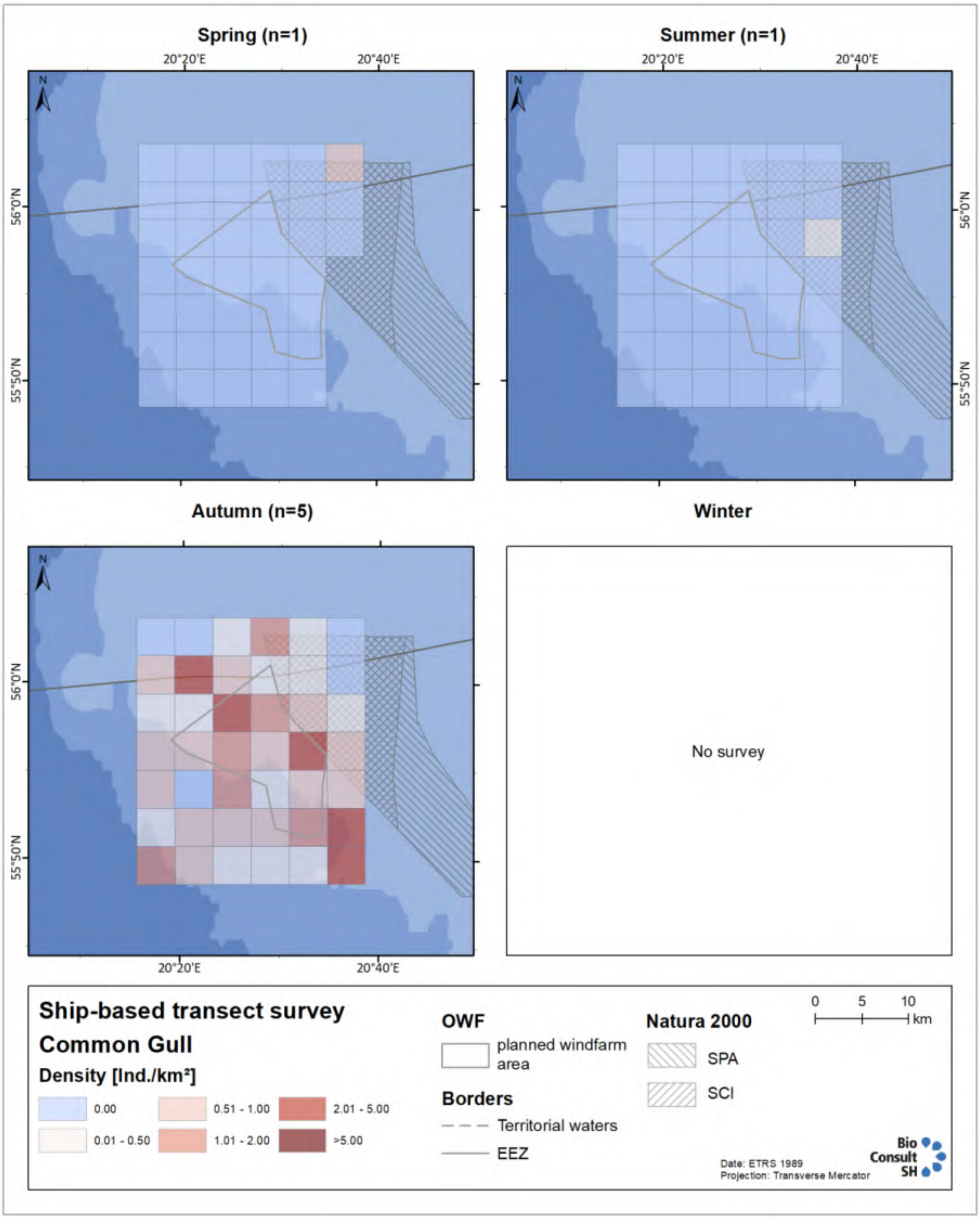

Figure 3.19 Common Gull distribution in the survey area per season during the ship-based transect surveys between September 2021 and September 2022.

3.2.7 Lesser Black-backed Gull

Lesser Black-backed Gull – *Larus fuscus*	**LI: Silkinis kiras**
Biogeographic population: *fuscus, NE Europe/Black Sea, SW Asia & Eastern Africa*	
Breeding range: N Norway, E Sweden, E Denmark, Finland, Estonia, W Russia E to White	
Wintering / core non-breeding range: E Africa S to Tanzania (+ few SW Asia)	
Population size:40,000 - 73,000	
1% value: 540	
Conservation status:	EU Birds Directive, Annex I: not listed EU SPEC Category: Non-SPEC[E] IUCN Red List Category: LC (Global & Europe)
Trend: DEC	Trend quality: Reasonable
Key food: omnivores: fish, insects, molluscs, seeds, small mammals, carrion, etc.	

The Lesser Black-backed Gull is distributed from West Europe (Iceland to Spain) up to Northwest Europe. Wetlands International recognizes five subspecies, but only the nominate form *L. f. fuscus* breeds from northern Norway, Sweden and Finland and eastwards to the White Sea and is the main subspecies expected to occur in the survey area. The subspecies is a long-distance migrant and spends the winter in equatorial Africa reaching even Tanzania. *L. f. fuscus* breeds in colonies on coasts or lakes but also as solitary pairs, especially on inland waters. The population has experienced a long-term decline over its entire range and the population size is estimated to range now between 40,000 and 73,000 individuals. The species is omnivorous but eats predominantly fish. As other gulls, they are also ship-followers and are very successful at getting their food from fishing ships (MENDEL et al. 2008a). The Lesser Black-backed Gull is less sensitive to anthropogenic factors. Nonetheless, they may be affected by oil spills and by the reduction of food due to fisheries, and getting trapped in nets (MENDEL et al. 2008a).

Density and distribution of Lesser Black-backed Gull in the survey area

Only 4 Lesser Black-backed Gulls were recorded during the six aerial surveys, all of them were registered in April 2022. Thus, the density was very low in that month: 0.01 ind./km². During ship-based surveys, 36 individuals were recorded. Here, the highest density was recorded in September 2022 with 0.29 ind./km². (**Fehler! Verweisquelle konnte nicht gefunden werden.**,Figure 3.20).

Since so few Lesser Black-backed Gulls were recorded during the digital aerial surveys, no spatial pattern can be described. Spatially, Lesser Black-backed Gulls were distributed quite evenly across the ship-based survey area during autumn (Figure 3.21). During spring, individuals occurred only in three grid cells in the western part of the study area, indicating local flocks, overlapping with the area of the planned wind farm.

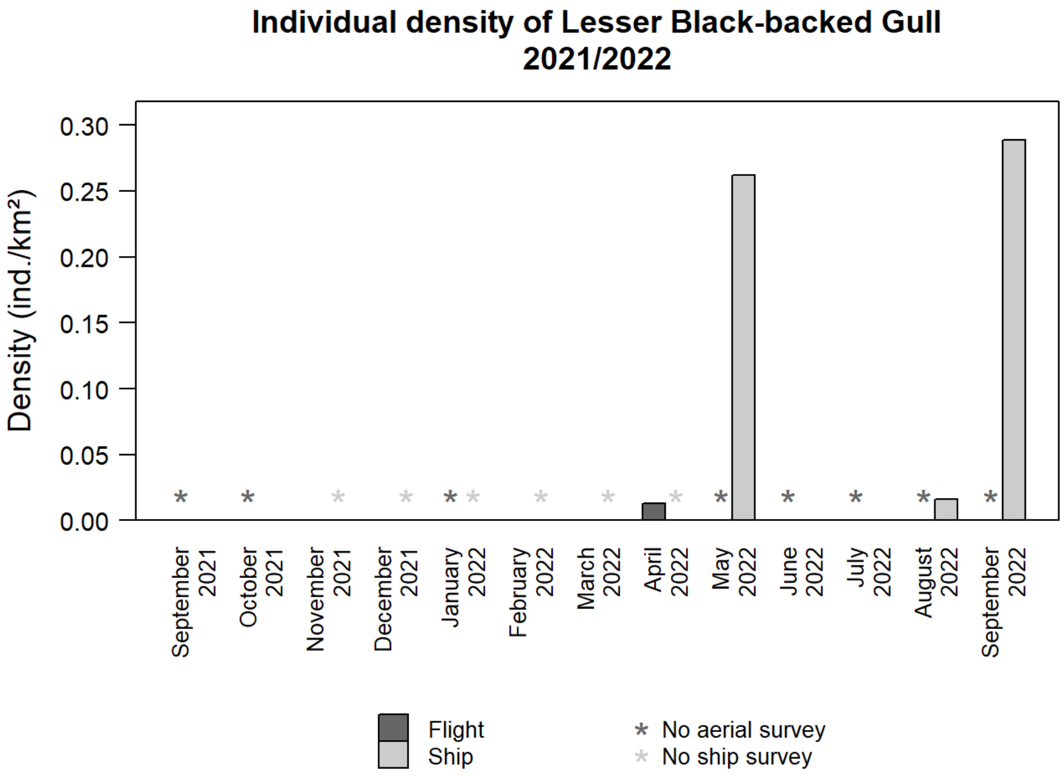

Figure 3.20 Monthly densities of Lesser Black-backed Gulls during aerial and ship-based transect surveys in the survey area between September 2021 and September 2022.

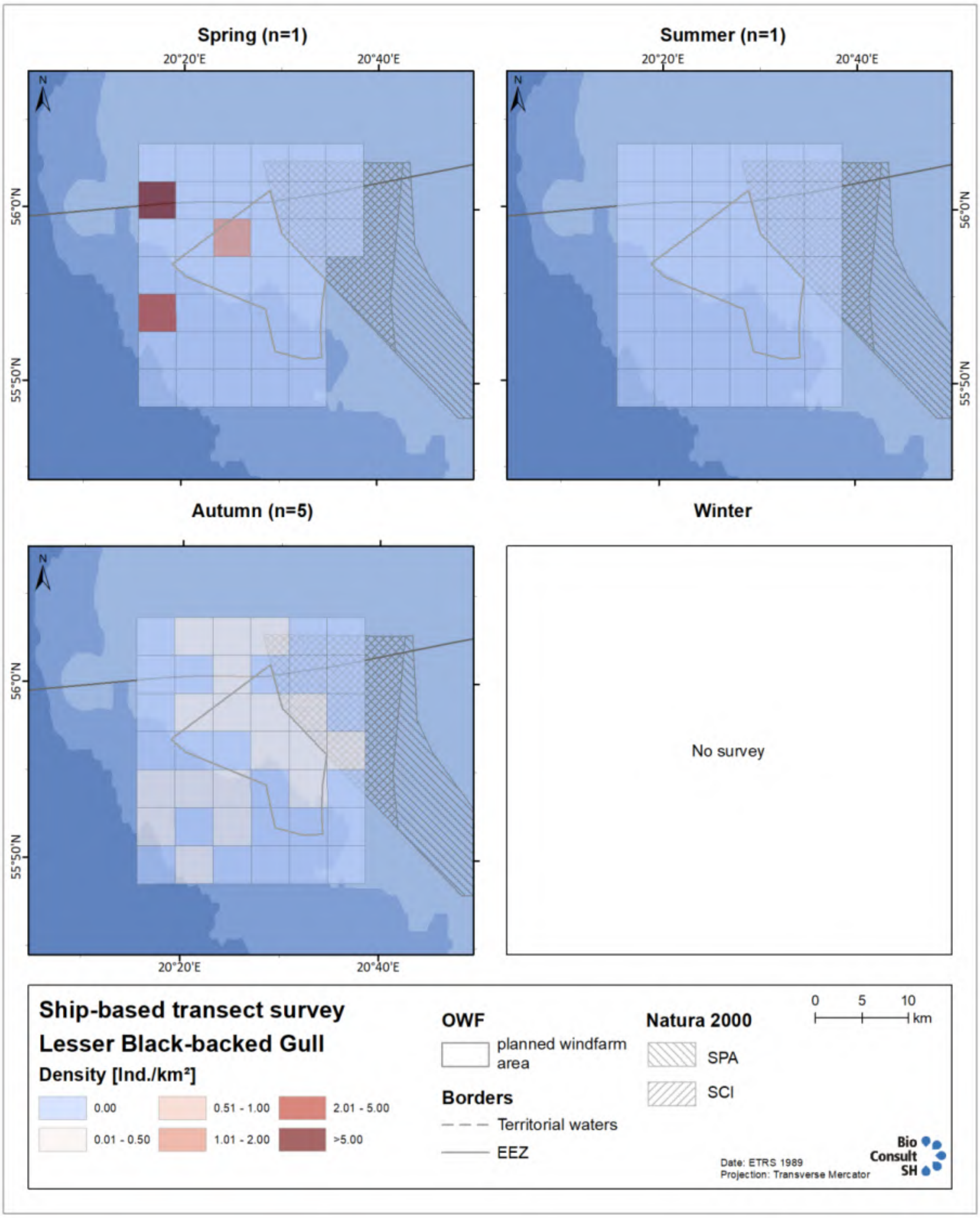

Figure 3.21 Lesser Black-backed Gull distribution in the survey area per season during the ship-based transect surveys between September 2021 and September 2022.

3.2.8 Herring Gull

Herring Gull – *Larus argentatus*	**LI: Sidabrinis kiras**
Biogeographic population: *argentatus*, North & North-west Europe*	
Breeding range: Denmark & Fenno-Scandia to E Kola Peninsula	
Non-breeding range: N & W Europe	
Population size: 860,000 – 1,000,000	
1% value: 9,300	
Conservation status:	EU Birds Directive, Annex I: not listed EU SPEC Category: SPEC 2 IUCN Red List Category: LC (Global & Europe)
Trend: DEC	Trend quality: Reasonable
Key food: various different food sources	

The Herring Gull is a very widespread species in the northern hemisphere. There are two subspecies and the nominate form is the one distributing in the survey area. It breeds from Fennoscandia and Denmark to Svalbard. The other subspecies is distributed west from *L. a. argentatus* and can be found until Iceland. The species is partly migratory with birds occurring further north migrating and birds occurring further south being resident. Their diet is opportunistic and diverse, but their main prey are invertebrates. They are also ship-followers feeding on fish discard (MENDEL et al. 2008a). The population size has been decreasing in the recent years and is currently estimated at 860,000 to 1 million individuals.

Density and distribution of Herring Gulls in the survey area

During the six aerial surveys, the highest density of Herring Gulls was recorded in November 2021 with 0.22 ind./km². During ship-based surveys, the highest density was recorded in August 2022 with 1.85 ind/km², but also July and September showed densities of >1 ind/km² (**Fehler! Verweisquelle konnte nicht gefunden werden.**, Figure 3.17), while the other months had much lower densities (with the exception of July 2022 with a density of 1.60 ind/km²).

Spatially, Herring Gulls were distributed with low densities quite evenly across the aerial survey area, without any local concentrations (Figure 3.23). During ship surveys, individuals were distributed across the whole survey area (and planned wind farm area) in autumn, but with varying densities (Figure 3.24).

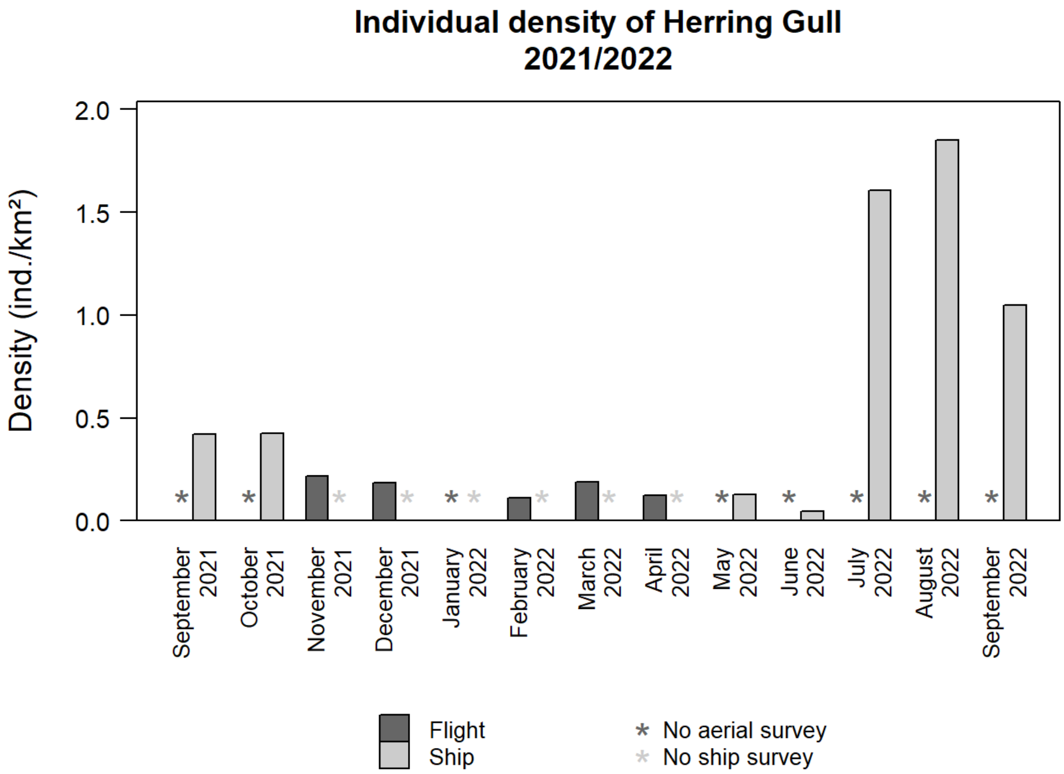

Figure 3.22 Monthly densities of Herring Gulls during aerial and ship-based transect surveys in the survey area between September 2021 and September 2022.

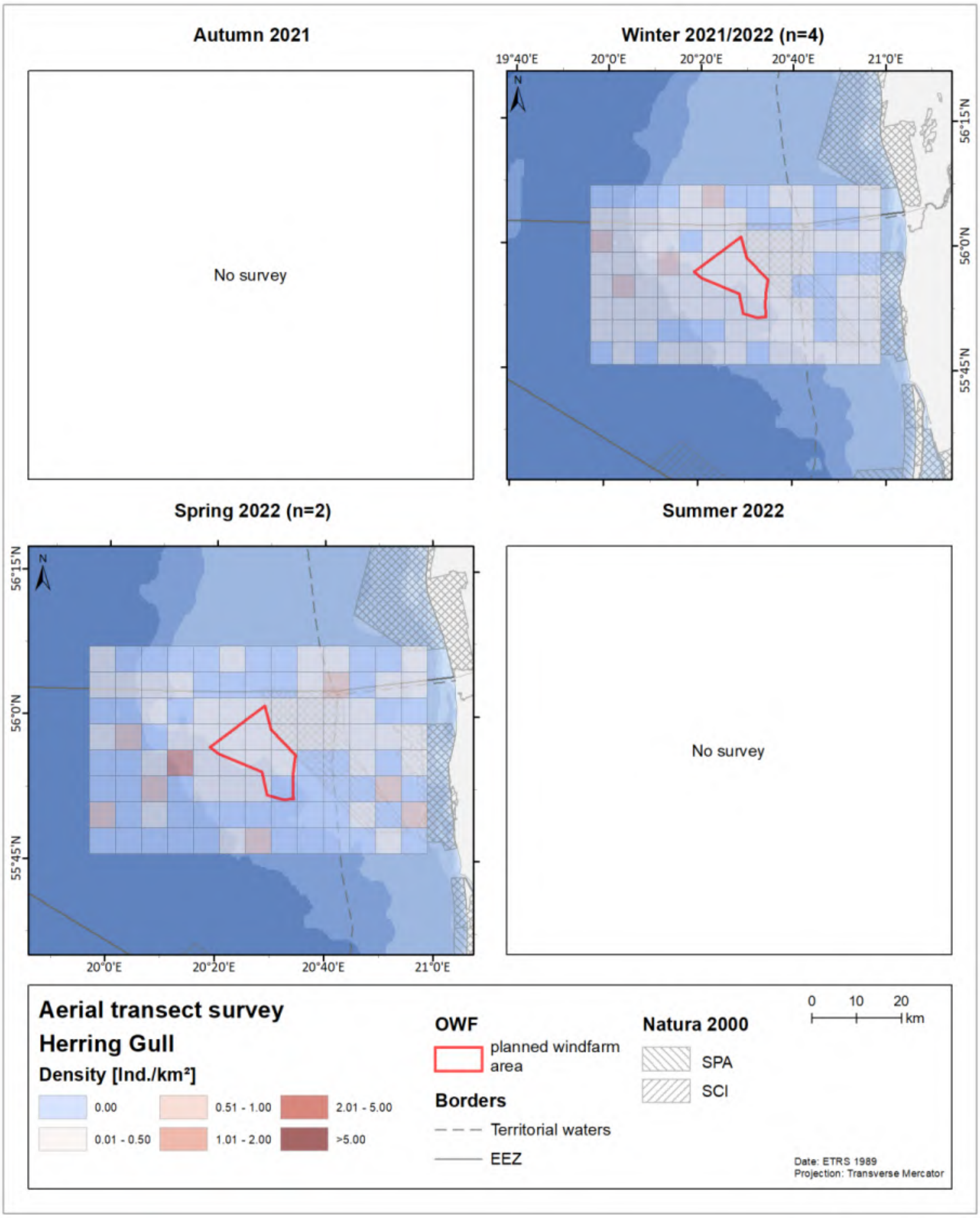

Figure 3.23 Distribution of Herring Gulls in the survey area during the digital aerial surveys between November 2021 and April 2022.

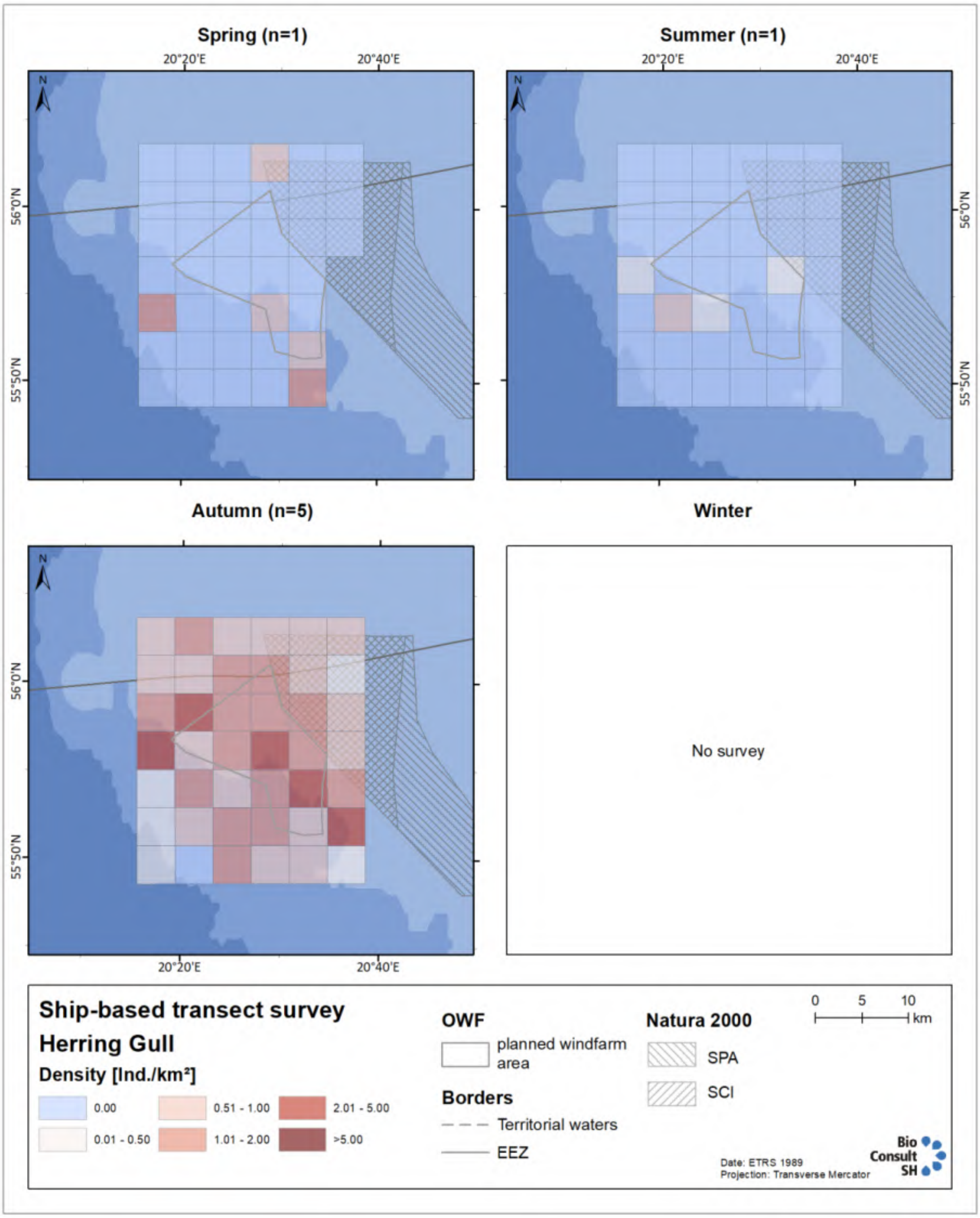

Figure 3.24 Herring Gull distribution in the survey area per season during the ship-based transect surveys between September 2021 and September 2022.

3.2.9 Common Guillemot

Common Guillemot – *Uria aalge*	**LI: Laibasnapis narunelis**
Biogeographic population: aalge, Baltic Sea*	
Breeding range: Sweden, Denmark, Finland	
Non-breeding range: Baltic Sea	
Population size: 77,000 – 100,000	
1% value: 880	
Conservation status:	EU Birds Directive, Annex I: not listed EU SPEC Category: SPEC 3 IUCN Red List Category: LC (Global & Europe)
Trend: INC	Trend quality: Good
Key food: fish	

For Common Guillemots it is somewhat unclear to which extent the North Atlantic flyway populations can be divided into sub-populations. MENDEL et al. (2008a) used an estimate for the Baltic Sea breeding population of 50,000 individuals. During winter, the highest densities in the Danish Baltic Sea are found in the central Kattegat (PETERSEN & NIELSEN 2011) with about 76,500 individuals for the year 2008. These birds are assumed to mostly originate from breeding colonies in the North Sea or Atlantic (MENDEL et al. 2008a). Common Guillemots have been found to avoid OWF, but responses varied from weak avoidance to strong avoidance in some cases (DIERSCHKE et al. 2016; PESCHKO et al. 2020).

Density and distribution of Common Guillemots in the survey area

During the six digital aerial surveys between November 2021 and April 2022, a total of 762 Common Guillemots were recorded whereas during the seven ship-based transect surveys between September 2021 and September 2022 (excluding the months between Nov 21 until April 22) 191 individuals were observed within the transect area (Table 3.1). During aerial surveys, also 137 unidentified auks (or Common Guillemot/Razorbill) were observed (14.9% of all auks). These are not considered here, and thus calculated densities for both species are somewhat underestimated.

During aerial surveys, the highest density was recorded in April 2022 with 0.73 ind./km². During ship-based surveys, the highest density was recorded in September 2022 with 1.67 ind/km² (**Fehler! Verweisquelle konnte nicht gefunden werden.**, Figure 3.25).

Common Guillemots were widely distributed across the study area, especially during autumn (ship-based surveys) and winter (aerial surveys, Figure 3.26, Figure 3.27). The highest densities were mainly found in some distance from the coast, in deeper waters, and indviduals were also recorded inside the planned OWF, at relatively high densities during both ship-based and aerial surveys.

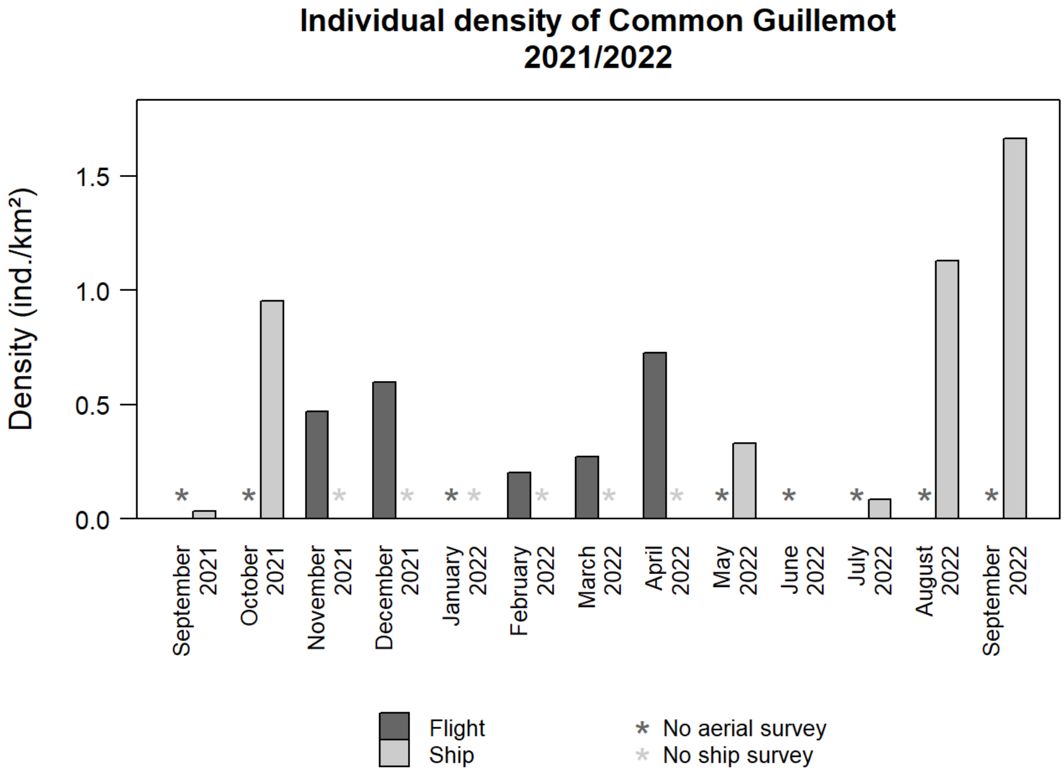

Figure 3.25 Monthly densities of Common Guillemots during aerial and ship-based transect surveys in the survey area between September 2021 and September 2022.

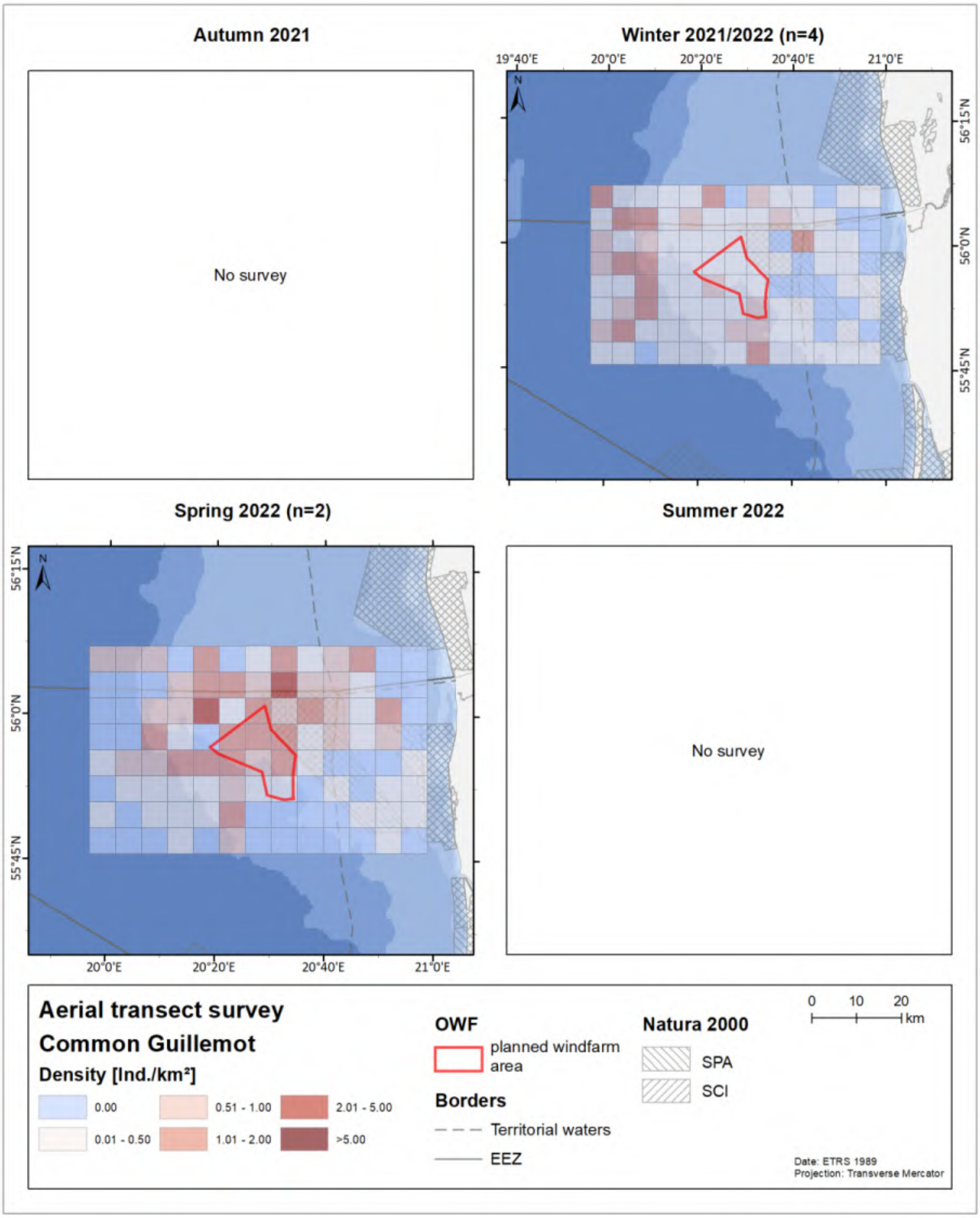

Figure 3.26 Distribution of Common Guillemots in the survey area during the digital aerial surveys between November 2021 and April 2022.

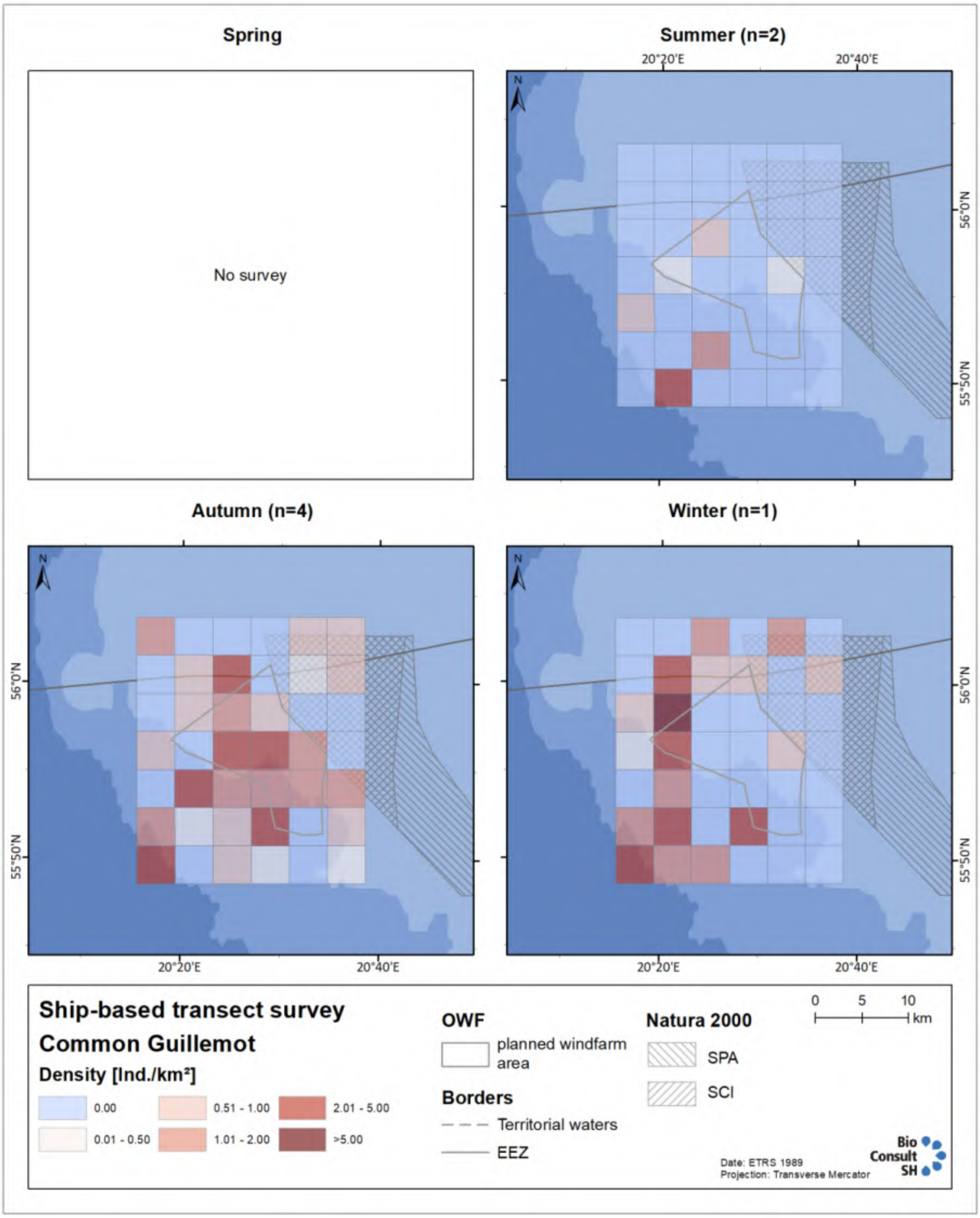

Figure 3.27 Distribution of Common Guillemot in the survey area per season during the ship-based transect surveys between September 2021 and September 2022.

3.2.10 Razorbill

Razorbill – *Alca torda*	**LI: Alka**
Biogeographic population: *torda*, E Atlantic	
Breeding range: -	
Wintering / core non-breeding range: -	
Population size: 290,000 – 350,000	
1% value: 13,800-	
Conservation status:	EU Birds Directive, Annex I: not listed EU SPEC Category: 1 IUCN Red List Category: LC (Global & Europe)
Trend: INC	Trend quality: Reasonable
Key food: mainly fish	

Razorbills are distributed in the Holarctic from North Europe to the East and West coasts of the Atlantic. They are adapted to life at sea and spend their whole life in the marine environment (like the Common Guillemot). They breed mainly on edges of steep cliffs or on small isolated islands and most often in large colonies (MENDEL et al. 2008a). There are two subspecies of Razorbills and three populations. The subspecies *torda*, is the one that occurs in the survey area. The size of the breeding 'East Atlantic' biogeographical population is estimated at 290,000-350,000 individuals for the period between 2008 and 2018. In total, however, the European population might range between 519,000 - 1,070,000 individuals according to BirdLife International (2021). The diet of Razorbills is dominated by fish, especially sprats which also constitutes the major component of the diet of its chicks (Lyngs, 2001). Like Common Guillemots, Razorbills have been found to avoid OWF, but the extent of avoidance varied (DIERSCHKE et al. 2016).

Density and distribution of Razorbill in the survey area

During the digital aerial surveys between November 2021 and April 2022 a total of 521 Razorbills were recorded whereas during the seven ship-based transect surveys between September 2021 and September 2022 (excluding the months between Nov 21 until April 22) 65 individuals were observed within the transect area (Table 3.1). As mentioned previously, also 137 unidentified auks (or Common Guillemot/Razorbill) were observed (14.9% of all auks) during aerial surveys. These are not considered here, and thus calculated densities for this species are probably somewhat underestimated.

During aerial surveys, the highest density was recorded in March 2022 with 0.54 ind./km². During ship-based surveys, the highest density was recorded in October 2021 with 1.28 ind/km² (**Fehler! Verweisquelle konnte nicht gefunden werden.**, Figure 3.28).

During aerial surveys, Razorbills were distributed across the whole study area, but with somewhat higher densities in some distance from the coast, in deeper waters. During ship-based surveys, occurence seemed more patchy during winter, but also here the highest density (>5 ind./km²) was reached on the western edge of the survey area. In lower densities Razorbills were also recorded inside the planned OWF.

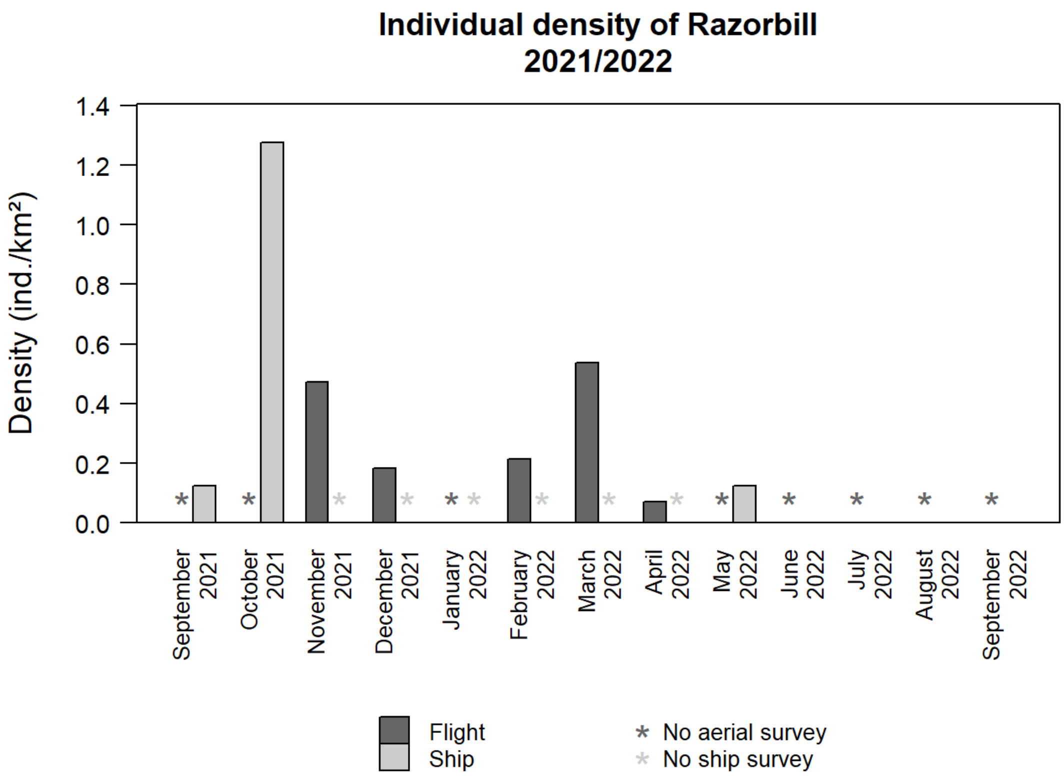

Figure 3.28 Monthly densities of Razorbills during aerial and ship-based transect surveys in the survey area between September 2021 and September 2022.

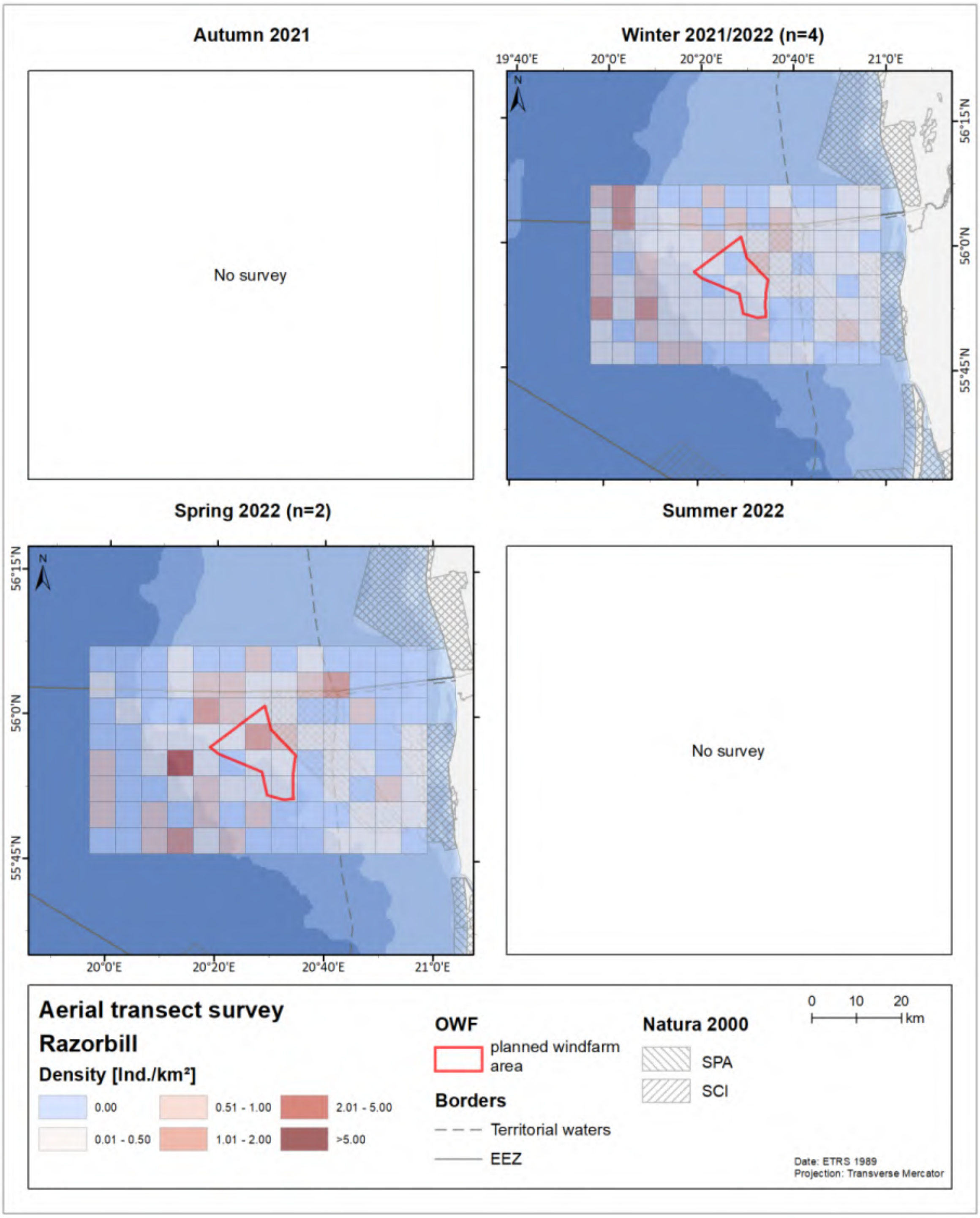

Figure 3.29 Distribution of Razorbills in the survey area during the digital aerial surveys between November 2021 and April 2022.

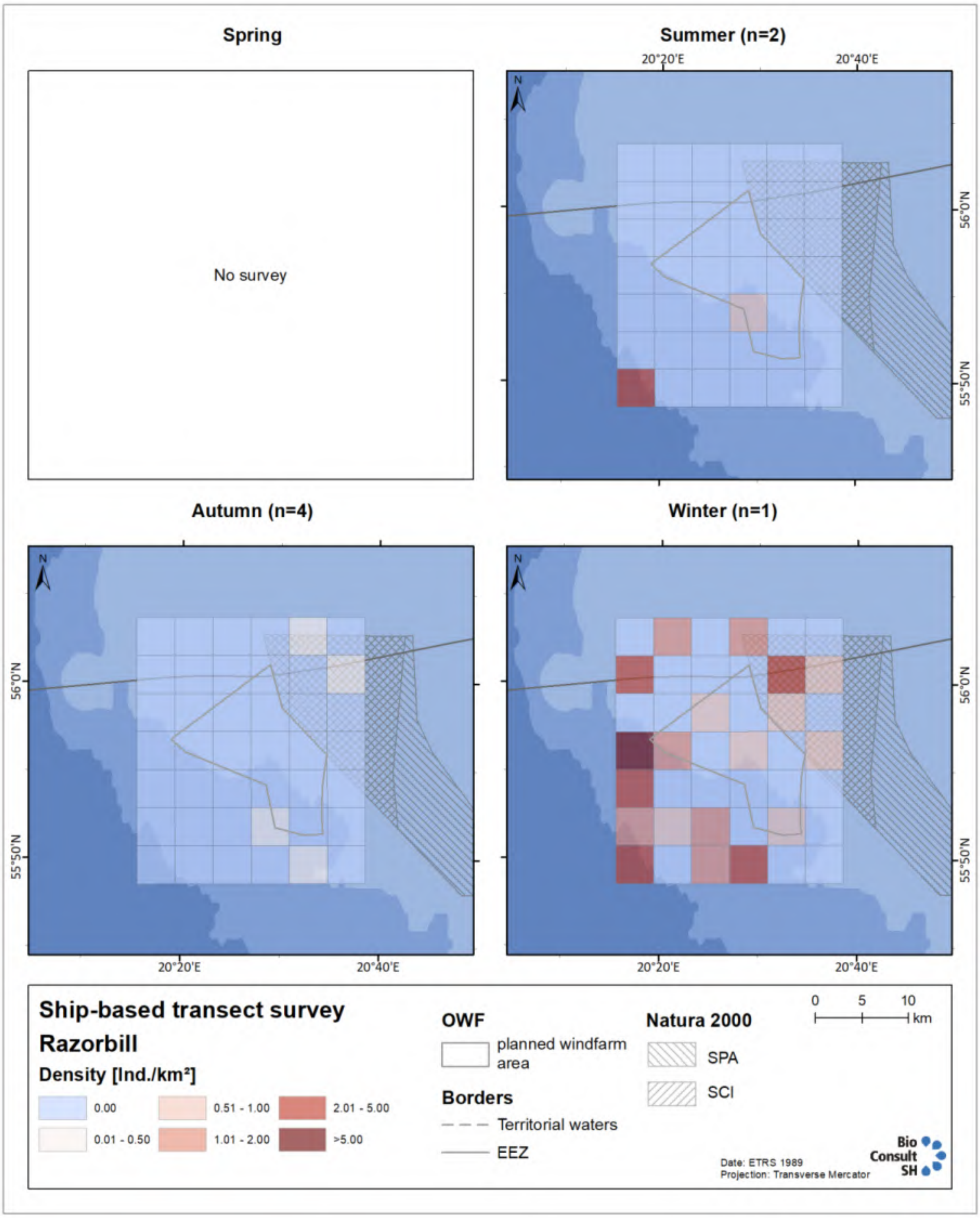

Figure 3.30 Distribution of Razorbills in the survey area per season during the ship-based transect surveys between September 2021 and September 2022.

4 DISCUSSION

4.1 Critique of methods

Data was collected during 6 digital aerial surveys and 7 ship-based surveys from September 2021 to September 2022. The two methods each have advantages and disadvantages. For example, during aerial surveys, a very large area can be covered with a uniform collection effort, while the ship survey area is usually relatively small. Moreover, animal movement and deterrence effects are known from ships (FLIESSBACH et al. 2019b), while they are negligible for digital aerial surveys, since disturbance to birds from a high-flying airplane is minimal (ŽYDELIS et al. 2019). One of the drawbacks of digital aerial surveys is however related to the identification of dark or small species such as Razorbills, Guillemots, and Common and Arctic Terns, which may be difficult to detect on the images and/or distinguish from each other. During ship surveys, these species can often be distinguished more easily. These differences need to be taken into account when comparing bird densities between ship and aerial surveys.

Many factors can influence the distribution and the seasonal occurrence of resting birds. These include environmental factors such as season, local weather conditions during the collection date and preceding days, feeding resources and anthropogenic factors such as fishing and shipping. Furthermore, each survey is conducted over a short period of time and over a relatively small area, when compared to the Baltic Sea as a whole. It only represents a snapshot of what is happening, and a high degree of temporal and spatial variability is expected. Consequently, any short-term population shift away from or into the survey area can lead to considerable fluctuations in the population estimates of the species under consideration.

4.2 Species abundance and distribution

The results of the ship-based and digital aerial surveys during the first year of the study were largely in line with expectations, but also showed a few unexpected patterns. Water depth in the study area varied, with greater water depth towards the West, and this was also reflected in the species range and distribution.

The study area included (only partly for ship surveys) the Special Protection Area (SPA) "Klaipėdos–Ventspilio plynaukštė", which extends to the east of the planned OWF area (EUROPEAN ENVIRONMENT AGENCY 2015). The SPA was designated for the protection of reefs, and as a place of regular wintering aggregations of Long-tailed Ducks, Velvet Scoters and Razorbills The standard data form also gives site evaluations for the species Red-throated Diver and Common Guillemot.

In the Baltic Sea, **divers** are found as winter visitors and migrants (MENDEL et al. 2008b). In Lithuanian waters, a key wintering area for the Red-throated Diver is located at the coast of Lithuania and reaching further North, with a core area off the Latvian coast (SKOV et al. 2011). In the SPA standard data form, a low density of only between 0.06 and 0.16 ind./km² is given. During aerial surveys, medium densities of Red-throated Divers were found within the study area. The highest densities were found during late winter (February) and during spring. Divers were found distributed across the whole study area during winter and concentrated in the eastern half of the area during spring, but still including the OWF footprint. Given the rather average densities (max. 0.57 ind./km²), the study area does not seem to be of high importance to this species. Nevertheless, as divers react very sensitive to anthropogenic disturbances like OWF, with displacement distances of up to 10-15 km in some studies (DIERSCHKE et al. 2016; MENDEL et al. 2019; HEINÄNEN et al. 2020), also individuals resting within the nearby SPA will likely be disturbed by the planned OWF.

Sea ducks were mainly recorded during aerial surveys, as these covered the relevant time period (no ship surveys during winter and early spring) and the study area also reached far to the east, into shallower waters. Of the sea duck species, **Long-tailed Ducks** were the second most abundant species. In general, the coasts of Lithuania are important wintering areas for this species, although the highest densities are reached in other parts of the Baltic Sea (SKOV et al. 2011). During aerial surveys, Long-tailed Ducks were frequently recorded in medium densities of up to 2,8 ind./km². In the SPA standard data form, a density of between 6.3 and 23.2 ind./km² is given. As expected, most birds were recorded within the SPA, but in some cases also within the borders of the planned OWF. Long-tailed Ducks have been shown to avoid wind farms and are sensitive to ship traffic, which might lead to habitat loss (DIERSCHKE et al. 2016). Although displacement distances vary somewhat, some habitat loss within the SPA can be expected with the currently planned OWF.

Velvet Scoters were the most abundant species during aerial surveys, with high densities during December and February (up to 9.21 ind./km²). In the SPA standard data form, a density of between 31.3 and 89.8 ind./km² is given and thus, the highest densities in this study would be expected within the SPA. However, especially during the surveys in December and February, rather high numbers of birds were recorded outside of the SPA, within the planned OWF area and just to the West, in an area of deep water > 30 m. This finding is in contrast to studies reporting Velvet Scoters occurring in water depth between 10 and 30 m (SKOV et al. 2011). In the present study, Velvet Scoters were absent only on the westernmost transect lines, with even deeper water. During the aerial surveys, birds appear to have shifted their expected occurrence from within the SPA more towards the West. It is however unclear, whether the observed distribution is a frequent pattern also in other years and this would require further investigations. As Velvet Scoters are sensitive to anthropogenic disturbances (DIERSCHKE et al. 2016), birds are expected to be displaced from the area of the planned OWF as well as from parts of the SPA, which borders the planned OWF area.

Of all gull species recorded during the surveys, **Little Gull** was by far the most abundant species. However, this was due to high densities during two ship surveys in autumn 2022, where a maximum of 36.1 ind./km² was recorded. No aerial surveys were conducted during this time period. Little Gulls were distributed across the whole ship study area, including the planned OWF area. As high densities were recorded during two subsequent surveys, birds seem to make consistent use of the area in autumn, although the area has not been identified as an important area by Durinck et al. (1994). More data would thus be needed to estimate the importance as a resting area for Little Gulls. As this species shows weak avoidance behaviour towards OWF, some displacement from the planned OWF area can be expected.

Of the auks, **Common Guillemots** were recorded in the study area more often than **Razorbills**, especially during ship surveys. During aerial surveys, about 15% of auks could only be identified as Common Guillemot/ Razorbill (only one unidentified auk during ship surveys). Common Guillemots occurred in the area almost throughout the year with varying densities, while the occurrence of Razorbills was more limited to the winter half of the year with no records between June and August.

Both species were distributed across the whole study area, with lower numbers closer to the coast and higher numbers far offshore in the western part of the study area. In the SPA standard data form, both species are listed to occur with a maximum number of 100 individuals and thus a density of 0.3 ind./km². The maximum densities in this study were found during ship surveys, and these densities were much higher, with max. 1.67 ind./km² (Common Guillemot) and 1.28 ind./km² (Razorbill), suggesting that the study area is of some importance for these species. Durinck et al. (1994) also listed the Lithuanian coast as an important location for Razorbills (not for Common Guillemots) with densities between 0.1 and 0.99 ind./km². As both species show avoidance of OWF, with varying distances, birds are expected to be displaced from the area of the planned OWF as well as parts of the SPA at the border the planned OWF area.

5 LITERATURE

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A APPENDIX

A.1 Species Lists

*Table A. 1 Overview of the total number of registered species in the aerial survey area from November 2021 to April 2022 , including number of individuals and indications of the status of the species in the area (Resting/Migration [R/M]: Species that can occur as resting and migrating birds in the survey area; Migration [M]: Species, that occur as migrating birds only) as well as conservation or hazard categories (VSchRL: EU Bird Directive, Annex I; EUR-Gef: European Red List Category; EU27-Gef.: EU27 Red List Category (Status: 2017); AEWA: Categories of the Agreement on the Conservation of African-Eurasian Migrants (Status: 2019); Red List Lithuania: *indicates that the species is listed (https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/9f3de7d2aa8811ea8aadde924aa85003, accessed 13.10.2022).*

Species	Name in Lithuanian	Status	Ind. ∑	EU Directive	EUR-Cat.	EU28-Cat.	AEWA	Red List Lithuania
Red-throated Diver	Rudakaklis naras	R/M	576	Annex I	LC	LC	C (1)	
Black-throated Diver	Juodakaklis naras	R/M	33	Annex I	LC	LC	B 2c	*
unidentified diver		R/M	58					
Great Crested Grebe	Ausuotasis kragas	R/M	5		LC	LC	C 1	
Slavonian Grebe	Raguotasis kragas	R/M	1	Annex I	NT	VU	A 1b	*
Red-necked/Great Crested Grebe		R/M	4					
Slavonian / Black-necked Grebe		R/M	1					
Great Cormorant	Didysis kormoranas	R/M	12		LC	LC	C1	
Bean Goose	Želmenine žasis	M	17		LC	VU	A 3c	
Greylag Goose	Pilkoji žasis	M	6		LC	LC	C1 / B 1	
Mallard	Didžioji antis	M	21		LC	LC	C 1c	
Greater Scaup	Žiloji antis	M	23		LC	EN	B 2c	
King Eider	Skiauteretoji gaga	R/M	1		LC	N/A	C 1	
Long-tailed Duck	Ledine antis	R/M	2,859		LC	LC	A 1b	*
Common Scoter	Juodoji antis	R/M	26		LC	N/A	B 2a	
Velvet Scoter	Paprastoji nuodegule	R/M	7,763		VU	VU	A 1b	*
Common/Velvet Scoter		R/M	103					
Common Goldeneye	Paprastoji klykuole	M	4		LC	LC	C 1	
Red-breasted Merganser	Vidutinis danciasnapis	M	6		NT	NT	A 3cc	*
Goosander	Didysis danciasnapis	M	11		LC	LC	C 1	

Species	Name in Lithuanian	Status	Ind. ∑	EU Directive	EUR-Cat.	EU28-Cat.	AEWA	Red List Lithuania
unidentified duck		M	1					
Common Kestrel	Paprastasis pelesakalis	M	1		LC	LC		*
Little Gull	Mažasis kiras	R/M	625	Annex I	LC	LC	B 1	*
Black-headed Gull	Rudagalvis kiras	R/M	11		LC	VU	B 2c	
Common Gull	Paprastasis kiras	R/M	108		LC	LC	C 1	
unidentified small gull		R/M	13					
Lesser Black-backed Gull	Silkinis kiras	R/M	4		LC	LC	C 1	
Herring Gull	Sidabrinis kiras	R/M	288		LC	VU	B 2c	
Common/ Herring Gull		R/M	2					
Great Black-backed Gull	Balnotasis kiras	R/M	5		LC	NT	C 1	
Black-legged Kittiwake	Tripirštis kiras	R/M	3		VU	EN	A 1b	
unidentified large gull		R/M	7					
unidentified gull		R/M	10					
Sandwich Tern	Margasnape žuvedra	R/M	1	Annex I	LC	LC	C 1	
Tern/small gull		R/M	2					
Common Guillemot	Laibasnapis narunelis	R/M	762		LC	LC	C 1	
Common Guillemot/ Razorbill		R/M	228		LC	LC		
Black Guillemot	Taiste	R/M	2		LC	LC	C 1	
Razorbill	Alka	R/M	521		LC	LC	A 4	
unidentified auk		R/M	5					
Chaffinch	Paprastasis kikilis	M	84		LC	LC		
Unidentified finch		M	415					
unidentified songbird		M	941					
unidentified bird			142					
Total			**15,711**					

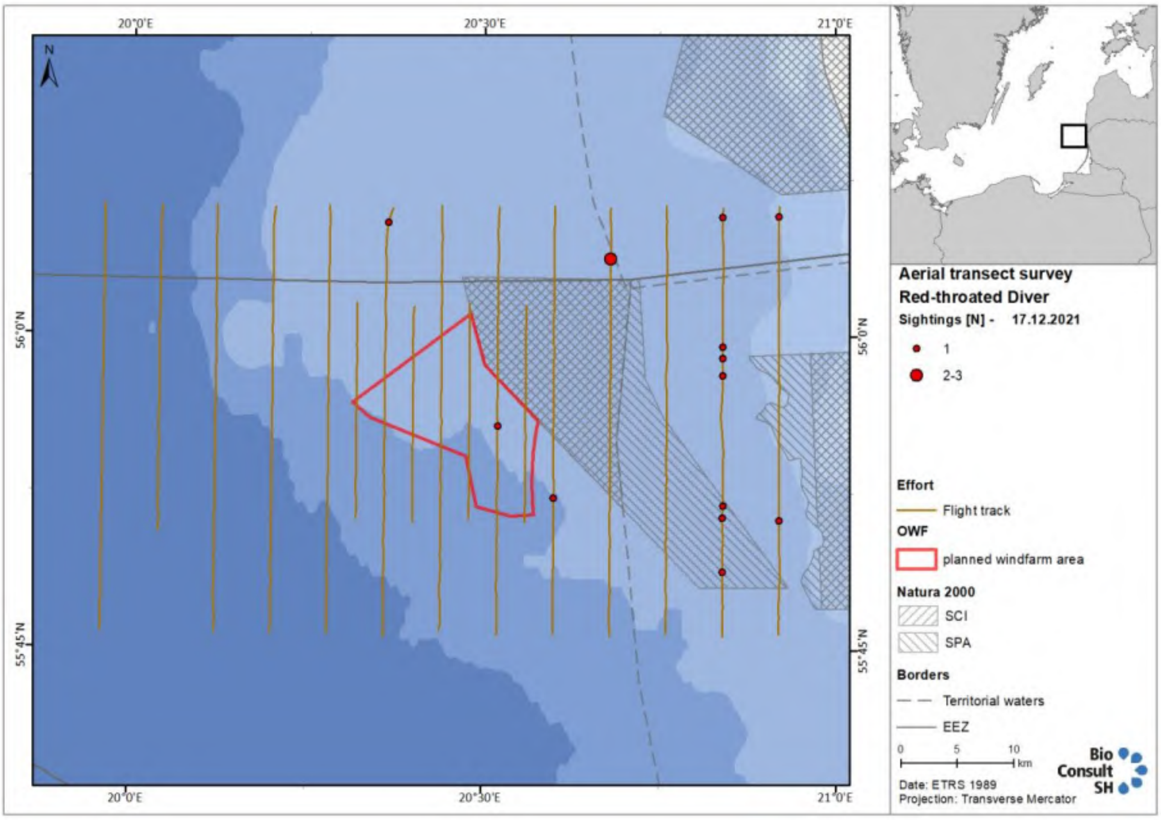
Table A. 2 *Overview of the total number of registered species in the ship-based survey area from September 2021 to September 2022 , including number of individuals (total and in transect) and indications of the status of the species in the area (Resting/Migration [R/M]: Species that can occur as resting and migrating birds in the survey area; Migration [M]: Species, that occur as migrating birds only) as well as conservation or hazard categories (VSchRL: EU Bird Directive, Annex I; EUR-Gef: European Red List Category; EU27-Gef.: EU27 Red List Category (Status: 2017); AEWA: Categories of the Agreement on the Conservation of African-Eurasian Migrants (Status: 2019); Red List Lithuania: *indicates that the species is listed (https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/9f3de7d2aa8811ea8aadde924aa85003, accessed 13.10.2022).*

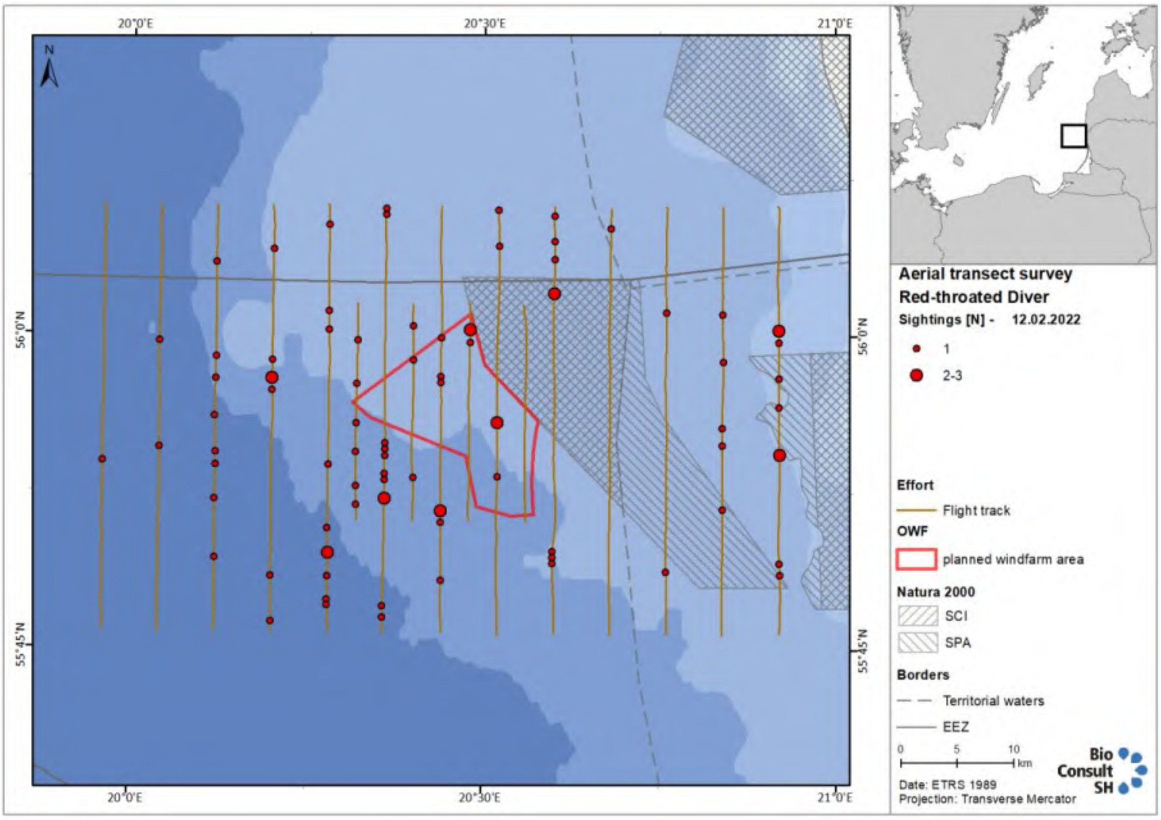
Species	Common name in Lithuanian	Status	Ind. ∑	Ind. transect	VSchRL	EUR-Cat.	EU28-Cat.	AEWA	Red List Lithuania
Red-throated Diver	Rudakaklis naras	R/M	18	12	Annex I	LC	LC	C (1)	
Black-throated Diver	Juodakaklis naras	R/M	44	27	Annex I	LC	LC	B 2c	*
unidentified diver		R/M	35	15					
Great Cormorant	Didysis kormoranas	R/M	49	5		LC	LC	C 1	
Greater White-fronted Goose	Baltakakte žasis	M	5	0	Annex I (ssp albifrons)	LC	LC	C 1	
Greater Scaup	Žiloji antis	M	2	0		LC	EN	B 2c	
Long-tailed Duck	Ledine antis	R/M	33	28		LC	LC	A 1b	*
Common Scoter	Juodoji antis	R/M	11	3		LC	N/A	B 2a	
Eurasian Golden Plover	Dirvinis sejikas	M	4	4	Annex I	LC	LC	B 2c	
Sanderling	Smiltinukas	M	10	10		LC	LC	C 1	
Ruddy Turnstone	Akmene	M	1	1		LC	EN	A 3c	
Little Gull	Mažasis kiras	R/M	3,975	3,307	Annex I	LC	LC	B 1	*
Black-headed Gull	Rudagalvis kiras	R/M	5	4		LC	VU	B 2c	
Common Gull	Paprastasis kiras	R/M	233	221		LC	LC	C 1	
Lesser Black-backed Gull	Silkinis kiras	R/M	45	36		LC	LC	C 1	
Herring Gull	Sidabrinis kiras	R/M	428	350		LC	VU	B 2c	
Great Black-backed Gull	Balnotasis kiras	R/M	1	1		LC	NT	C 1	
Common Tern	Upine žuvedra	R/M	2	0	Annex I	LC	LC	C 1	
Arctic Tern	Arktine žuvedra	R/M	18	9	Annex I	LC	LC	C1	
unidentified tern		R/M	1	1					
Common Guillemot	Laibasnapis narunelis	R/M	196	191		LC	LC	C 1	
Razorbill	Alka	R/M	65	65		LC	LC	A 4	
unidentified auk		R/M	3	1					
Short-eared Owl	Baline peleda	M	1	1	Annex I	LC	LC		*
Eurasian Skylark	Dirvinis vieversys	M	1	1		LC	LC		
Western Yellow Wagtail	Geltonoji kiele	M	6	6		LC	LC		
White Wagtail/ Pied Wagtail	Baltoji kiele	M	7	7		LC	LC		
unidentified wagtail		M	1	1					
European Robin	Liepsnele	M	4	4		LC	LC		

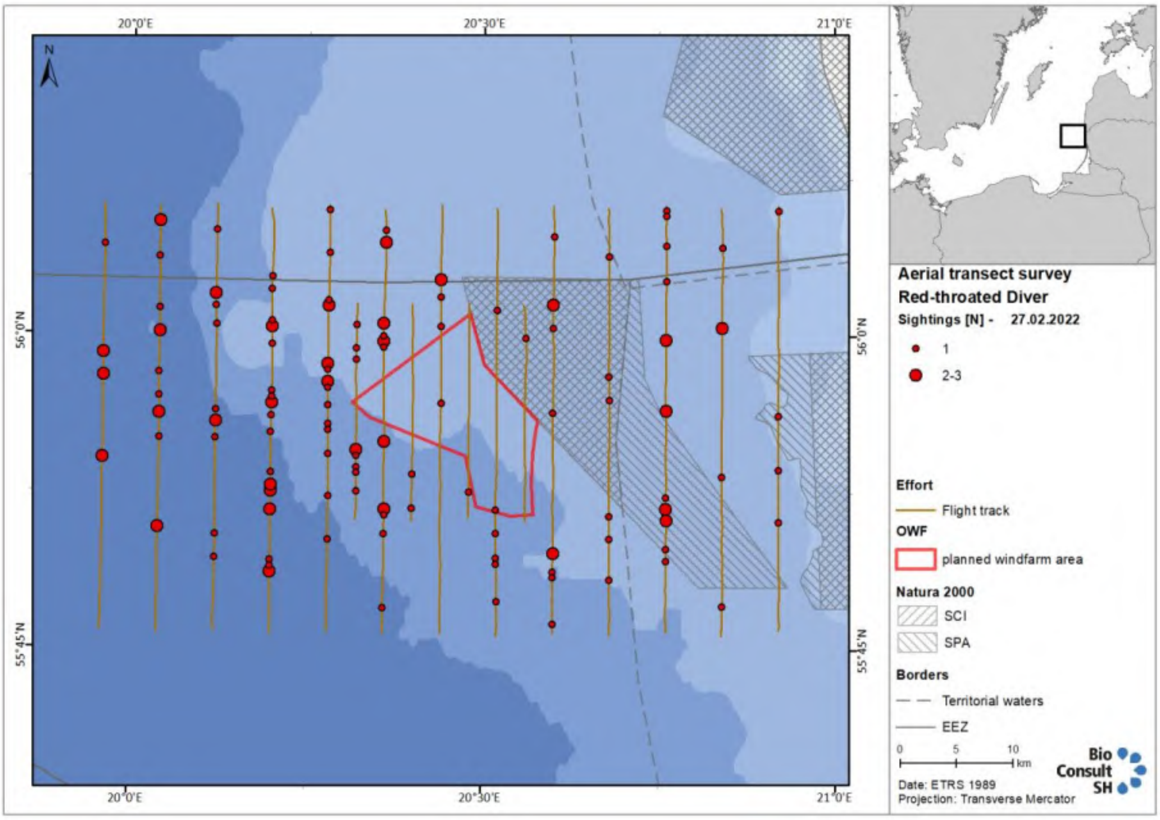
Species	Common name in Lithuanian	Status	Ind. ∑	Ind. transect	VSchRL	EUR-Cat.	EU28-Cat.	AEWA	Red List Lithuania
Goldcrest	Paprastasis nykštukas	M	2	2		LC	LC		
Total			**5,206**	**4,313**					

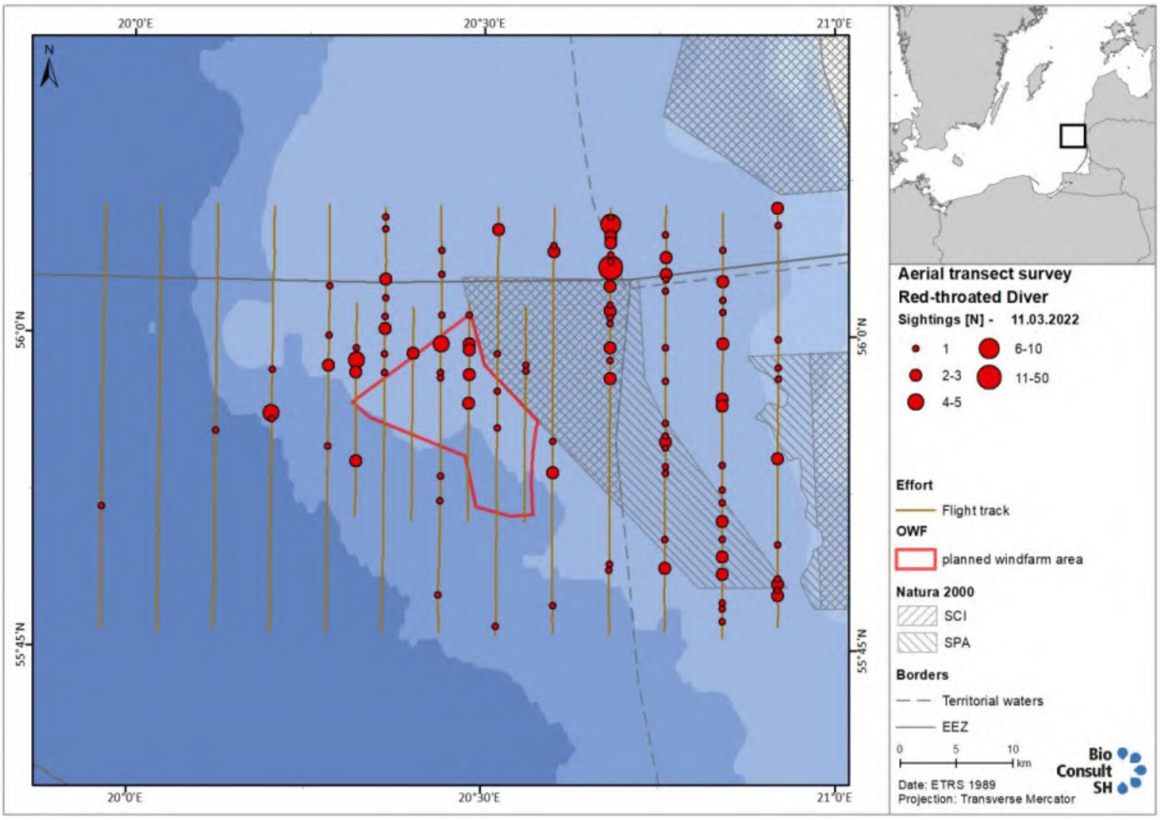
A.2 Species Distribution Maps Aerial Surveys

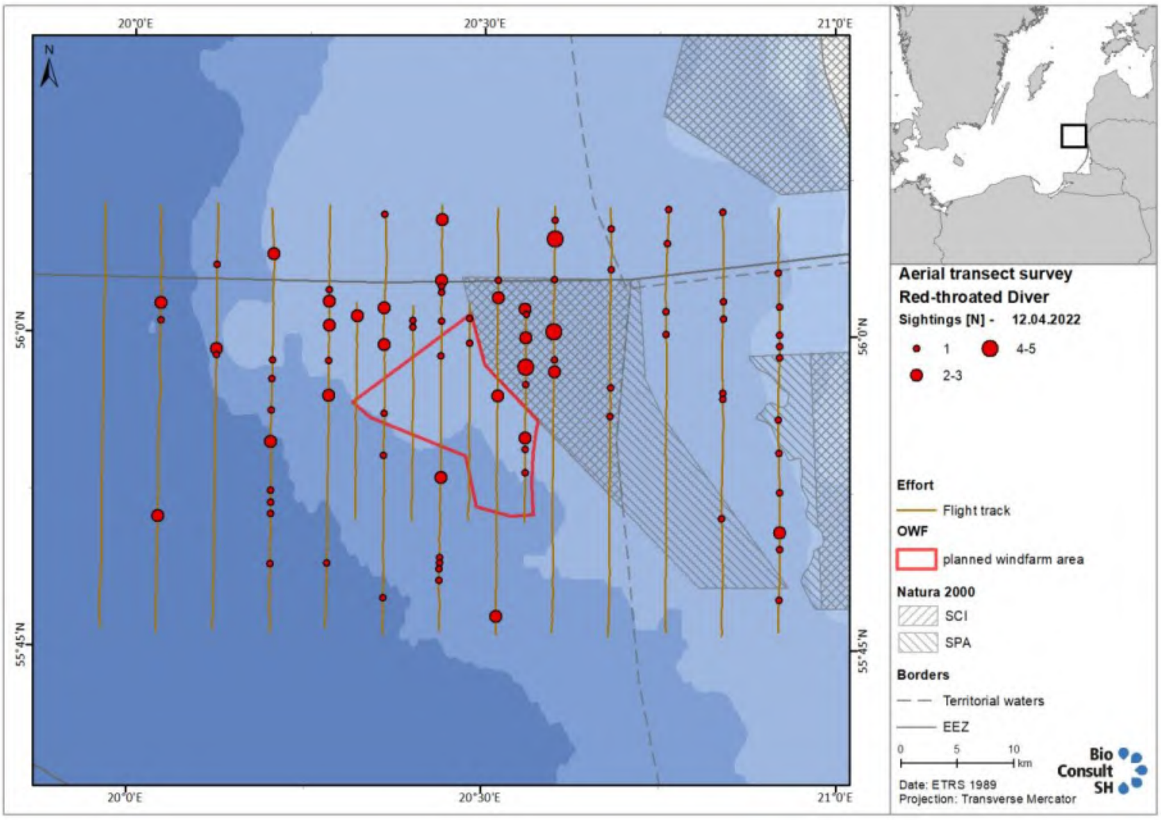
A.2.1 Red-throated Diver (*Gavia stellata)*





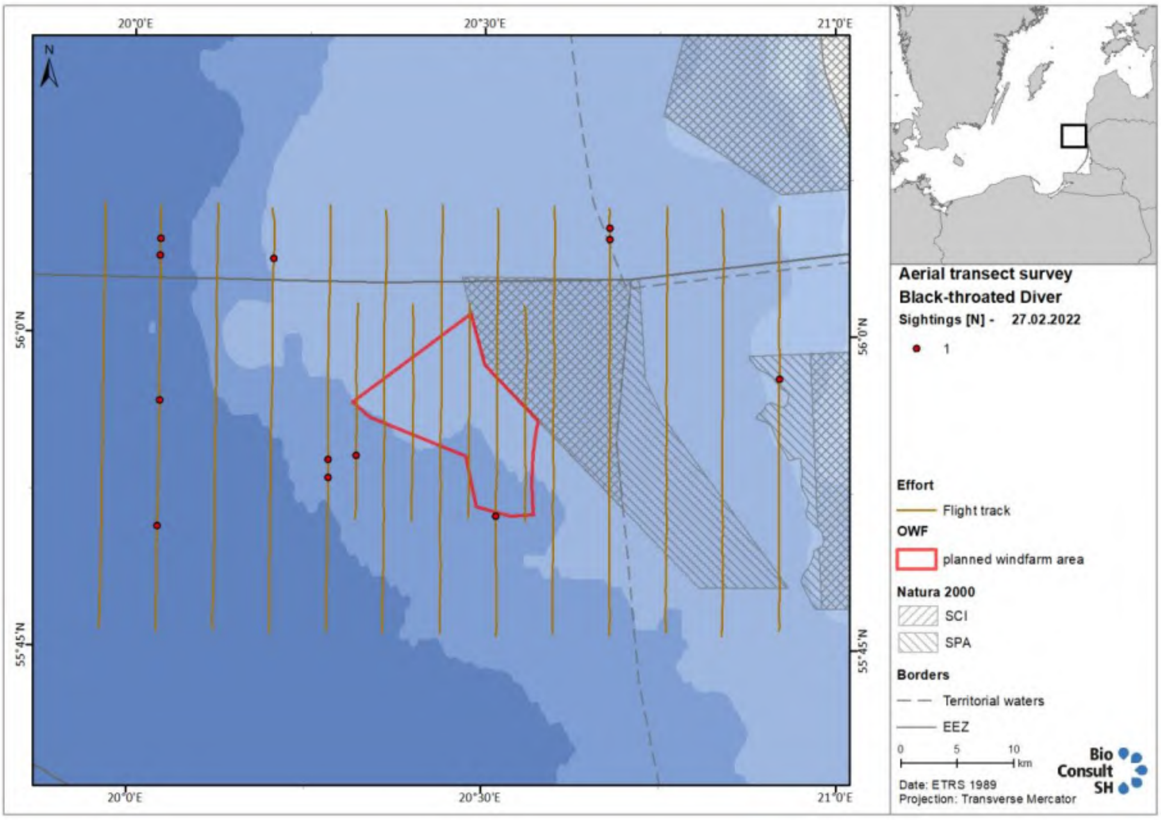

20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Red-throated Diver
Sightings [N] - 27.02.2022
1
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

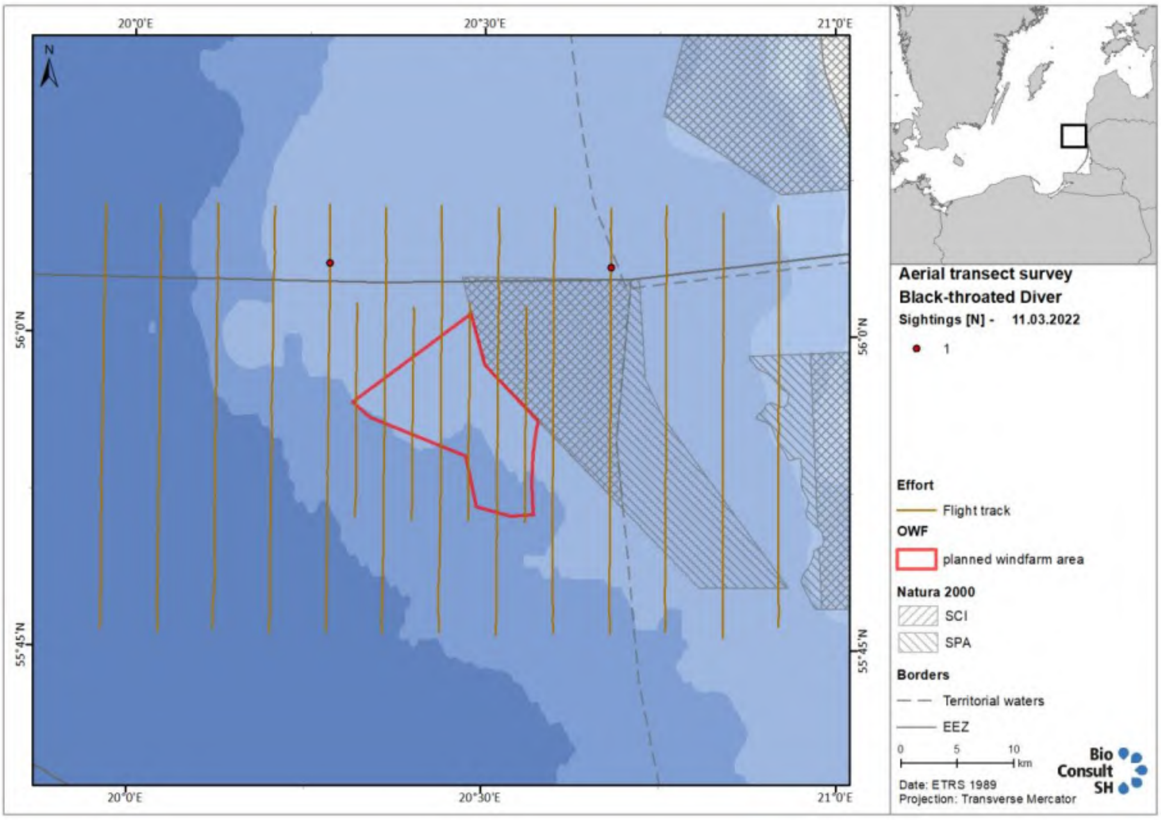

20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Red-throated Diver
Sightings [N] - 11.03.2022
1
2-3
4-5
6-10
11-50
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

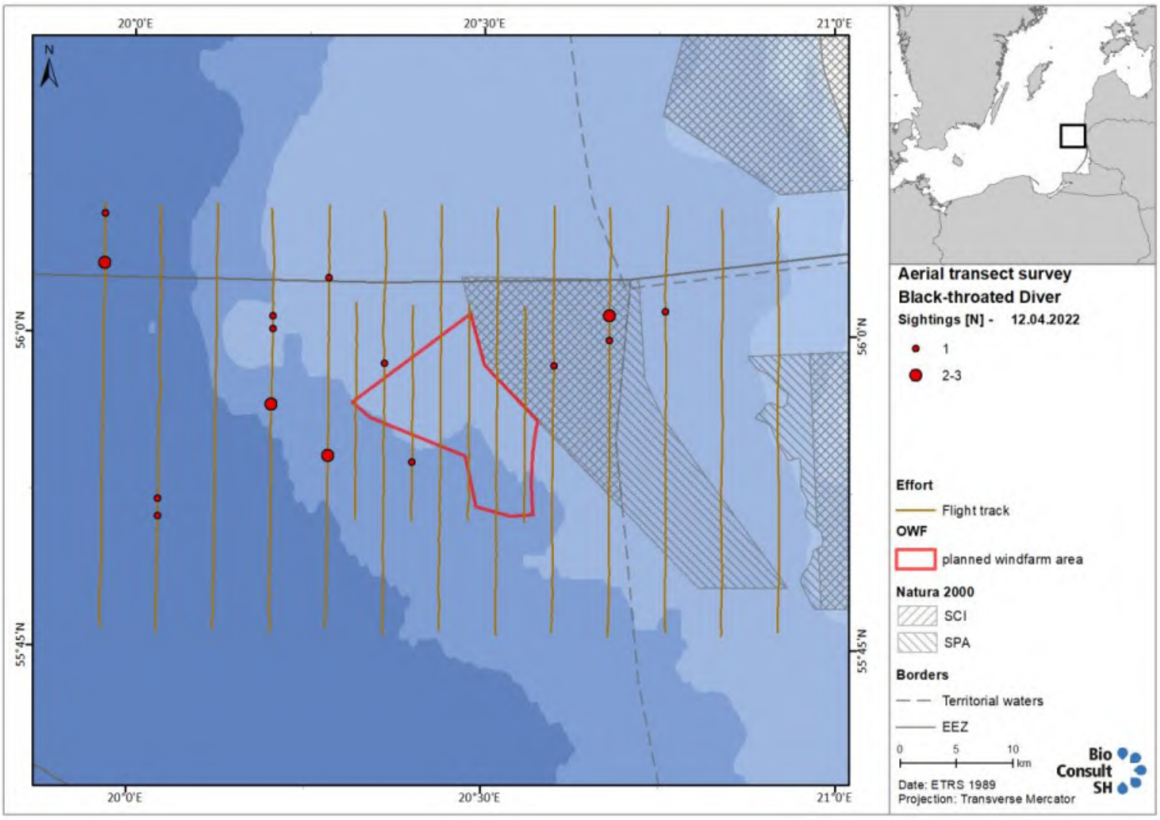


20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Red-throated Diver
Sightings [N] - 12.04.2022
1
4-5
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator

A.2.2 Black-throated Diver (*Gavia arctica*)

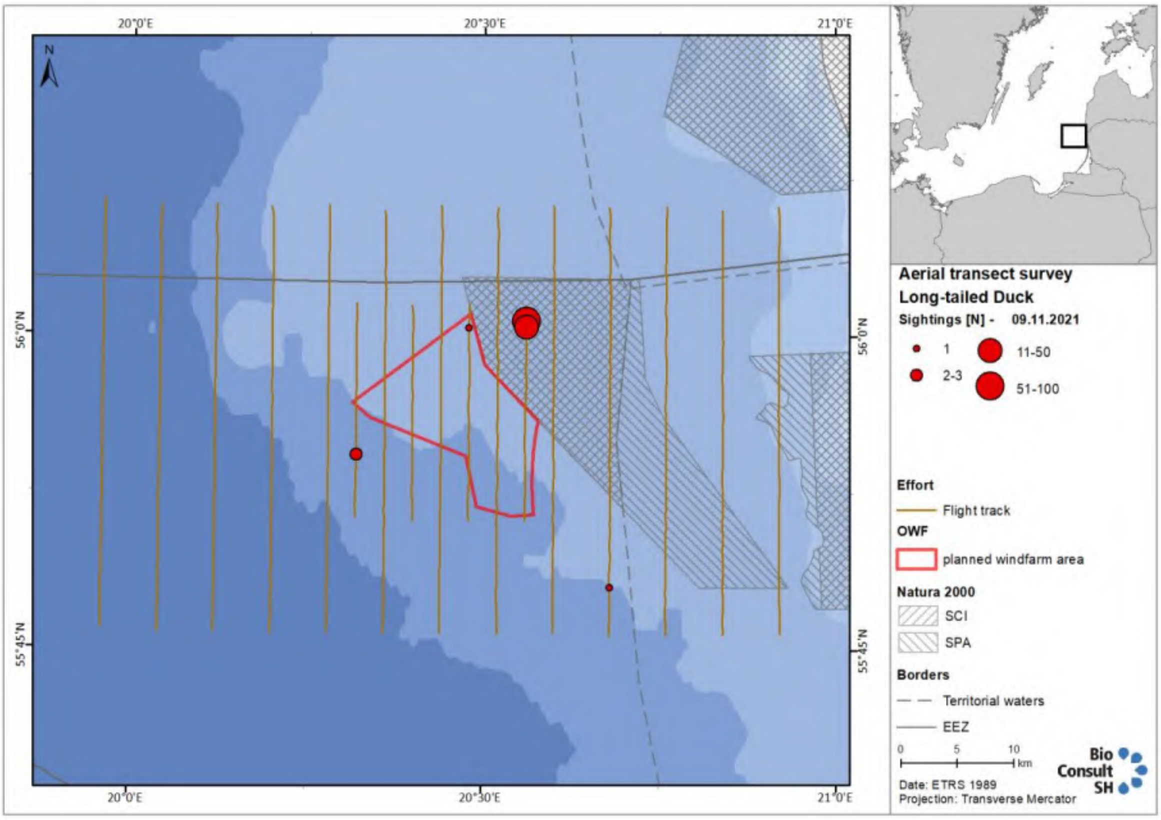

Aerial transect survey
Black-throated Diver
Sightings [N] - 27.02.2022
1
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
Date: ETRS 1989
Projection: Transverse Mercator

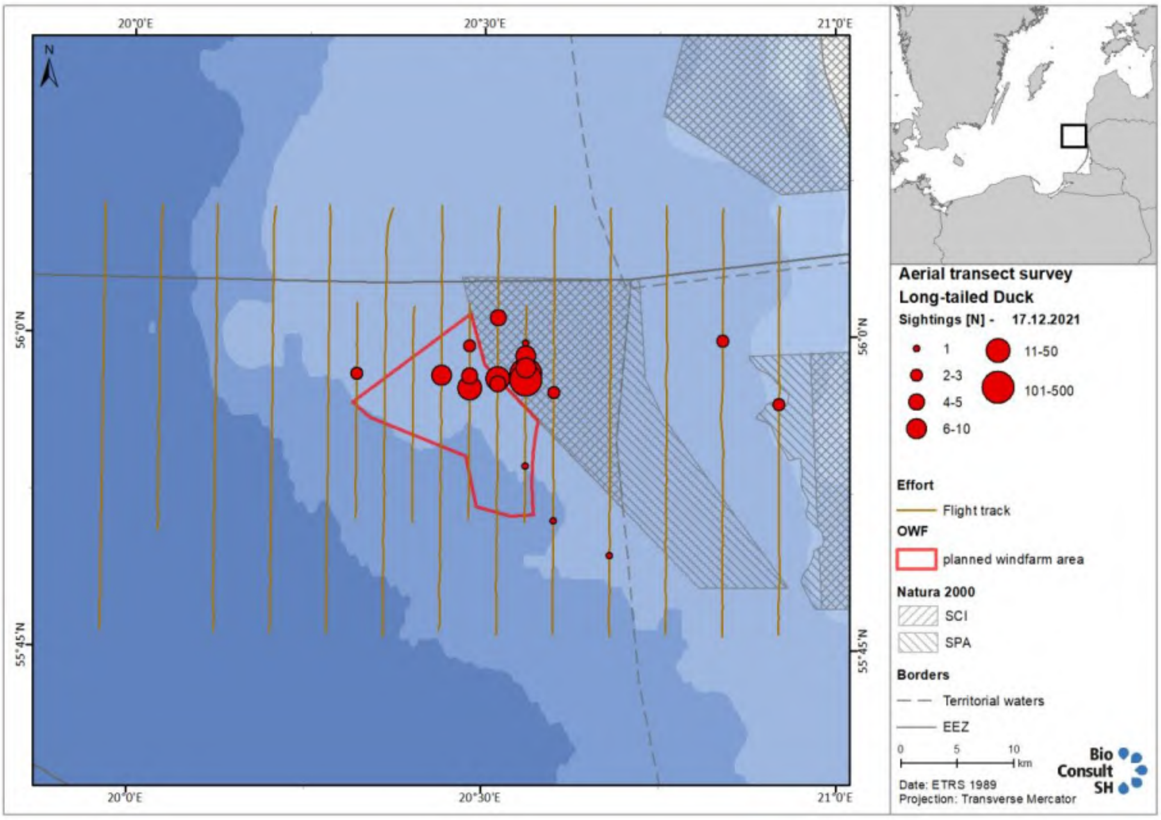

Aerial transect survey
Black-throated Diver
Sightings [N] - 11.03.2022
1
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
Date: ETRS 1989
Projection: Transverse Mercator

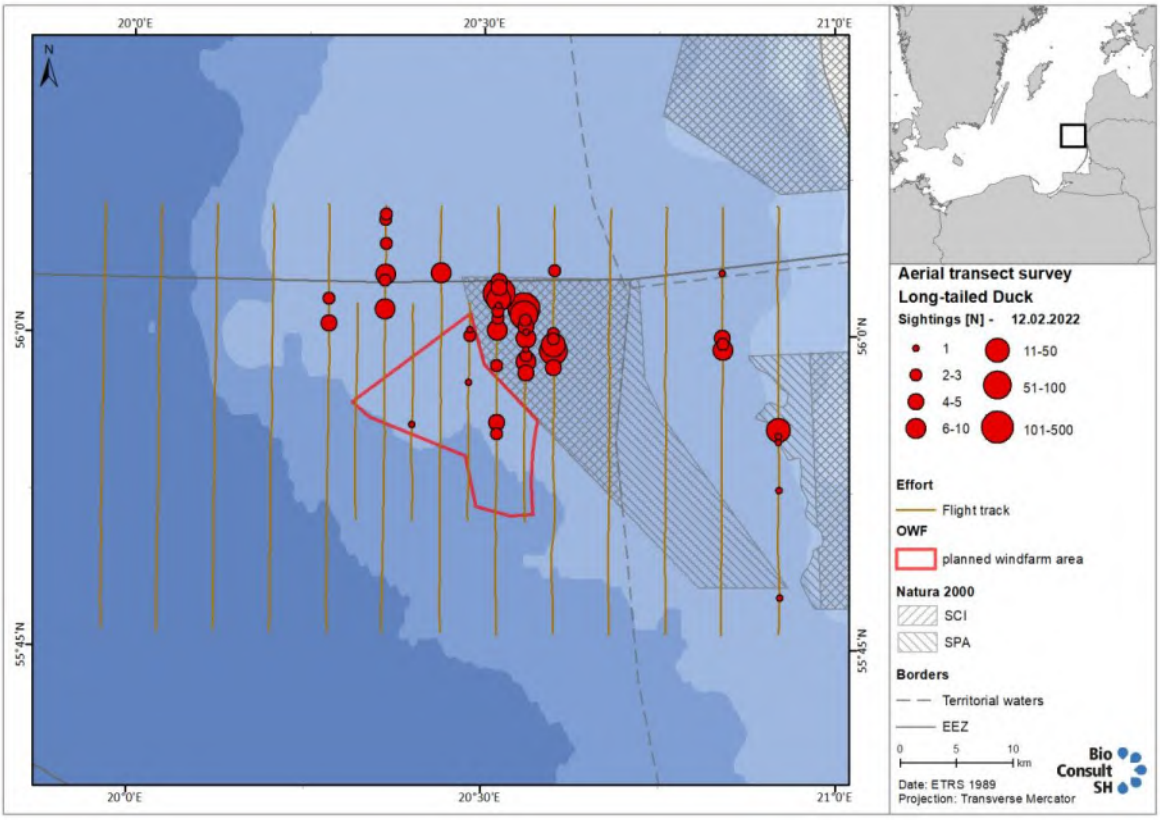


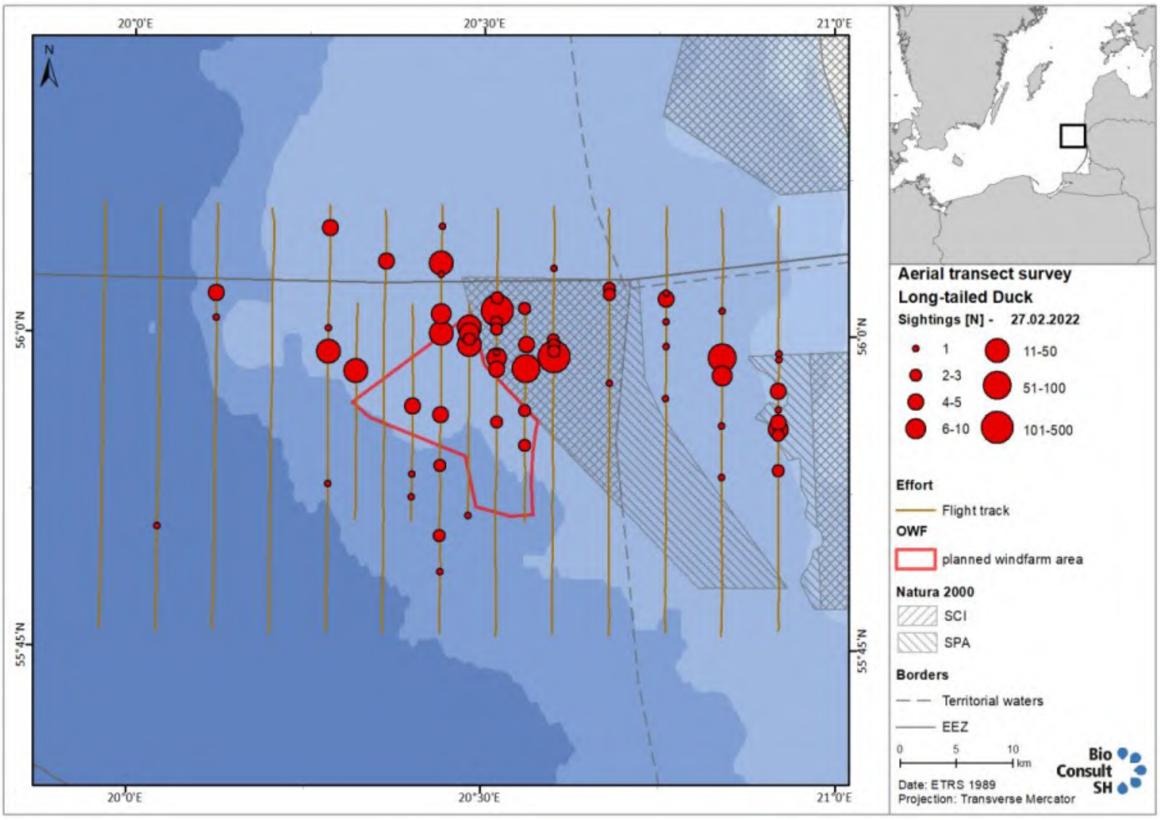
20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Black-throated Diver
Sightings [N] - 12.04.2022
1
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

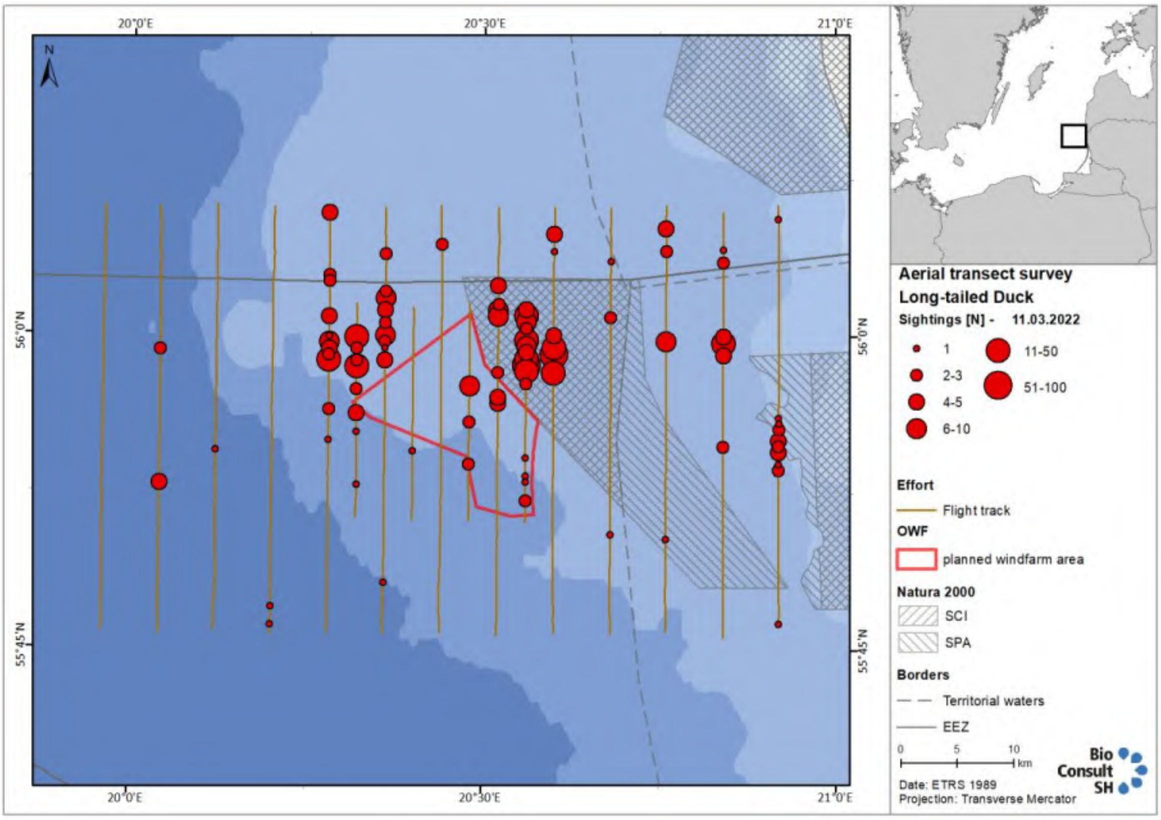
A.2.3 Long-tailed Duck (*Clangula hyemalis*)

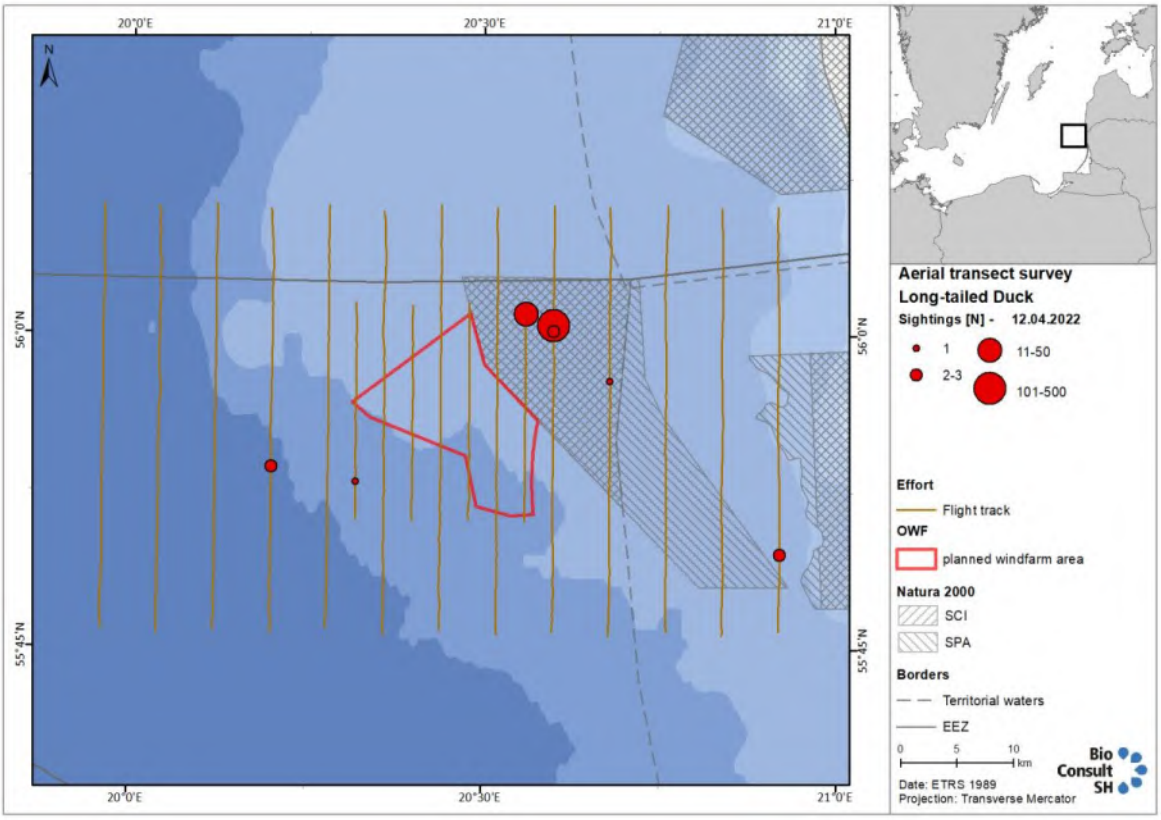




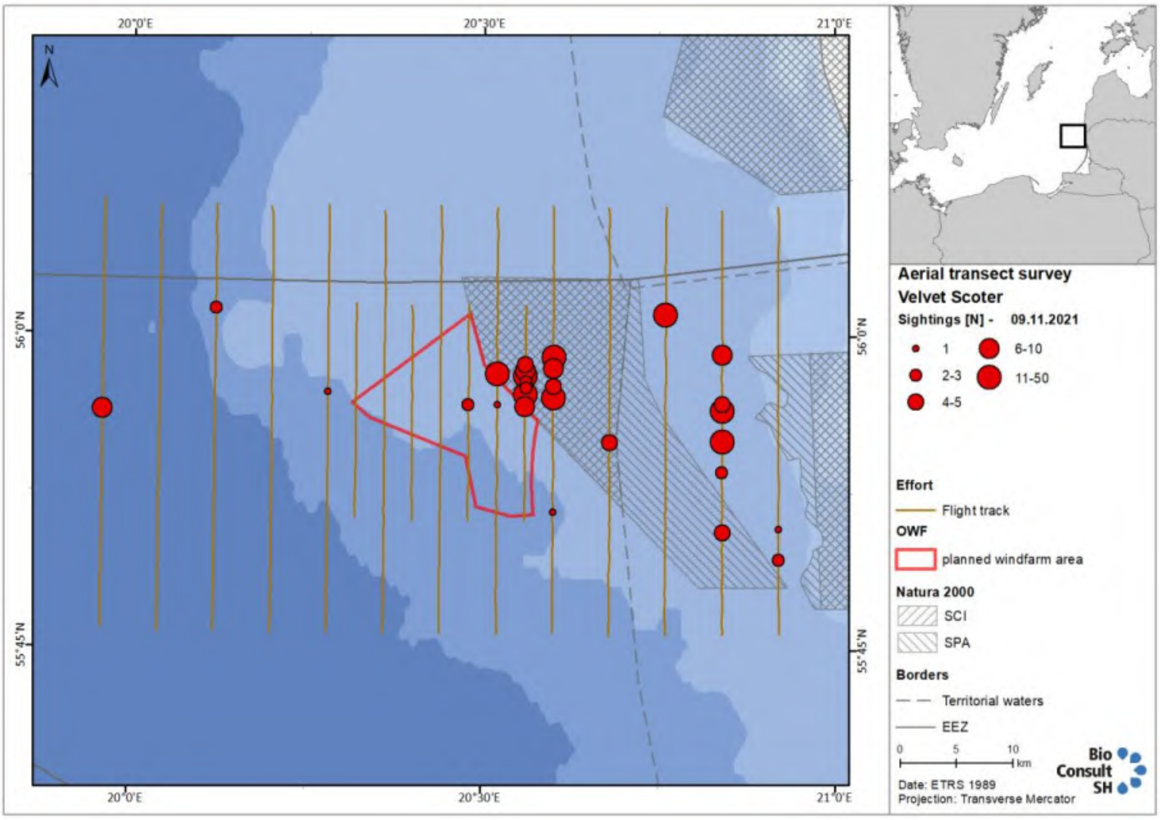

Aerial transect survey
Long-tailed Duck
Sightings [N] - 12.02.2022
1
2-3
4-5
6-10
11-50
51-100
101-500
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
Date: ETRS 1989
Projection: Transverse Mercator

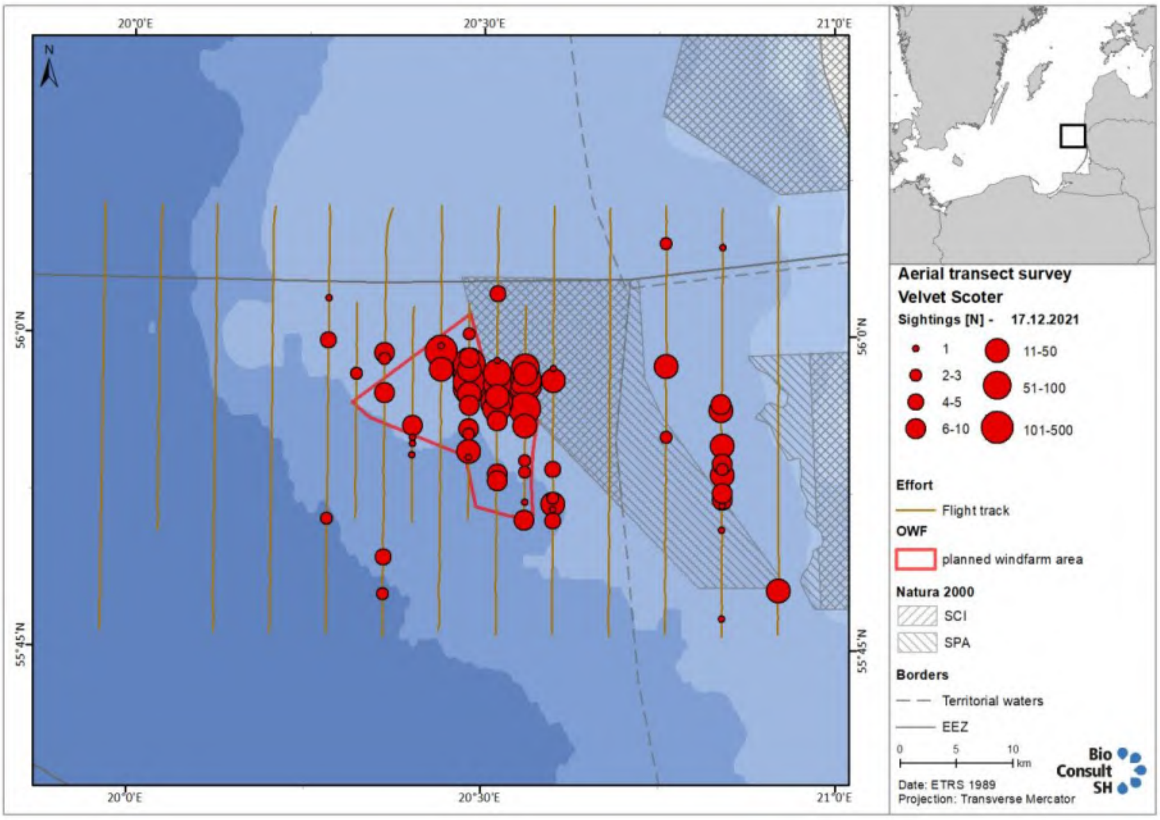

Aerial transect survey
Long-tailed Duck
Sightings [N] - 27.02.2022
1
2-3
4-5
6-10
11-50
51-100
101-500
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
Date: ETRS 1989
Projection: Transverse Mercator

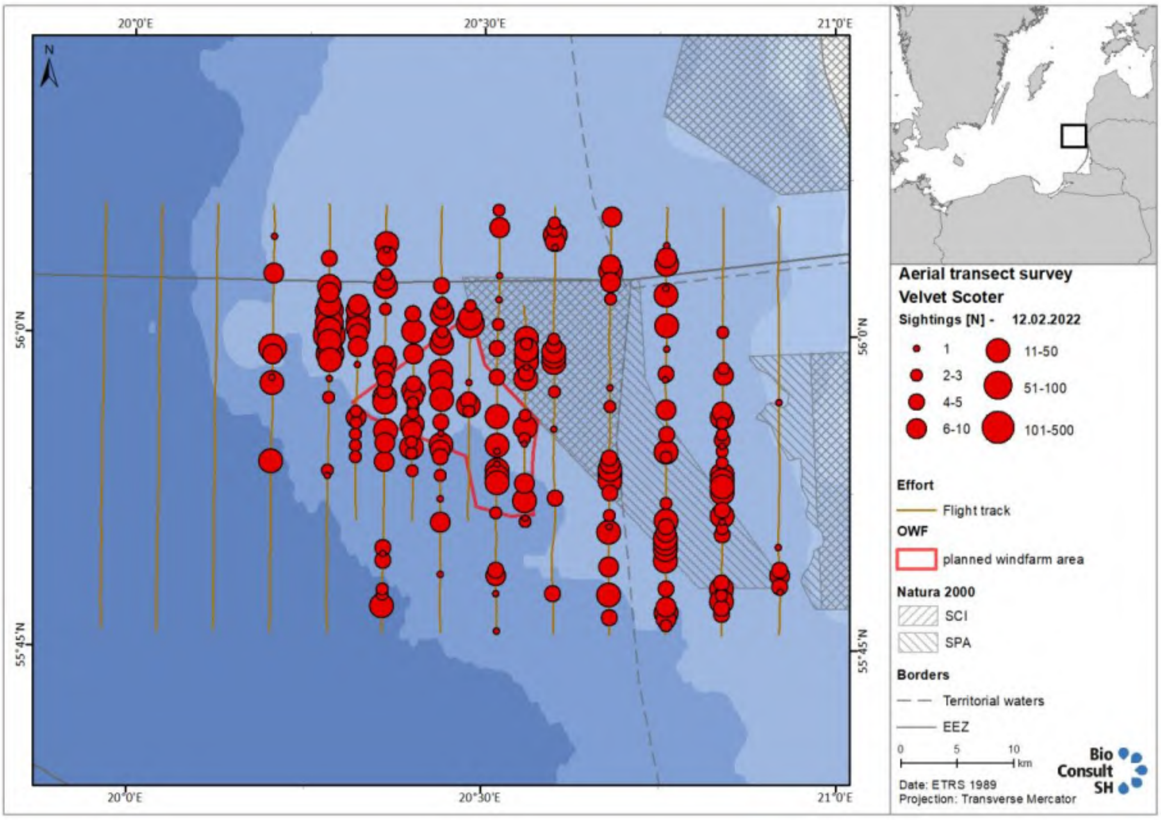

20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Long-tailed Duck
Sightings [N] - 11.03.2022
1
2-3
4-5
6-10
11-50
51-100
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Bio Consult SH
Date: ETRS 1989
Projection: Transverse Mercator


20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Long-tailed Duck
Sightings [N] - 12.04.2022
1
2-3
11-50
101-500
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Bio Consult SH
Date: ETRS 1989
Projection: Transverse Mercator

A.2.4 Velvet Scoter (*Melanitta fusca*)



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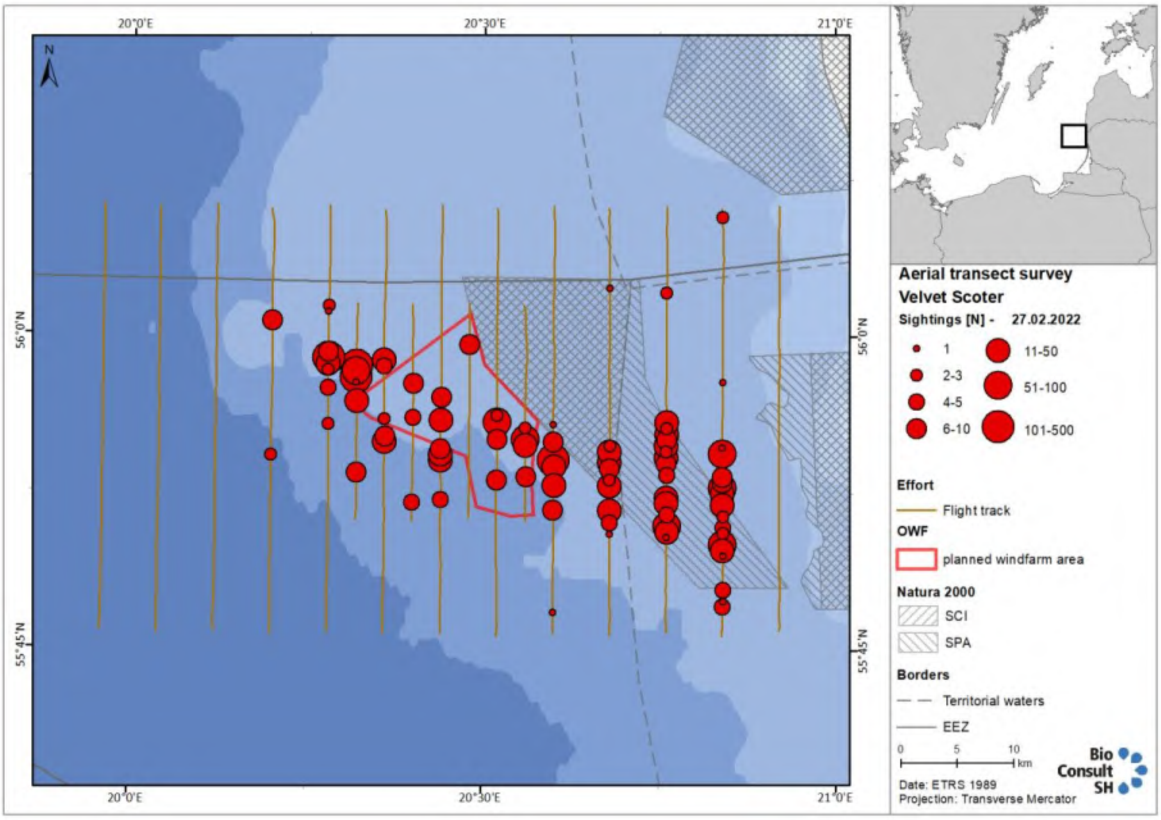
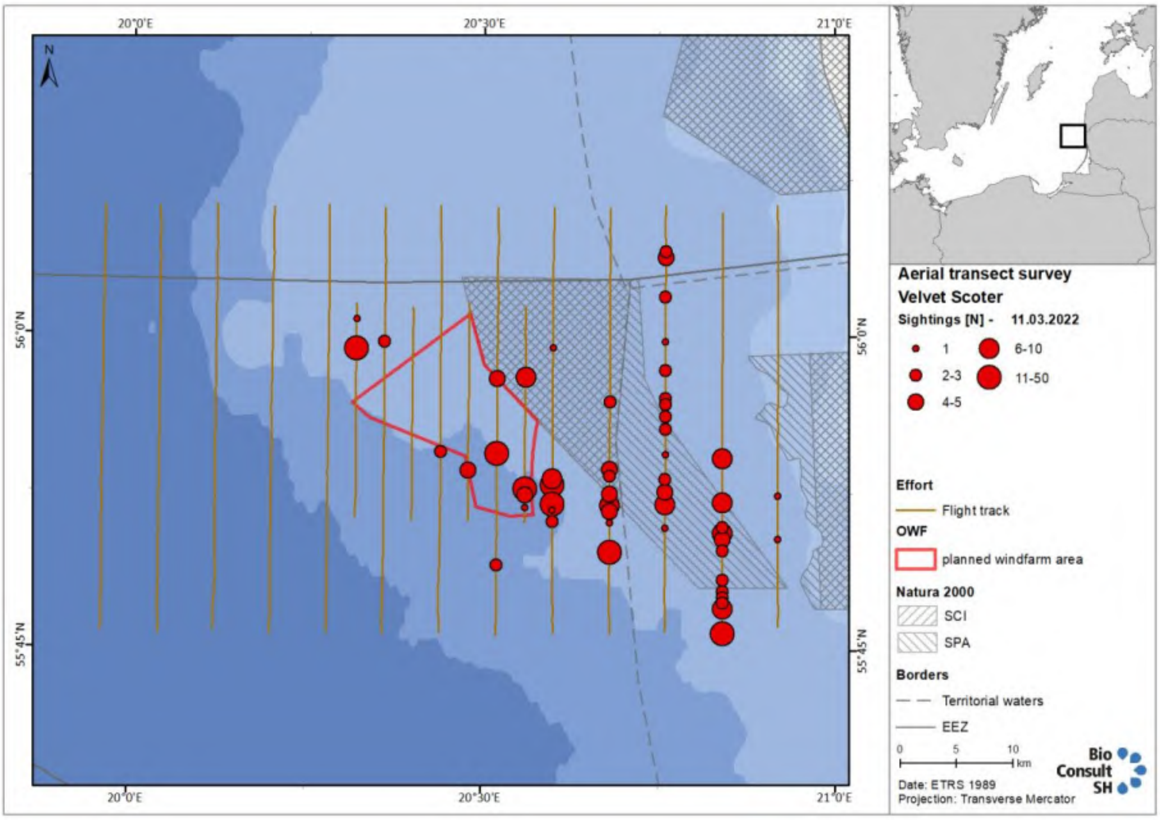
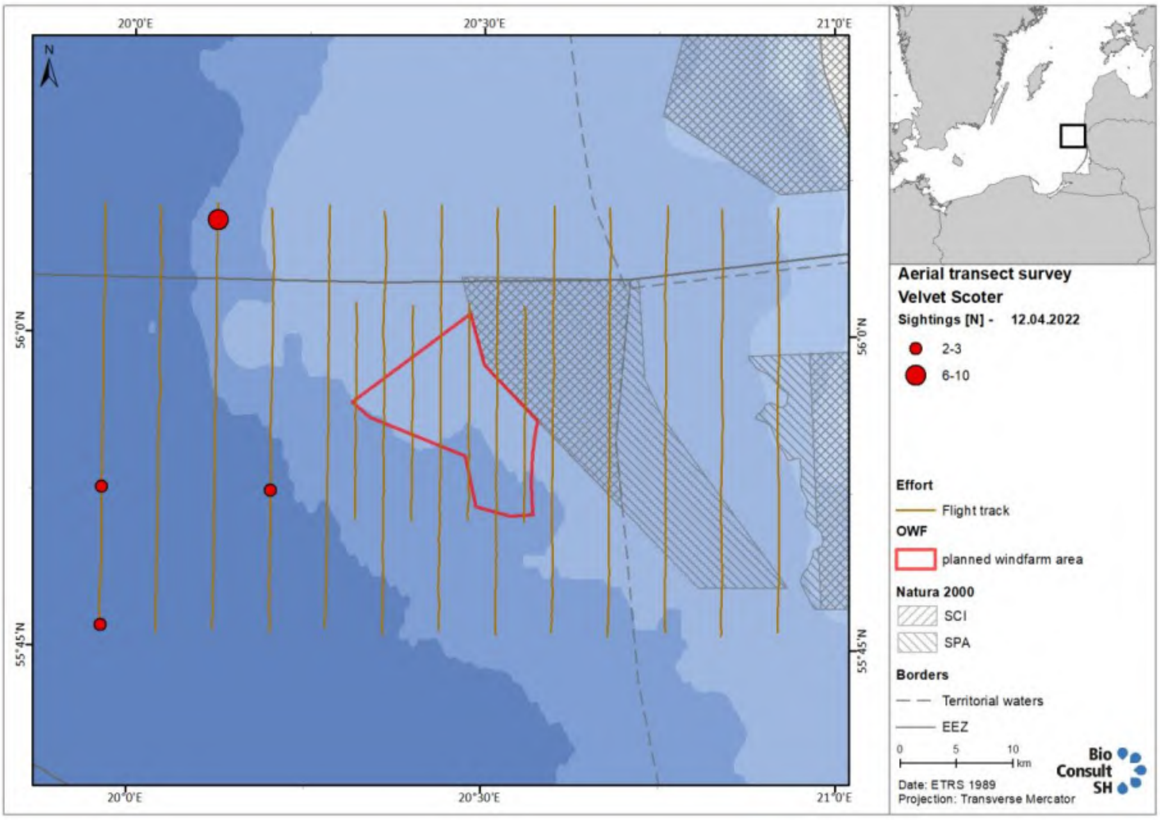
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Velvet Scoter
Sightings [N] - 12.02.2022
1
2-3
4-5
6-10
11-50
51-100
101-500
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH


20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Velvet Scoter
Sightings [N] - 27.02.2022
1
2-3
4-5
6-10
11-50
51-100
101-500
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

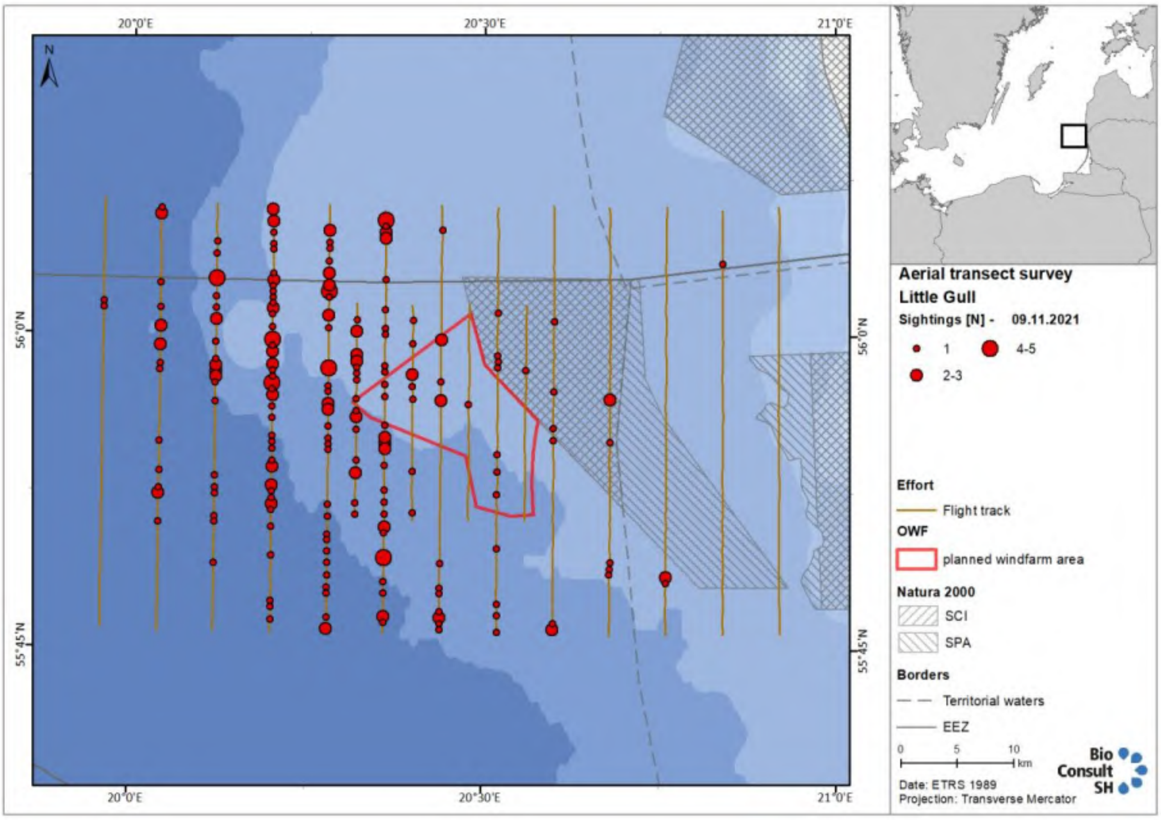


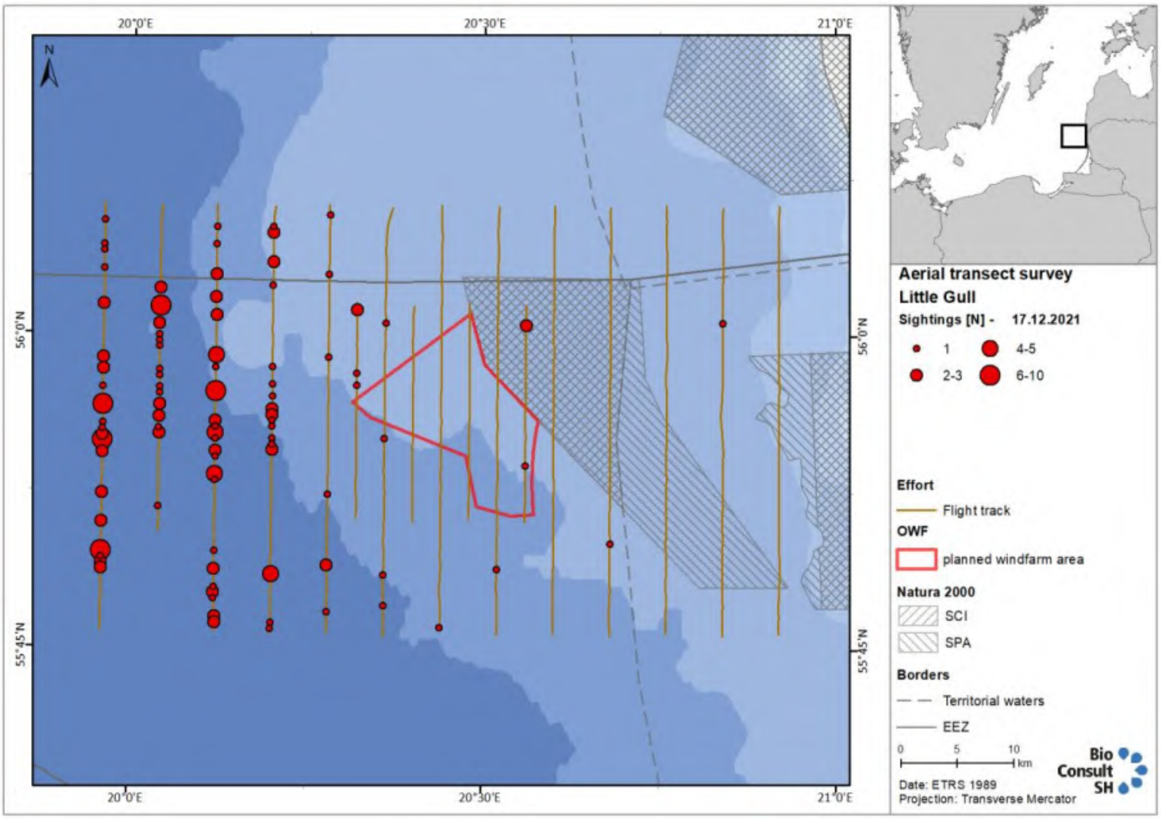
20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Velvet Scoter
Sightings [N] - 11.03.2022
1
2-3
4-5
6-10
11-50
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

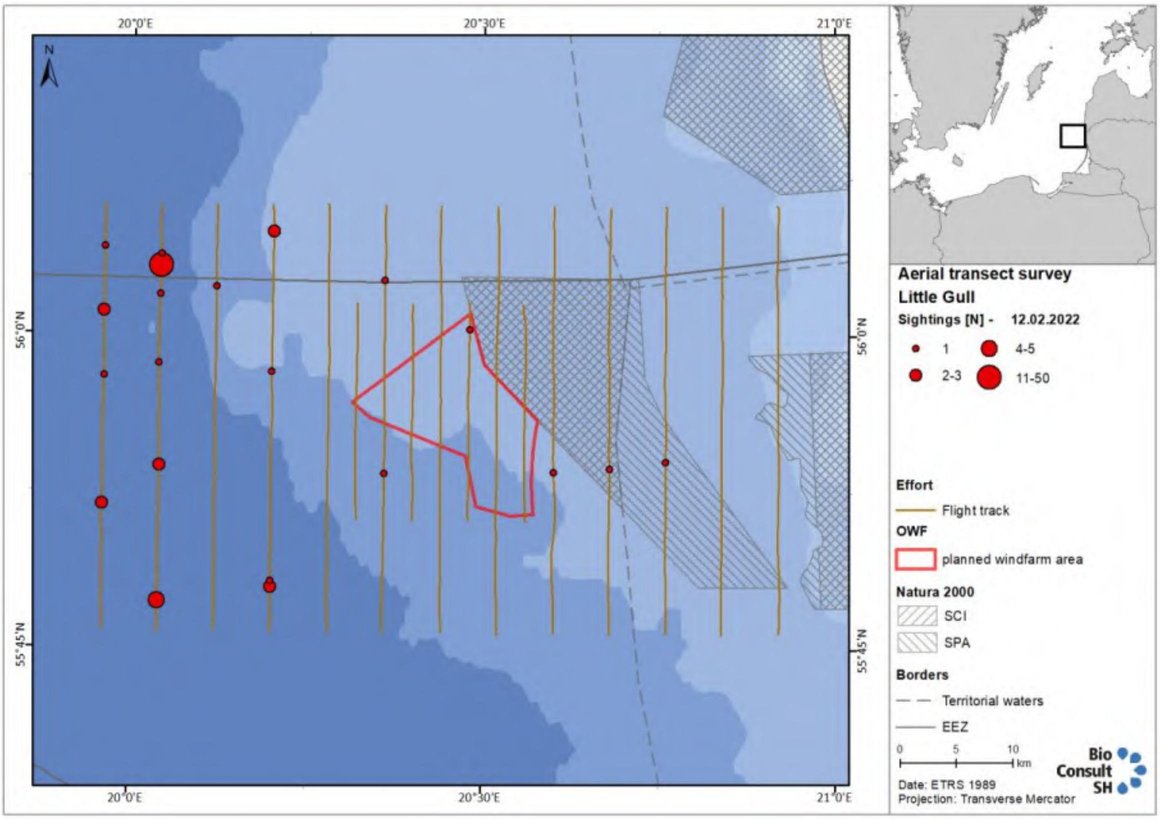


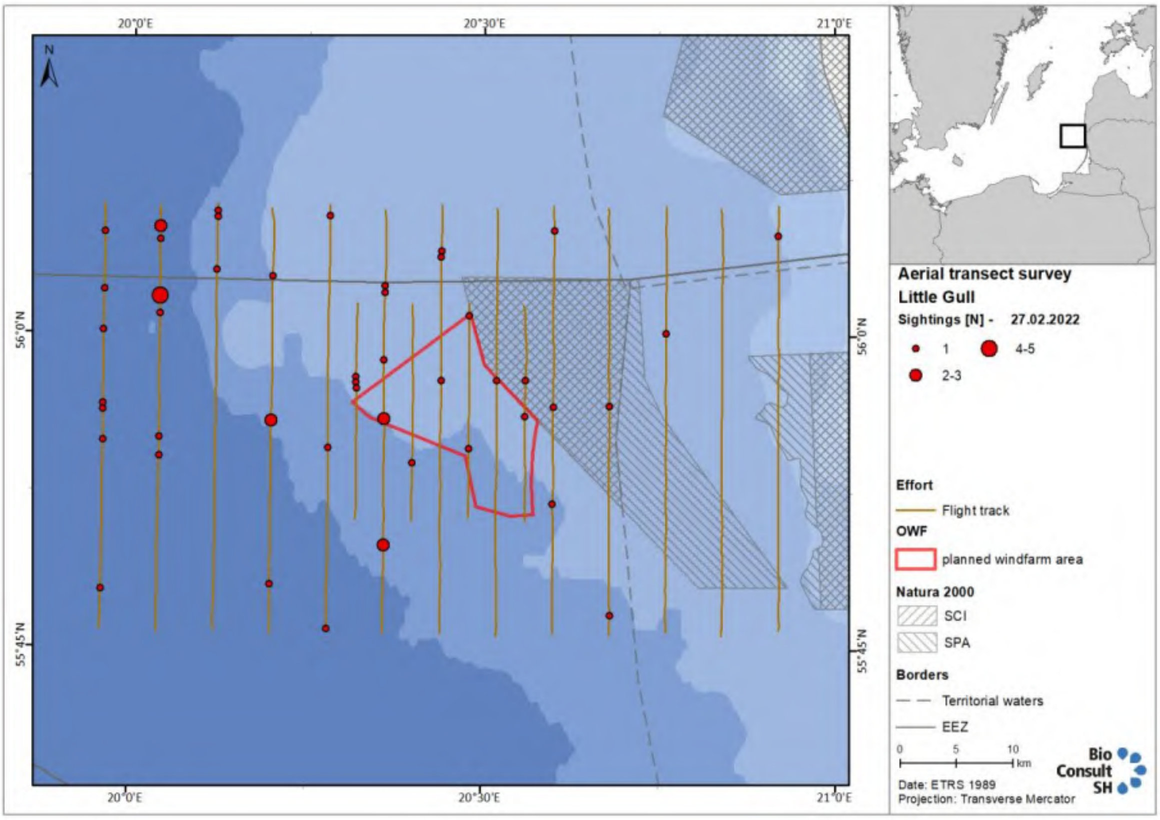
20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Velvet Scoter
Sightings [N] - 12.04.2022
2-3
6-10
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

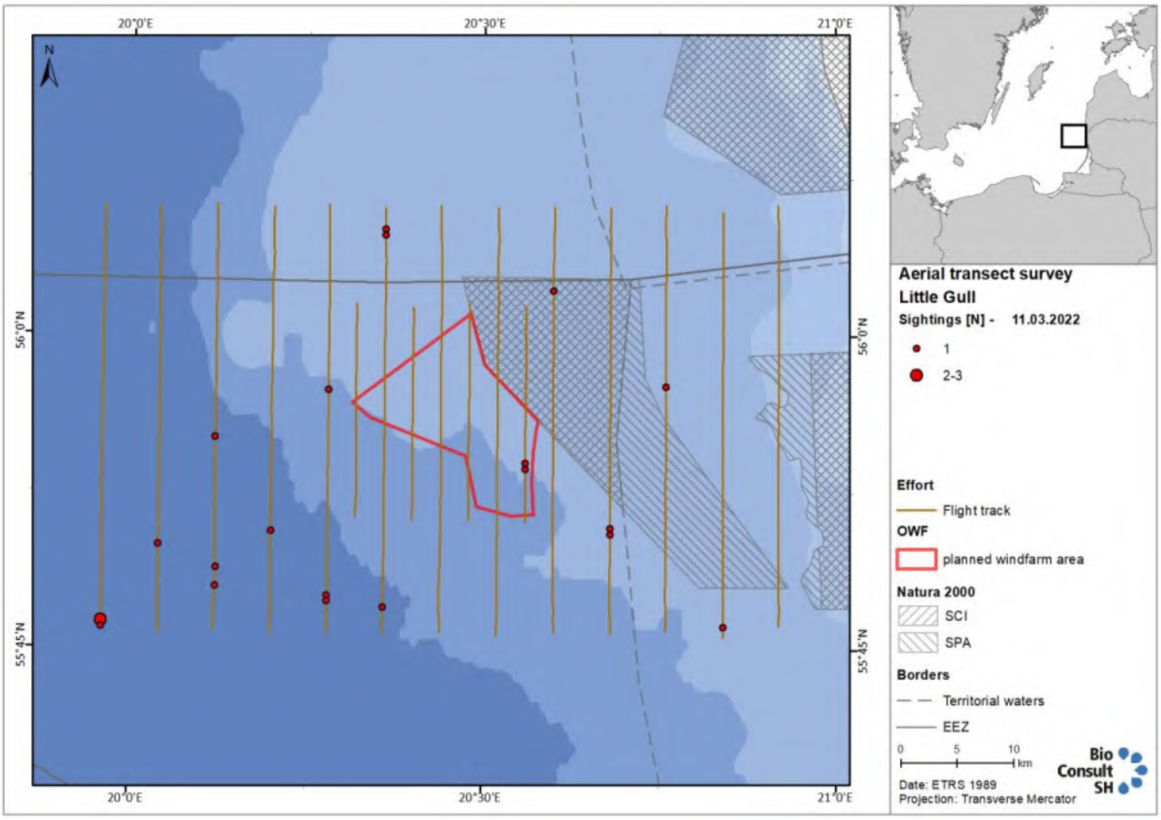
A.2.5 Little Gull (*Hydrocoloeus minutus*)



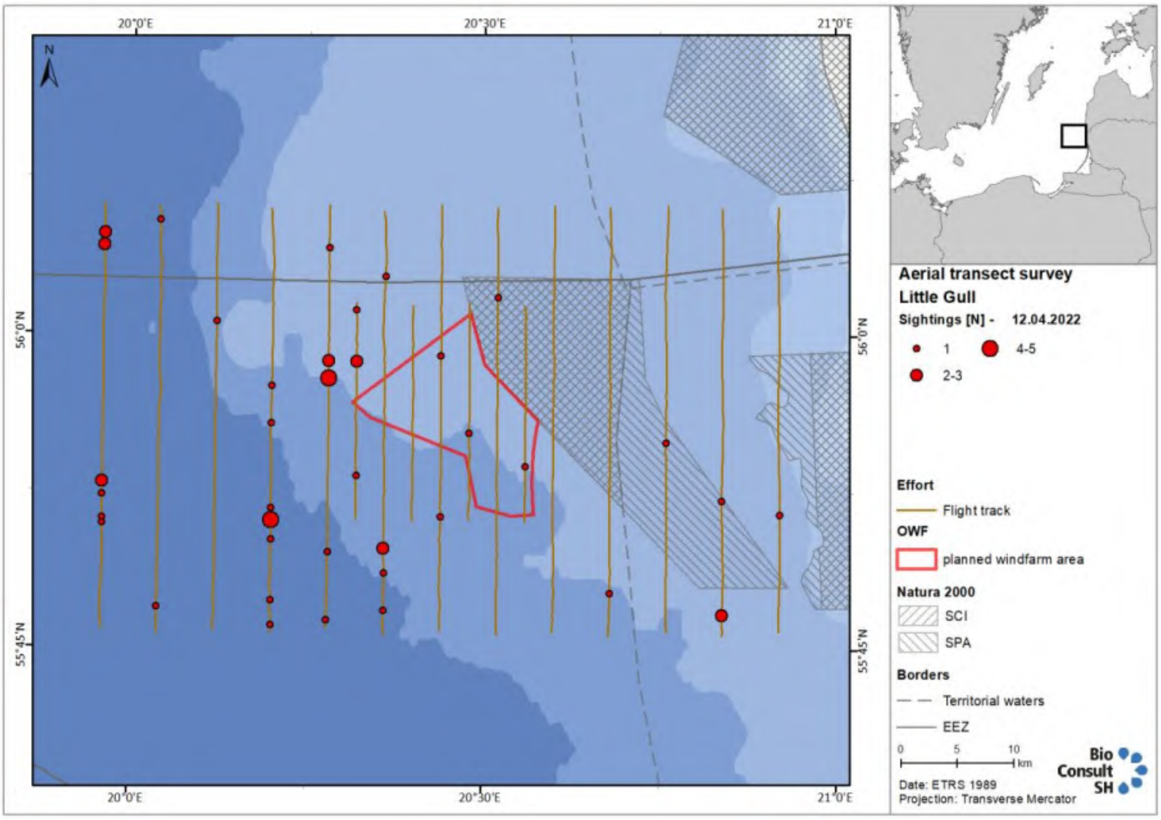



20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
Aerial transect survey
Little Gull
Sightings [N] - 12.02.2022
1
2-3
4-5
11-50
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator


20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
Aerial transect survey
Little Gull
Sightings [N] - 27.02.2022
1
2-3
4-5
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator

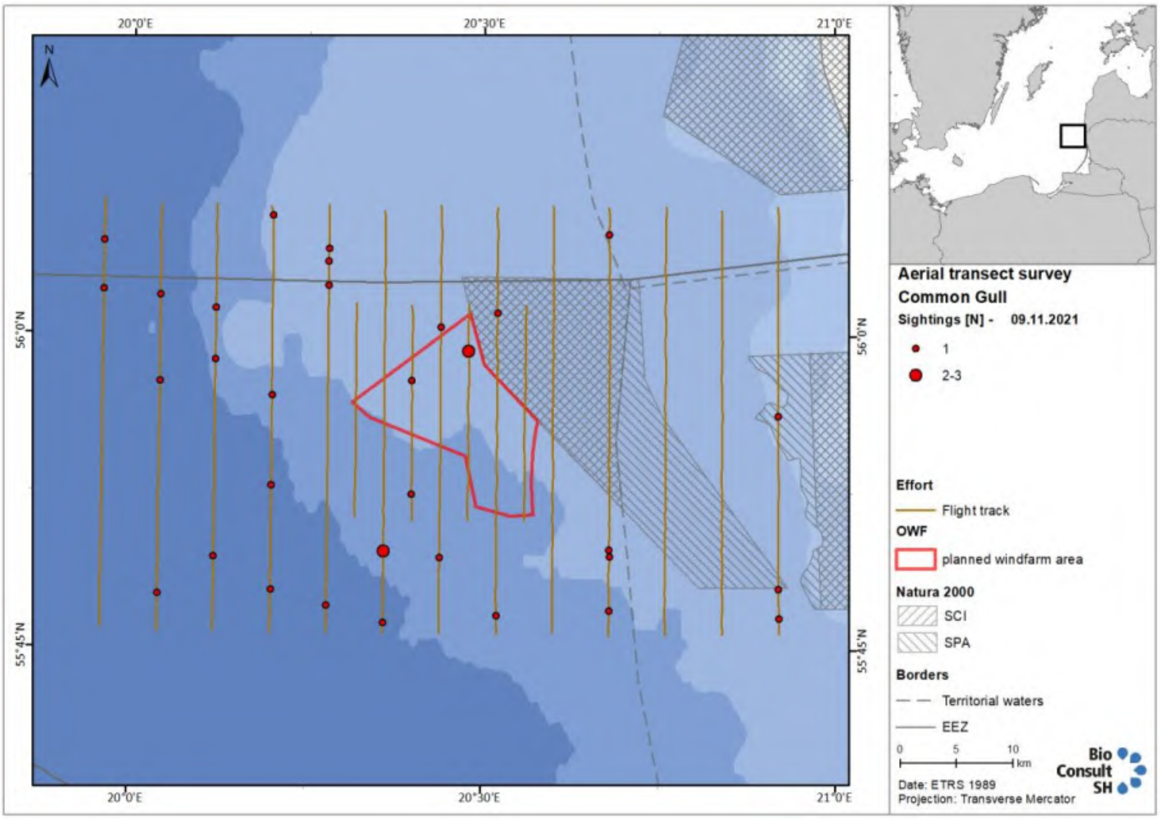


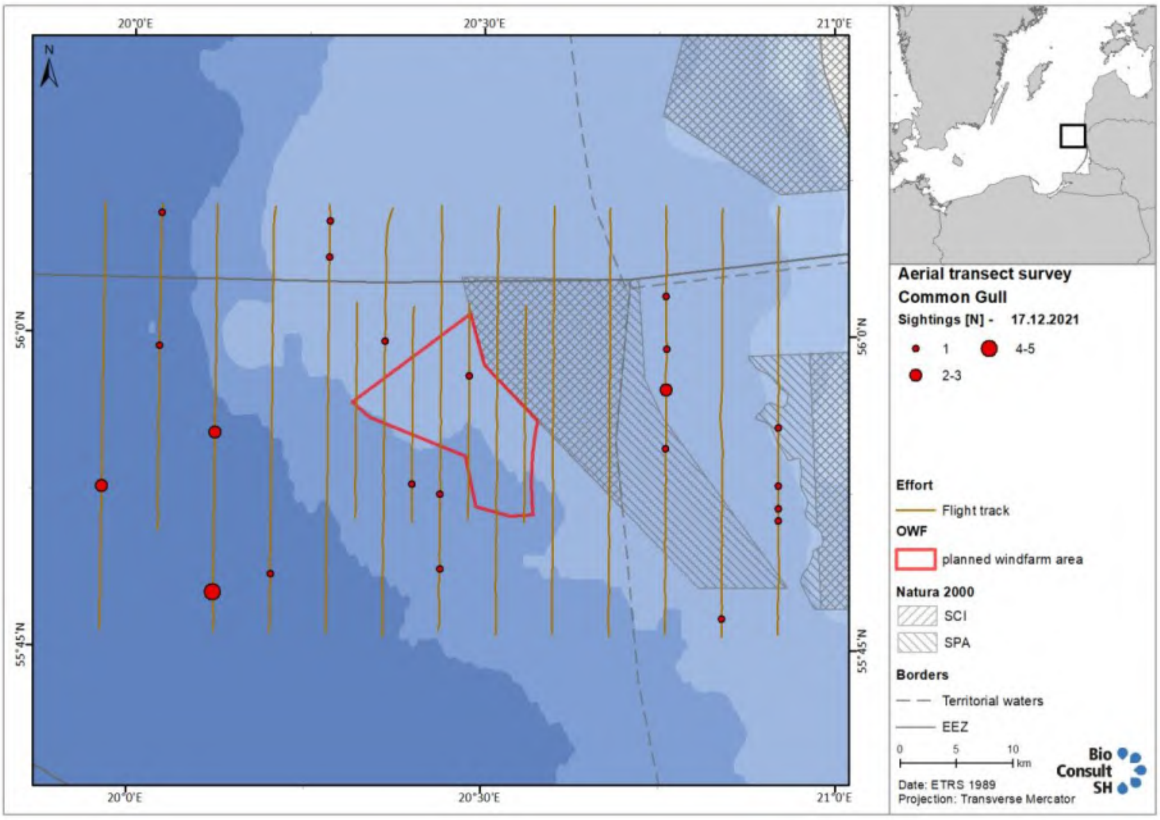
Aerial transect survey
Little Gull
Sightings [N] - 11.03.2022
1
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
Date: ETRS 1989
Projection: Transverse Mercator

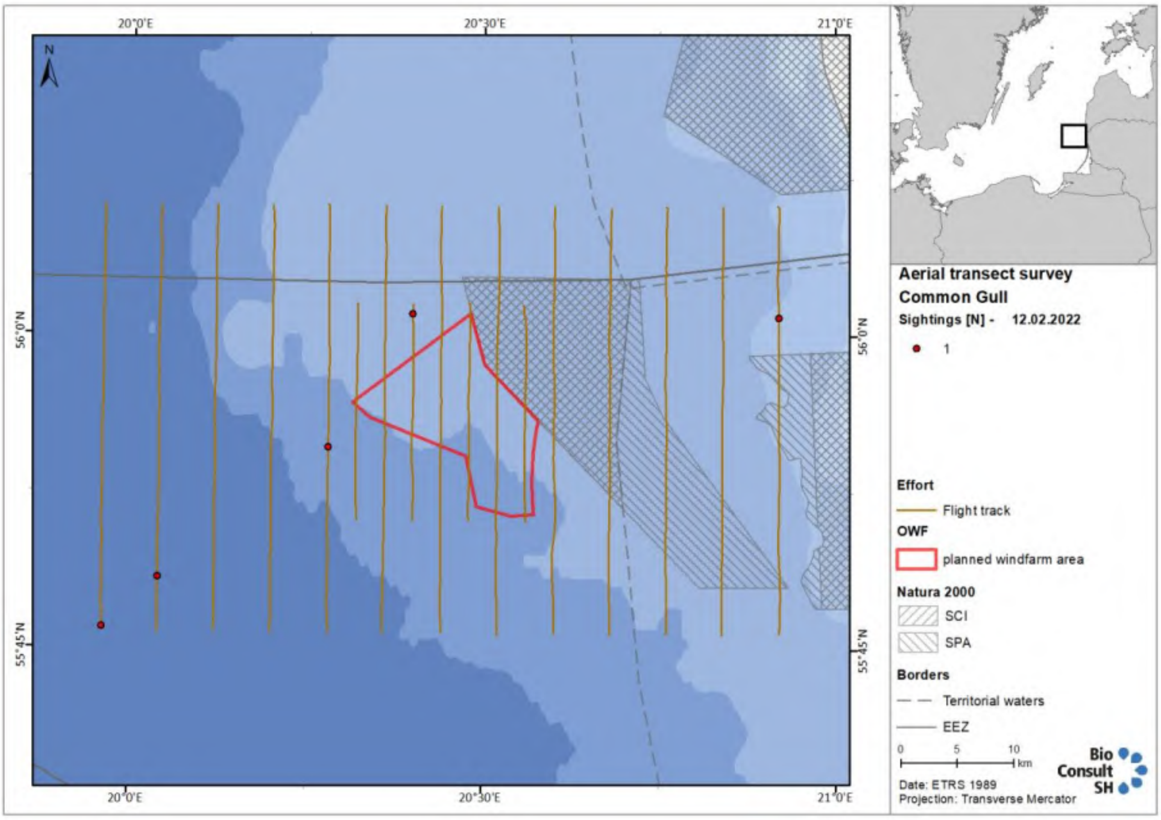


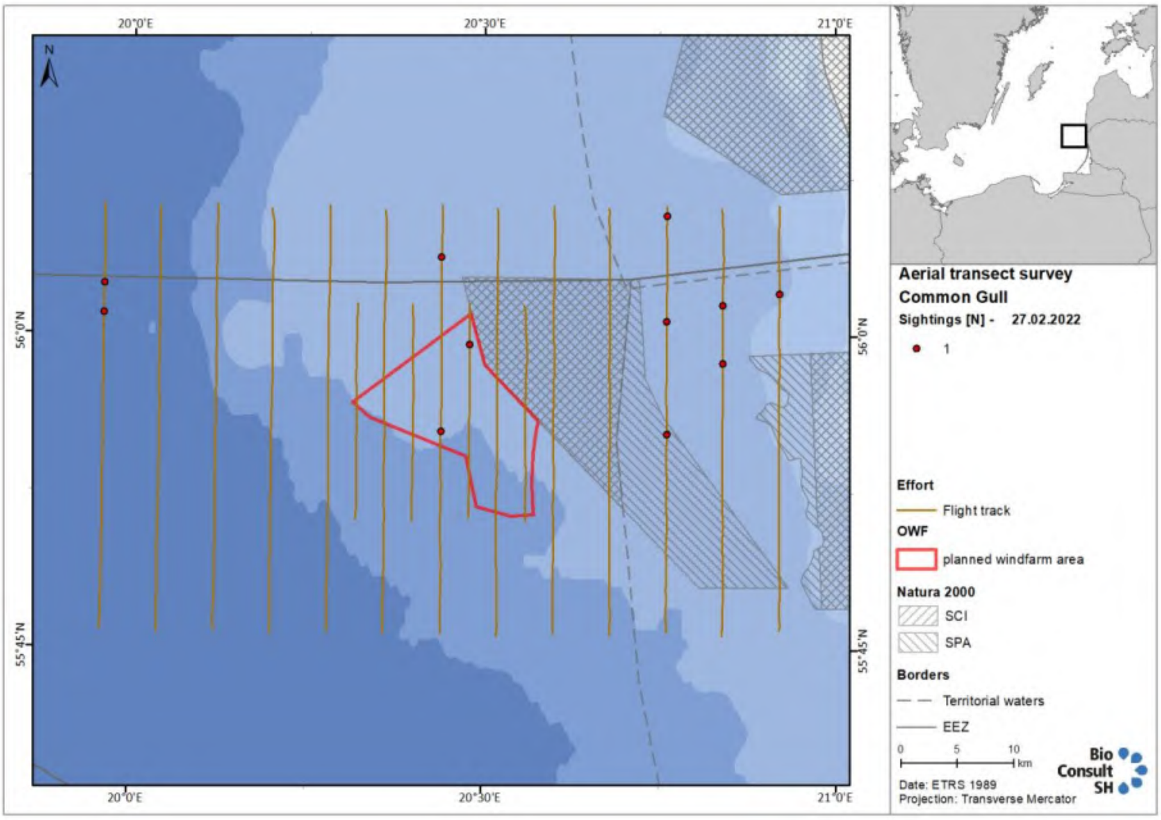
Aerial transect survey
Little Gull
Sightings [N] - 12.04.2022
1
4-5
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
Date: ETRS 1989
Projection: Transverse Mercator

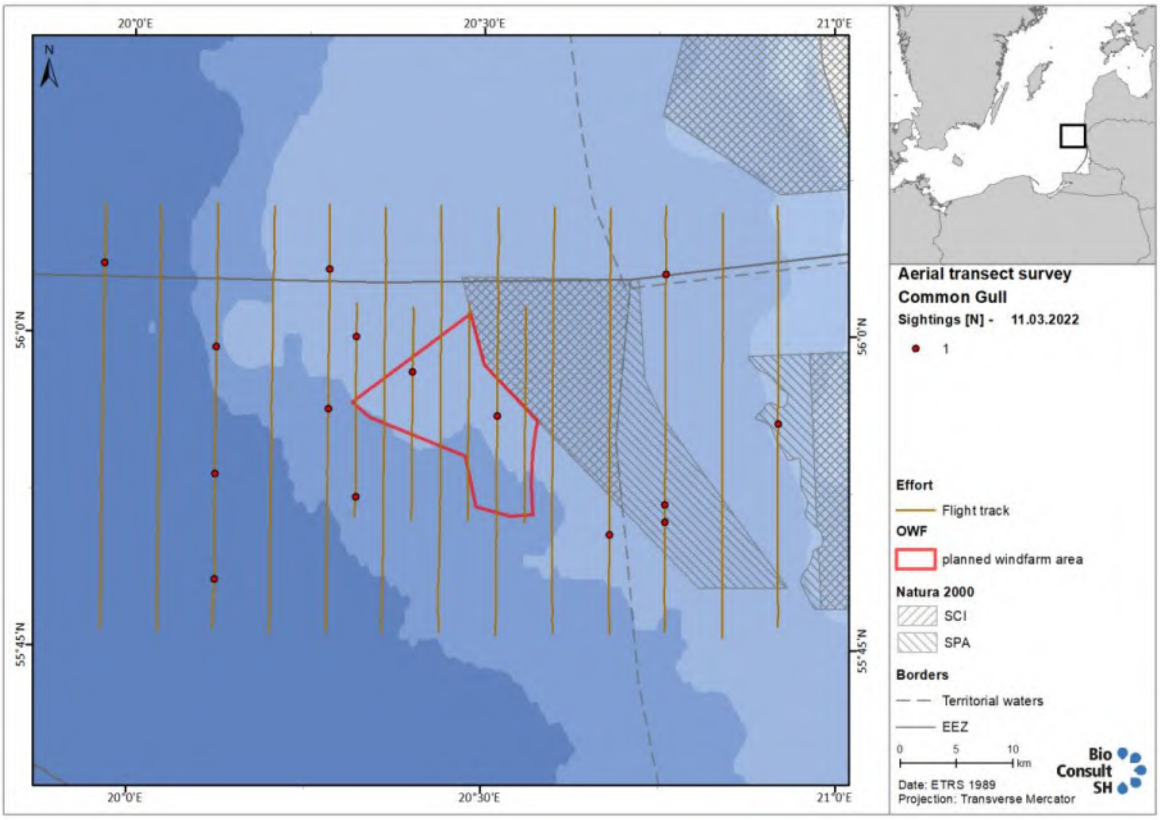
A.2.6 Common Gull (*Larus canus*)

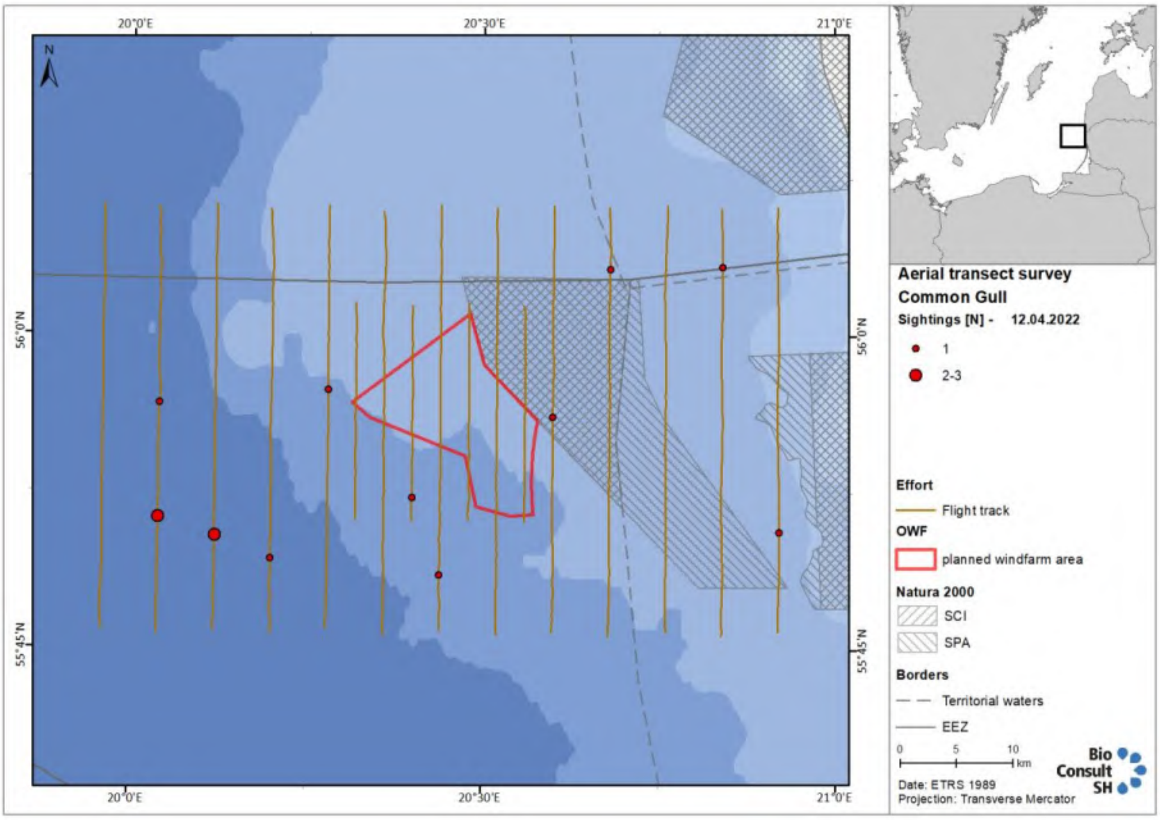





20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Common Gull
Sightings [N] - 12.02.2022
1
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Bio Consult SH
Date: ETRS 1989
Projection: Transverse Mercator


20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Common Gull
Sightings [N] - 27.02.2022
1
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Bio Consult SH
Date: ETRS 1989
Projection: Transverse Mercator


20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Common Gull
Sightings [N] - 11.03.2022
1
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator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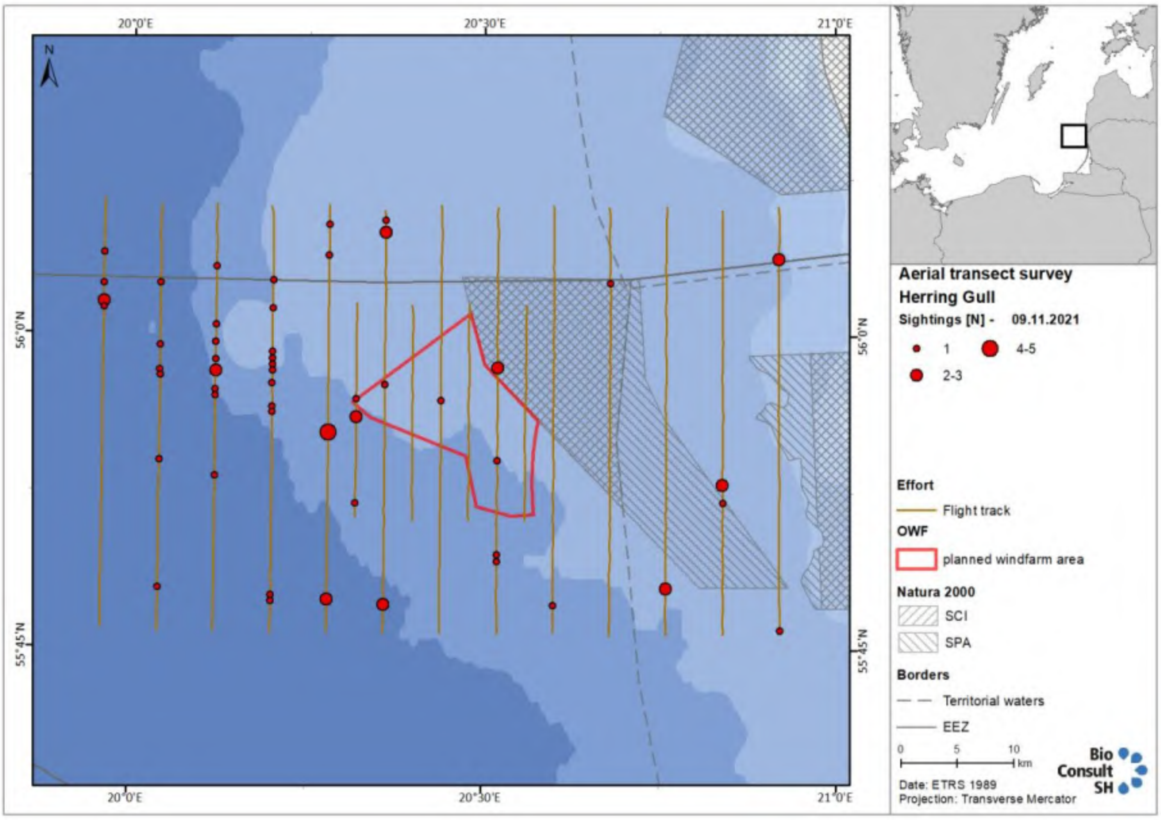
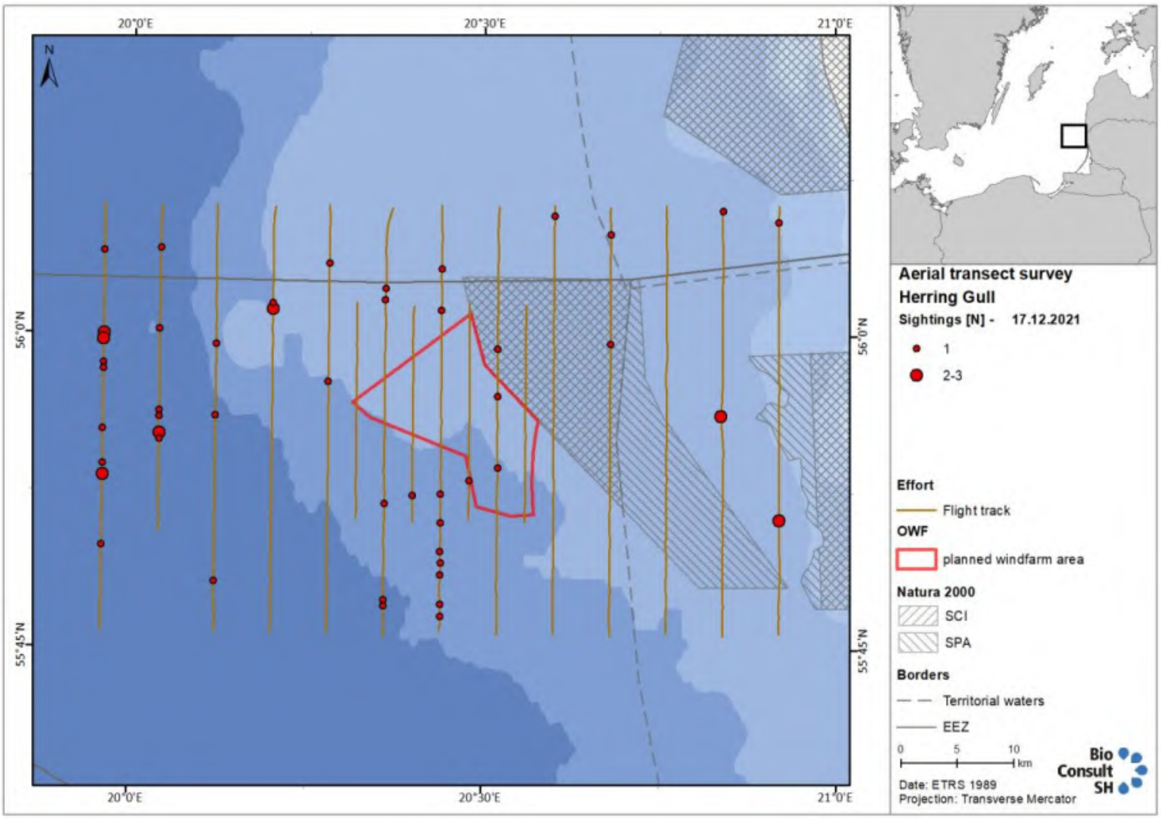
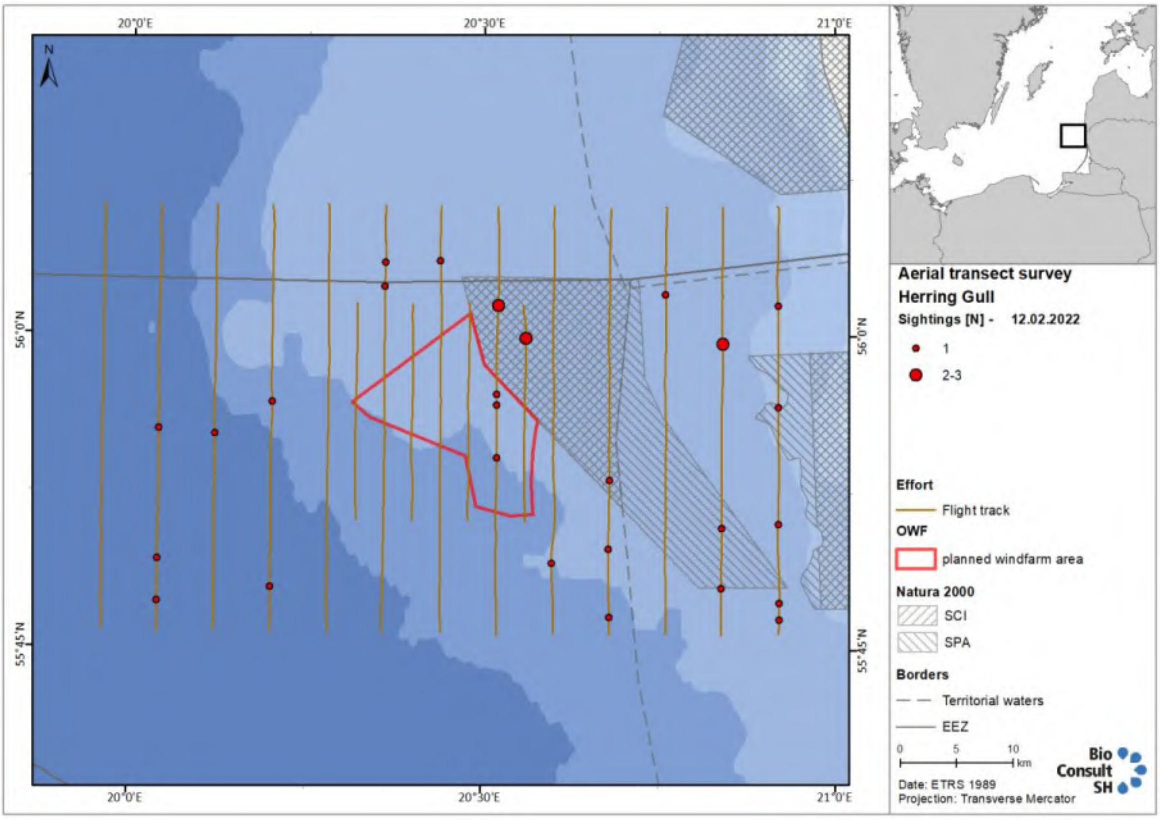
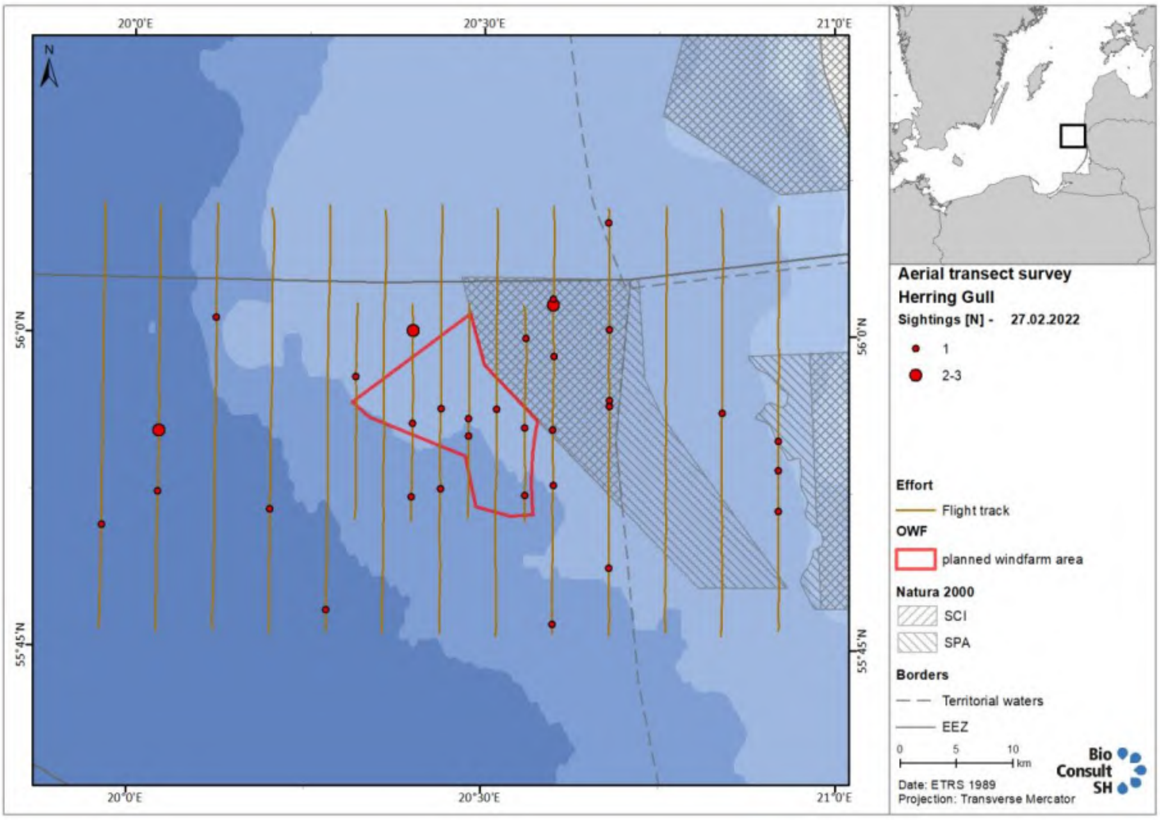
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Common Gull
Sightings [N] - 12.04.2022
1
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator

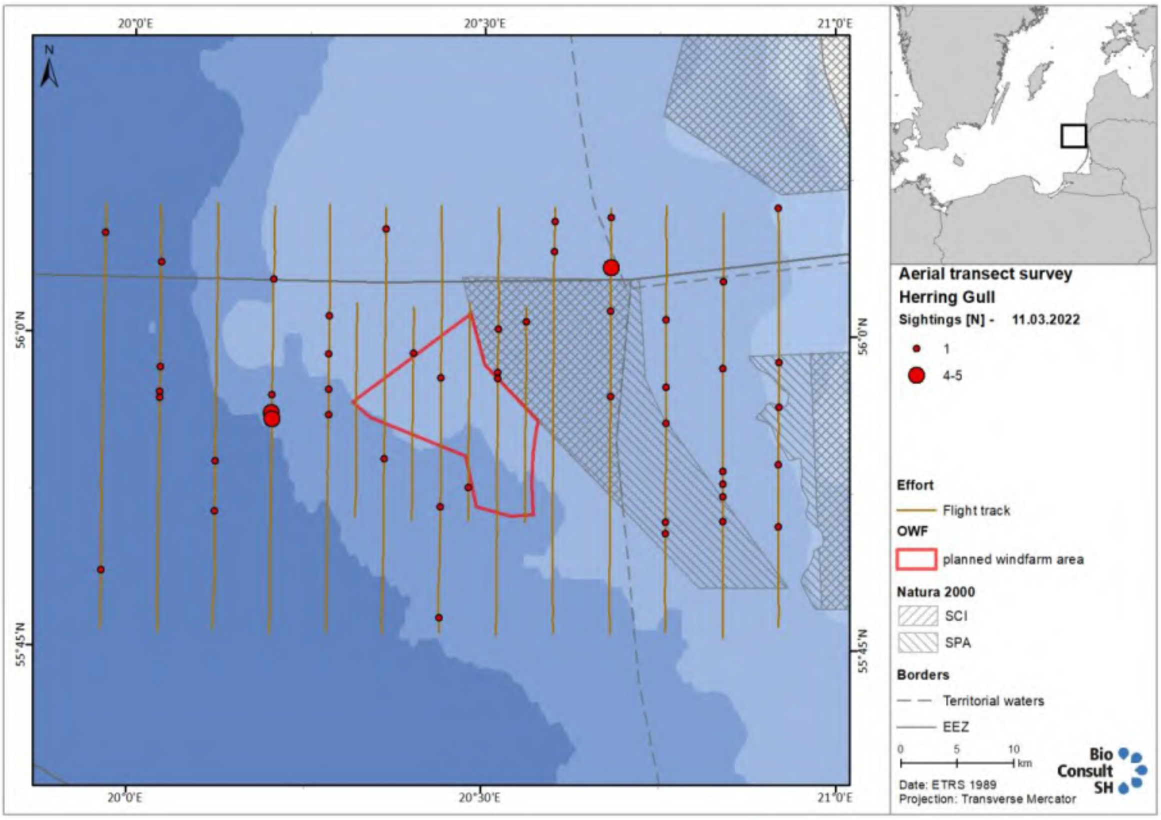
A.2.7 Herring Gull (*Larus argentatus*)



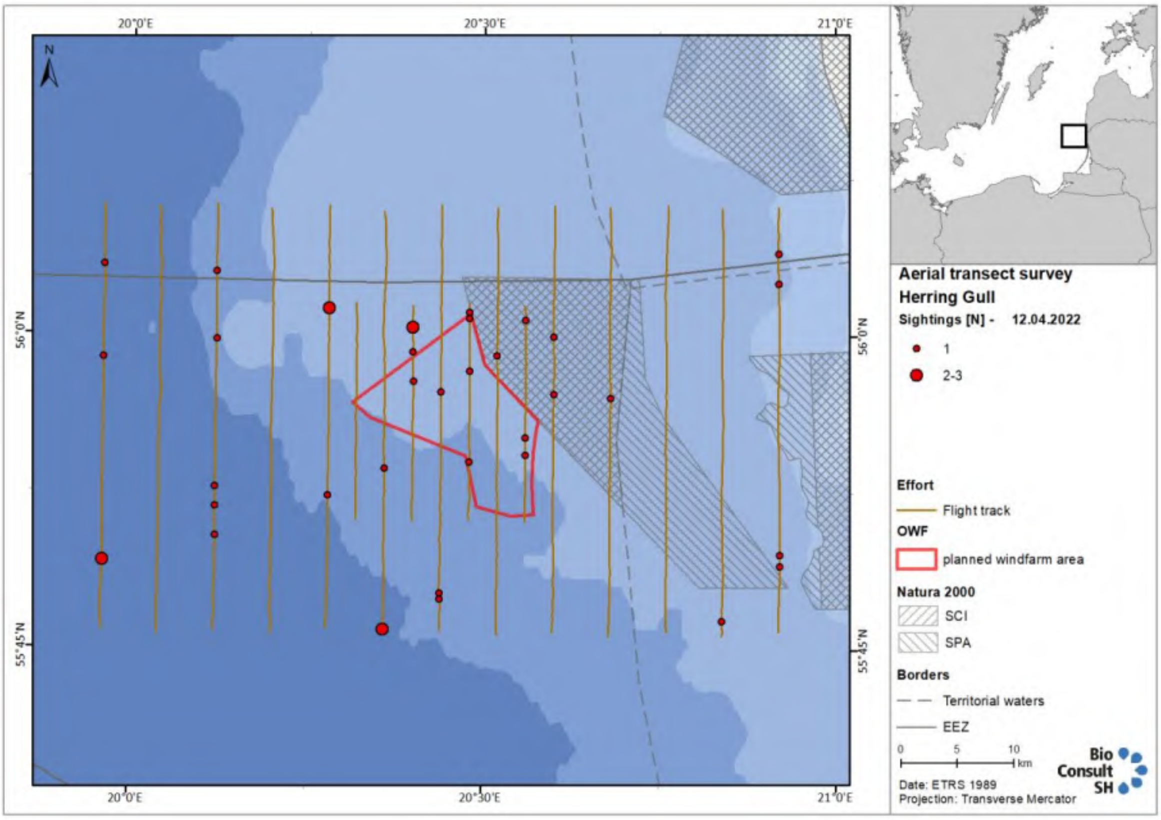



20°0'E
20°30'E
21°0'E
N
56°0'N
55°45'N
Aerial transect survey
Herring Gull
Sightings [N] - 12.02.2022
1
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH


20°0'E
20°30'E
21°0'E
N
56°0'N
55°45'N
Aerial transect survey
Herring Gull
Sightings [N] - 27.02.2022
1
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

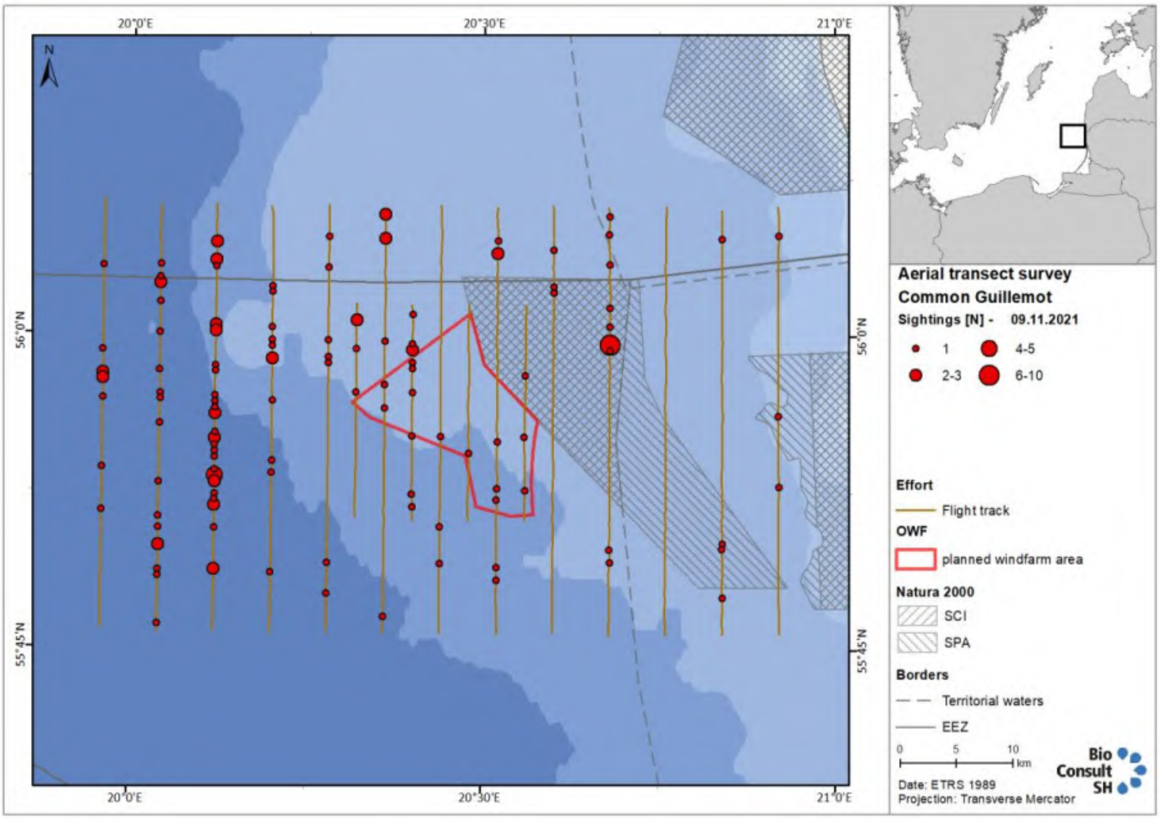


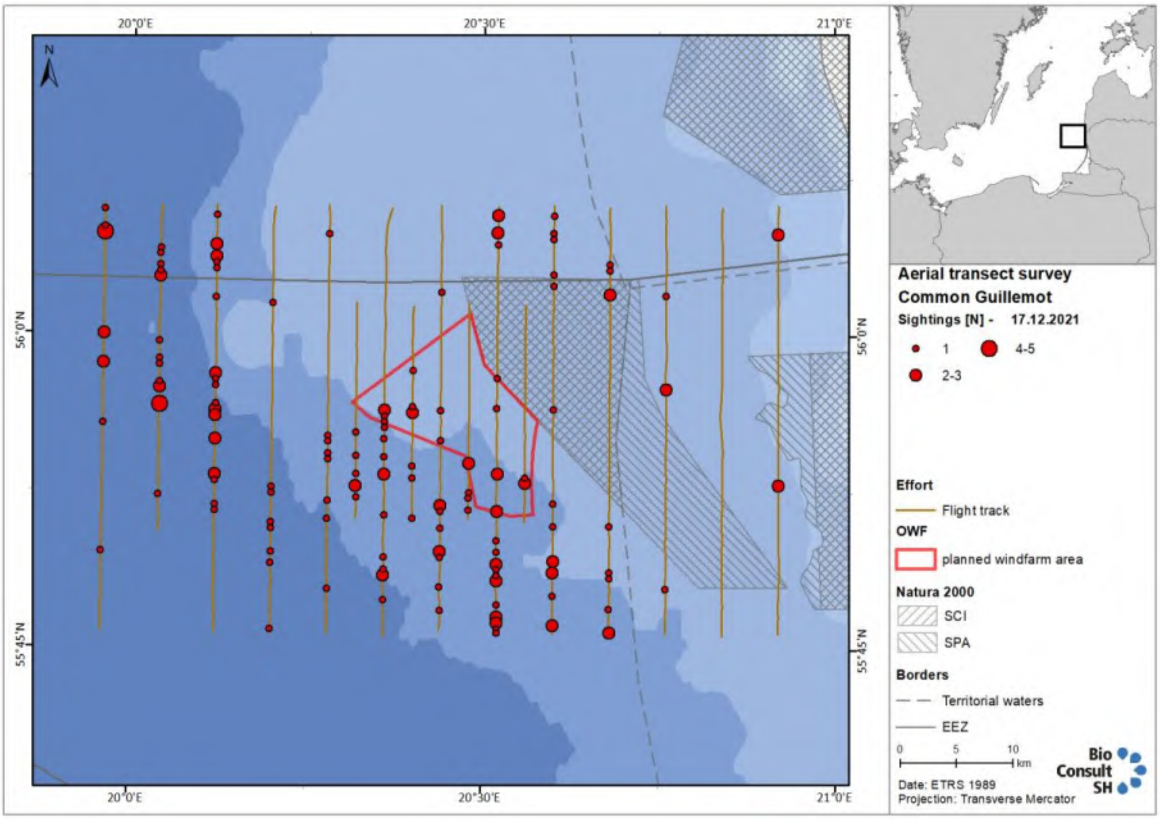
20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Herring Gull
Sightings [N] - 11.03.2022
1
4-5
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator

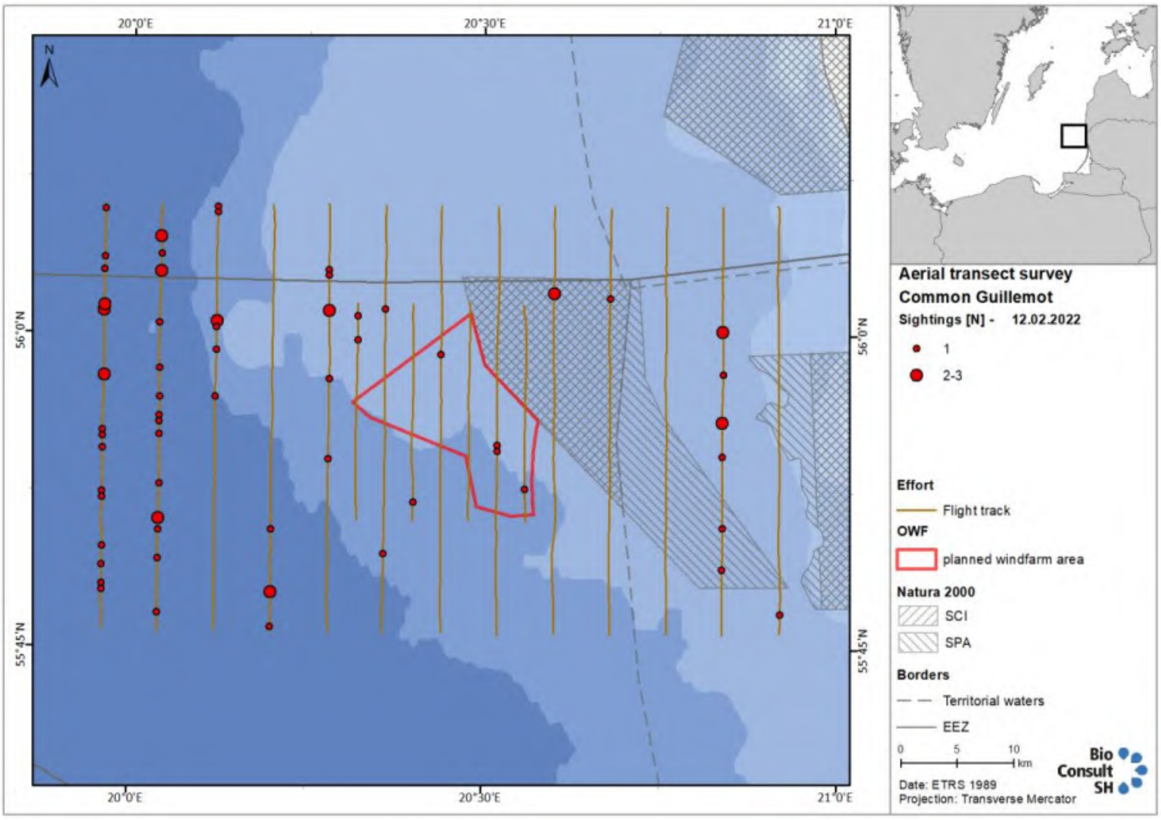


20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Herring Gull
Sightings [N] - 12.04.2022
1
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator

A.2.8 Common Guillemot (*Uria aalge*)



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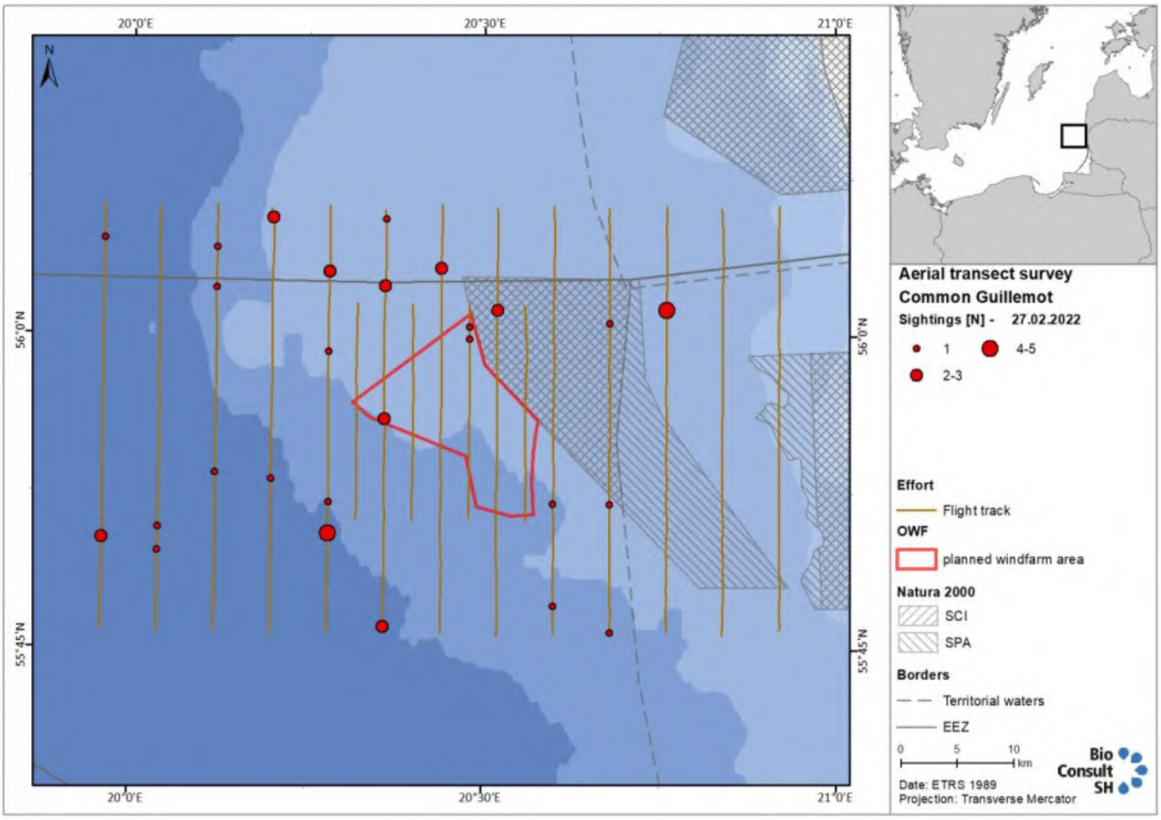
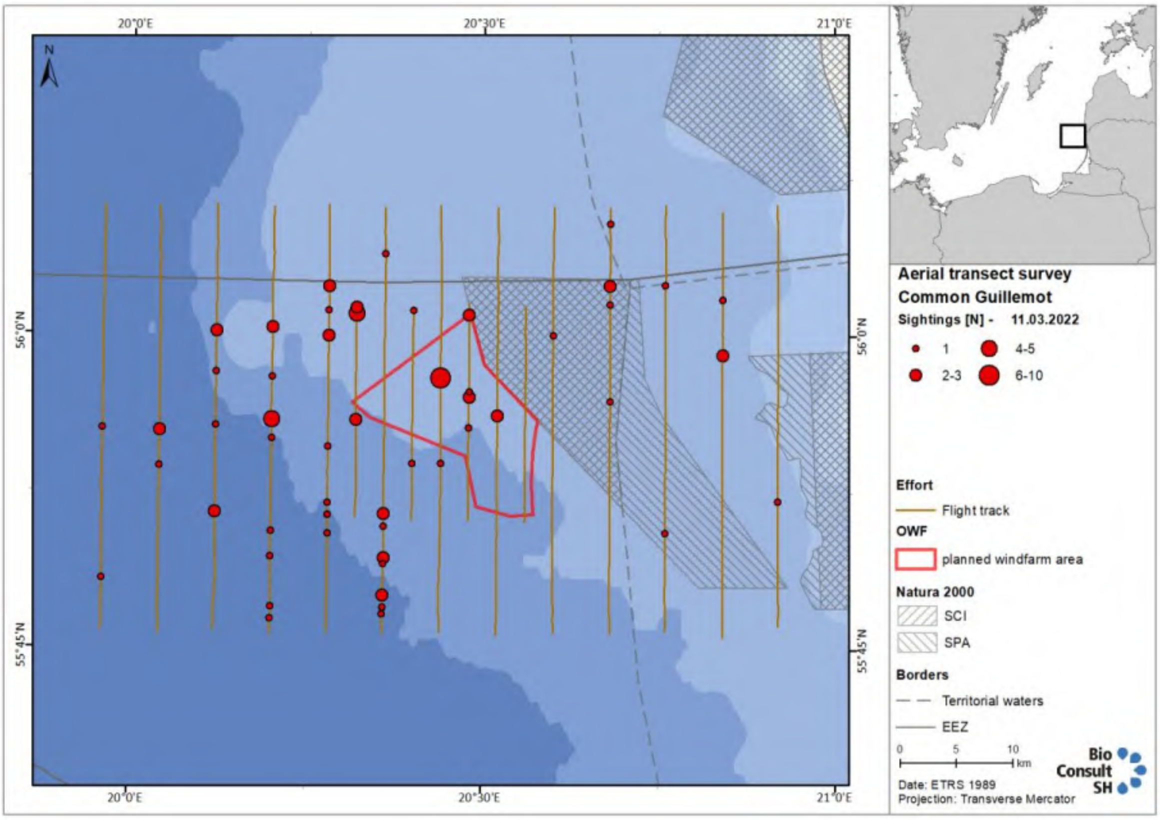
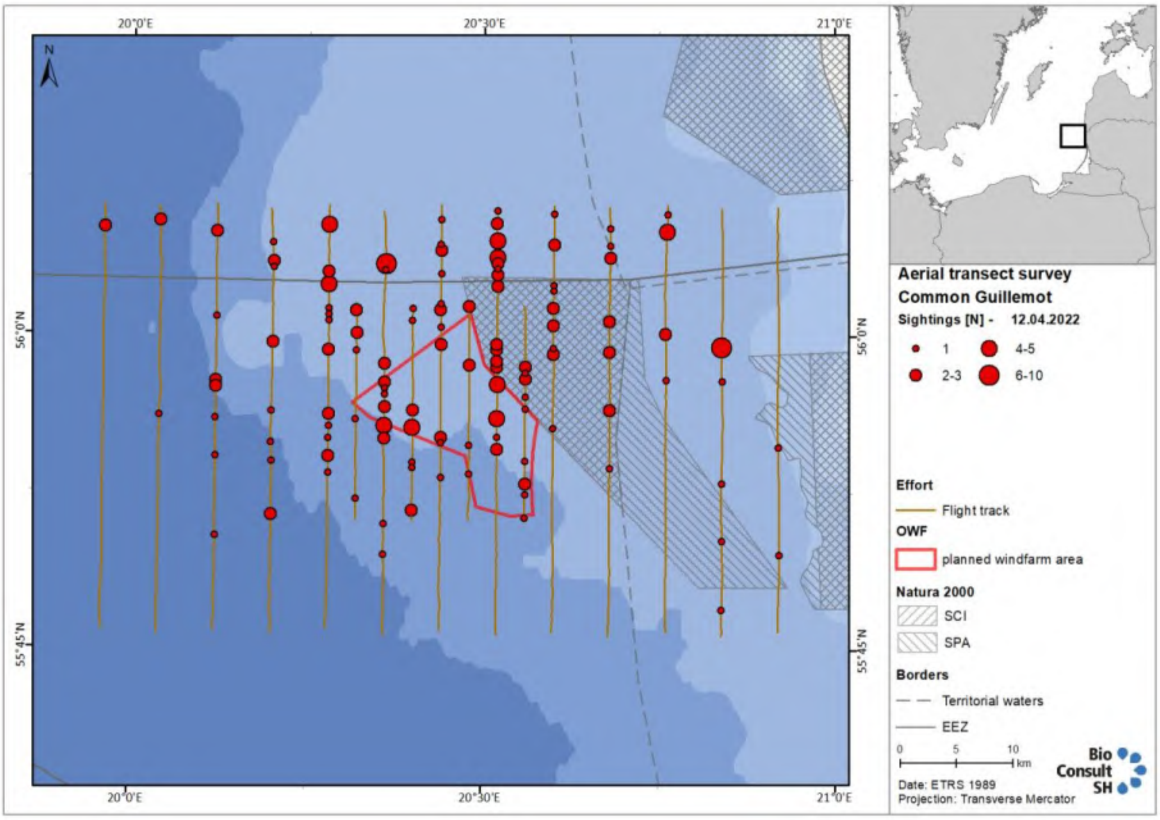
21°0'E
56°0'N
55°45'N
Aerial transect survey
Common Guillemot
Sightings [N] - 12.02.2022
1
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator


20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
Aerial transect survey
Common Guillemot
Sightings [N] - 27.02.2022
1
4-5
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator


20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Common Guillemot
Sightings [N] - 11.03.2022
1
2-3
4-5
6-10
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0
5
10
km
Bio Consult SH
Date: ETRS 1989
Projection: Transverse Mercator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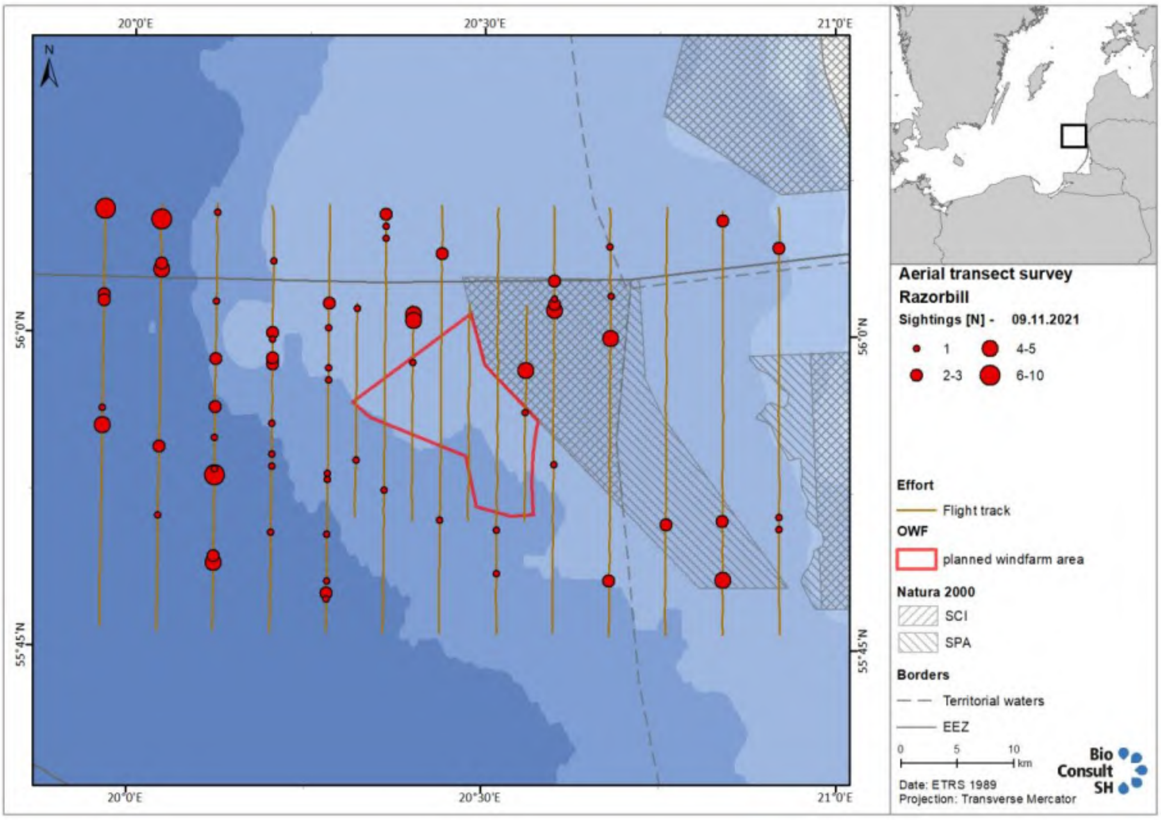
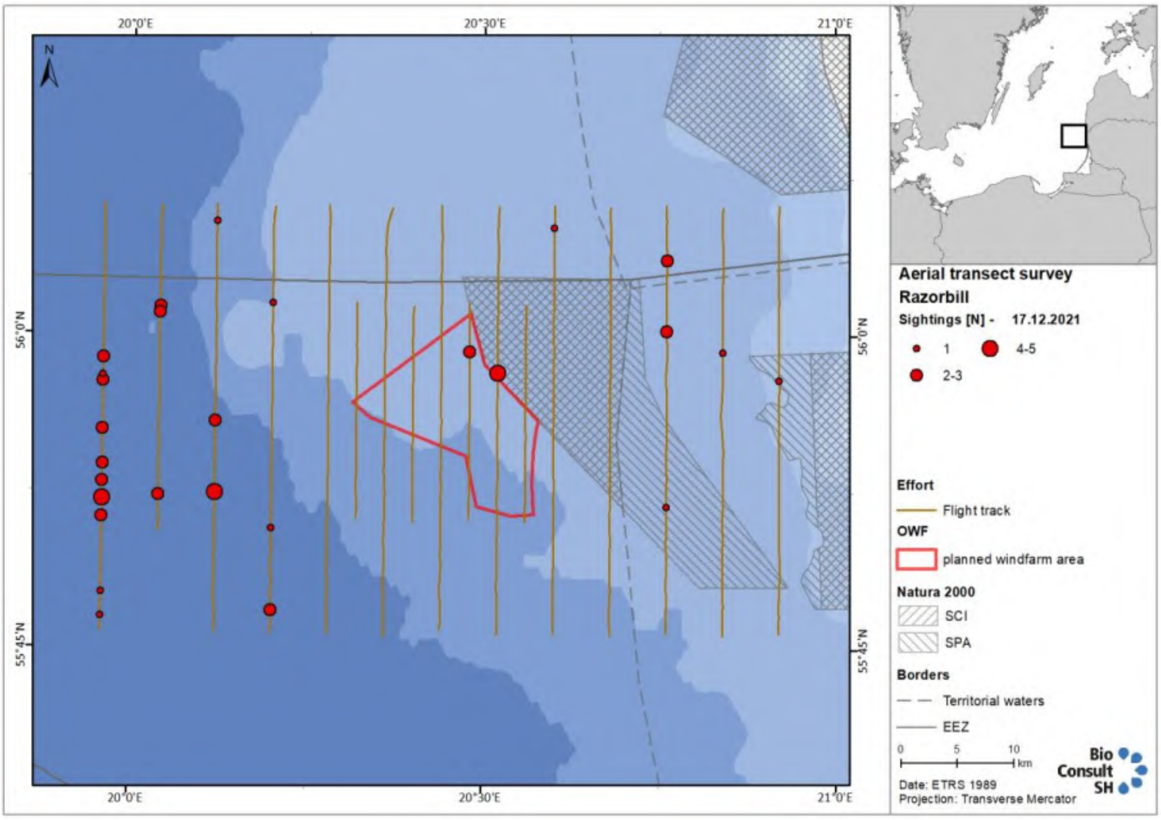
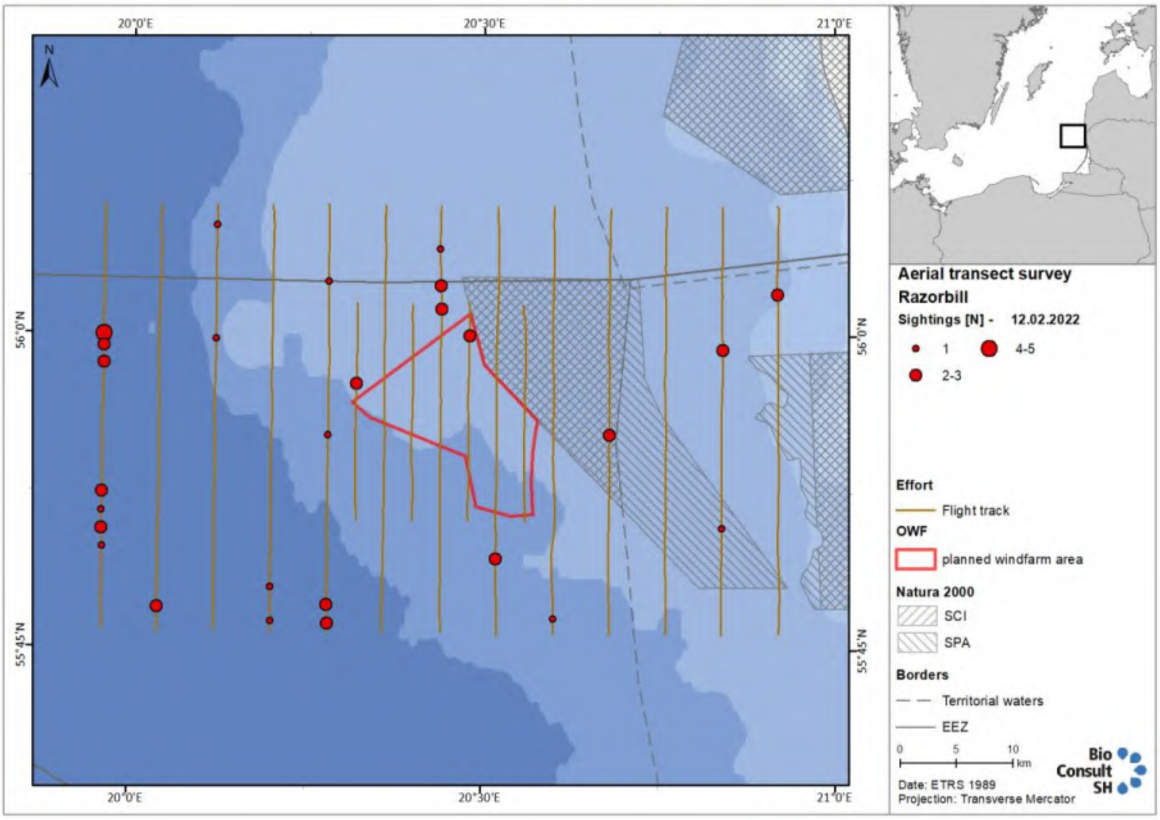
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Common Guillemot
Sightings [N] - 12.04.2022
1
2-3
4-5
6-10
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0
5
10
km
Bio Consult SH
Date: ETRS 1989
Projection: Transverse Mercator

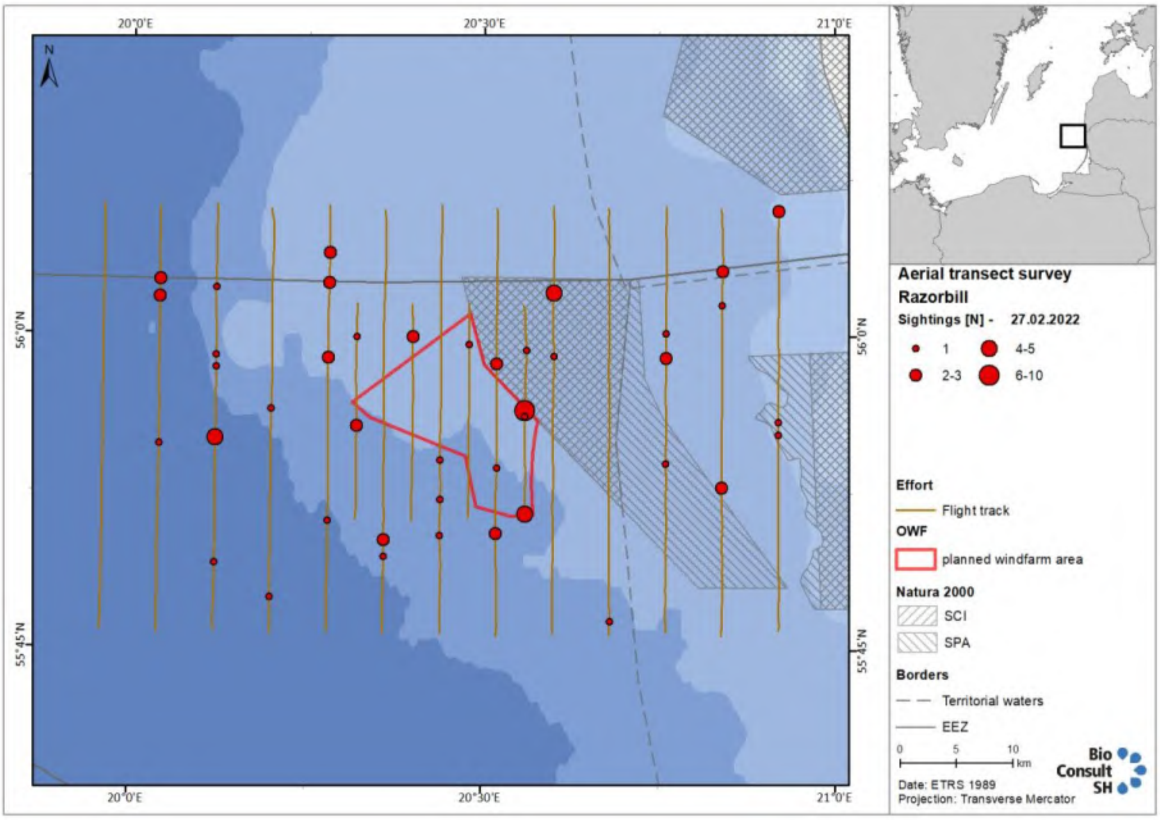
A.2.9 Razorbill (*Alca torda*)



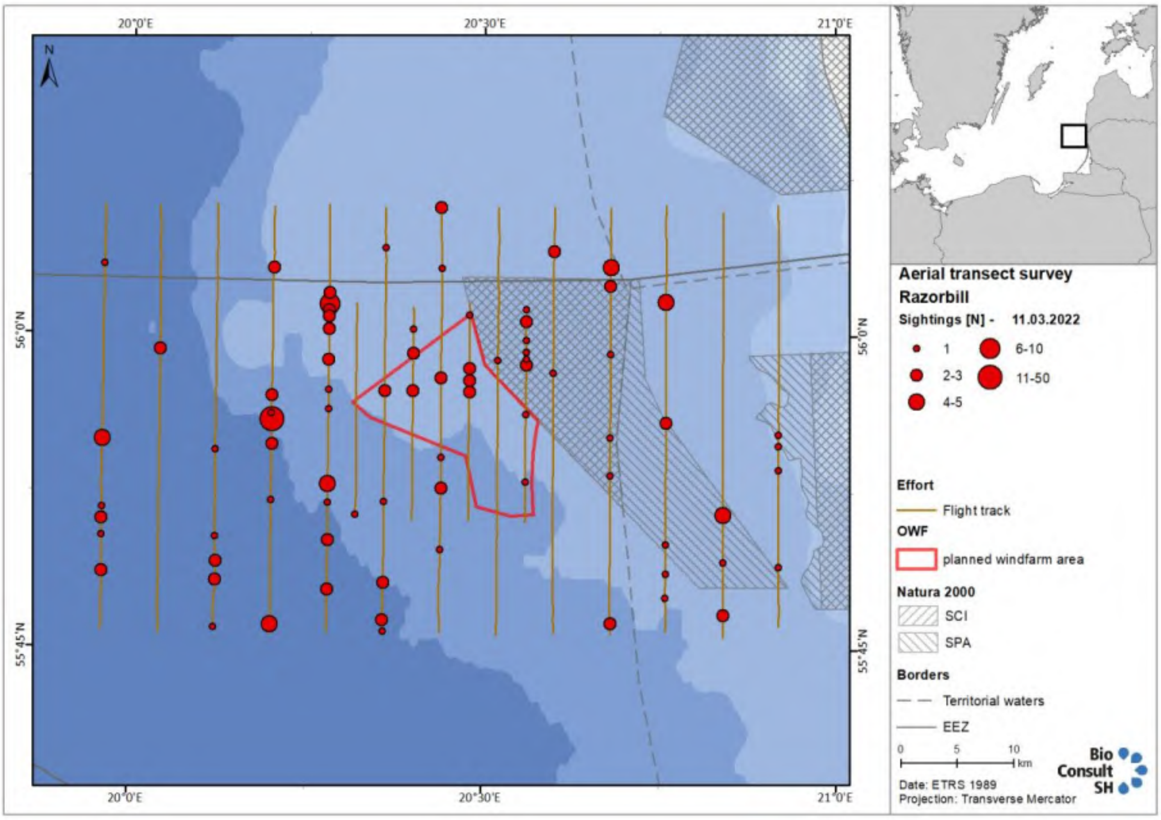




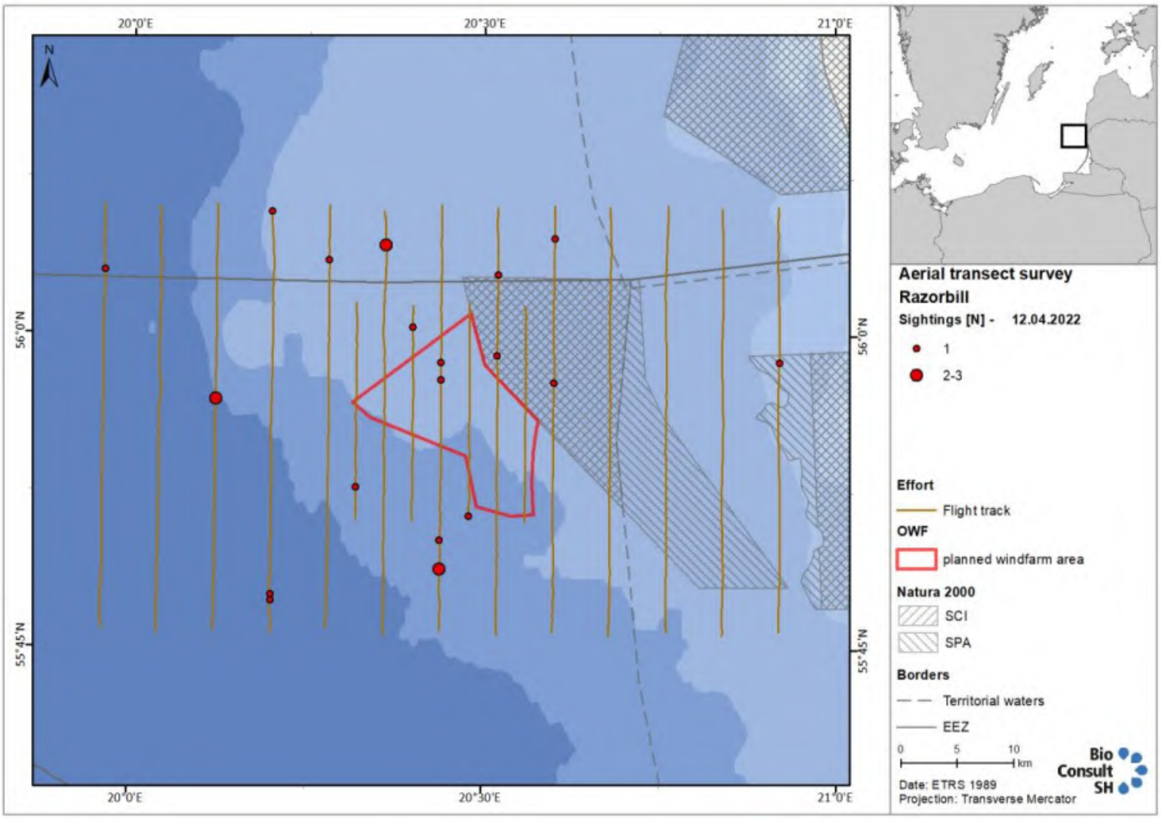
20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Razorbill
Sightings [N] - 12.02.2022
1
4-5
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH



20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Razorbill
Sightings [N] - 27.02.2022
1
4-5
2-3
6-10
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0 5 10 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH



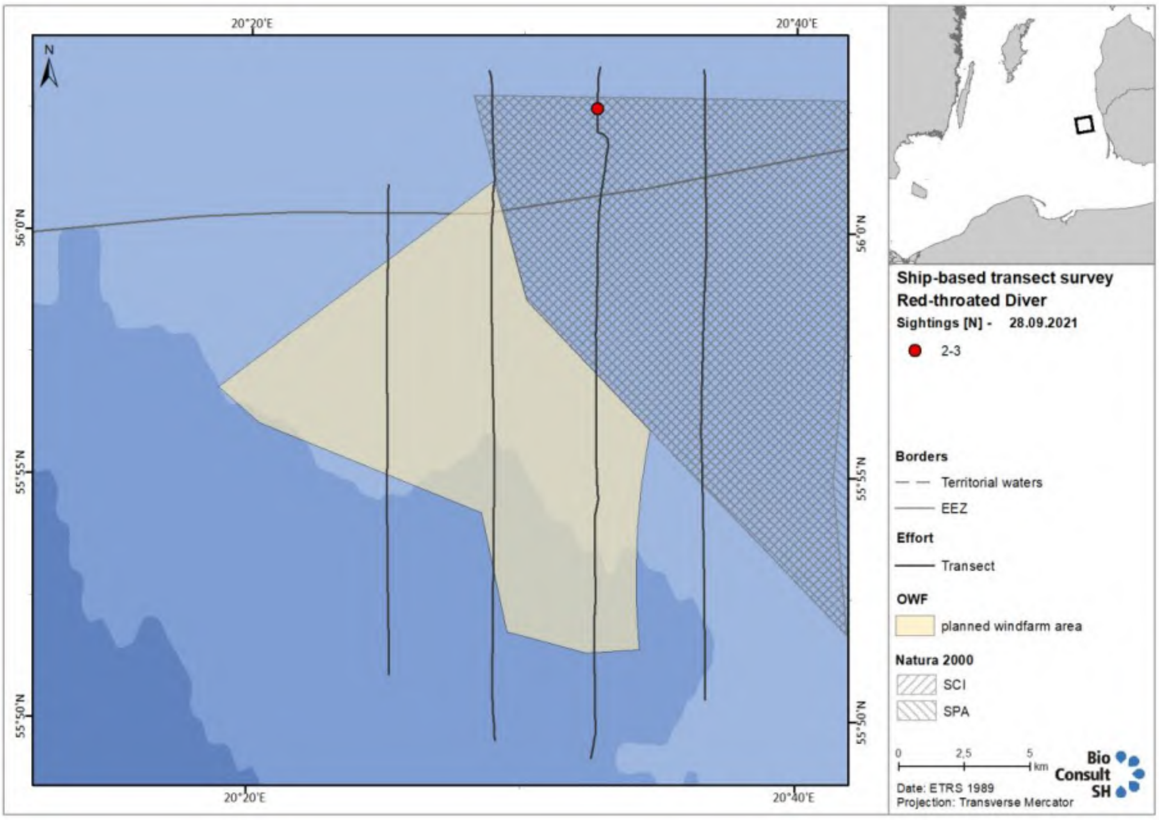
20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Razorbill
Sightings [N] - 11.03.2022
1
2-3
4-5
6-10
11-50
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0
5
10
km
Bio Consult SH
Date: ETRS 1989
Projection: Transverse Mercator

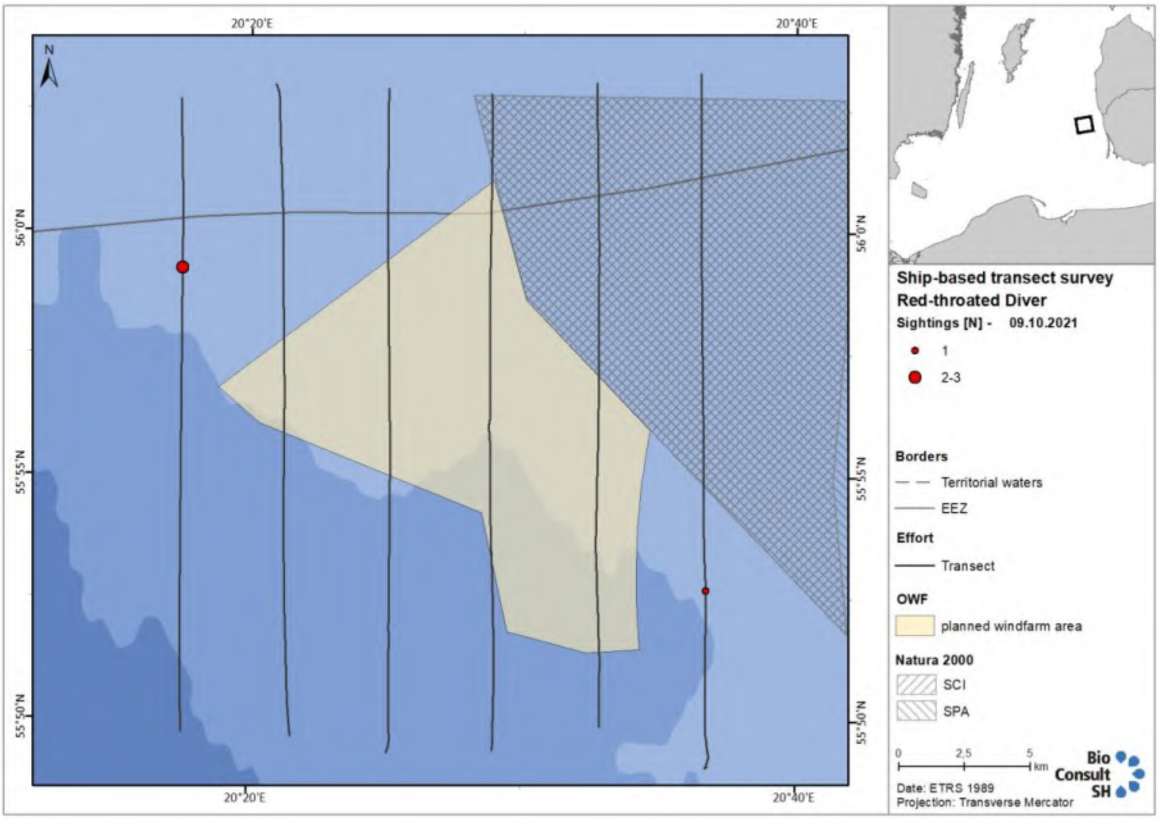


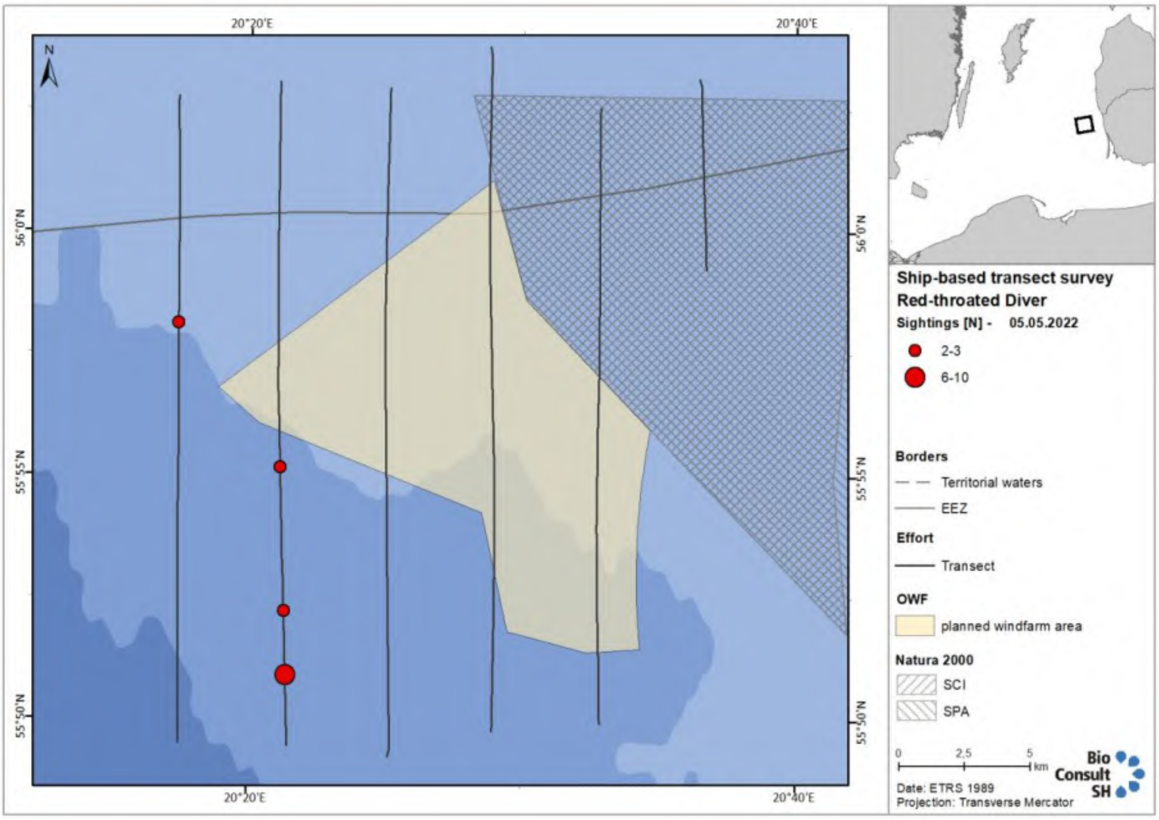
20°0'E
20°30'E
21°0'E
56°0'N
55°45'N
N
Aerial transect survey
Razorbill
Sightings [N] - 12.04.2022
1
2-3
Effort
Flight track
OWF
planned windfarm area
Natura 2000
SCI
SPA
Borders
Territorial waters
EEZ
0
5
10
km
Bio Consult SH
Date: ETRS 1989
Projection: Transverse Mercator

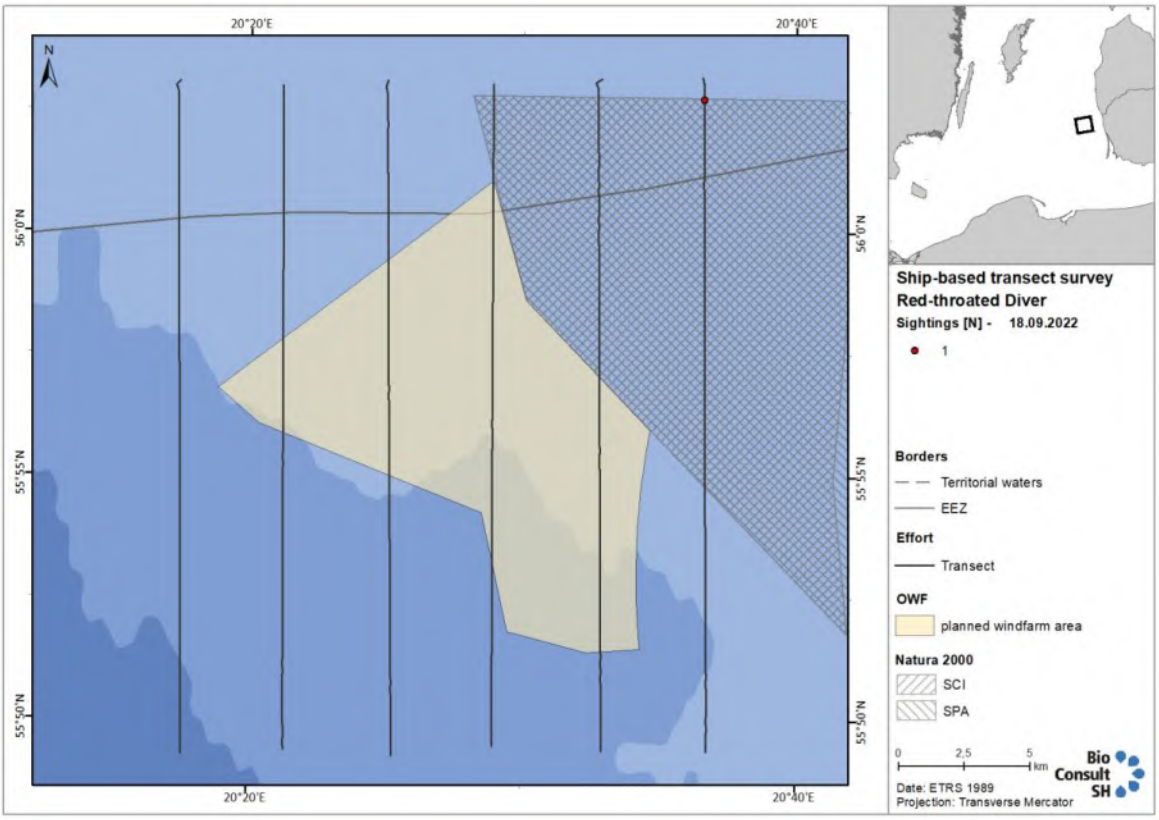
A.3 Species Distribution Maps Ship Surveys

A.3.1 Red-throated Diver (*Gavia stellata)*

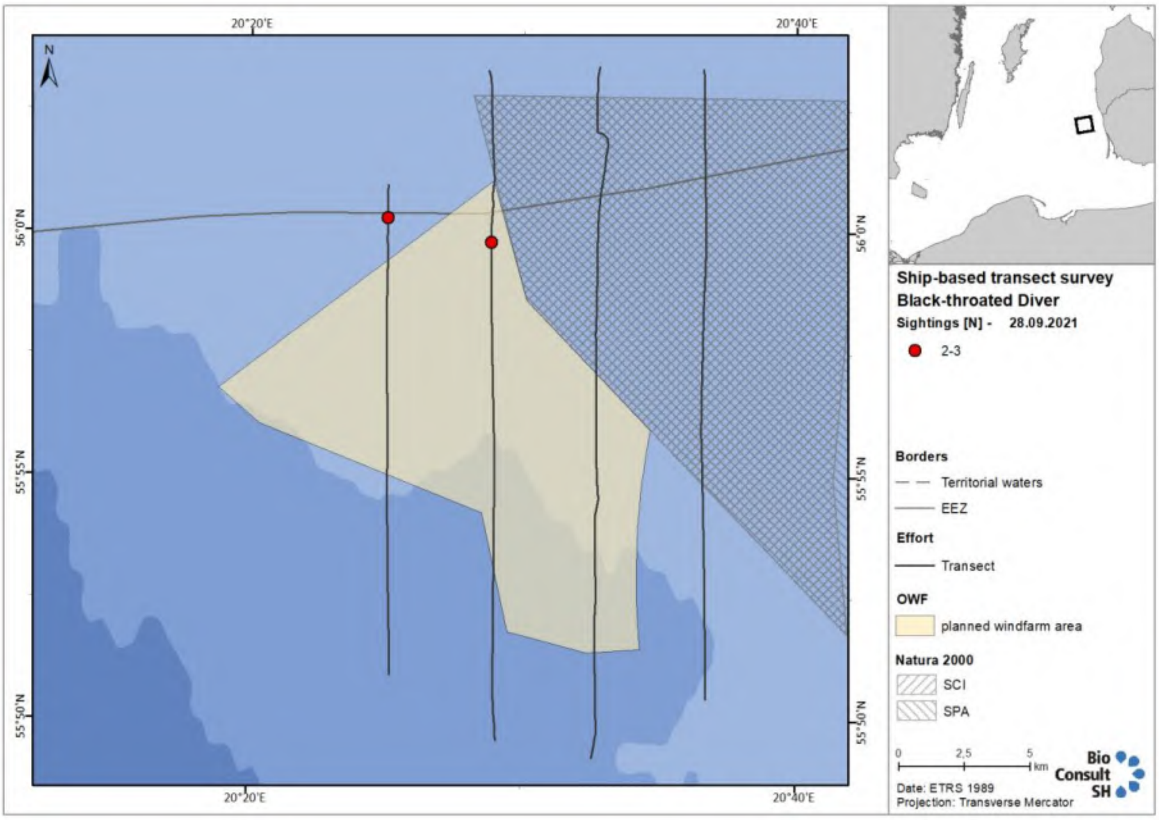


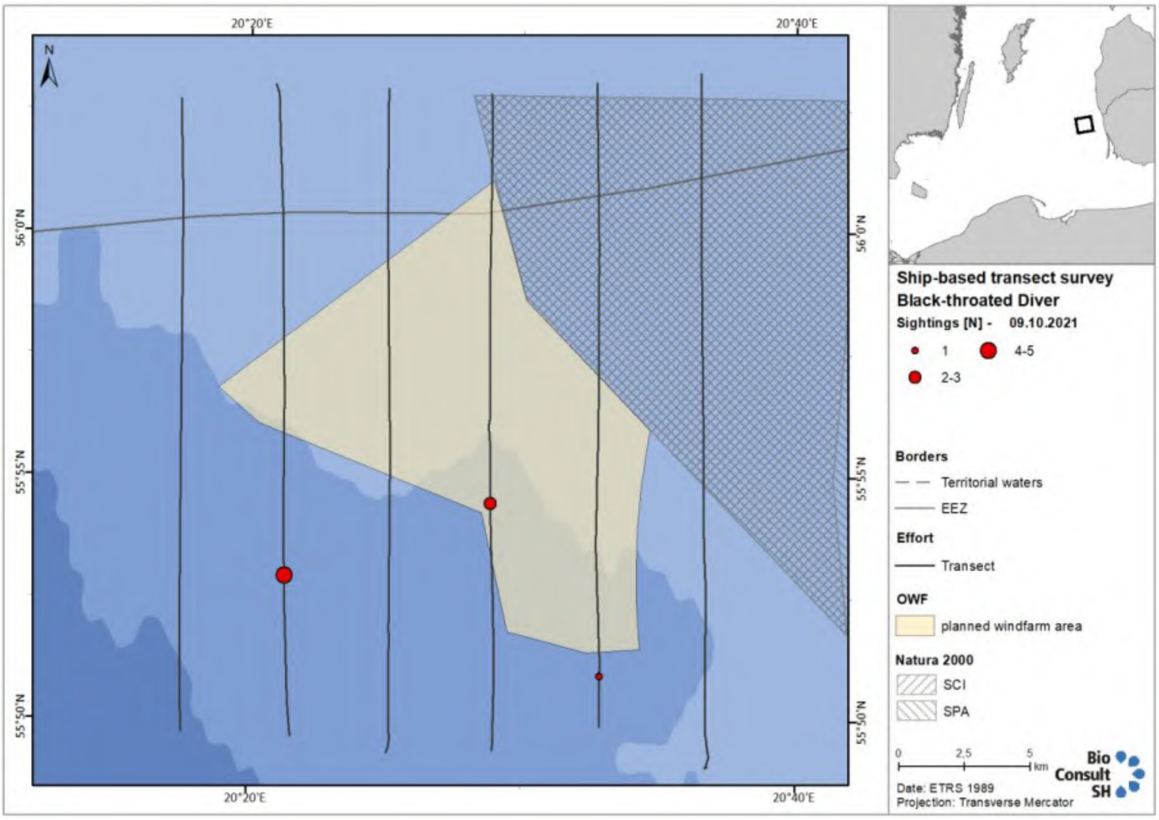


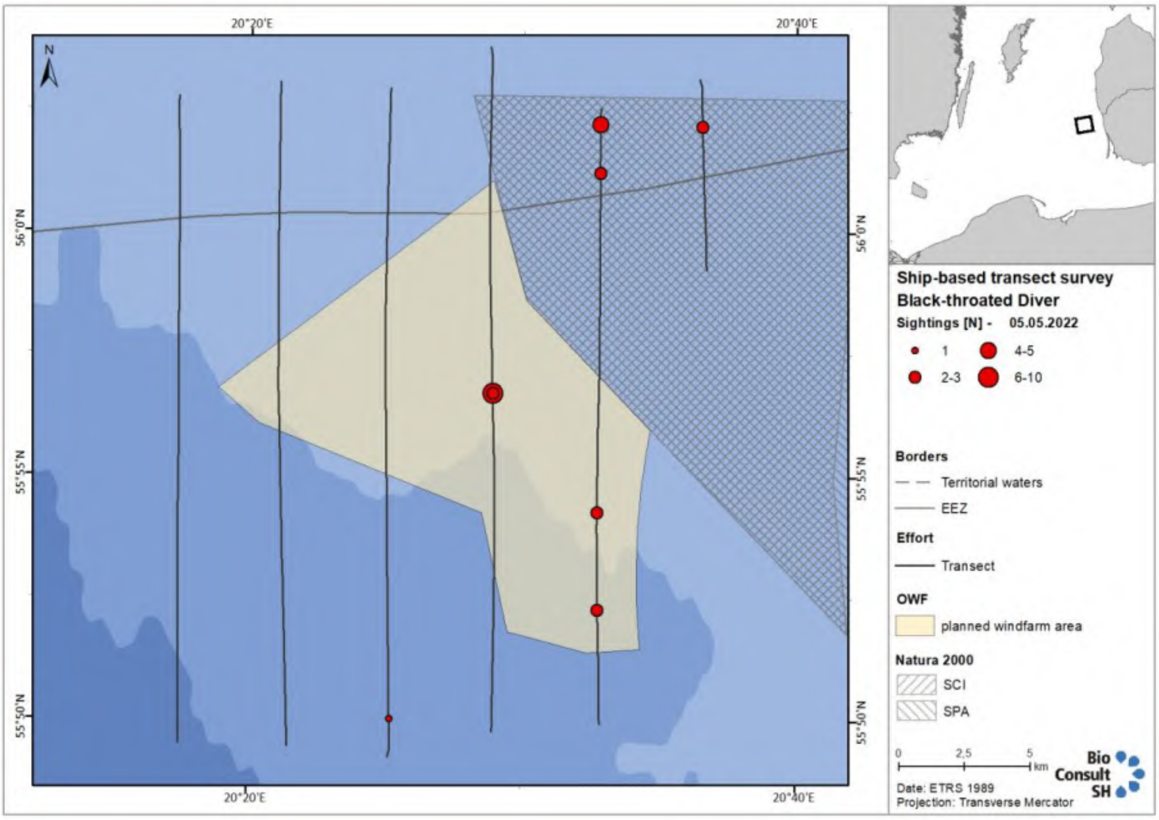

20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Red-throated Diver
Sightings [N] - 05.05.2022
2-3
6-10
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH


20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Red-throated Diver
Sightings [N] - 18.09.2022
1
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

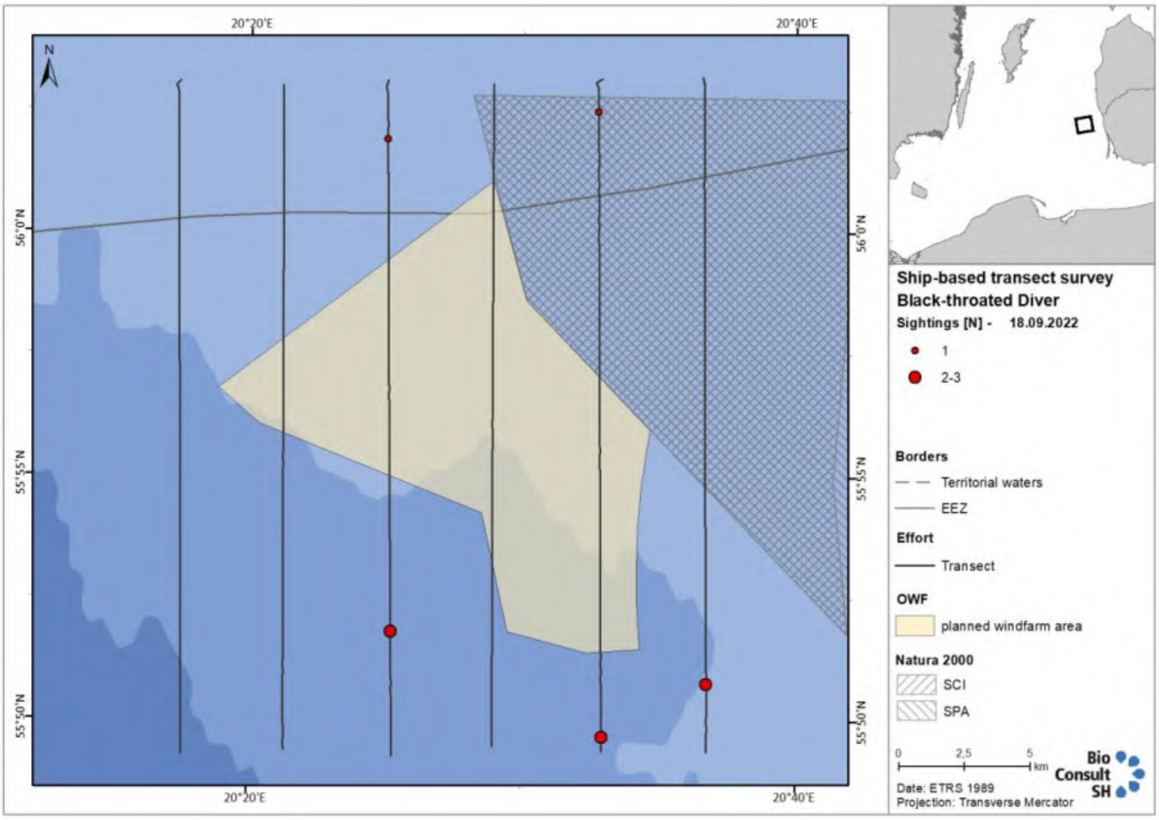
A.3.2 Black-throated Diver (*Gavia arctica*)





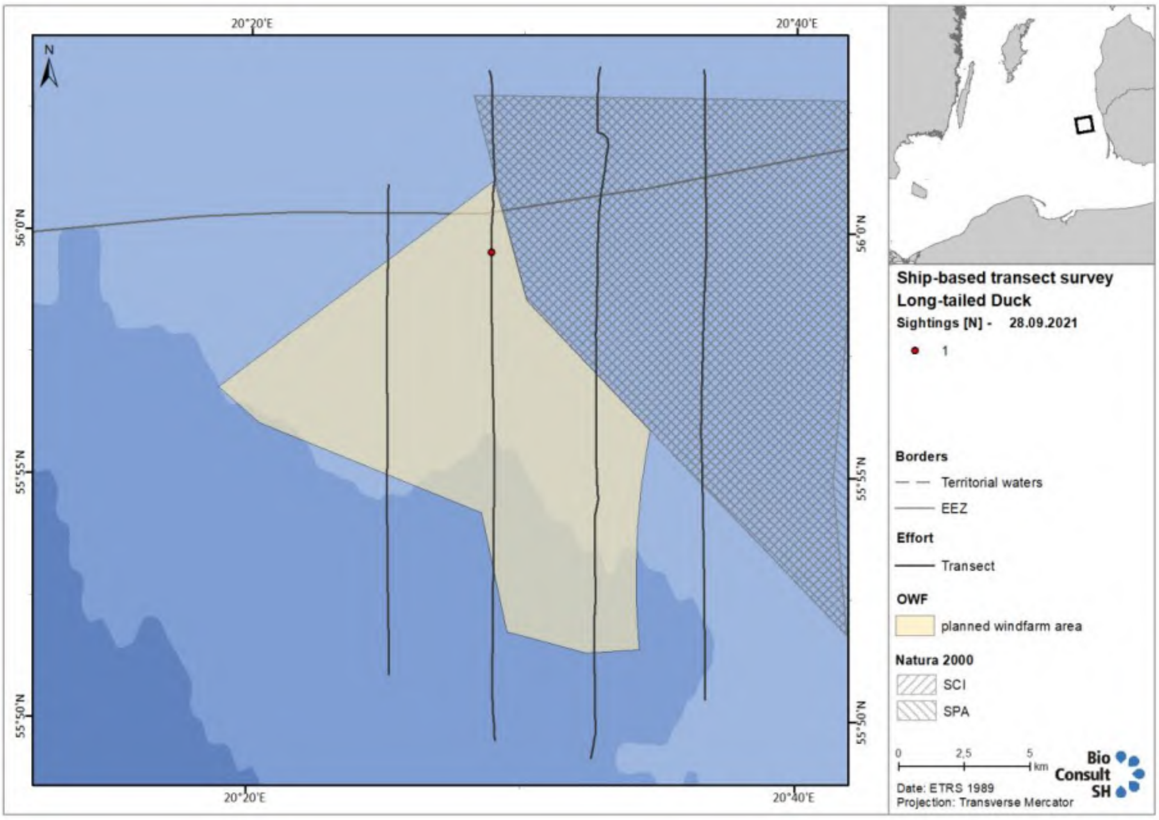


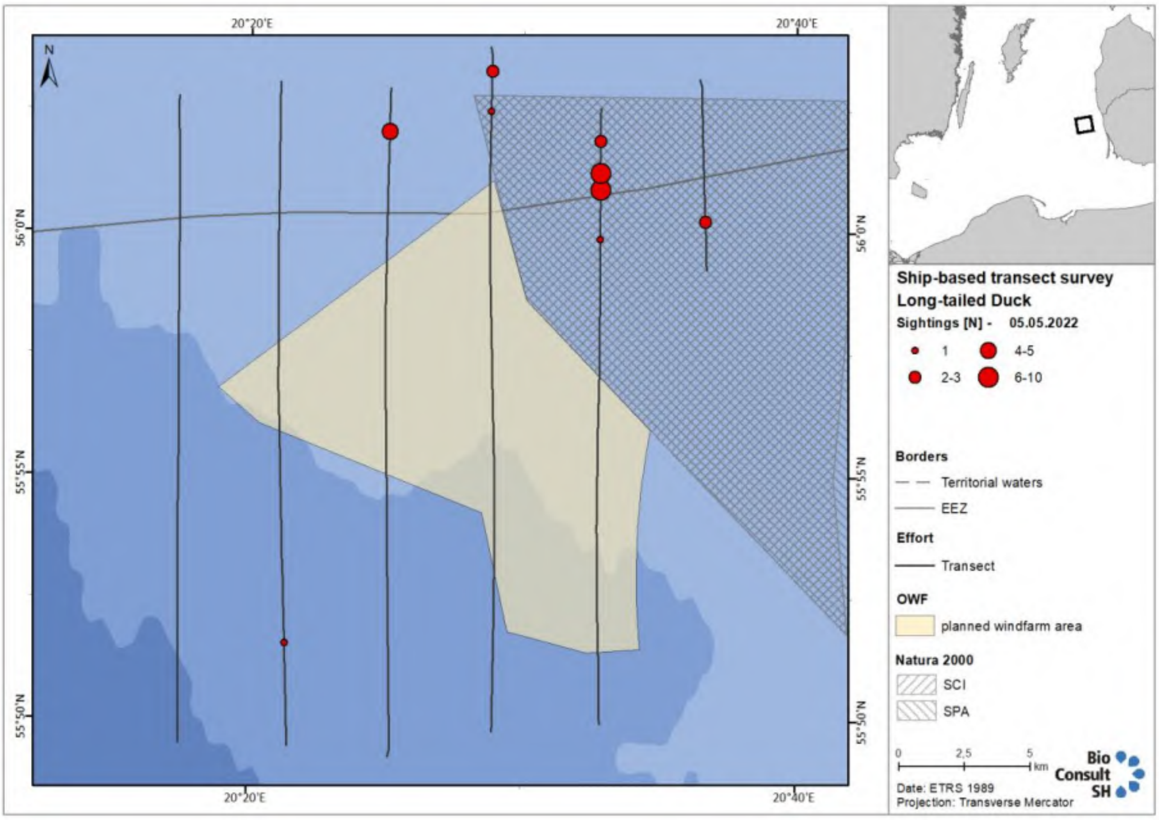
20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Black-throated Diver
Sightings [N] - 05.05.2022
1
2-3
4-5
6-10
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH



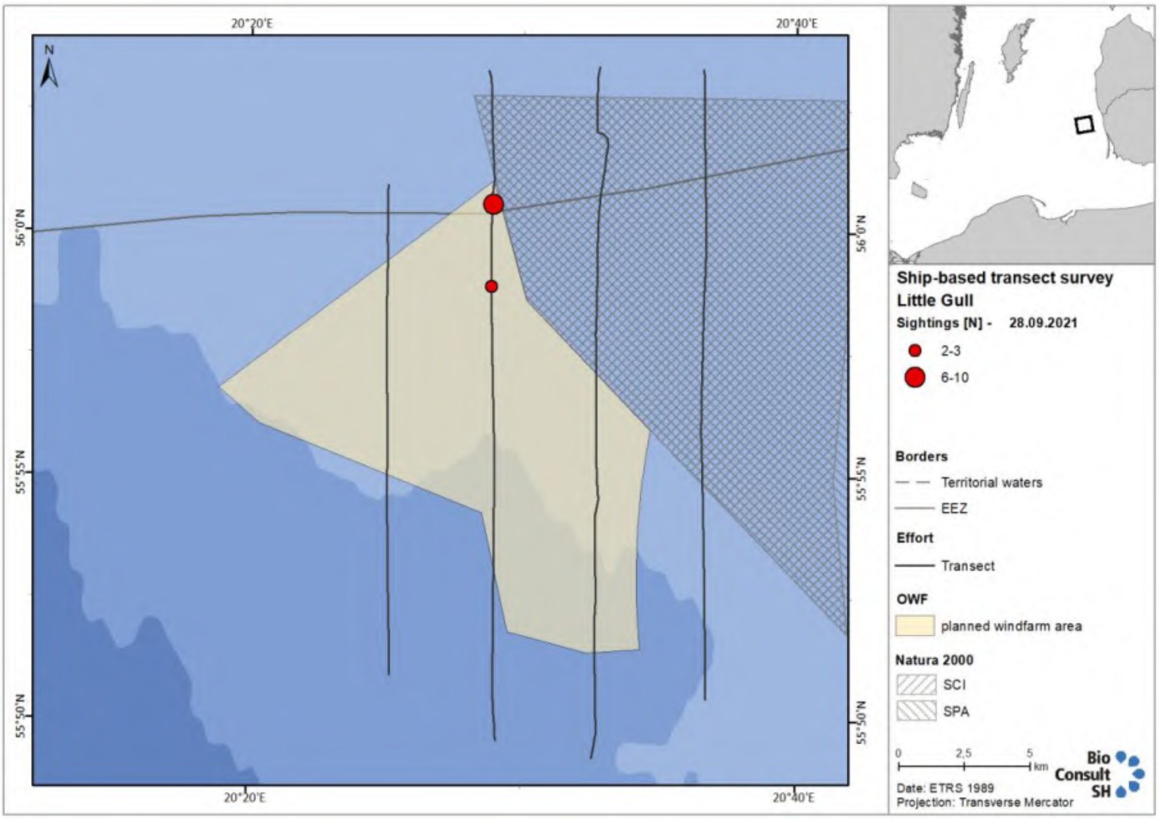
20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Black-throated Diver
Sightings [N] - 18.09.2022
1
2-3
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

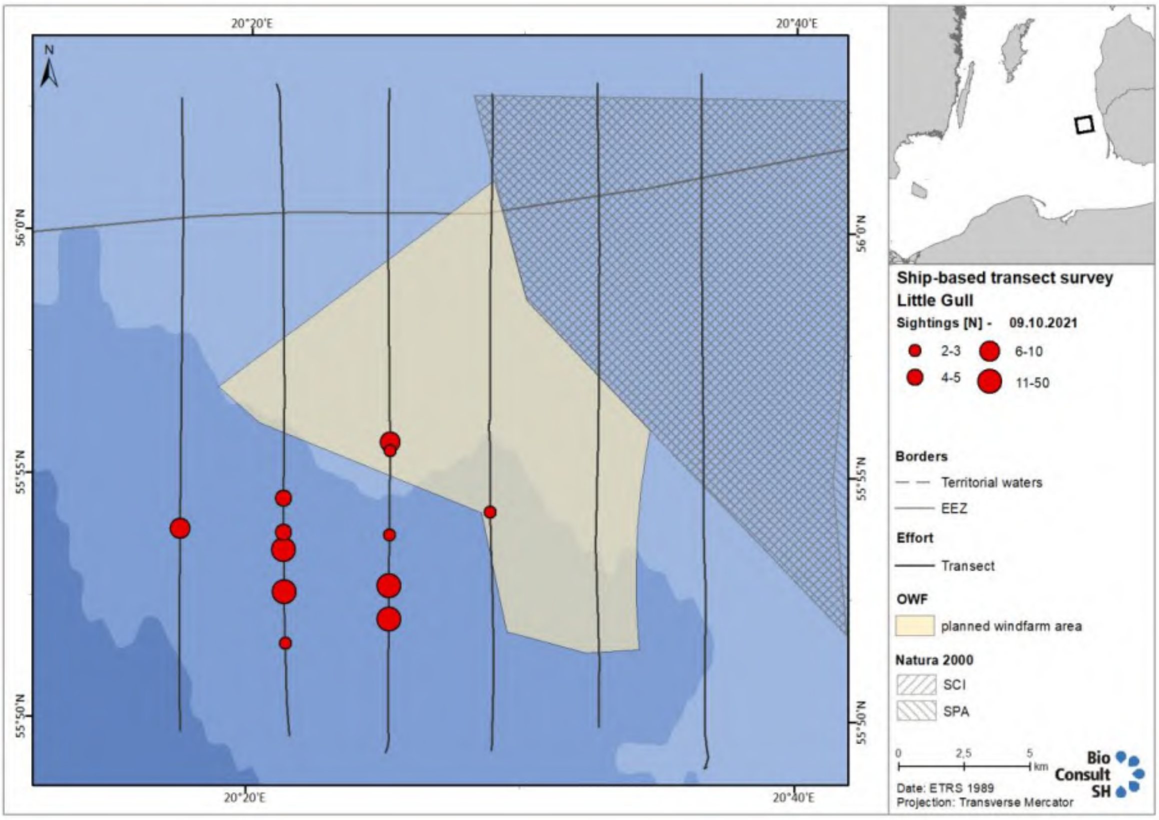
A.3.3 Long-tailed Duck (*Clangula hyemalis*)

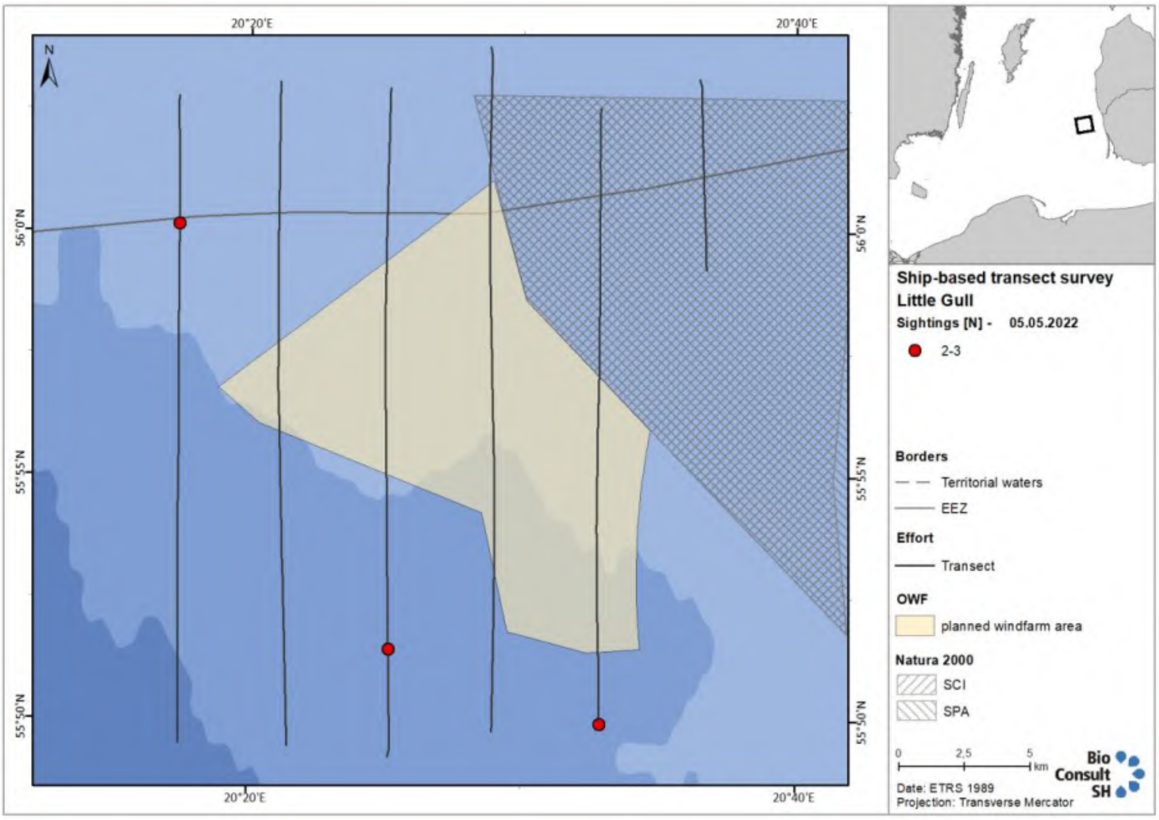


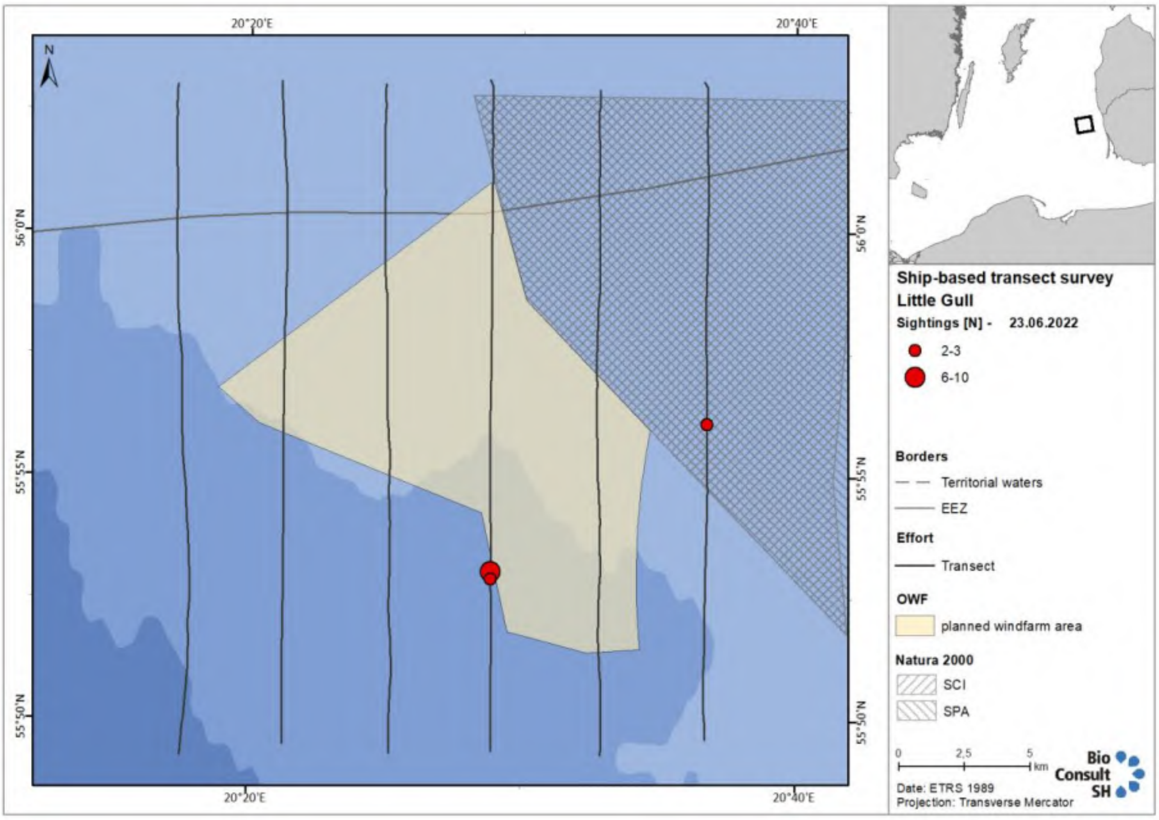


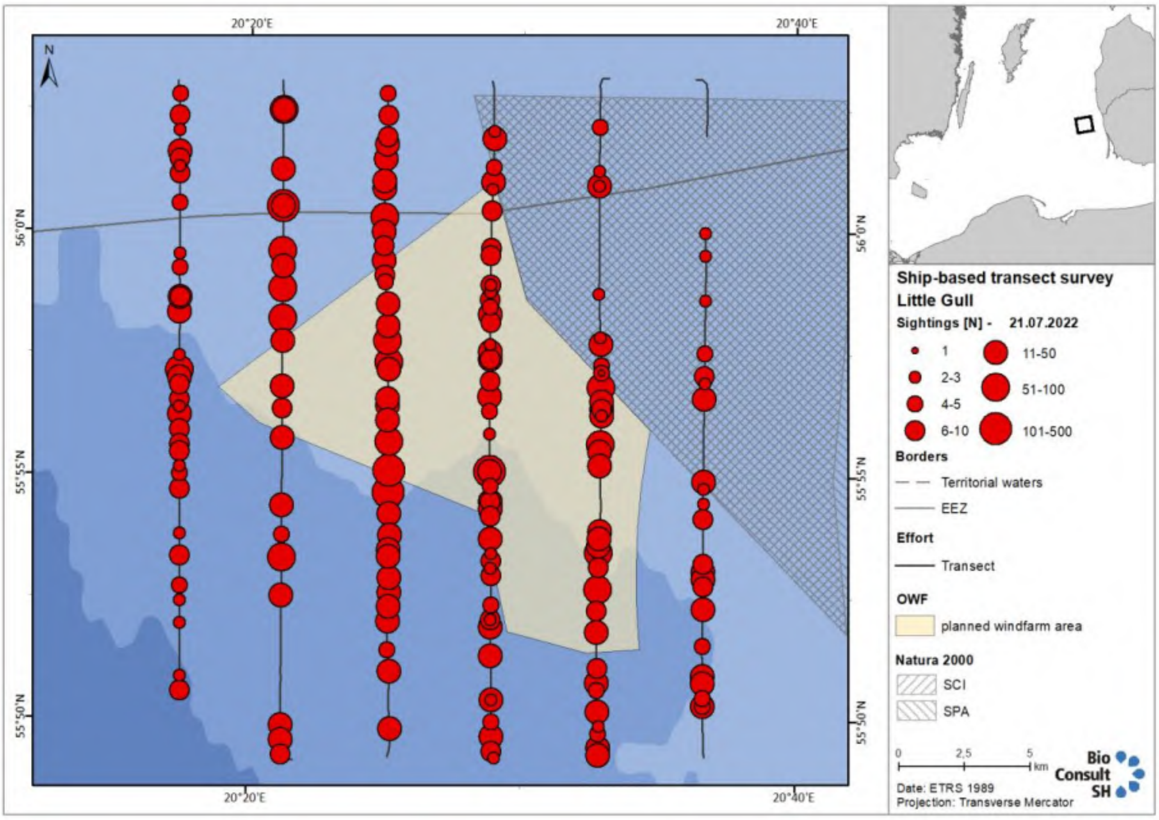
A.3.4 Little Gull (*Hydrocoloeus minutus*)

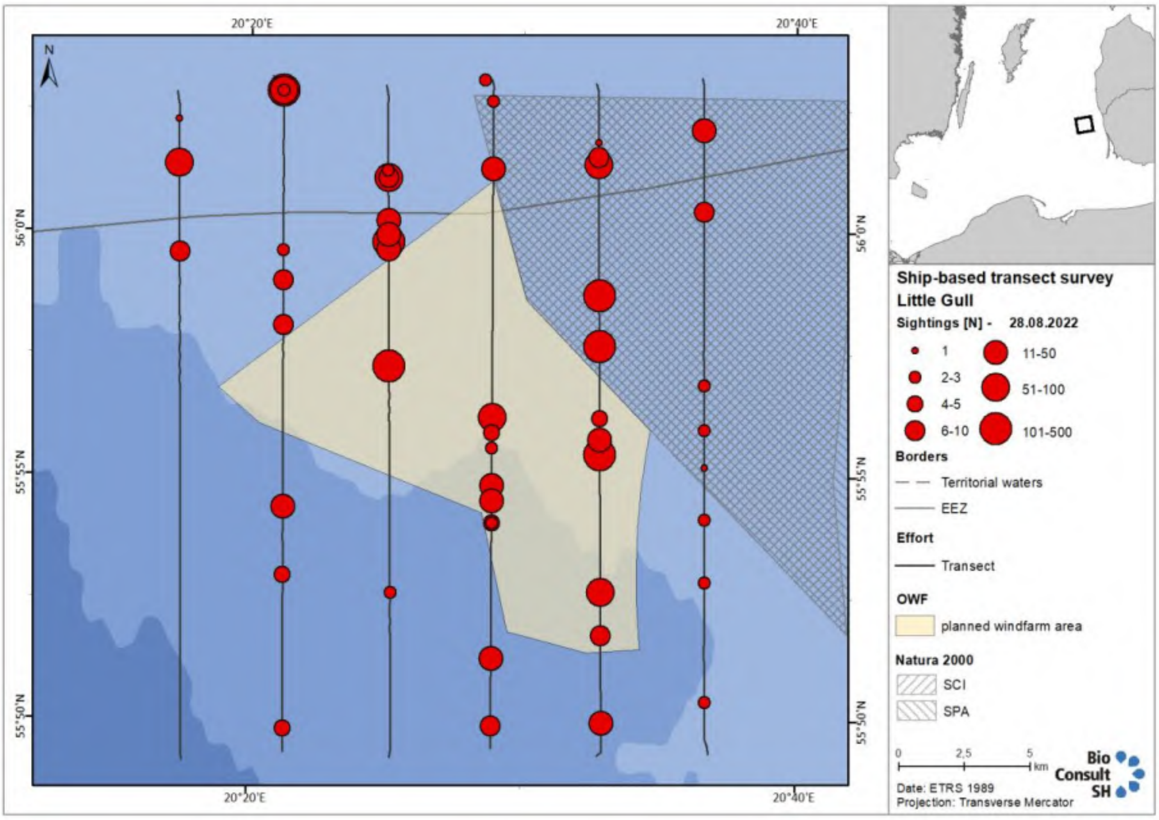


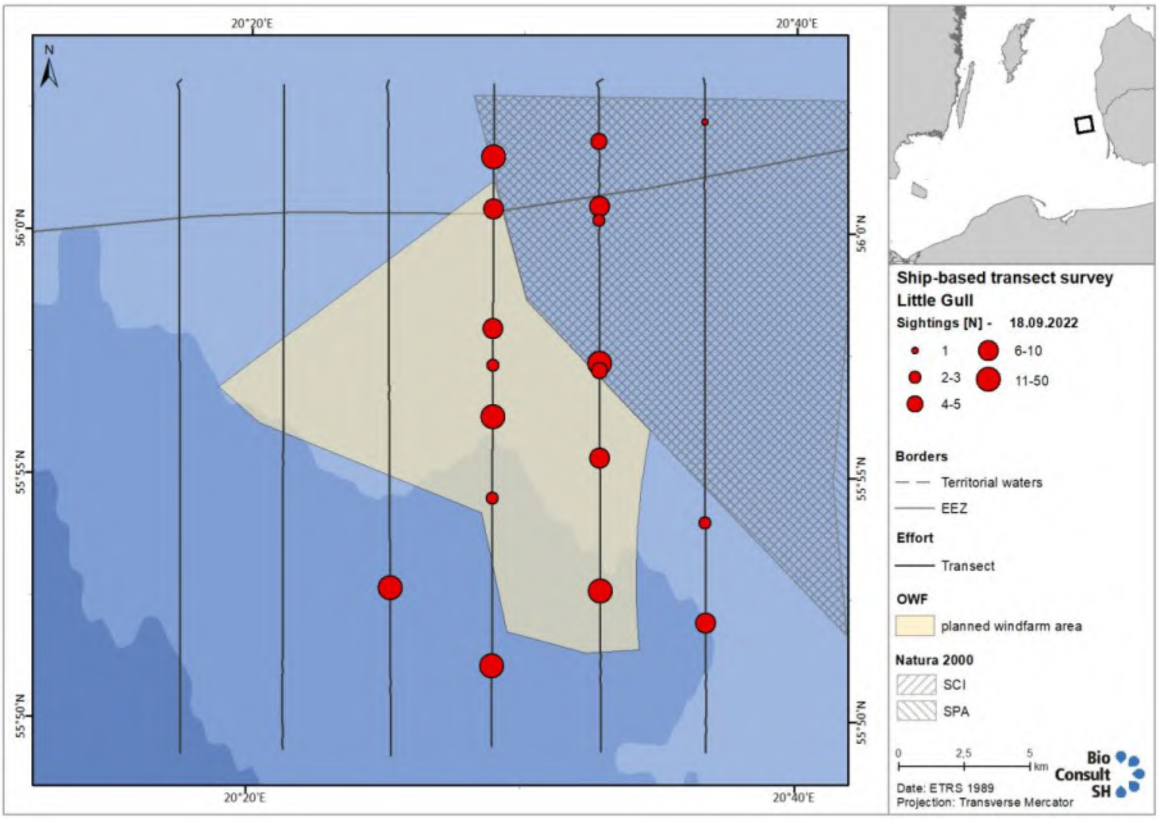



20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Little Gull
Sightings [N] - 05.05.2022
2-3
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator


20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Little Gull
Sightings [N] - 23.06.2022
2-3
6-10
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator

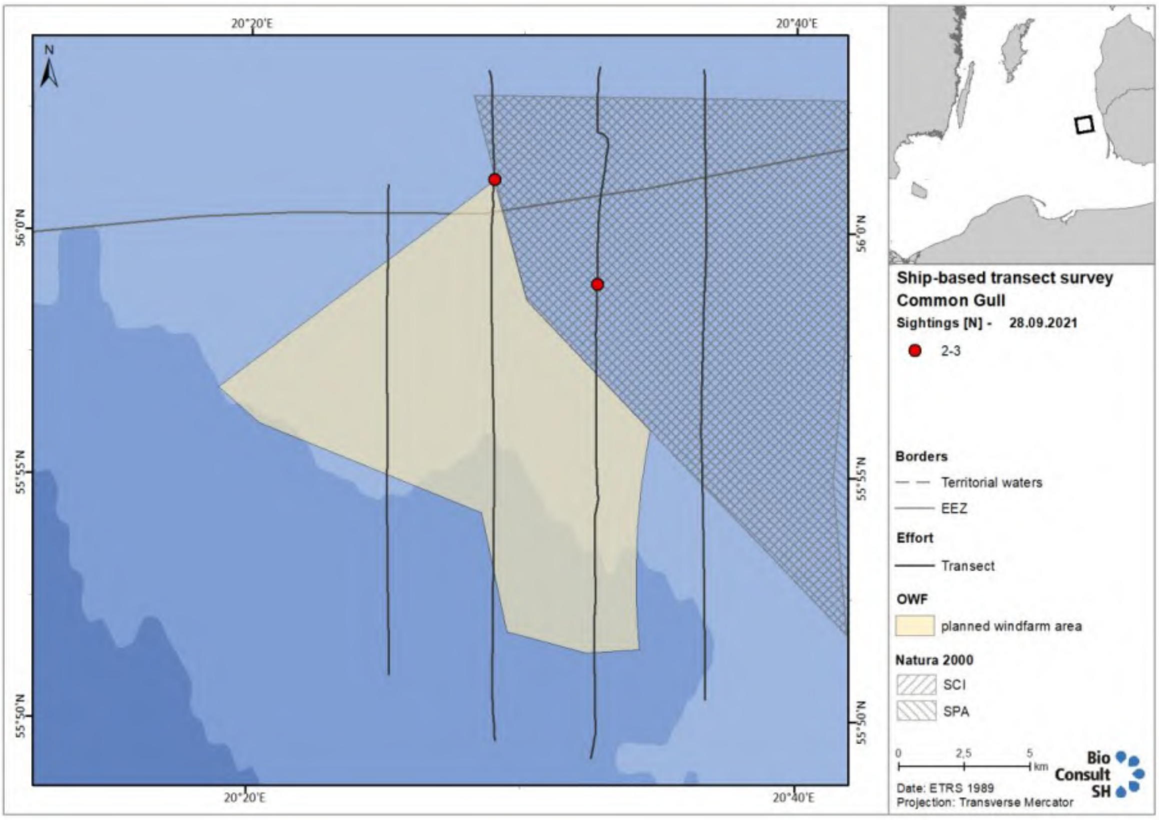

20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Little Gull
Sightings [N] - 21.07.2022
1
2-3
4-5
6-10
11-50
51-100
101-500
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

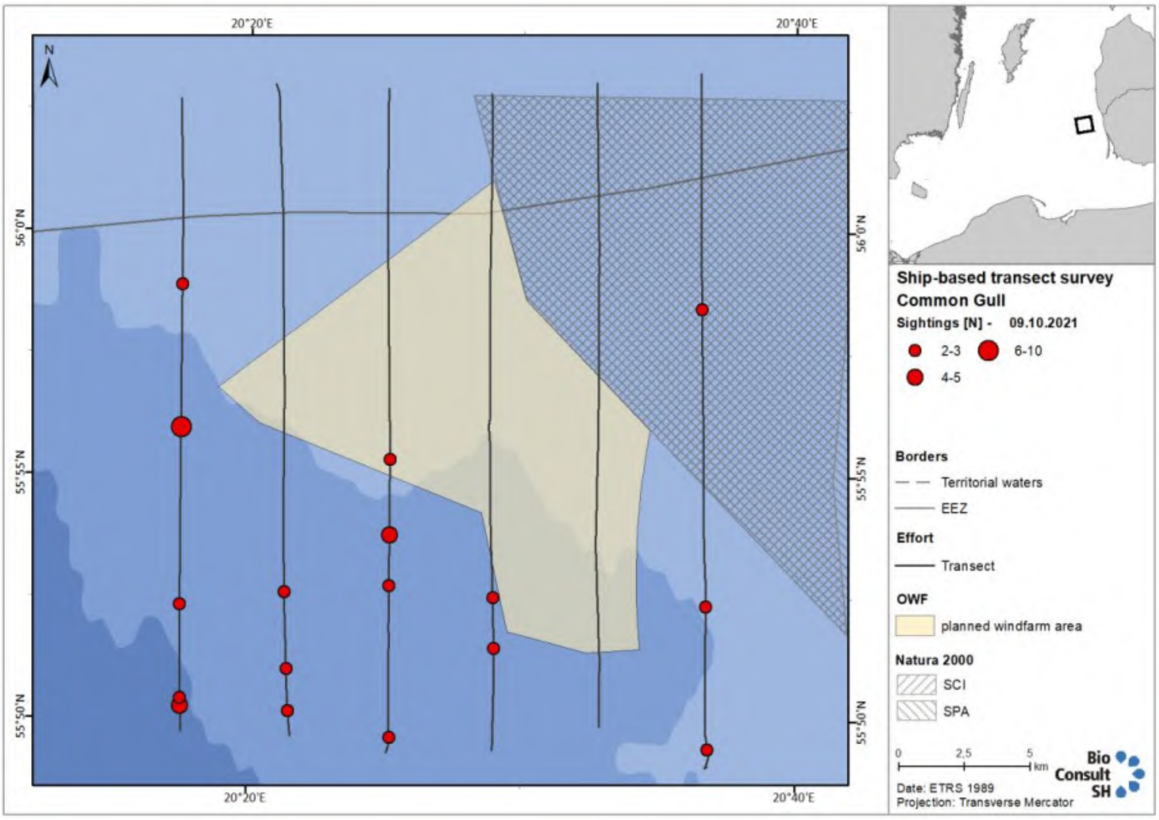

20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Little Gull
Sightings [N] - 28.08.2022
1
2-3
4-5
6-10
11-50
51-100
101-500
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

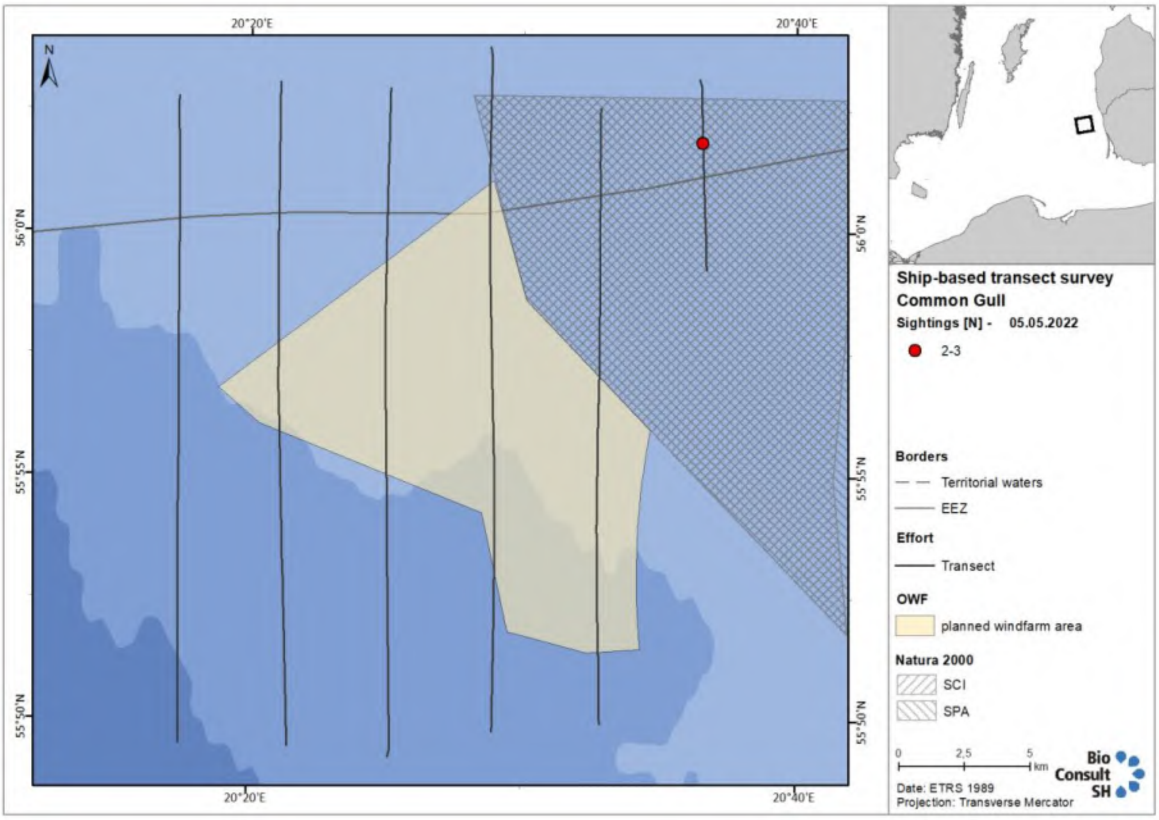


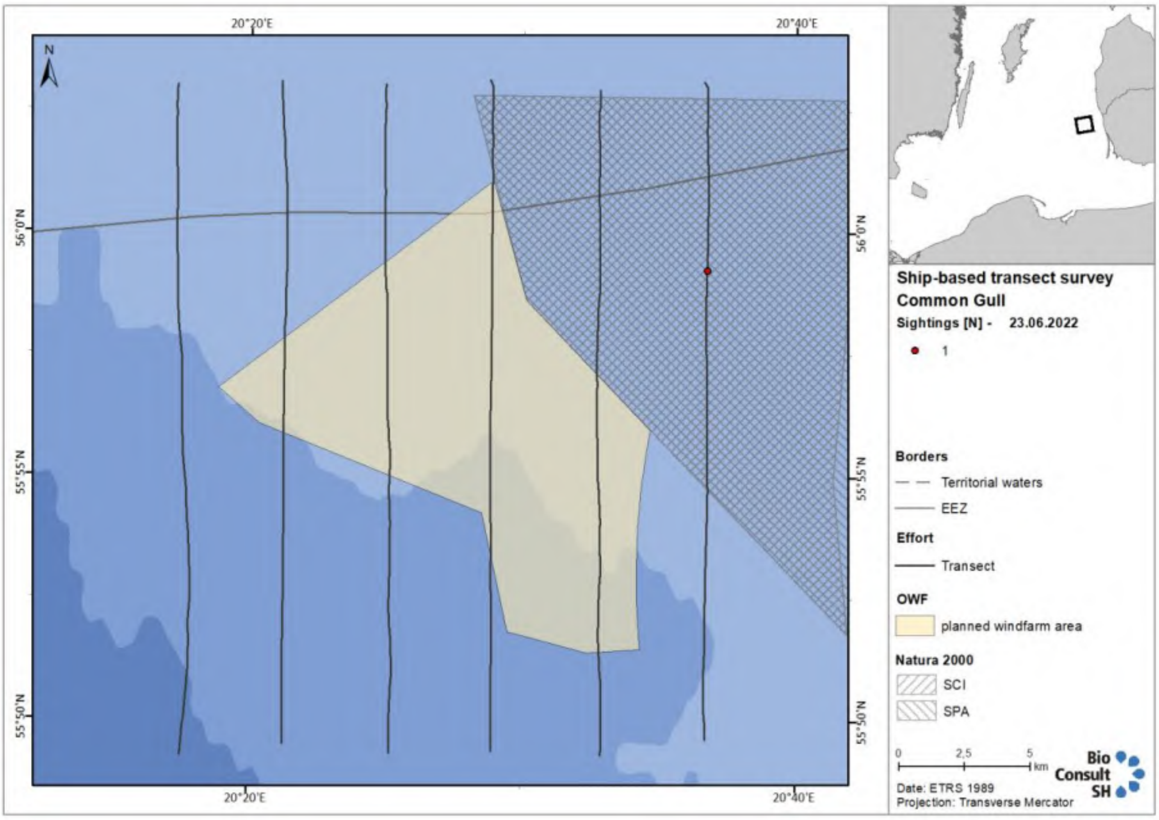
20°20'E
20°40'E
N
56°0'N
55°55'N
55°50'N
Ship-based transect survey
Little Gull
Sightings [N] - 18.09.2022
1
2-3
4-5
6-10
11-50
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

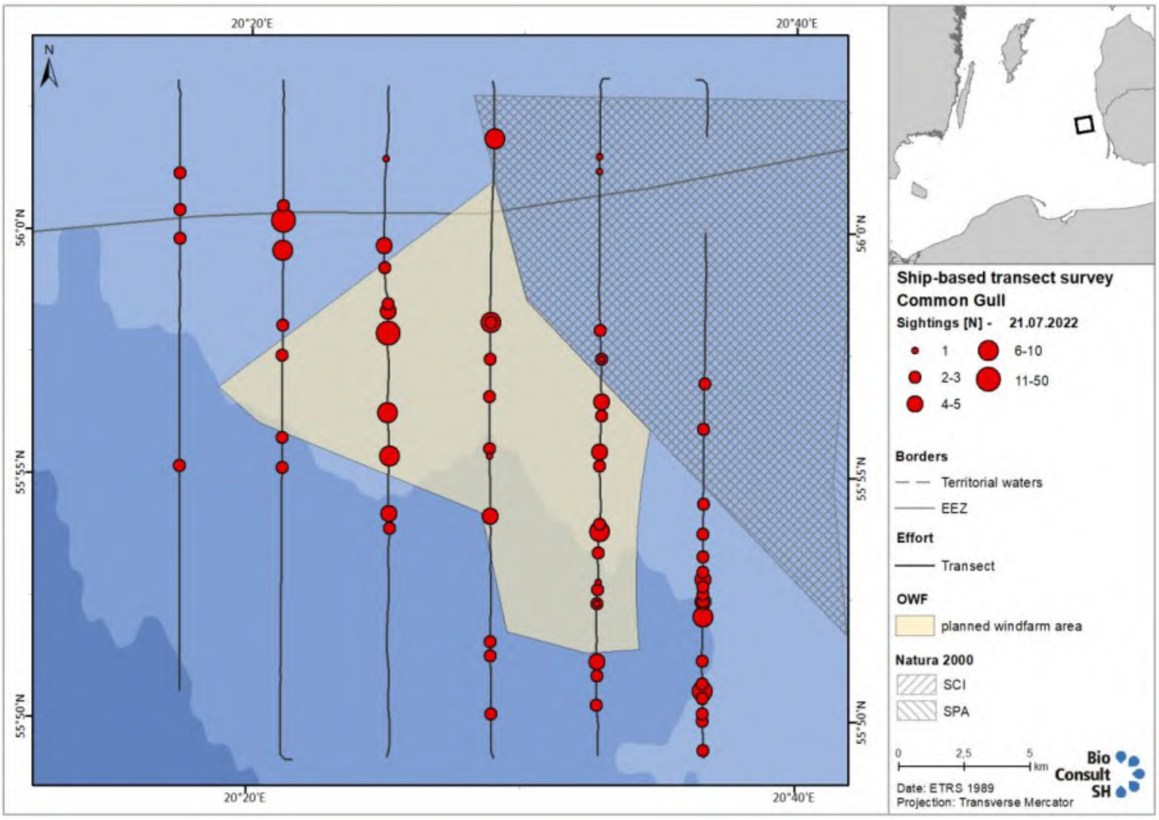
A.3.5 Common Gull (*Larus canus*)

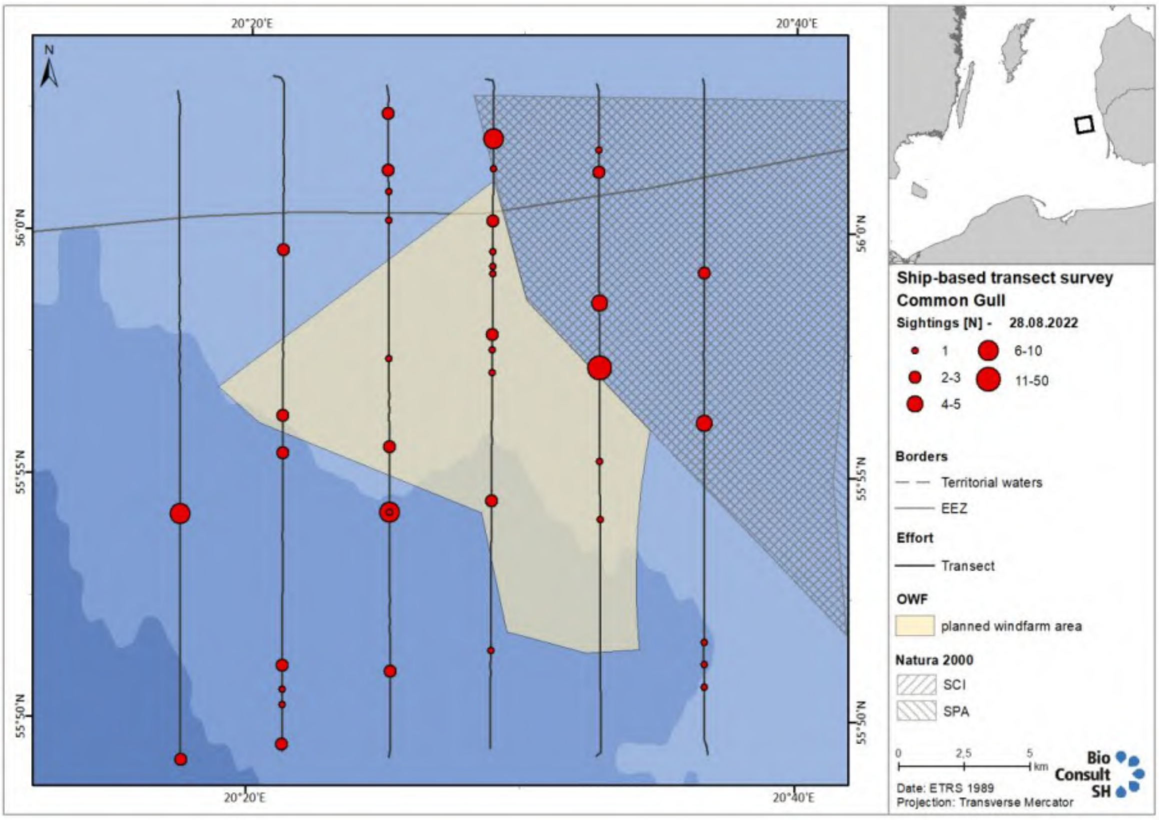


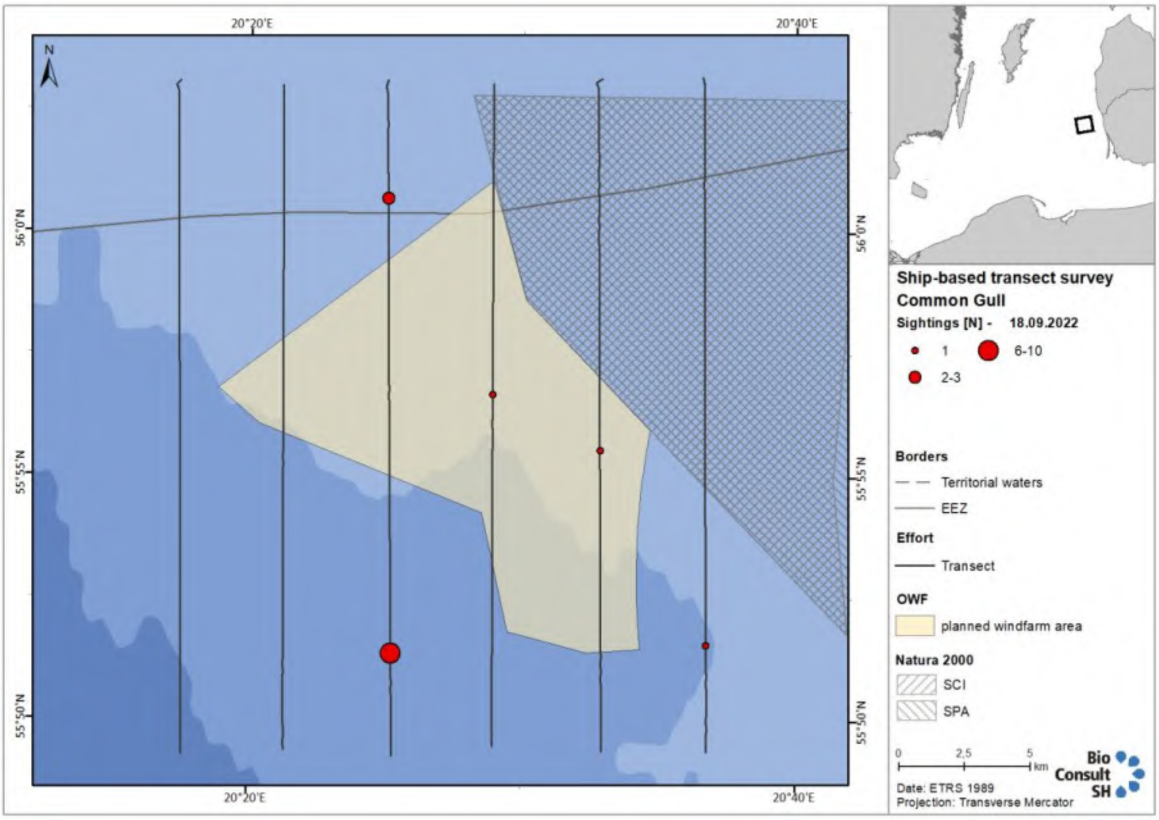



20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Common Gull
Sightings [N] - 05.05.2022
2-3
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0
2,5
5
km
Date: ETRS 1989
Projection: Transverse Mercator


20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Common Gull
Sightings [N] - 23.06.2022
1
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0
2,5
5
km
Date: ETRS 1989
Projection: Transverse Mercator

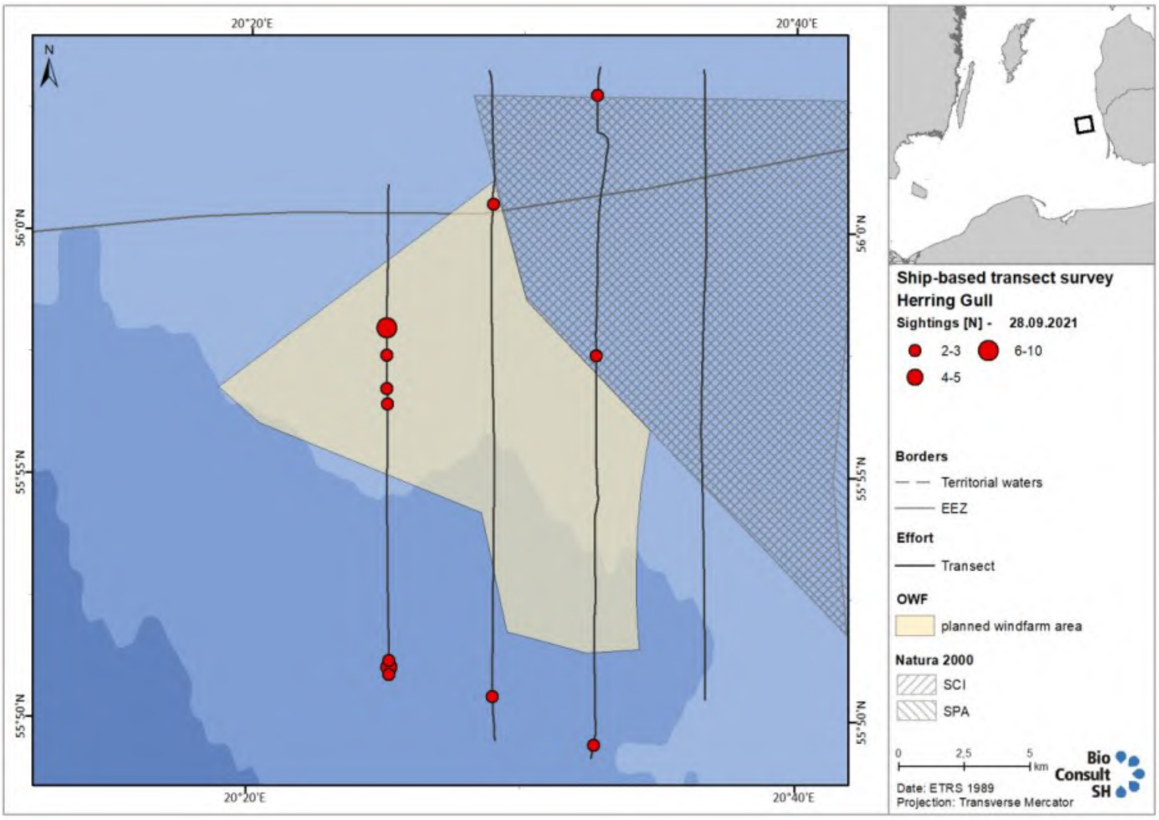

20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Common Gull
Sightings [N] - 21.07.2022
1
2-3
4-5
6-10
11-50
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

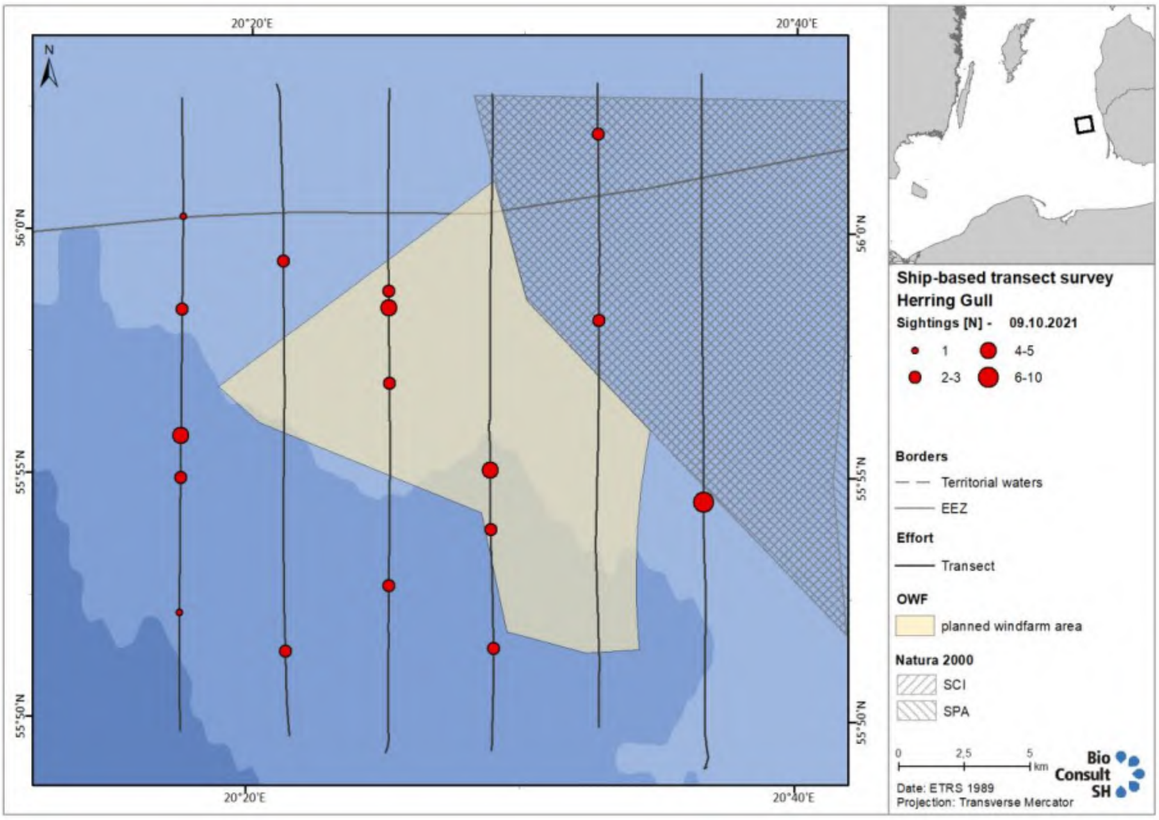

20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Common Gull
Sightings [N] - 28.08.2022
1
2-3
4-5
6-10
11-50
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

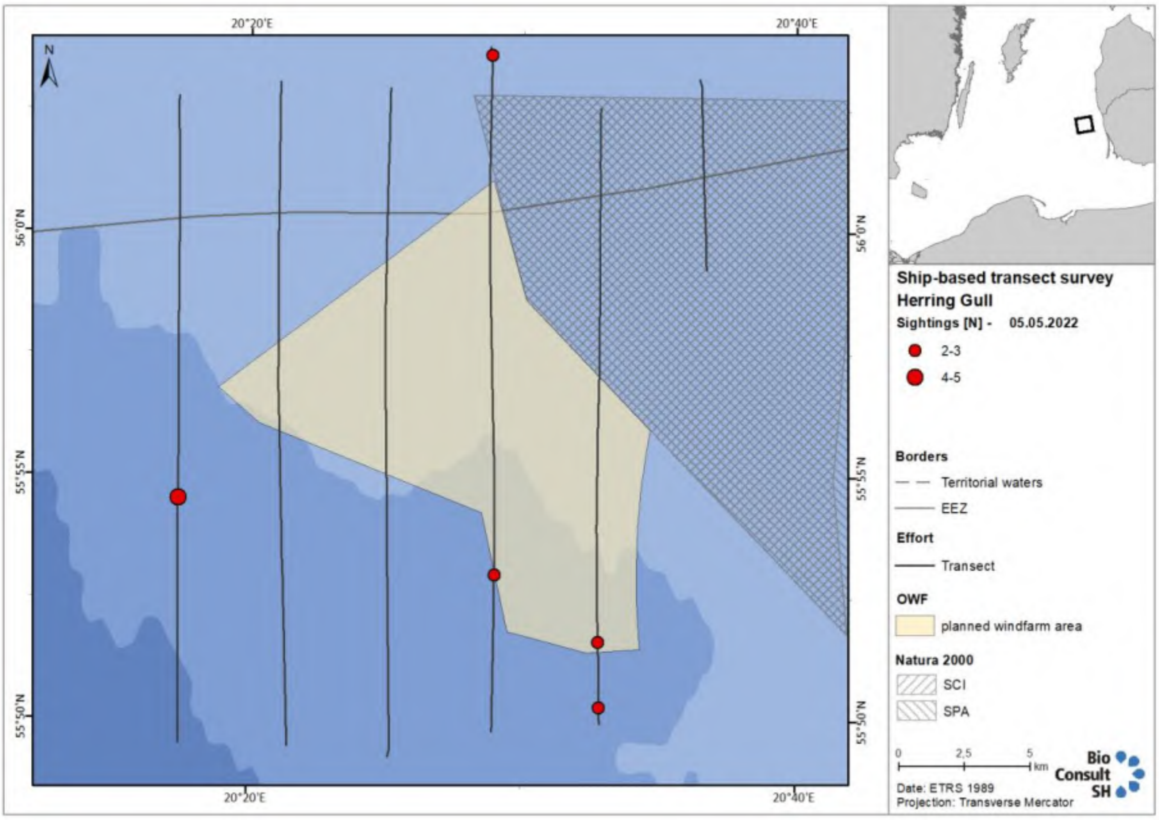


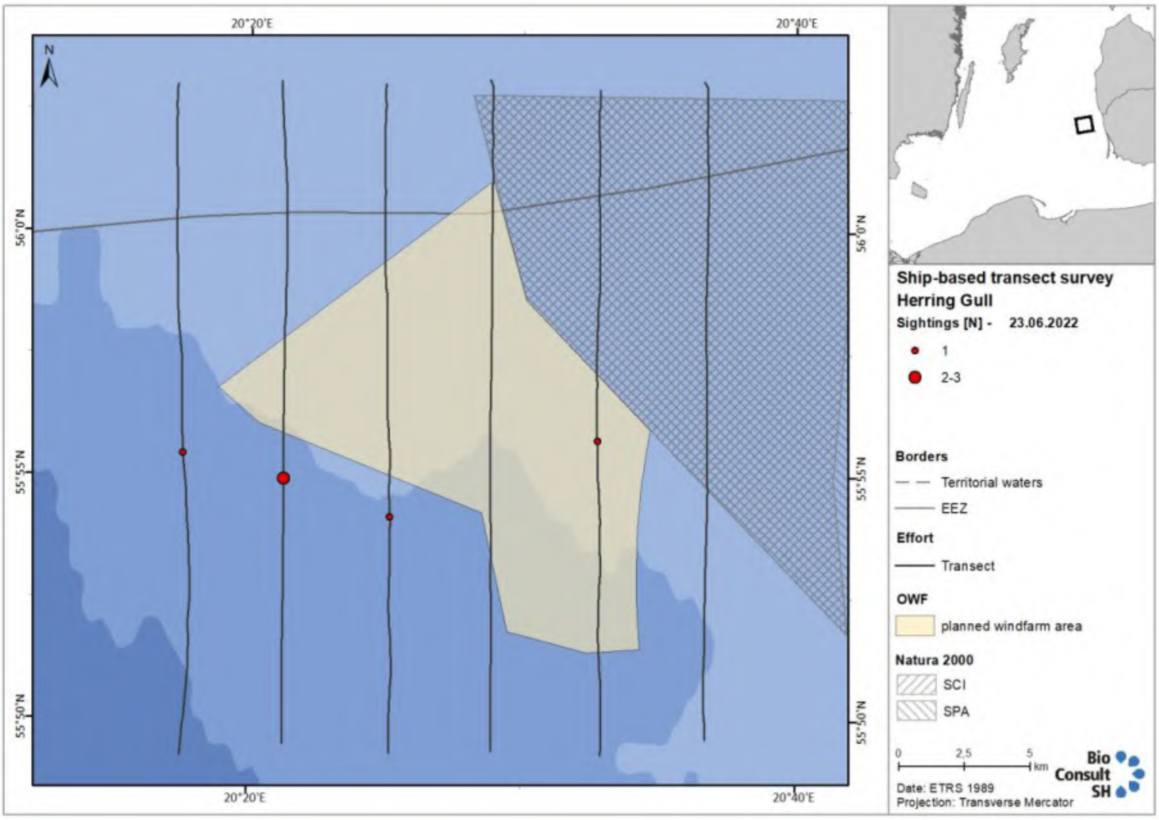
20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Common Gull
Sightings [N] - 18.09.2022
1
6-10
2-3
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

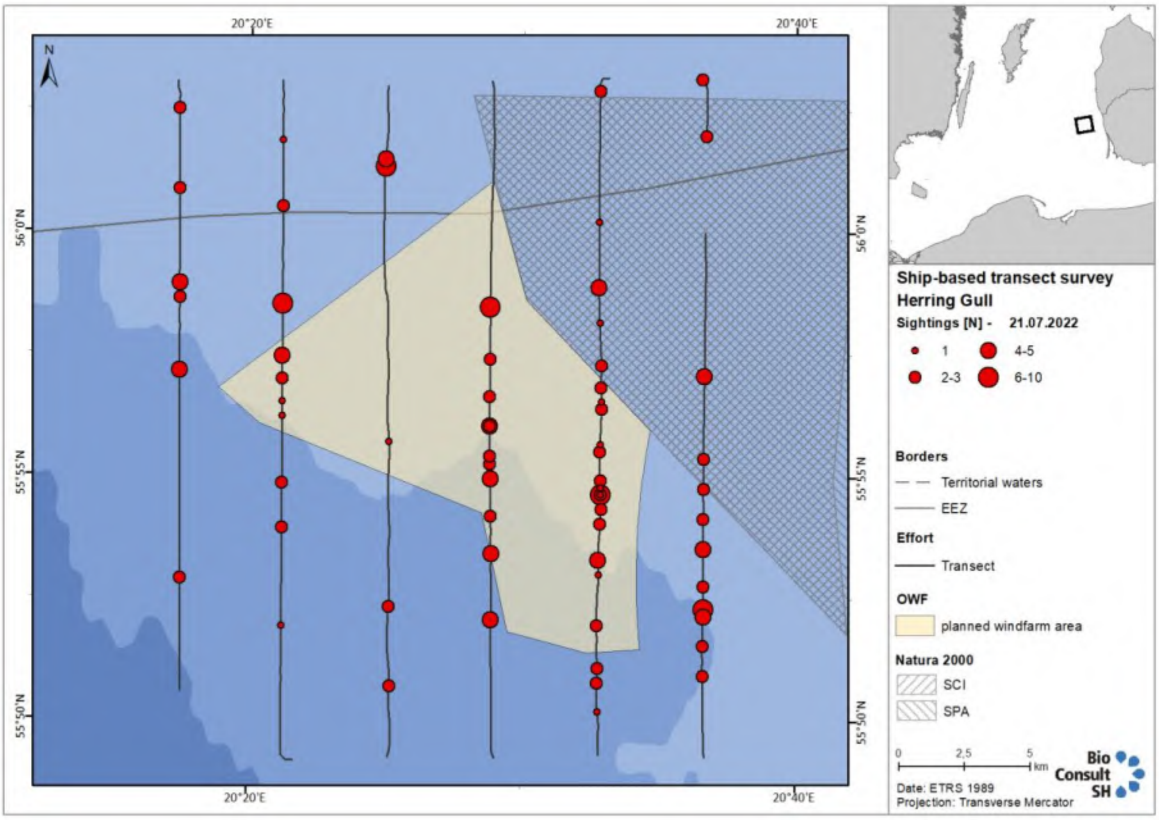
A.3.6 Herring Gull (*Larus argentatus*)

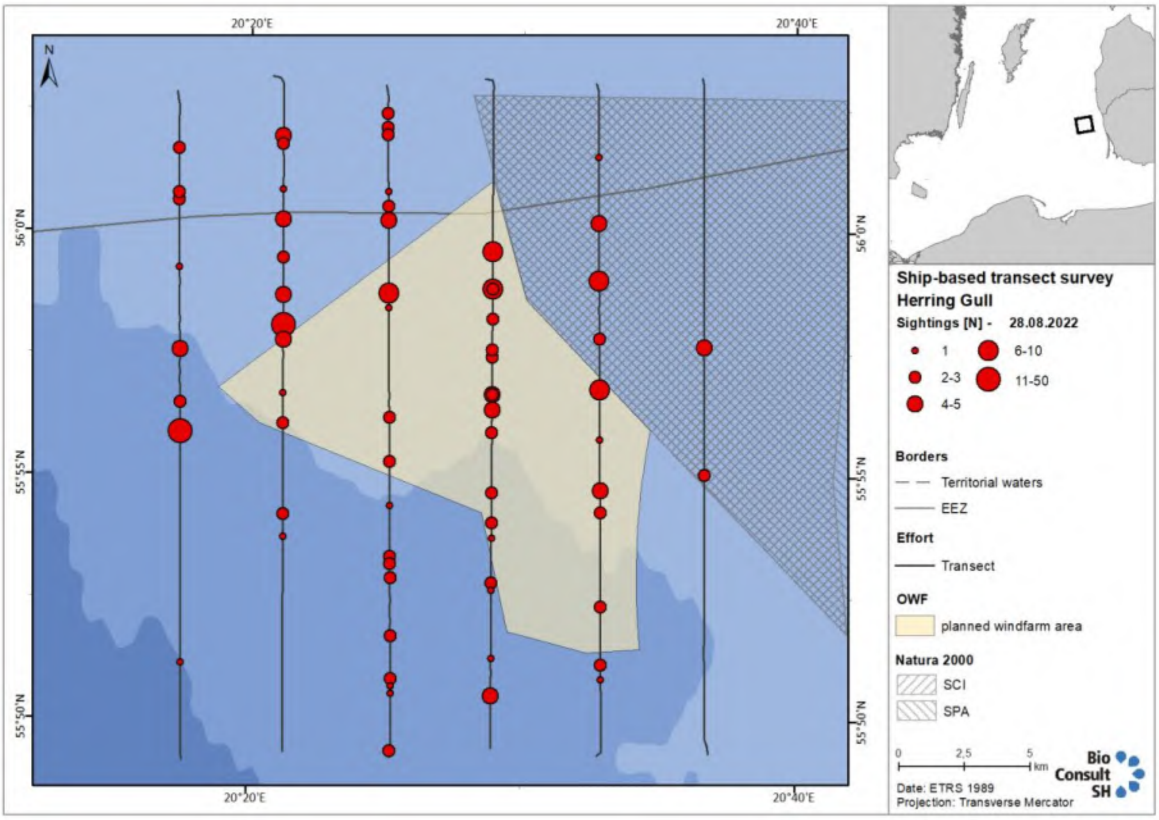


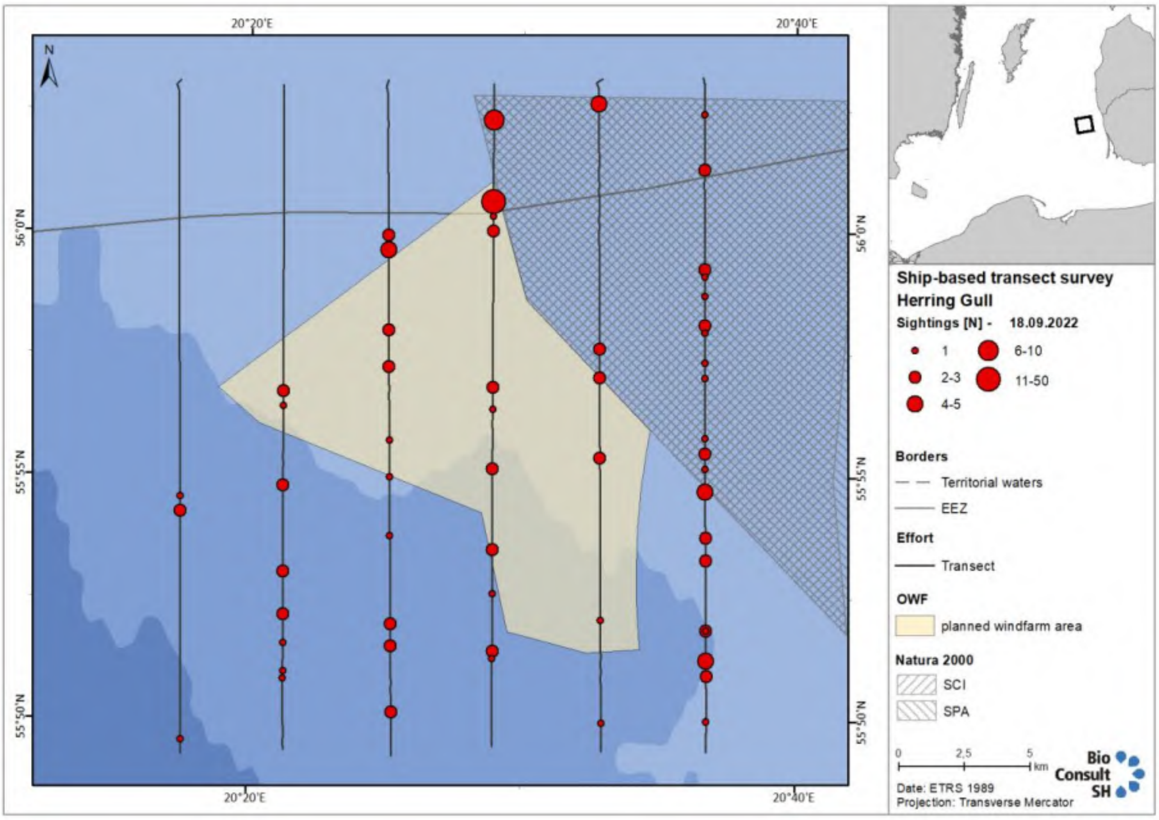



20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Herring Gull
Sightings [N] - 05.05.2022
2-3
4-5
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

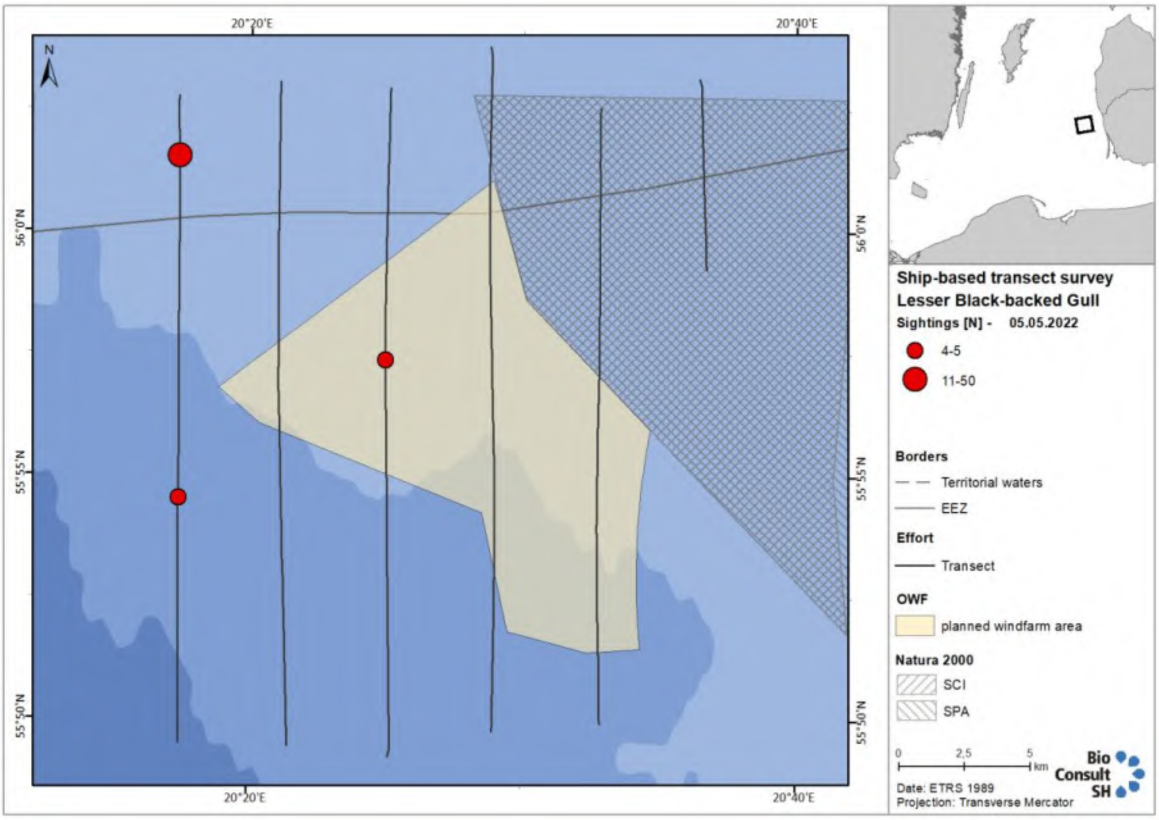

20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Herring Gull
Sightings [N] - 23.06.2022
1
2-3
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

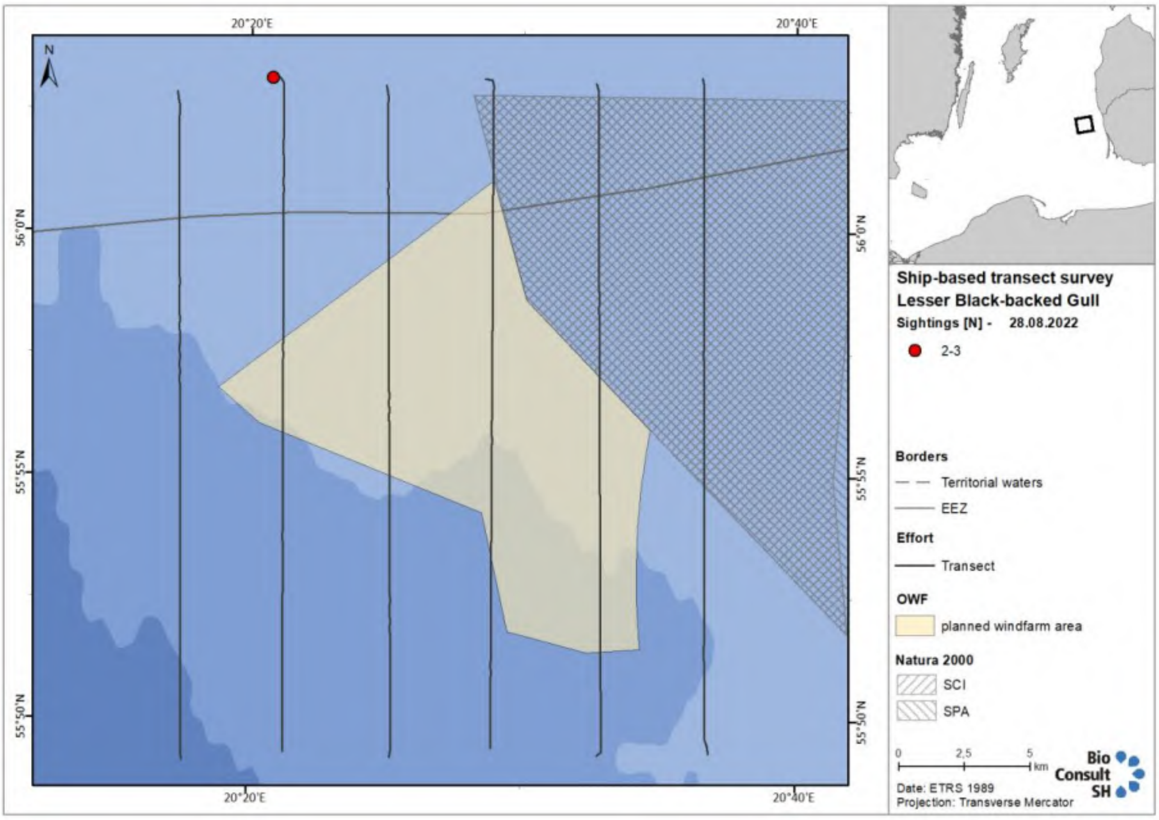

20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Herring Gull
Sightings [N] - 21.07.2022
1
2-3
4-5
6-10
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator

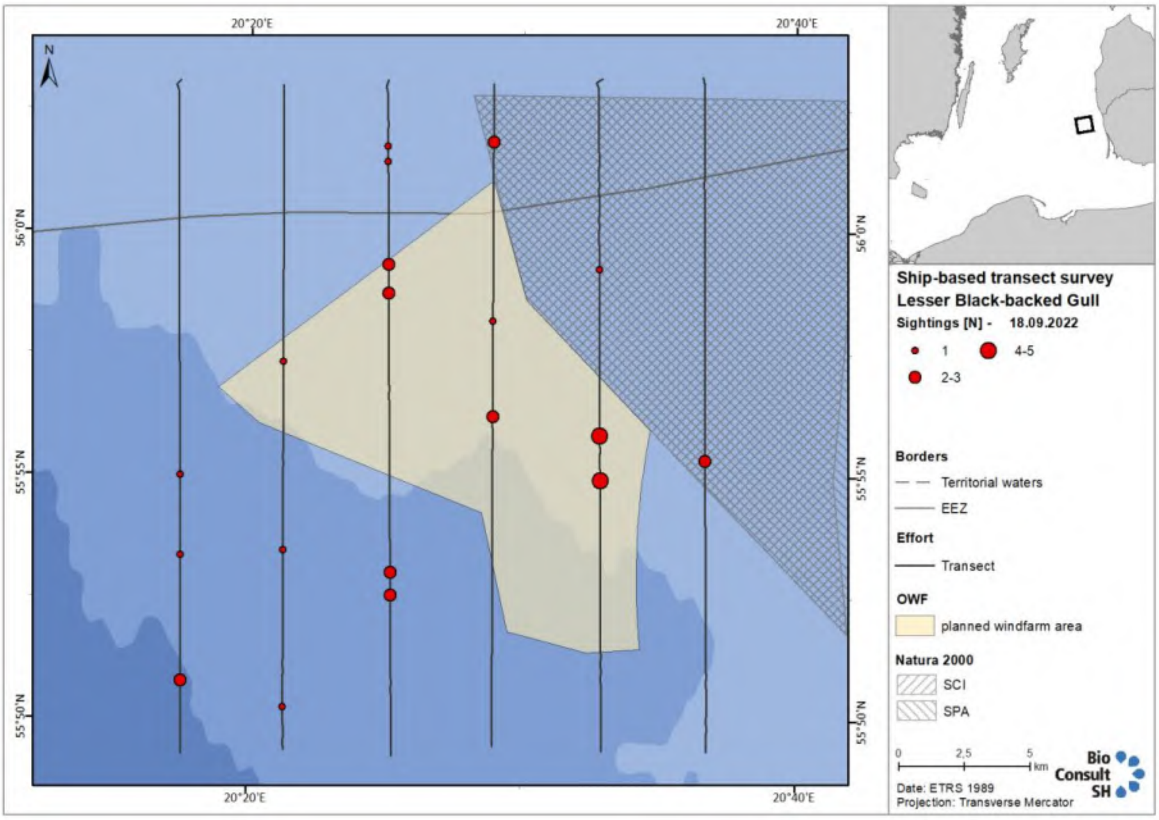

20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Herring Gull
Sightings [N] - 28.08.2022
1
2-3
4-5
6-10
11-50
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator


20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Herring Gull
Sightings [N] - 18.09.2022
1
2-3
4-5
6-10
11-50
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator

A.3.7 Lesser Black-backed Gull (*Larus fuscus*)

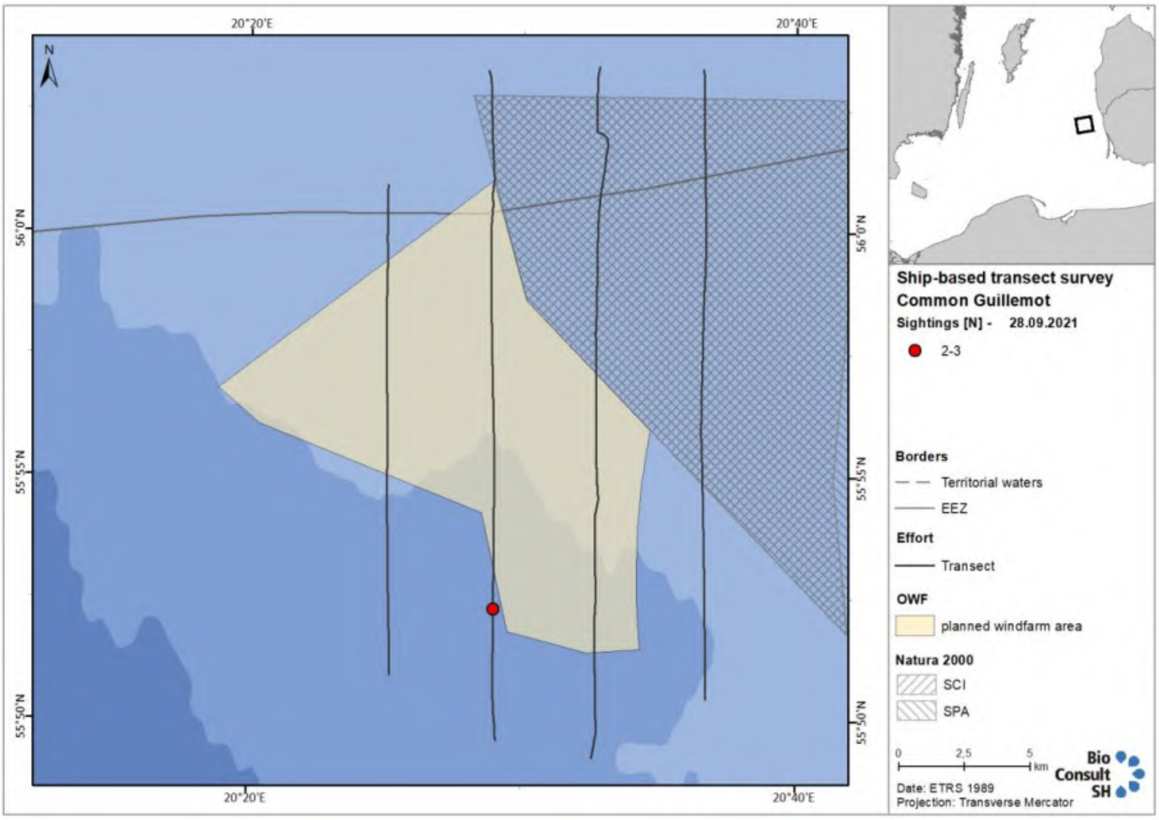

20°20'E
20°40'E
N
56°0'N
55°55'N
55°50'N
Ship-based transect survey
Lesser Black-backed Gull
Sightings [N] - 05.05.2022
4-5
11-50
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator

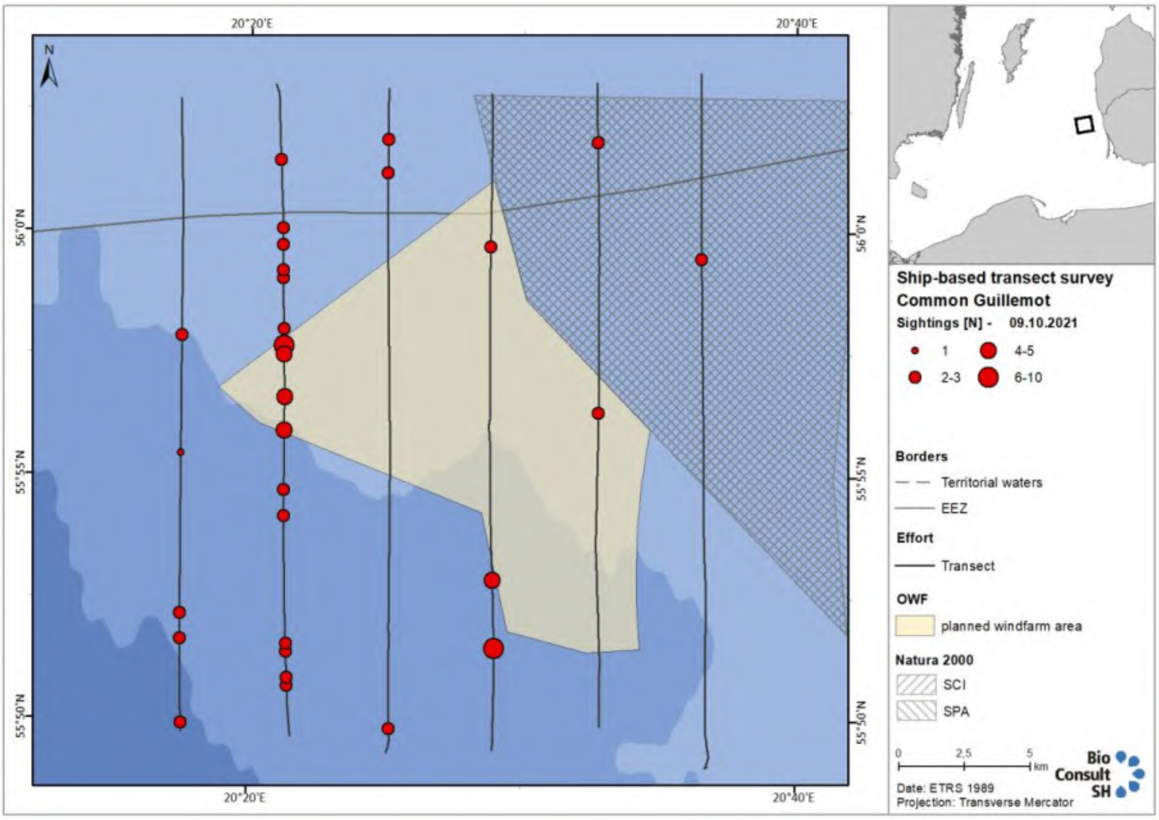

20°20'E
20°40'E
N
56°0'N
55°55'N
55°50'N
Ship-based transect survey
Lesser Black-backed Gull
Sightings [N] - 28.08.2022
2-3
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator

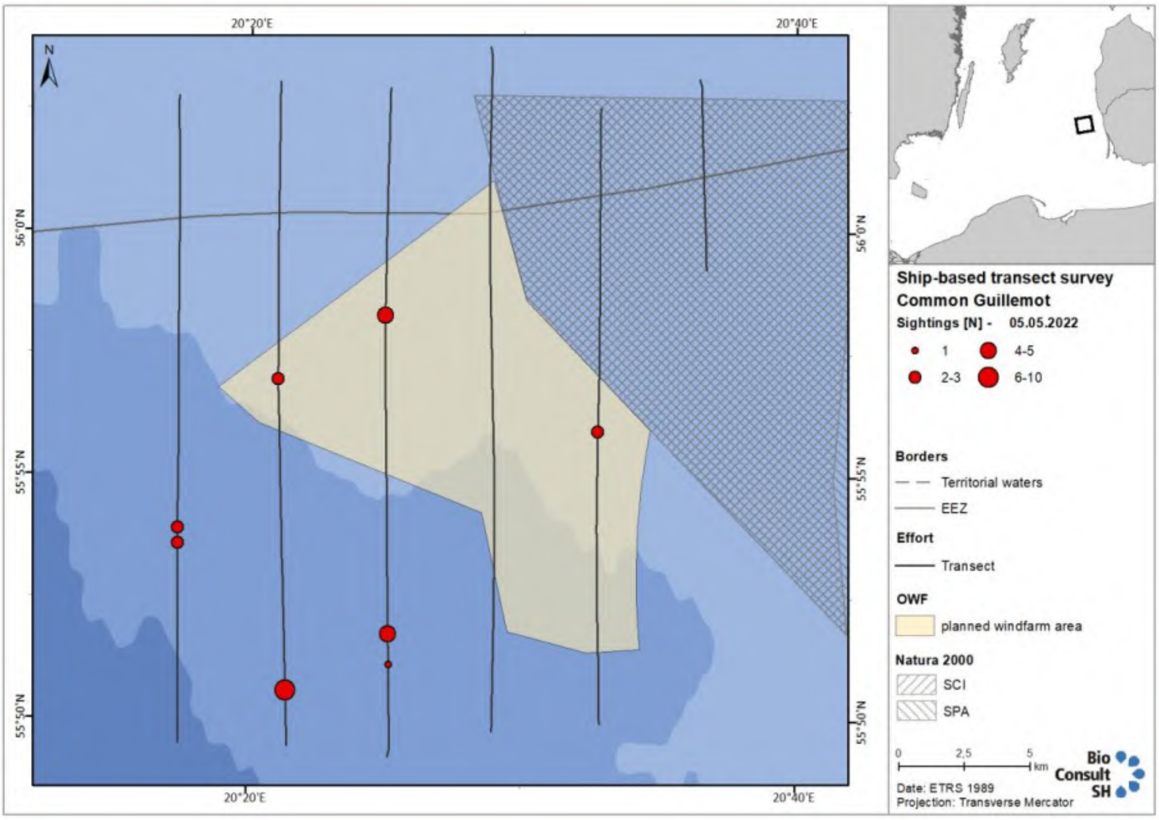


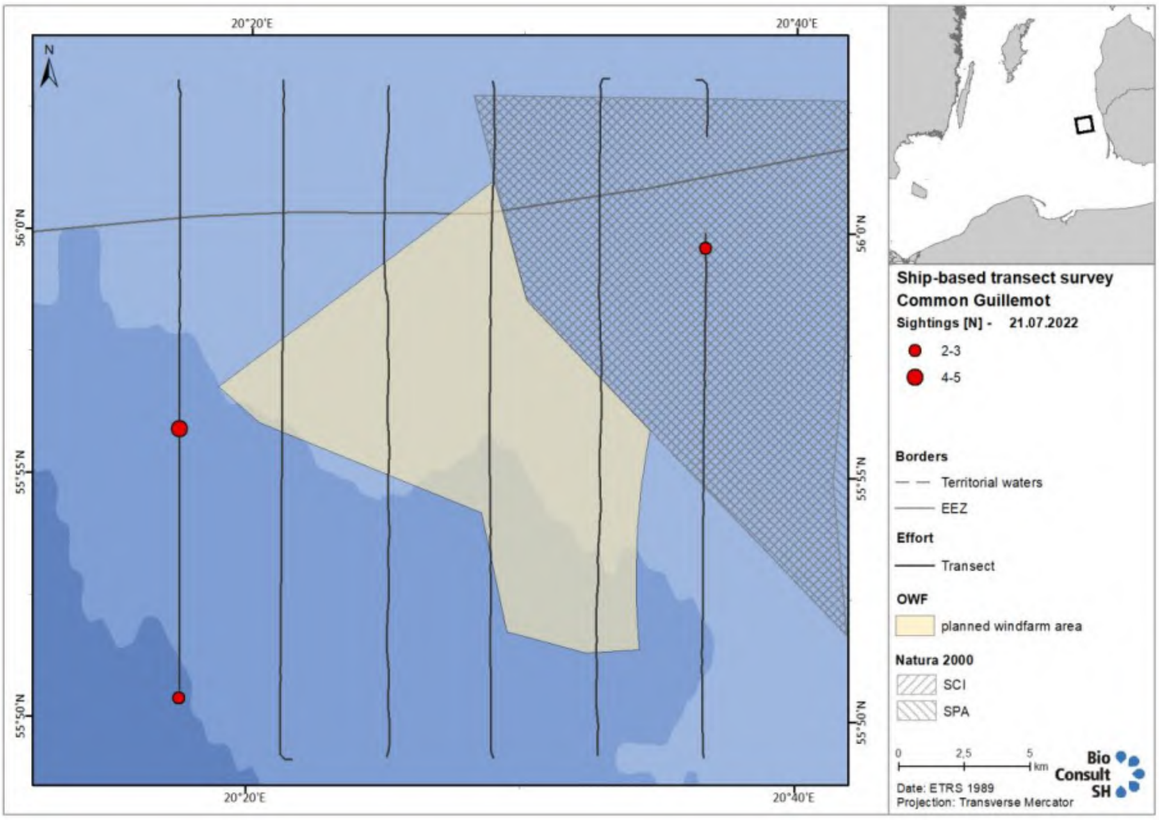
20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Lesser Black-backed Gull
Sightings [N] - 18.09.2022
1
2-3
4-5
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator

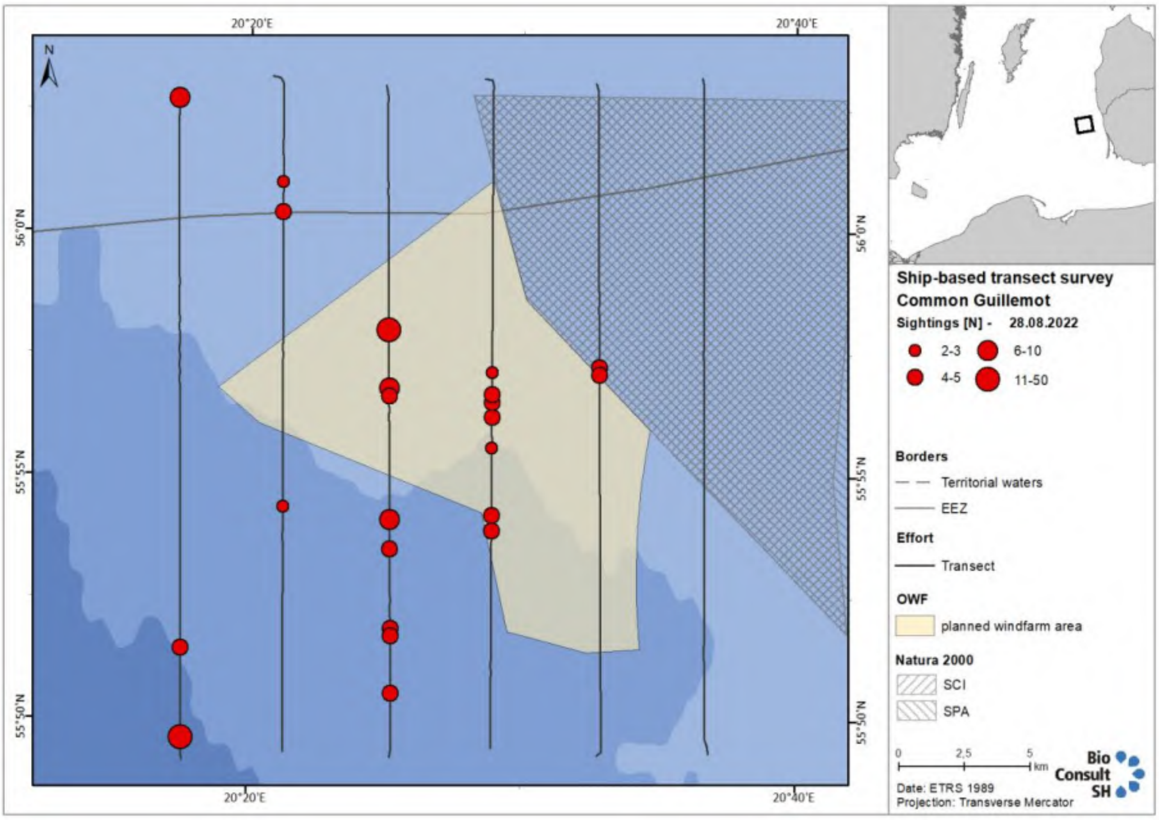
A.3.8 Common Guillemot (*Uria aalge*)

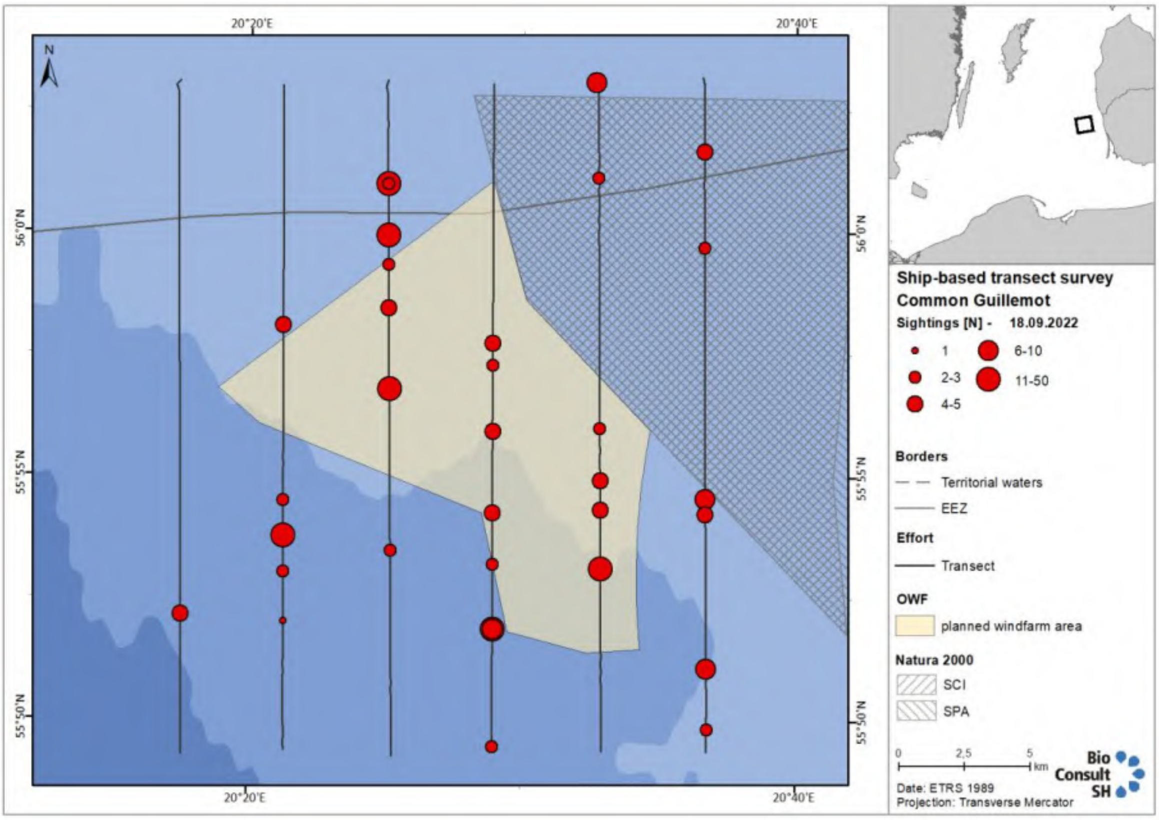




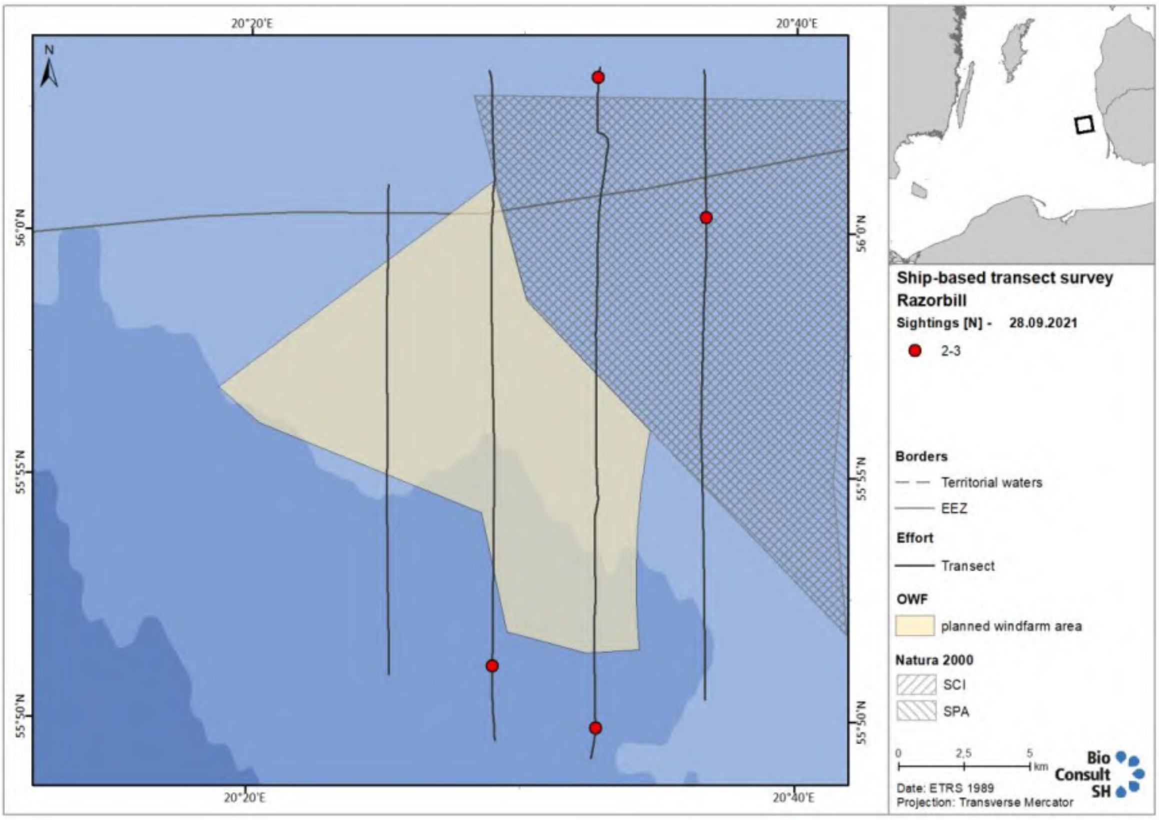

20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Common Guillemot
Sightings [N] - 05.05.2022
1
2-3
4-5
6-10
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

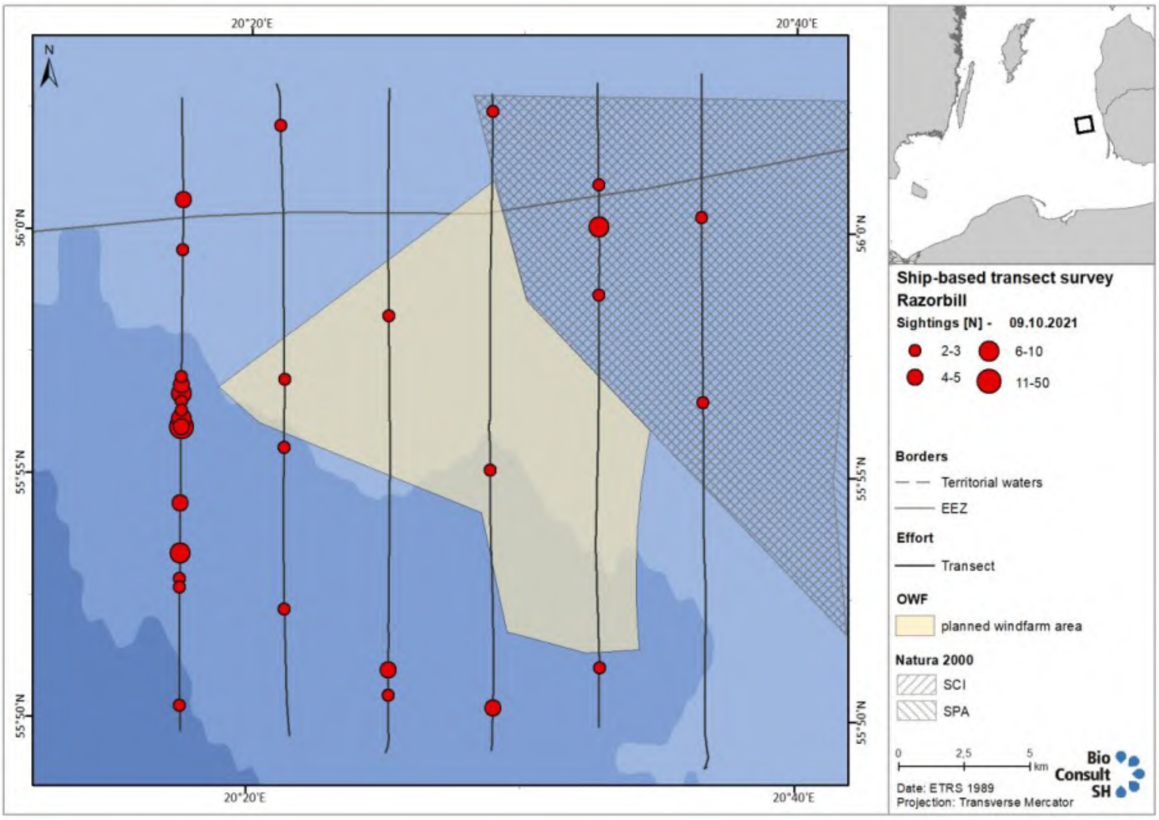

20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Common Guillemot
Sightings [N] - 21.07.2022
2-3
4-5
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator
Bio Consult SH

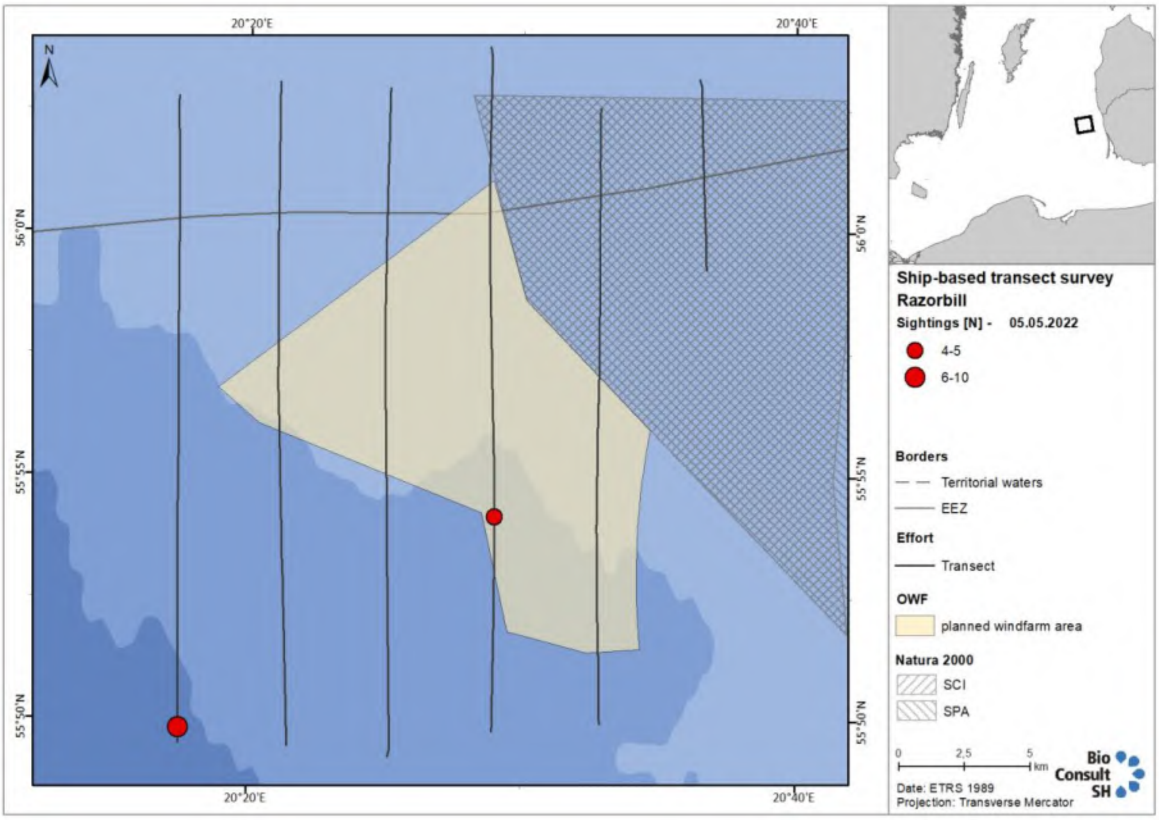

20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Common Guillemot
Sightings [N] - 28.08.2022
2-3
6-10
4-5
11-50
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator


20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Common Guillemot
Sightings [N] - 18.09.2022
1
6-10
2-3
11-50
4-5
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator

A.3.9 Razorbill (*Alca torda*)







20°20'E
20°40'E
56°0'N
55°55'N
55°50'N
N
Ship-based transect survey
Razorbill
Sightings [N] - 05.05.2022
4-5
6-10
Borders
Territorial waters
EEZ
Effort
Transect
OWF
planned windfarm area
Natura 2000
SCI
SPA
0 2,5 5 km
Date: ETRS 1989
Projection: Transverse Mercator

4 PRIEDAS

Jūrinių vėjo elektrinių parko vizualizacija

4 PRIEDAS: 350 m aukščio VE (90 elektrinių) vizualizacijos iš vertintų regyklų skirtingais metų laikais

VšĮ „Pajūrio tyrimų ir planavimo instituto" specialistai atliko planuojamo įrengti jūrinių vėjo elektrinių (toliau-VE) parko vizualizacijas iš aktualių regyklų. Vizualizacijos buvo atliktos naudojantis WindPro (versija 3.5) programinės įrangos „Vizual Photomontage" plėtiniu. Planuojamų VE vizualizacijoms atlikti priimtos sąlygos:

- Fotofiksacijos atliktos apžvalgos vietose (lentelė Nr. 1) skirtingais metų laikais, skirtingu paros metu ir vyraujant skirtingoms oro sąlygoms. Atvaizduojamų VE apšvietimo sąlygas nusako saulės padėtis danguje, kuri priklauso nuo fotografavimo laiko ir vyravusių orų sąlygų (debesuotumas, matomumo sąlygos);
- Atliekant planuojamų VE vizualizacijas priimta, kad matomumo sąlygos yra geriausios, t.y. matomumas jūroje yra virš 30 km ir visos planuojamos VE bus matomos;
- Fotofiksacijai objektyvo židinio nuotolis priimtas 50 mm, kuris atspindi žmogaus akies matymo lauką;

Pastaba. Atsižvelgiant į Palangos savivaldybės atstovų ateityje planuojamą atverti vaizdą į jūrą (pašalinant šalia esančius želdinius) ties apžvalgos vieta Nr. 2 – Alkos kalnas, planuojamos įrengti VE, kurios šiuo metu yra užstojamos želdinių yra atvaizduotos raudona spalva.

1 lentelė. Planuojamo įrengti Jūrinių vėjo elektrinių parko vizualizacijoms naudojamos foto fiksacijų informacija.

Nr.	Jūrinių vėjo elektrinių parko apžvalgos vieta	Apžvalgos vietos koordinatės	Foto fiksacijos data	Fotografavimo taško altitudė (virš jūros lygio), m
1	Papės paplūdimys	315127, 6228454	2022 m., rugpjūčio 19 d., 10 val. 47 min	2,3
2	Alkos kalnas	317719, 6215747	2022 m., gegužės 3 d., 8 val. 57 min; 2022 m., liepos 19 d., 9 val. 29 min; 2022 m., spalio 31 d., 9 val. 58 min;	6,3
3	Apžvalgos aikštelė prie Žvejo dukrų	317432, 6214301	2022 m., gegužės 3 d., 6 val. 47 min; 2022 m., rugpjūčio 13 d., 15 val. 50 min; 2022 m., spalio 31 d., 9 val. 42 min;	7,2
4	Išėjimas ties neįgaliųjų paplūdimiu	317477, 6211481	2022 m., rugpjūčio 13 d., 15 val. 28 min;	6,2
5	Išėjimas ties Jūratės g.	315913, 6202720	2022 m., rugpjūčio 13 d., 14 val. 22 min;	5,2
6	Palangos tilto apžvalgos aikštelė	315661, 6202326	2022 m., kovo 11 d., 11 val. 55 min; 2022 m., gegužės 18 d., 21 val. 39 min; 2022 m., rugpjūčio 8 d., 9 val. 29 min; 2022 m., rugpjūčio 12 d., 21 val. 4 min; 2022 m., rugpjūčio 13 d., 13 val. 59 min; 2022 m., spalio 12 d., 18 val. 26 min; 2022 m., spalio 31 d., 8 val. 33 min.	7,5

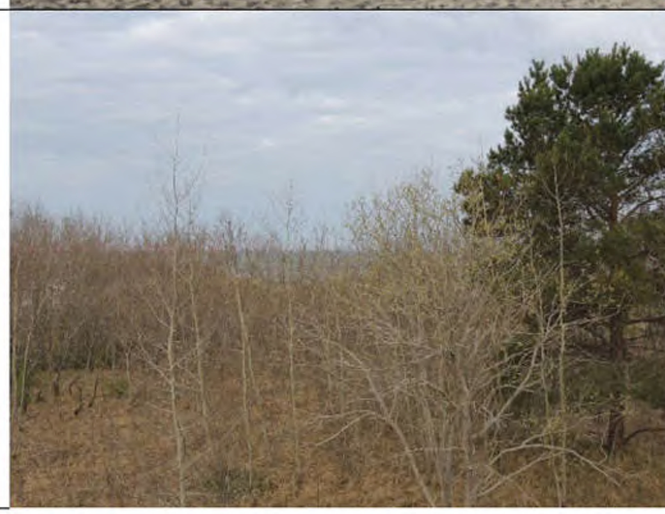
Nr.	Jūrinių vėjo elektrinių parko apžvalgos vieta	Apžvalgos vietos koordinatės	Foto fiksacijos data	Fotografavimo taško altitudė (virš jūros lygio), m
7	Palangos tiltas	315277, 6202401	2022 m., kovo 11 d., 12 val. 4 min; 2022 m., gegužės 18 d., 21 val. 16 min; 2022 m., liepos 12 d., 23 val. 57 min; 2022 m., spalio 10 d., 18 val. 31 min; 2022 m., spalio 31 d., 8 val. 40 min;	5,0
8	Paplūdimys (išėjimas iš Dariaus ir Girėno g.)	315655, 6201565	2022 m., rugpjūčio 13 d., 13 val. 49 min	3,2
9	Birutės kalnas	315733, 6200770	2022 m., gegužės 3 d., 7 val. 18 min; 2022 m., rugpjūčio 13 d., 13 val. 41 min; 2022 m., rugpjūčio 13 d., 13 val. 41 min; 2022 m., rugpjūčio 18 d., 20 val. 30 min; 2022 m., spalio 31 d., 9 val. 6 min;	17,5
10	Olandų kepurė	316140, 6188763	2022 m., rugpjūčio 19 d., 12 val. 18 min; 2022 m., rugpjūčio 19 d., 12 val. 18 min;	13,1
11	Klaipėdos uosto šiaurinis molas	316793, 6181101	2022 m., rugpjūčio 19 d., 12 val. 50 min;	3,3

Vizualizacijų žiūrėjimo ypatumai:

Siekiant kuo tiksliau atkartoti žmogaus akiai artimą vaizdinių suvokimą svarbu teisingai žiūrėti į atliktas vizualizacija (nuotraukas). Nuotraukų dirbtinis didinimas (ar mažinimas) gali smarkiai iškreipti vaizdą (ir objektų suvokimą), todėl rekomenduojama, kad parengtos vizualizacijos būtų stebimos su specialistų pagalba ir remiantis standartine žiūrėjimo instrukcija (A4 formato nuotraukos turi būti žiūrimos iš 29 cm atstumo).

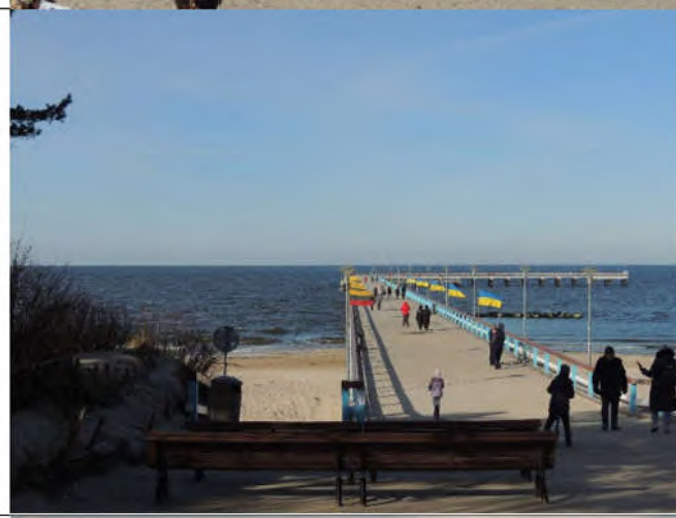
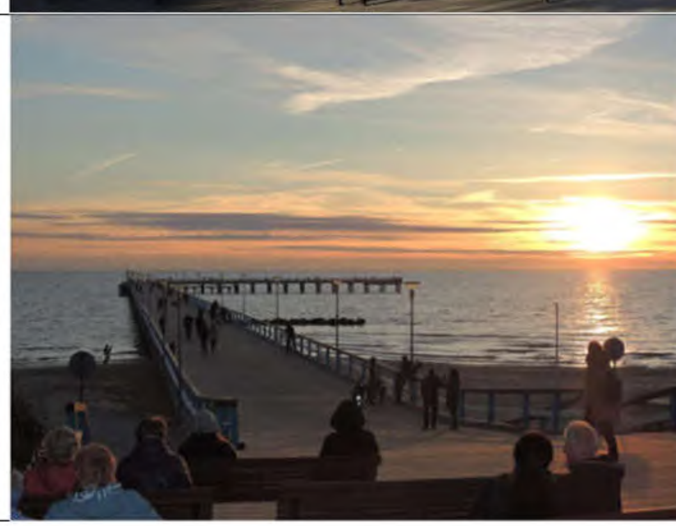
Projekto viešinimo metu bus parengtas stendas su vizualizacijomis, kurias padės stebėti kraštovaizdžio specialistai.

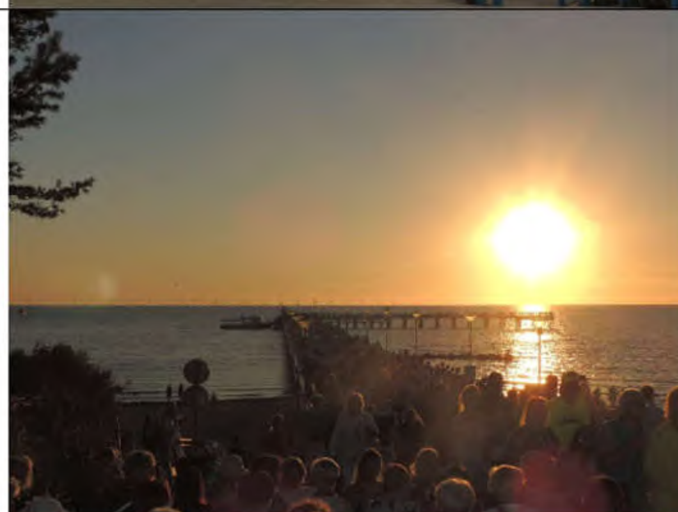
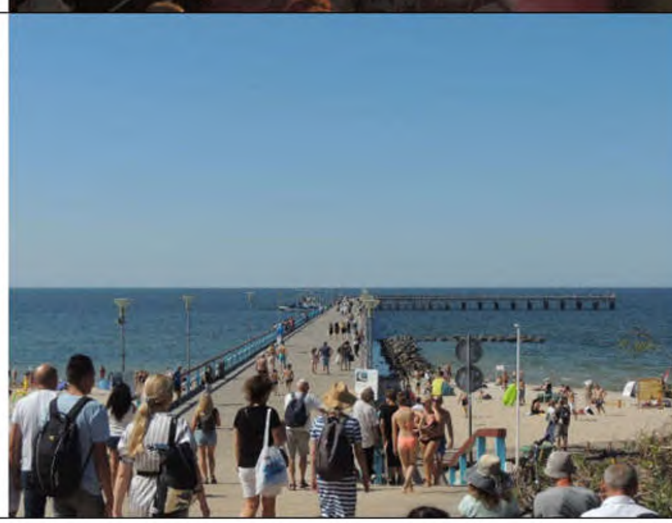
Atliktų vizualizacijų sąvadas:

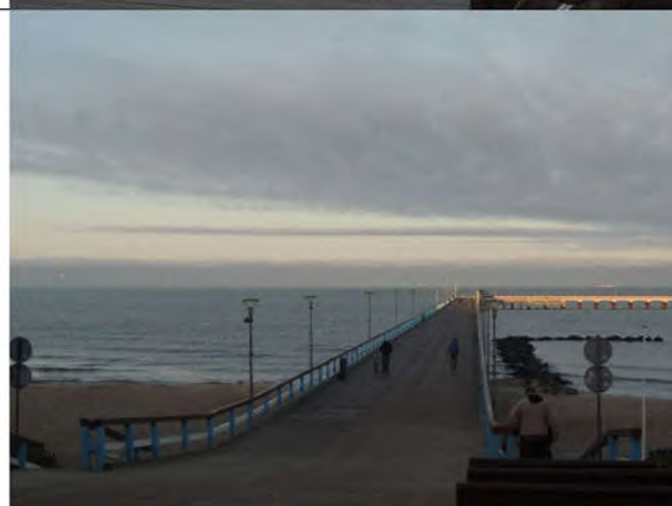
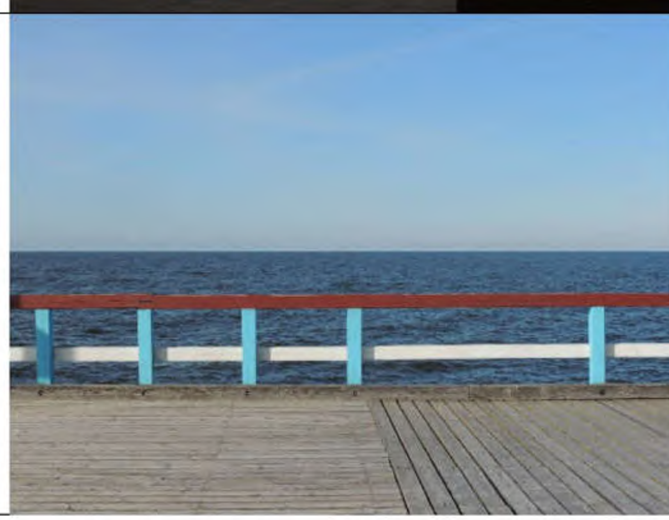
Papės paplūdimys	koordinatės *315127, 6228454* **Fotografavimo data –** 2022 m., rugpjūčio 19 d., 10 val. 47 min **Fotografavimo azimutas –** 225º **Fotografavimo taško altitudė (virš jūros lygio) –** 2,3 m	
Alkos kalnas	koordinatės *317719, 6215747* **Fotografavimo data –** 2022 m., gegužės 3 d., 8 val. 57 min **Fotografavimo azimutas –** 270º **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	
	koordinatės *317719, 6215747* **Fotografavimo data –** 2022 m., liepos 19 d., 9 val. 29 min **Fotografavimo azimutas –** 270º **Fotografavimo taško altitudė (virš jūros lygio) –** 6,3 m	

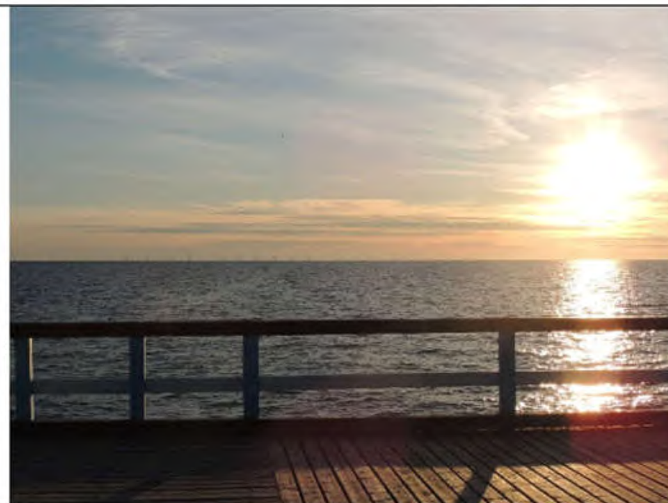
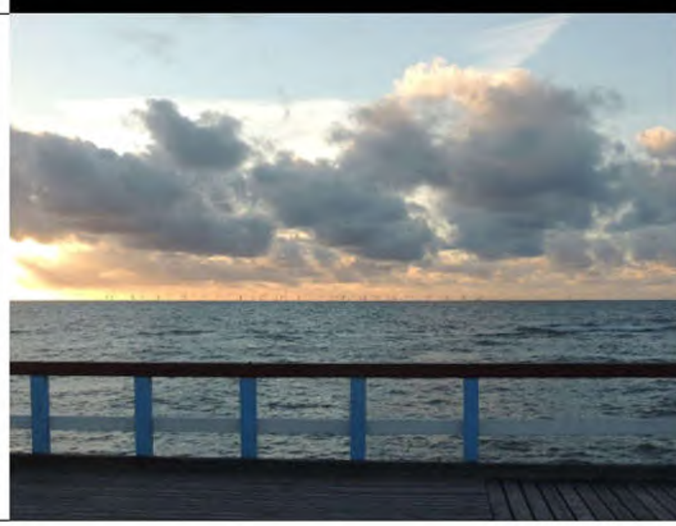
	koordinatės *317724, 6215748* **Fotografavimo data –** 2022 m., spalio 31 d., 9 val. 58 min **Fotografavimo azimutas –** 265° **Fotografavimo taško altitudė (virš jūros lygio) –** 6,3 m	
Apžvalgos aikštelė prie Žvejo dukrų	koordinatės 3*17433, 6214311* **Fotografavimo data –** 2022 m., spalio 31 d., 9 val. 42 min **Fotografavimo azimutas –** 255° **Fotografavimo taško altitudė (virš jūros lygio) –** 6,5 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	
	koordinatės 3*17432, 6214301* **Fotografavimo data –** 2022 m., rugpjūčio 13 d., 15 val. 50 min **Fotografavimo azimutas –** 250° **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	

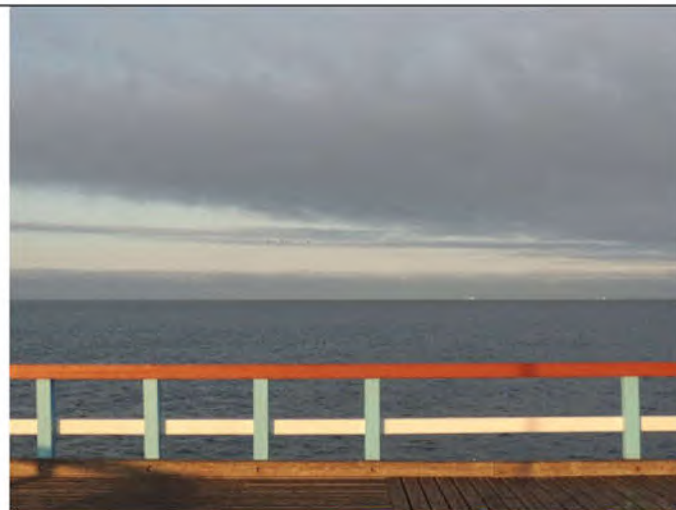
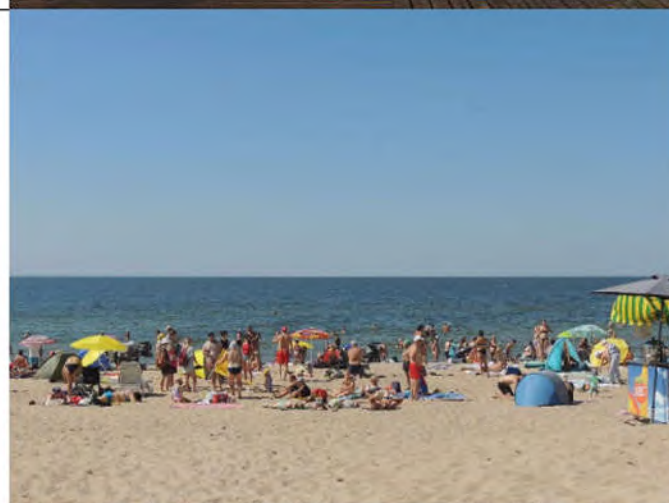
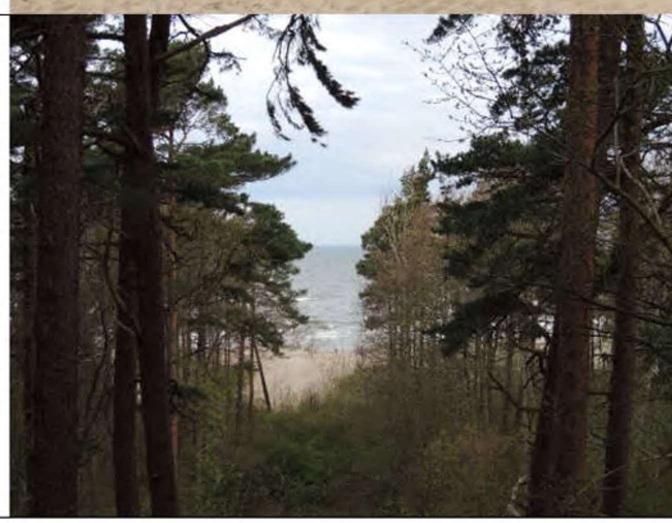
	koordinatės 3*17433, 6214311* **Fotografavimo data –** 2022 m., spalio 31 d., 9 val. 42 min **Fotografavimo azimutas –** 255º **Fotografavimo taško altitudė (virš jūros lygio) –** 6,5 m	
Neįgaliųjų paplūdimys	koordinatės *317477, 6211481* **Fotografavimo data –** 2022 m., rugpjūčio 13 d., 15 val. 28 min **Fotografavimo azimutas –** 260º **Fotografavimo taško altitudė (virš jūros lygio) –** 6,2 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	
	koordinatės *317468, 6211455* **Fotografavimo data –** 2022 m., spalio 31 d., 11 val. 20 min **Fotografavimo azimutas –** 260º **Fotografavimo taško altitudė (virš jūros lygio) –** 6,5 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	

Palanga, Jūratės g.	koordinatės *315913, 6202720* **Fotografavimo data –** 2022 m., rugpjūčio 13 d., 14 val. 22 min **Fotografavimo azimutas –** 275° **Fotografavimo taško altitudė (virš jūros lygio) –** 5,2 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	
Palangos tilto apžvalgos aikštelė	koordinatės *315661, 6202326* **Fotografavimo data –** 2022 m., kovo 11 d., 11 val. 55 min **Fotografavimo azimutas –** 275° **Fotografavimo taško altitudė (virš jūros lygio) –** 7,5 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	
	koordinatės *315657, 6202324* **Fotografavimo data –** 2022 m., gegužės 18 d., 21 val. 39 min **Fotografavimo azimutas –** 290° **Fotografavimo taško altitudė (virš jūros lygio) –** 7,2 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	

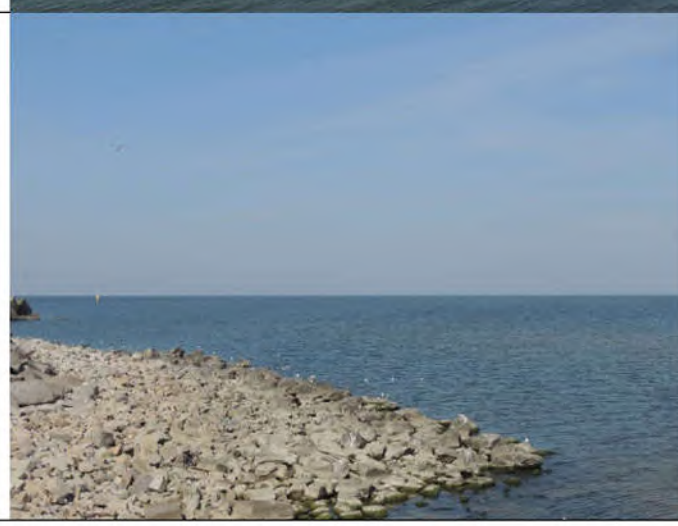
	koordinatės *315650, 6202335* **Fotografavimo data –** 2022 m., rugpjūčio 8 d., 9 val. 29 min **Fotografavimo azimutas –** 275° **Fotografavimo taško altitudė (virš jūros lygio) –** 6,3 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	
	koordinatės *315661, 6202326* **Fotografavimo data –** 2022 m., rugpjūčio 12 d., 21 val. 4 min **Fotografavimo azimutas –** 280° **Fotografavimo taško altitudė (virš jūros lygio) –** 7,5 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	
	koordinatės *315659, 6202334* **Fotografavimo data –** 2022 m., rugpjūčio 13 d., 13 val. 59 min **Fotografavimo azimutas –** 275° **Fotografavimo taško altitudė (virš jūros lygio) –** 7,1 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	

	koordinatės *315659, 6202334* **Fotografavimo data –** 2022 m., spalio 12 d., 18 val. 26 min **Fotografavimo azimutas –** 265° **Fotografavimo taško altitudė (virš jūros lygio) –** 7,1 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	
	koordinatės *315659, 6202334* **Fotografavimo data –** 2022 m., spalio 31 d., 8 val. 33 min **Fotografavimo azimutas –** 270° **Fotografavimo taško altitudė (virš jūros lygio) –** 7,1 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	
Palangos tiltas	koordinatės *315277, 6202401* **Fotografavimo data –** 2022 m., kovo 11 d., 12 val. 4 min **Fotografavimo azimutas –** 275° **Fotografavimo taško altitudė (virš jūros lygio) –** 5 m **Fotografavimo aukštis –** 1,7 m nuo tilto dangos	

	koordinatės *315277, 6202401* **Fotografavimo data –** 2022 m., gegužės 18 d., 21 val. 16 min **Fotografavimo azimutas –** 280° **Fotografavimo taško altitudė (virš jūros lygio) –** 5 m **Fotografavimo aukštis –** 1,7 m nuo tilto dangos	
	koordinatės *315277, 6202401* **Fotografavimo data –** 2022 m., liepos 12 d., 23 val. 57 min **Fotografavimo azimutas –** 275° **Fotografavimo taško altitudė (virš jūros lygio) –** 5 m **Fotografavimo aukštis –** 1,7 m nuo tilto dangos	
	koordinatės *315277, 6202401* **Fotografavimo data –** 2022 m., spalio 10 d., 18 val. 31 min **Fotografavimo azimutas –** 275° **Fotografavimo taško altitudė (virš jūros lygio) –** 5 m **Fotografavimo aukštis –** 1,7 m nuo tilto dangos	

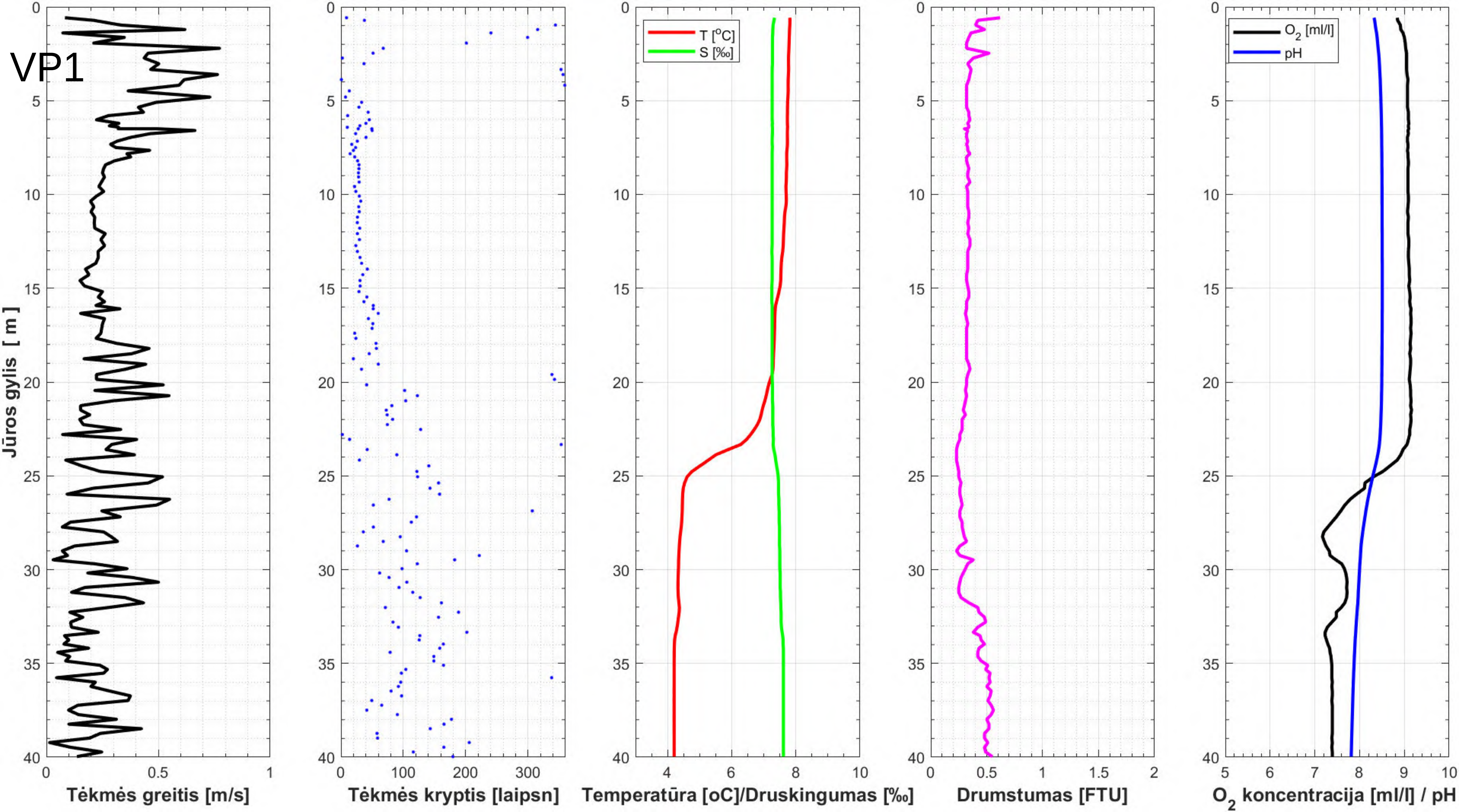
	koordinatės *315277, 6202401* **Fotografavimo data –** 2022 m., spalio 31 d., 8 val. 40 min **Fotografavimo azimutas –** 275° **Fotografavimo taško altitudė** (virš jūros lygio) **– 5 m** **Fotografavimo aukštis –** 1,7 m nuo tilto dangos	
Palanga, Dariaus ir Girėno g.	koordinatės *315655, 6201565* **Fotografavimo data –** 2022 m., rugpjūčio 13 d., 13 val. 49 min **Fotografavimo azimutas –** 275° **Fotografavimo taško altitudė (virš jūros lygio) –** 3,2 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	
Birutės kalnas	koordinatės *315733, 6200770* **Fotografavimo data –** 2022 m., gegužės 3 d., 7 val. 18 min **Fotografavimo azimutas –** 290° **Fotografavimo taško altitudė (virš jūros lygio) –** 17,5 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	

	koordinatės *315733, 6200770* **Fotografavimo data –** 2022 m., rugpjūčio 13 d., 13 val. 41 min **Fotografavimo azimutas –** 290° **Fotografavimo taško altitudė (virš jūros lygio) –** 17,5 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus		
	koordinatės *315733, 6200770* **Fotografavimo data –** 2022 m., rugpjūčio 18 d., 20 val. 30 min **Fotografavimo azimutas –** 290° **Fotografavimo taško altitudė (virš jūros lygio) –** 17,5 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus		
	koordinatės *315733, 6200770* **Fotografavimo data –** 2022 m., spalio 31 d., 9 val. 6 min **Fotografavimo azimutas –** 290° **Fotografavimo taško altitudė (virš jūros lygio) –** 17,5 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus		

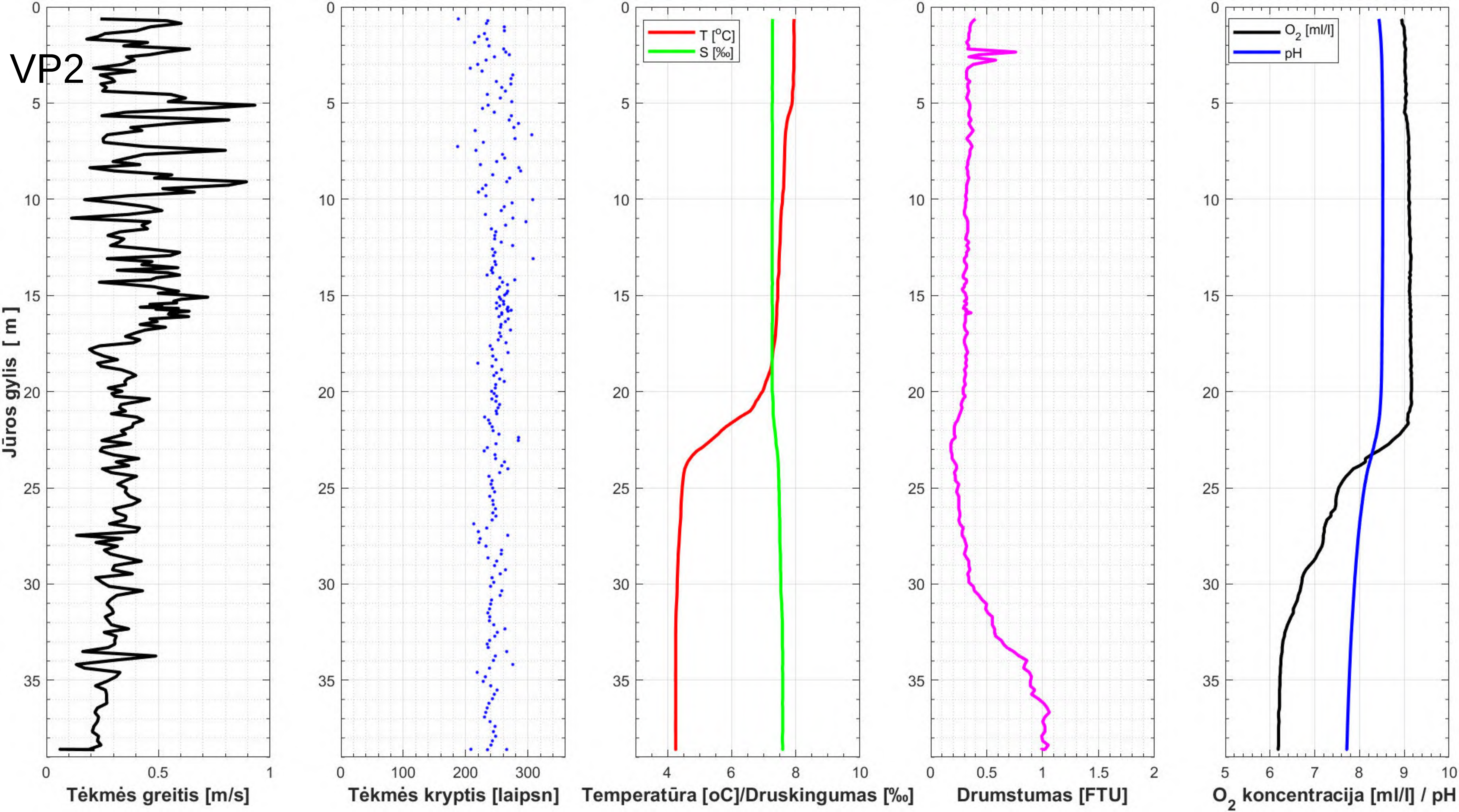
Olandų kepurė	koordinatės *316140, 6188763* **Fotografavimo data –** 2022 m., rugpjūčio 19 d., 12 val. 18 min **Fotografavimo azimutas –** 315° **Fotografavimo taško altitudė (virš jūros lygio) –** 13,1 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	
	koordinatės *316140, 6188763* **Fotografavimo data –** 2022 m., rugpjūčio 19 d., 12 val. 18 min **Fotografavimo azimutas –** 295° **Fotografavimo taško altitudė (virš jūros lygio) –** 13,1 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	
Klaipėdos uosto šiaurinis molas	koordinatės *316793, 6181101* **Fotografavimo data –** 2022 m., rugpjūčio 19 d., 12 val. 50 min **Fotografavimo azimutas –** 320° **Fotografavimo taško altitudė (virš jūros lygio) –** 3,3 m **Fotografavimo aukštis –** 1,7 m nuo žemės paviršiaus	

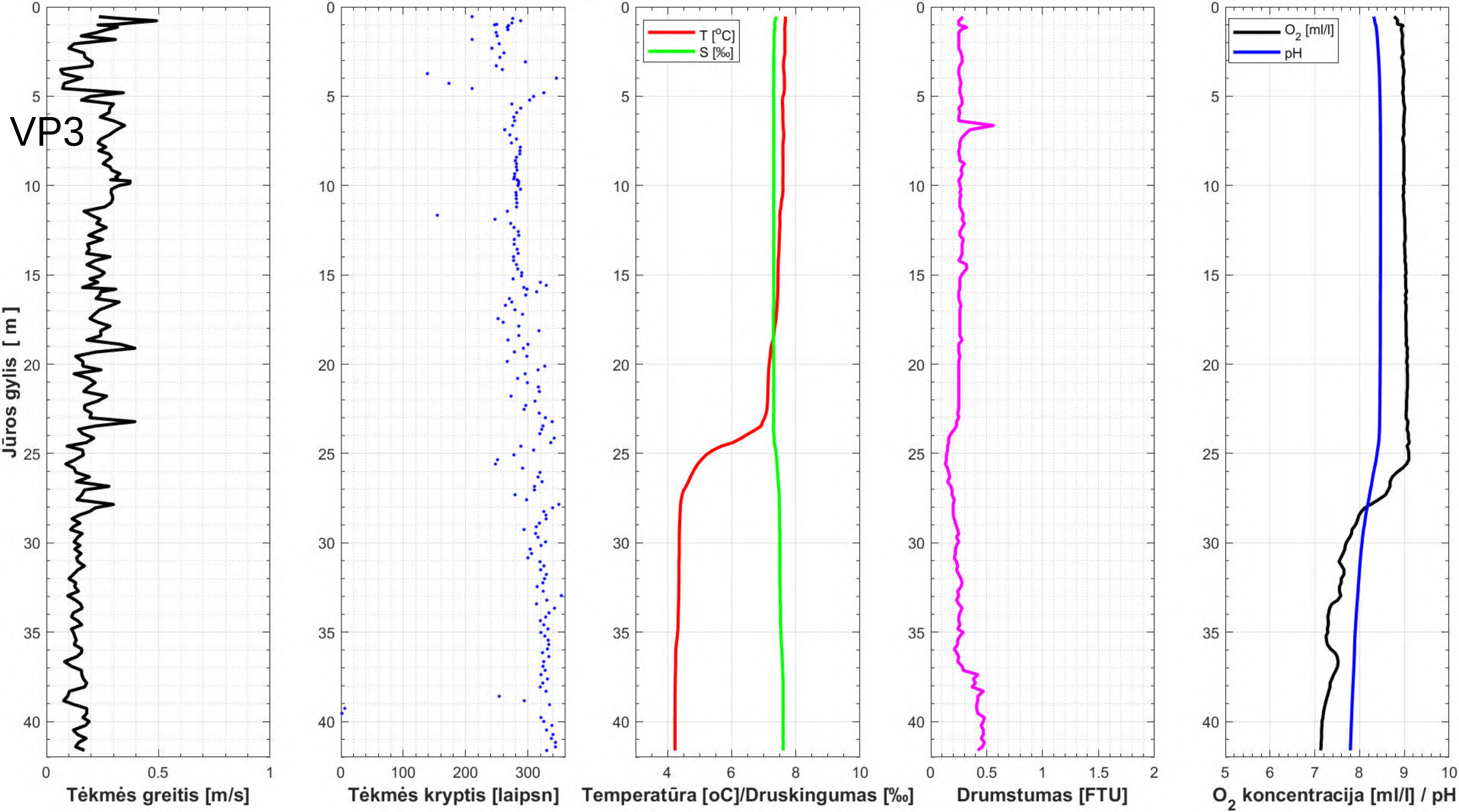
5 PRIEDAS

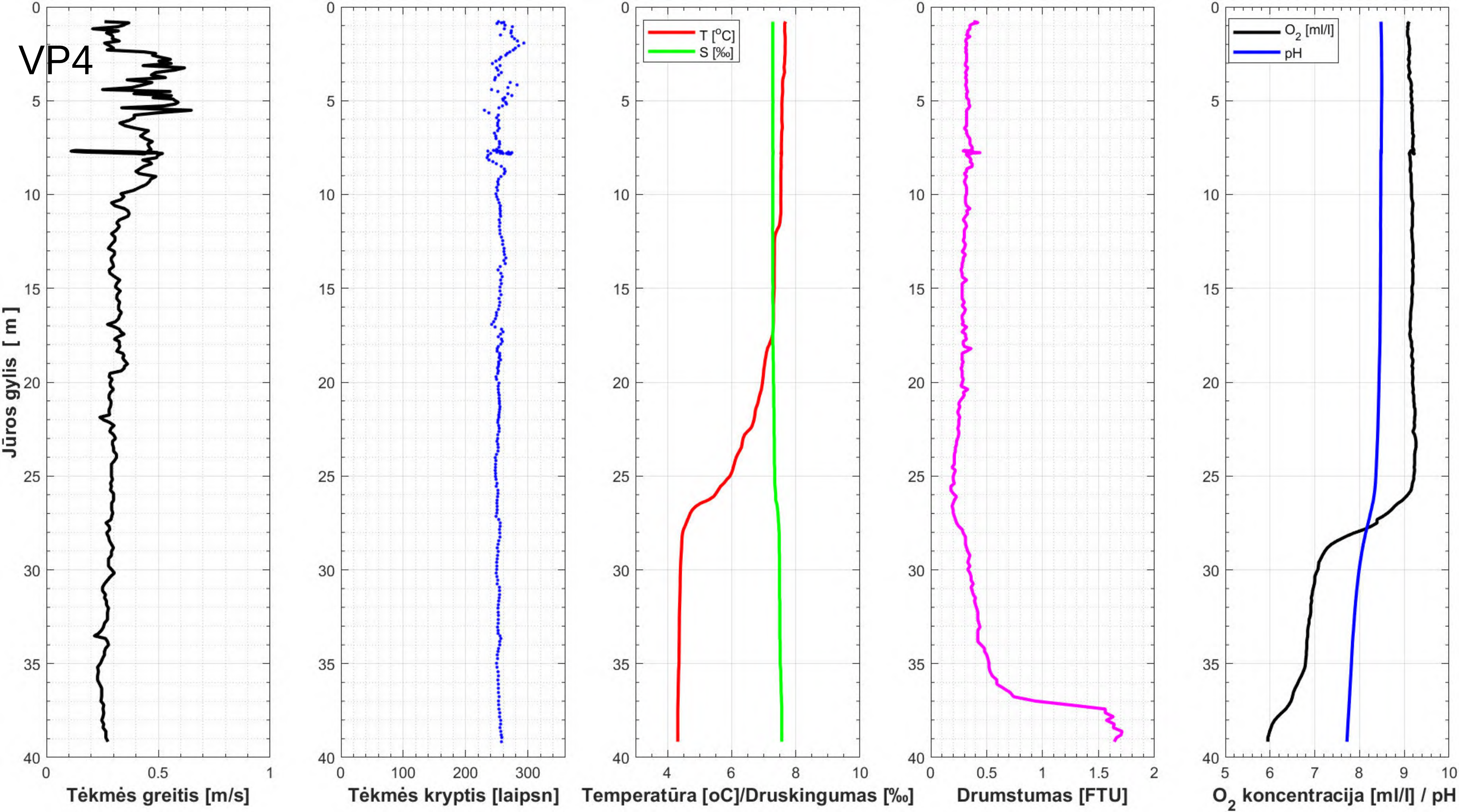
Hidrologinių ir hidrocheminių parametrų vertikalios kaitos profiliai tyrimų stotyse



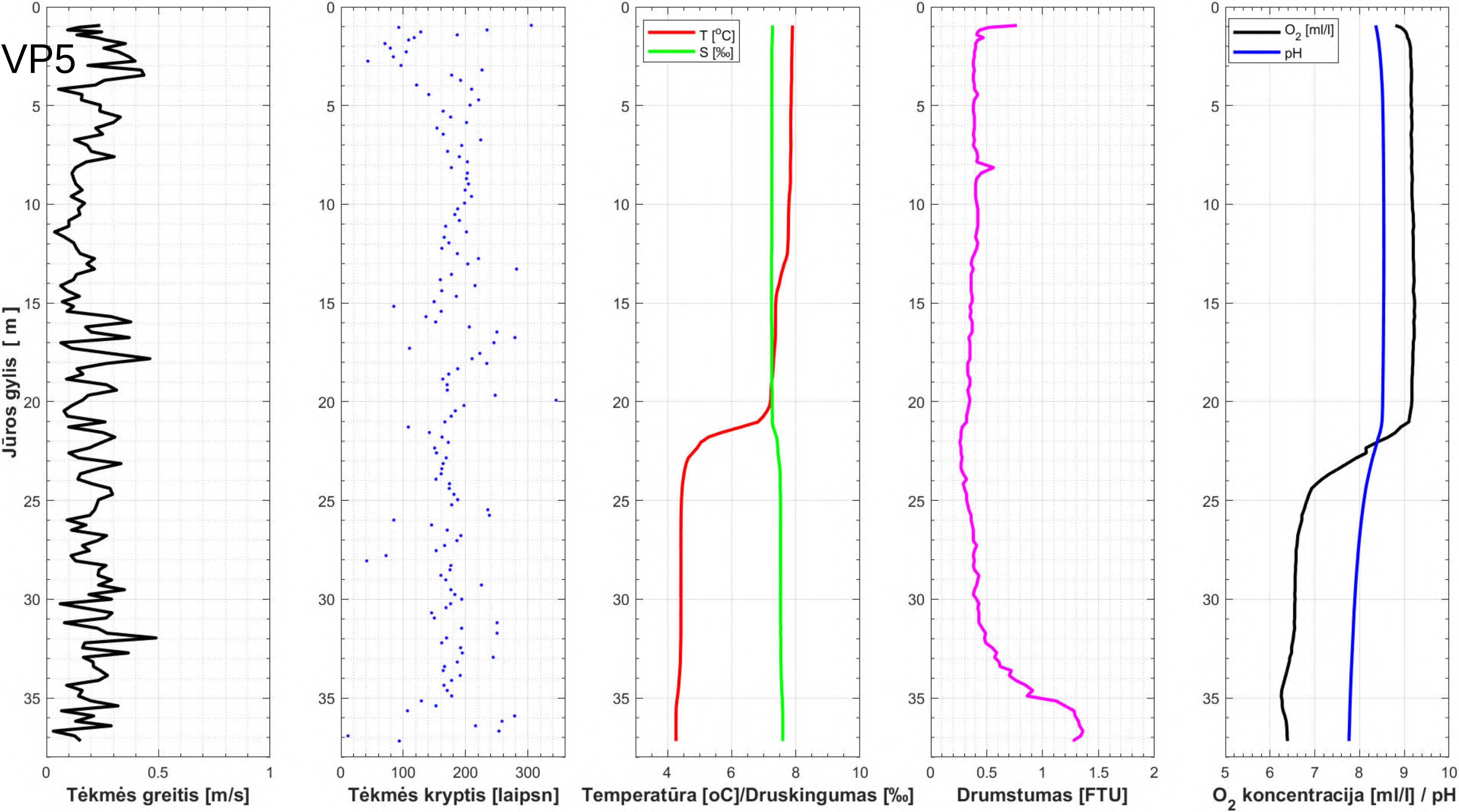
VP1
Jūros gylis [m]
Tėkmės greitis [m/s]
Tėkmės kryptis [laipsn]
T [°C]
S [‰]
Temperatūra [oC]/Druskingumas [‰]
Drumstumas [FTU]
O_2 [ml/l]
pH
O_2 koncentracija [ml/l] / pH


VP2
Jūros gylis [m]
Tėkmės greitis [m/s]
Tėkmės kryptis [laipsn]
T [°C]
S [‰]
Temperatūra [oC]/Druskingumas [‰]
Drumstumas [FTU]
O_2 [ml/l]
pH
O_2 koncentracija [ml/l] / pH

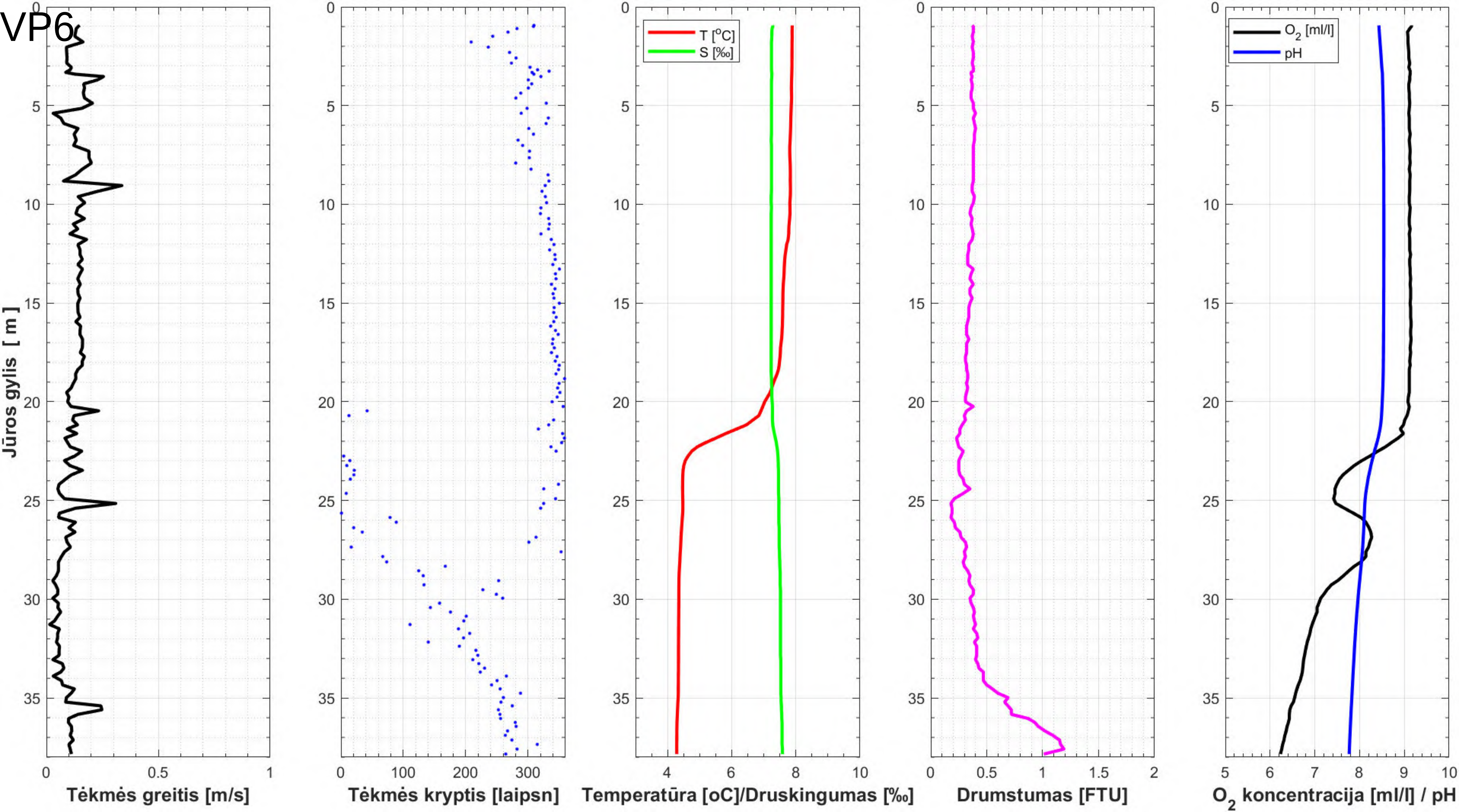

VP3
Jūros gylis [m]
Tėkmės greitis [m/s]
Tėkmės kryptis [laipsn]
T [°C]
S [‰]
Temperatūra [oC]/Druskingumas [‰]
Drumstumas [FTU]
O2 [ml/l]
pH
O2 koncentracija [ml/l] / pH

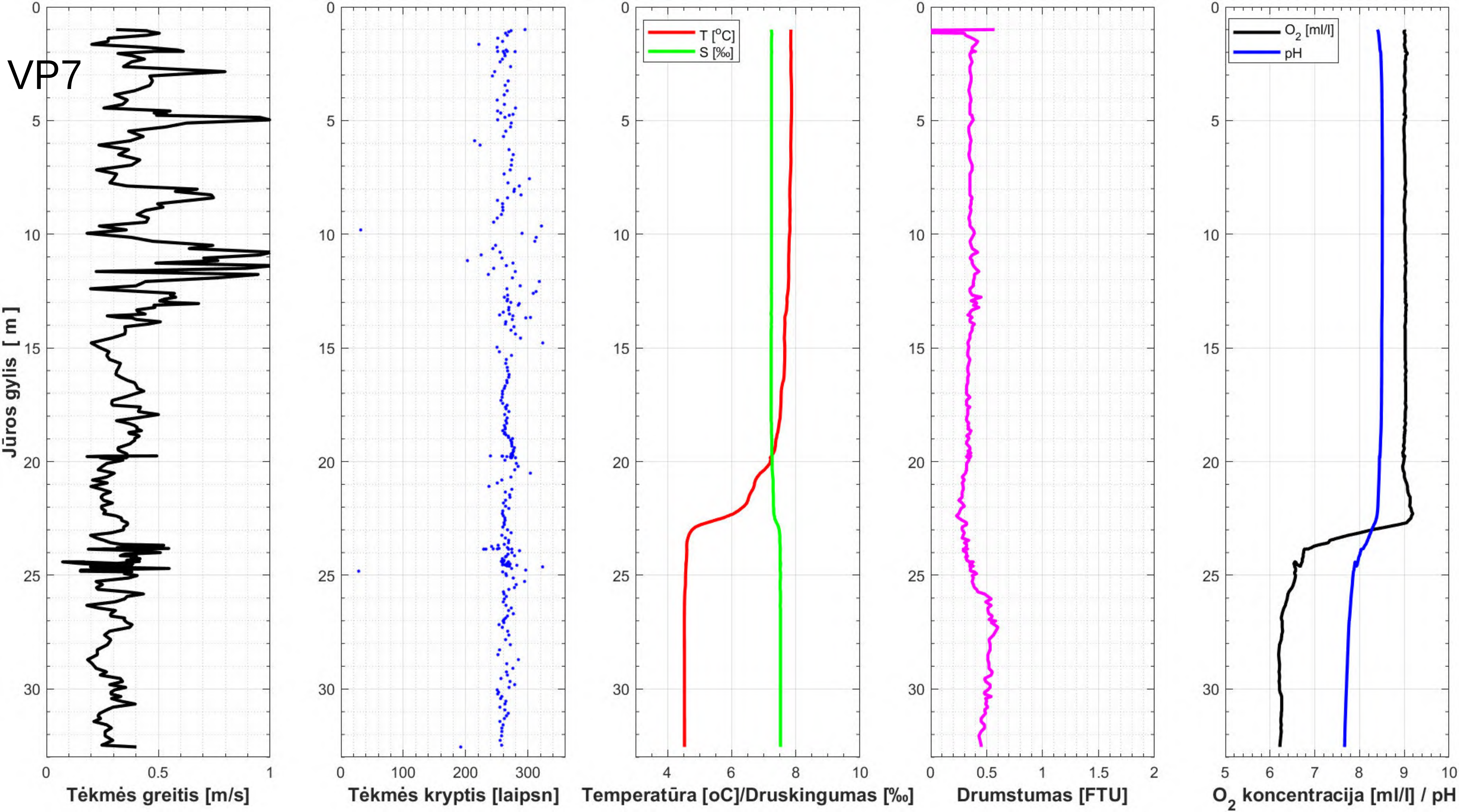


VP4
Jūros gylis [m]
Tėkmės greitis [m/s]
Tėkmės kryptis [laipsn]
T [°C]
S [‰]
Temperatūra [oC]/Druskingumas [‰]
Drumstumas [FTU]
O_2 [ml/l]
pH
O_2 koncentracija [ml/l] / pH

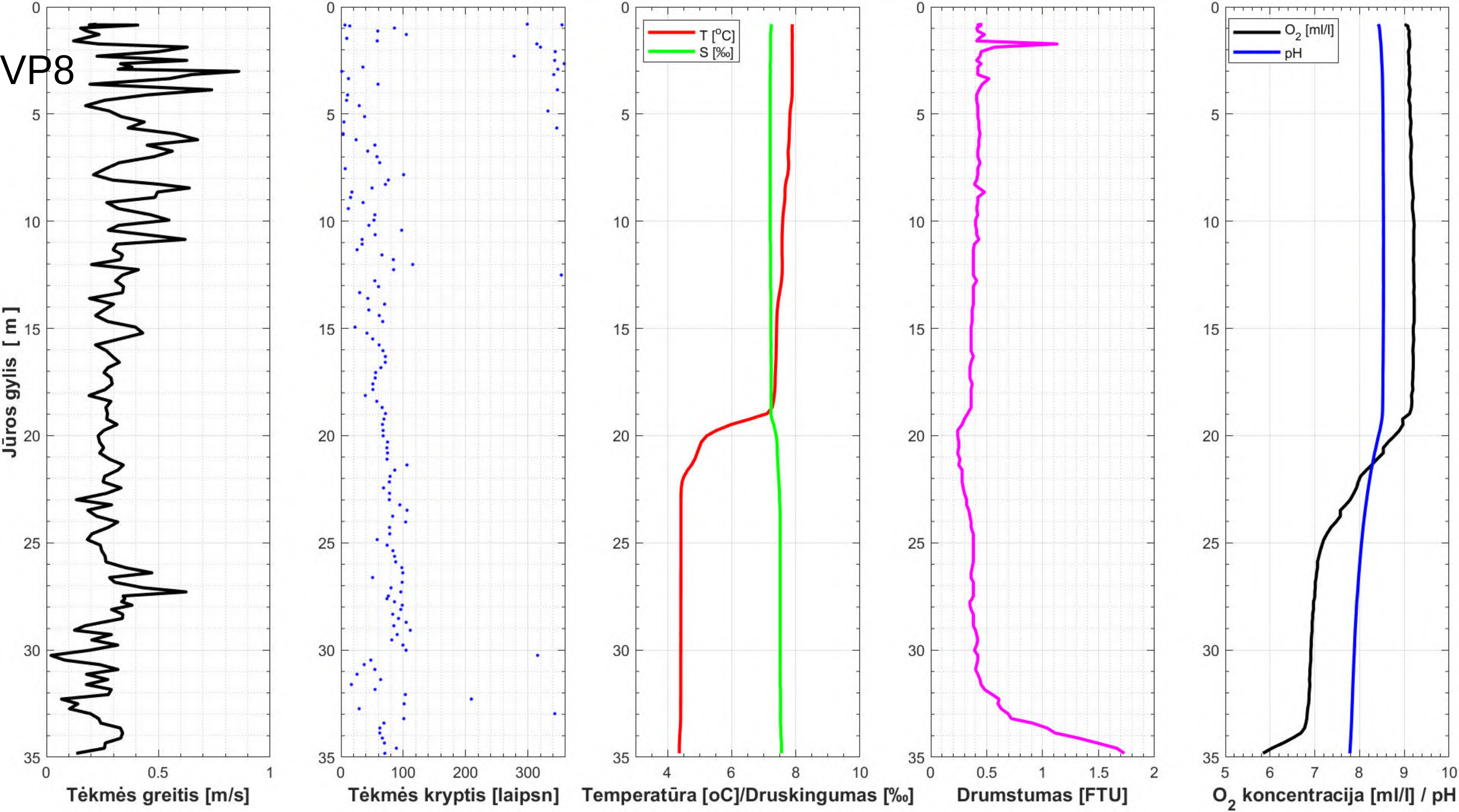


VP5
Jūros gylis [m]
Tėkmės greitis [m/s]
Tėkmės kryptis [laipsn]
T [°C]
S [‰]
Temperatūra [oC]/Druskingumas [‰]
Drumstumas [FTU]
O_2 [ml/l]
pH
O_2 koncentracija [ml/l] / pH


VP6
Jūros gylis [m]
Tėkmės greitis [m/s]
Tėkmės kryptis [laipsn]
T [°C]
S [‰]
Temperatūra [oC]/Druskingumas [‰]
Drumstumas [FTU]
O2 [ml/l]
pH
O2 koncentracija [ml/l] / pH

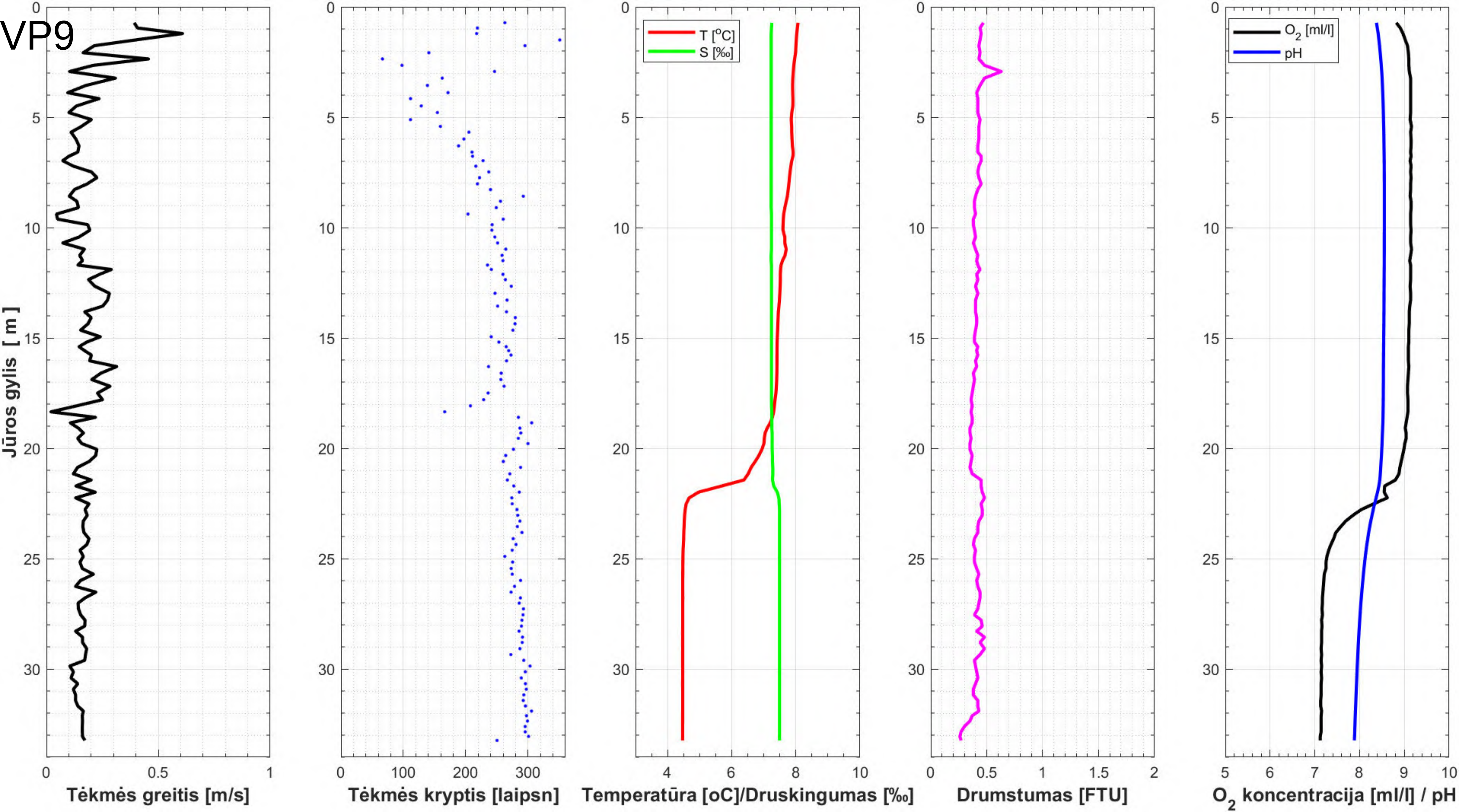


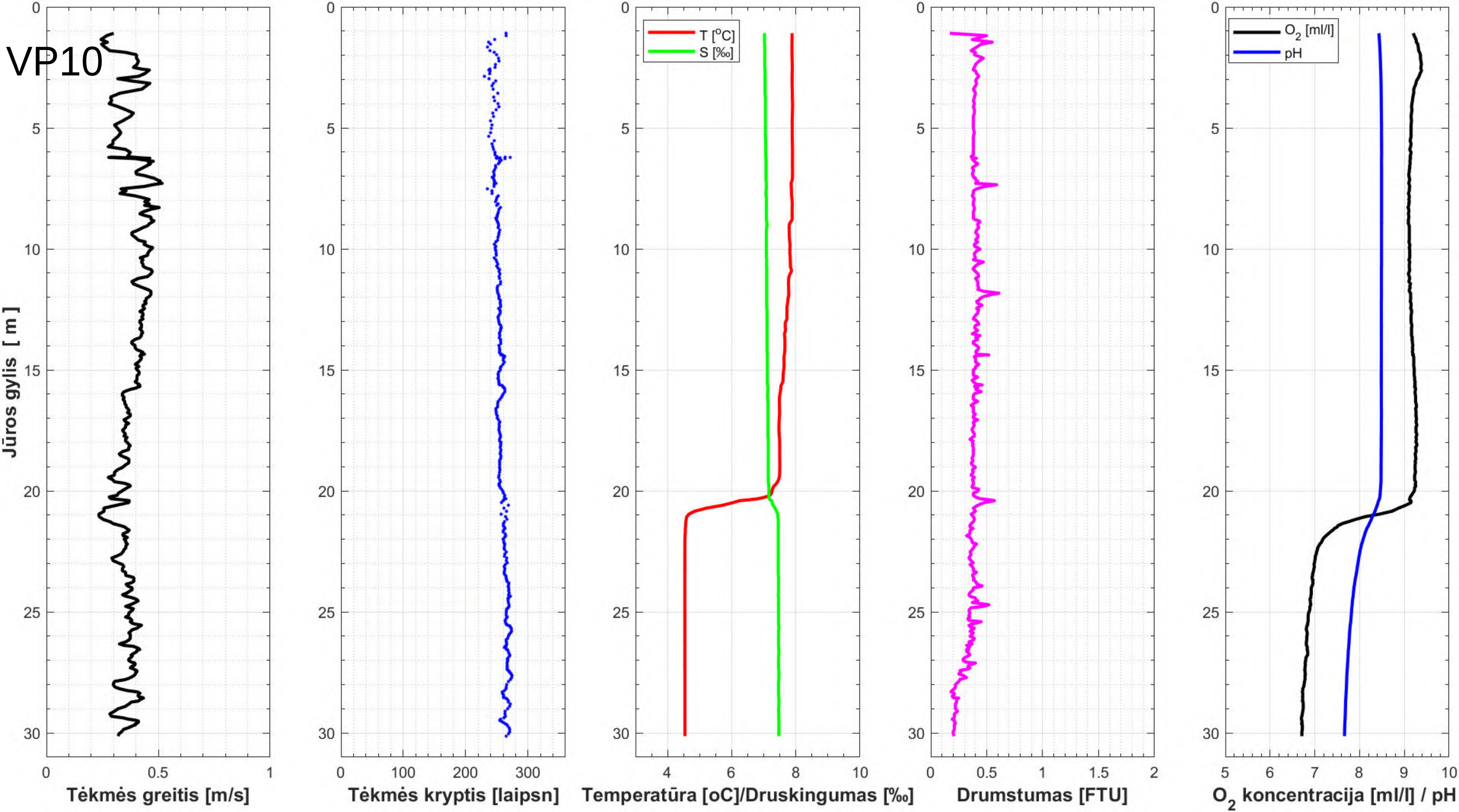
VP7
Jūros gylis [m]
Tėkmės greitis [m/s]
Tėkmės kryptis [laipsn]
T [°C]
S [‰]
Temperatūra [oC]/Druskingumas [‰]
Drumstumas [FTU]
O2 [ml/l]
pH
O2 koncentracija [ml/l] / pH



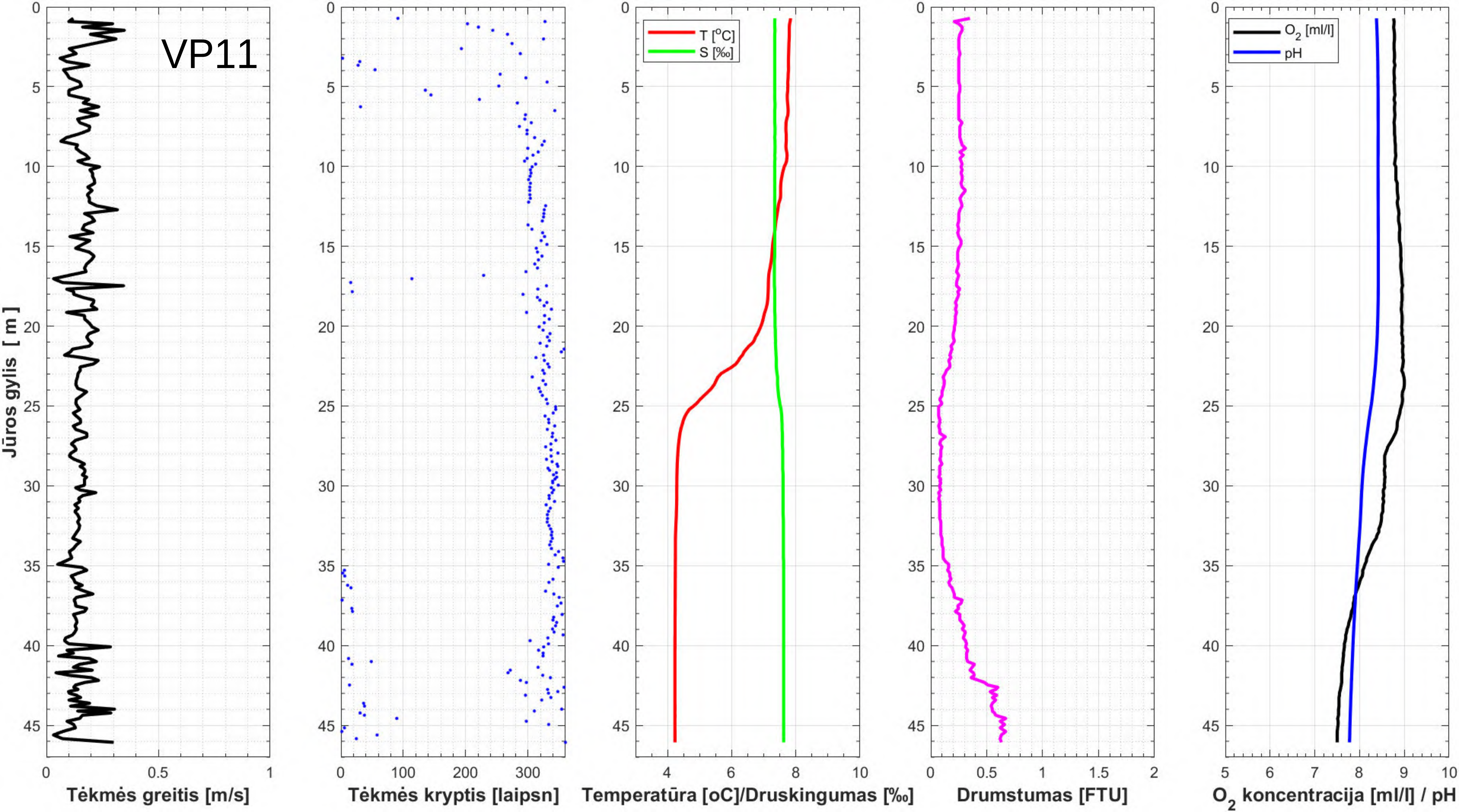
VP8
Jūros gylis [m]
Tėkmės greitis [m/s]
Tėkmės kryptis [laipsn]
T [°C]
S [‰]
Temperatūra [oC]/Druskingumas [‰]
Drumstumas [FTU]
O_2 [ml/l]
pH
O_2 koncentracija [ml/l] / pH

VP9


Jūros gylis [m]
Tėkmės greitis [m/s]
Tėkmės kryptis [laipsn]
T [°C]
S [‰]
Temperatūra [oC]/Druskingumas [‰]
Drumstumas [FTU]
O2 [ml/l]
pH
O2 koncentracija [ml/l] / pH



VP10
Jūros gylis [m]
Tėkmės greitis [m/s]
Tėkmės kryptis [laipsn]
T [°C]
S [‰]
Temperatūra [oC]/Druskingumas [‰]
Drumstumas [FTU]
O2 [ml/l]
pH
O2 koncentracija [ml/l] / pH



VP11
Jūros gylis [m]
Tėkmės greitis [m/s]
Tėkmės kryptis [laipsn]
T [°C]
S [‰]
Temperatūra [oC]/Druskingumas [‰]
Drumstumas [FTU]
O2 [ml/l]
pH
O2 koncentracija [ml/l] / pH