



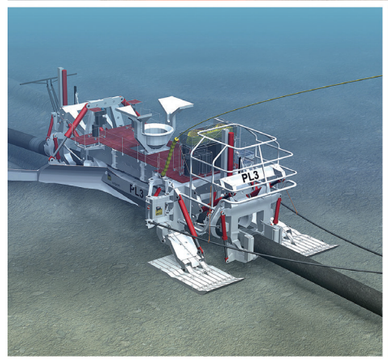


ATLAS

Environmental Impact Assessment
Danish section

Nord Stream 2

March 2017

W-PE-EIA-PDK-DWG-805-010100EN-14

RAMBØLL

OFFSHORE PIPELINES THROUGH THE BALTIC SEA

ATLAS

Environmental Impact Assessment
Danish section

Nord Stream 2

March 2017

Prepared by: Rambøll A/S
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Introduction

Nord Stream 2 is a pipeline through the Baltic Sea planned to deliver natural gas from vast reserves in Russia directly to the EU gas market to fill the growing gas import demand.

The twin 1,200 kilometre subsea pipelines will have the capacity to supply 55 billion cubic metres of gas per year in an economic, environmentally safe and reliable way, compensating for the drop in the EU's domestic production.

The privately funded €8 billion infrastructure project will ensure long-term access to an important, low emissions energy source, thereby contributing to the EU's climate protection efforts. Additional supplies will boost competition in the market and support the EU's global industrial competitiveness.

Nord Stream 2 follows in the footsteps of the successful experience of construction and operation of the existing Nord Stream Pipeline, which has been recognised for its high environmental and safety standards, green logistics, open dialogue and public consultation.

Atlas maps

This ATLAS is part of the Environmental Impact Assessment (EIA) for the Danish section of the planned NSP2 pipeline system.

The purpose of this ATLAS is to describe the general geographical distribution of physical, chemical and biological parameters in the Baltic Sea around the planned offshore pipelines.

When reading the text part of the Environmental Impact Assessment there will be references to the ATLAS.
The individual Atlas maps are presented in a sequence that reflects the structure of the report.

The maps that are presented in the ATLAS are based on information from authorities, organisations and international databases, data gained from existing Nord Stream pipeline project, and on data from Nord Stream 2 field surveys carried out in 2015 – 2016 along the planned pipeline corridor. The references used are shown in the ATLAS maps' legends.

Please be aware that the marked route of the pipeline on the maps is not representative of the actual pipeline width. It serves merely as an indication of the route.

An overview of the topics covered by the ATLAS and of the individual ATLAS maps is shown overleaf.

Note:

General references on all Atlas maps:
- Limits of Exclusive Economic Zones and Territorial Waters: IBRU May 2010
- Background sea charts are "Not to be used for navigation"
- Background sea chart; © Crown Copyright and/or database rights.
Reproduced by permission of the Controller of Her Majesty's
Stationery Office and the UK Hydrographic Office (www.ukho.gov.uk)

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2. DESCRIPTION OF ALTERNATIVES
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4. WATER QUALITY
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7. PROTECTED AREAS
8. FISH
9. MARINE MAMMALS
10. BIRDS
11. MILITARY AREAS
12. INFRASTRUCTURE
13. MUNITIONS, CONVENTIONAL/CHEMICAL
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15. SHIP TRAFFIC
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17. CULTURAL HERITAGE
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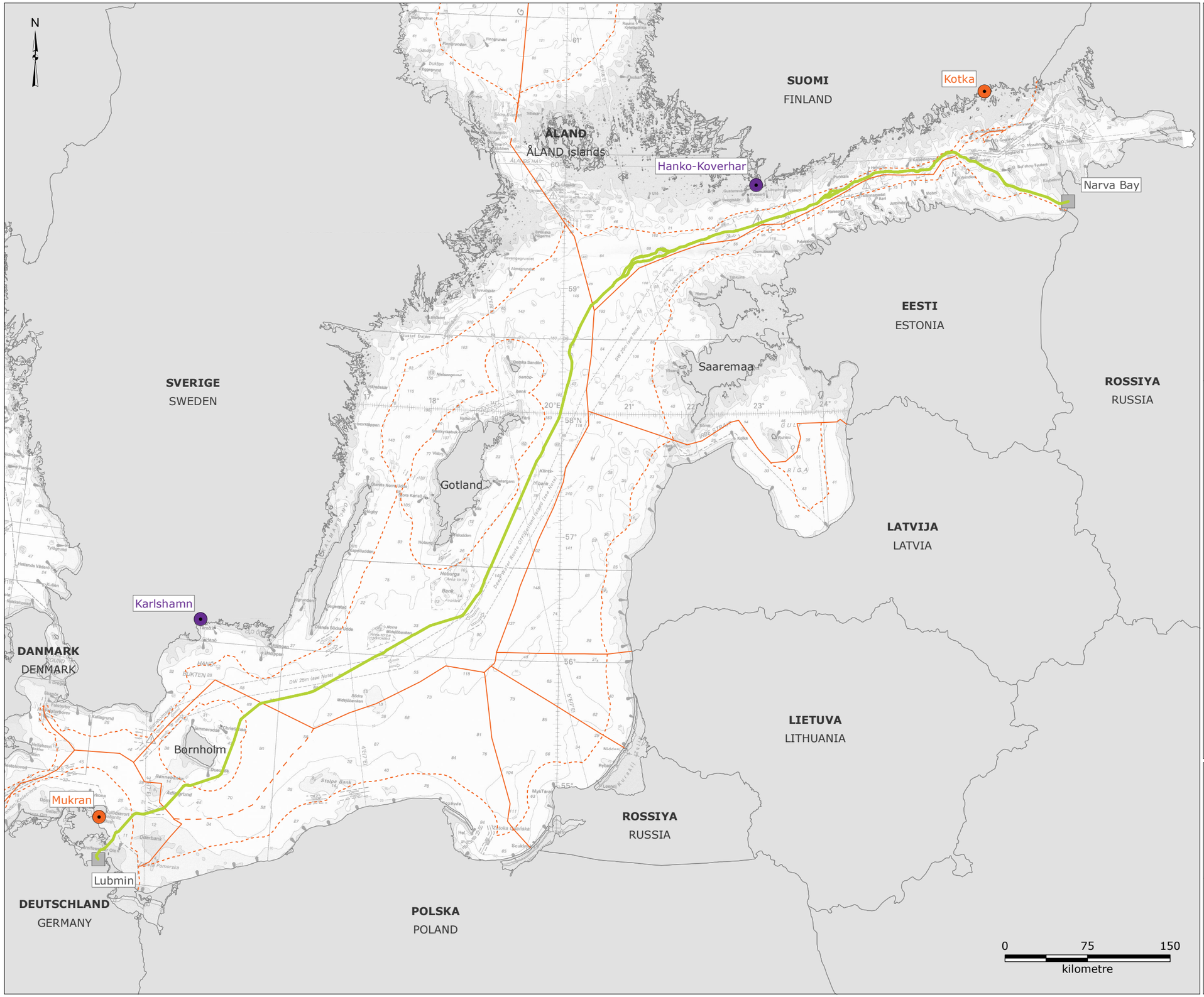
PROJECT DESCRIPTION

DESCRIPTION OF THE PROJECT

DESCRIPTION OF ALTERNATIVES



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Landfall

Storage yards:

- Pipe coating plant / pipe storage site
- Pipe storage site

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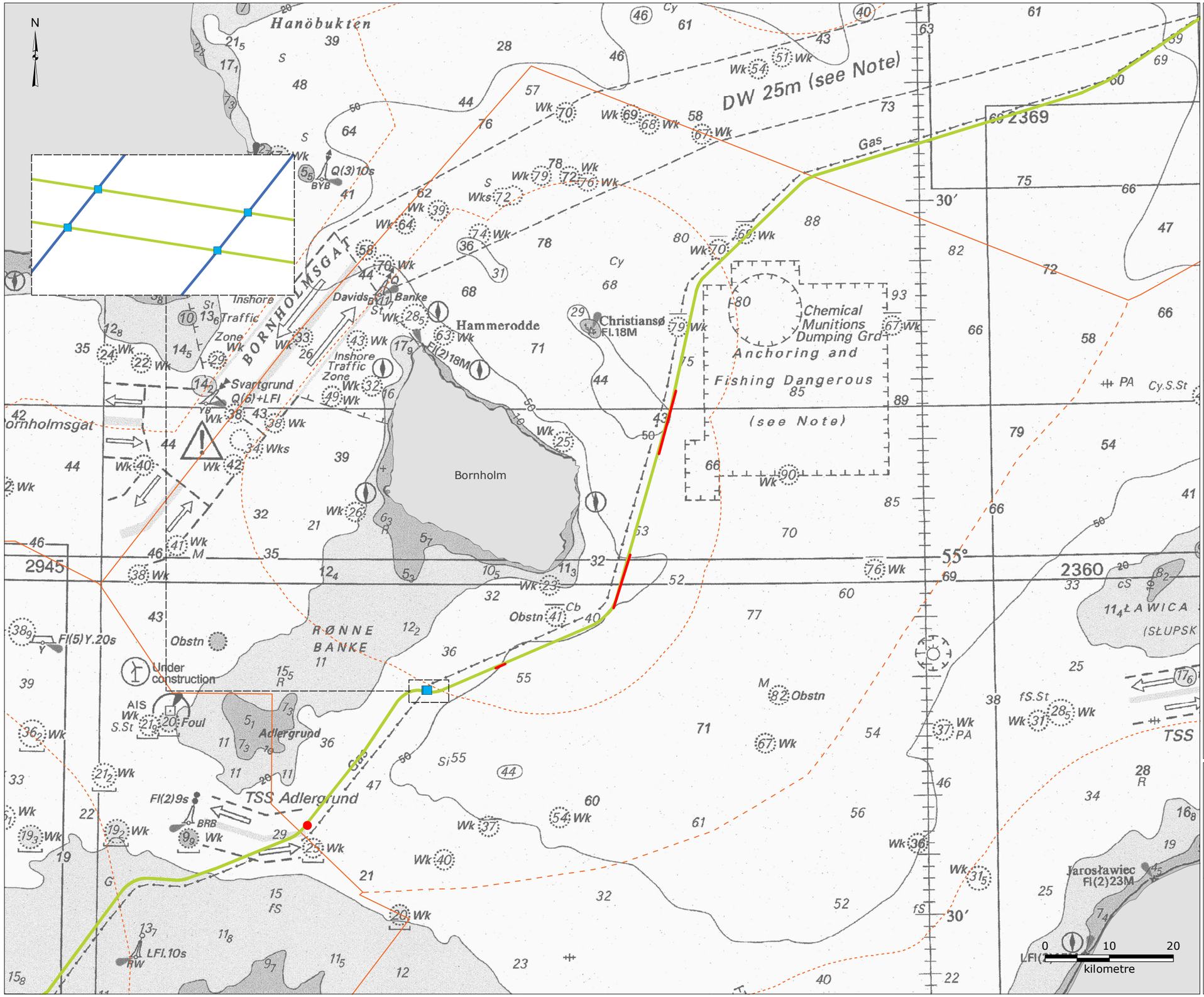
Date: 2017-03-01
Prepared: MSTB
Controlled: JCXS

PR-01

Preferred pipeline route and onshore facilities

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Potential post-lay trenching/rock placement
- Pipeline crossing - rock placement
- Potential above water tie-in - rock placement

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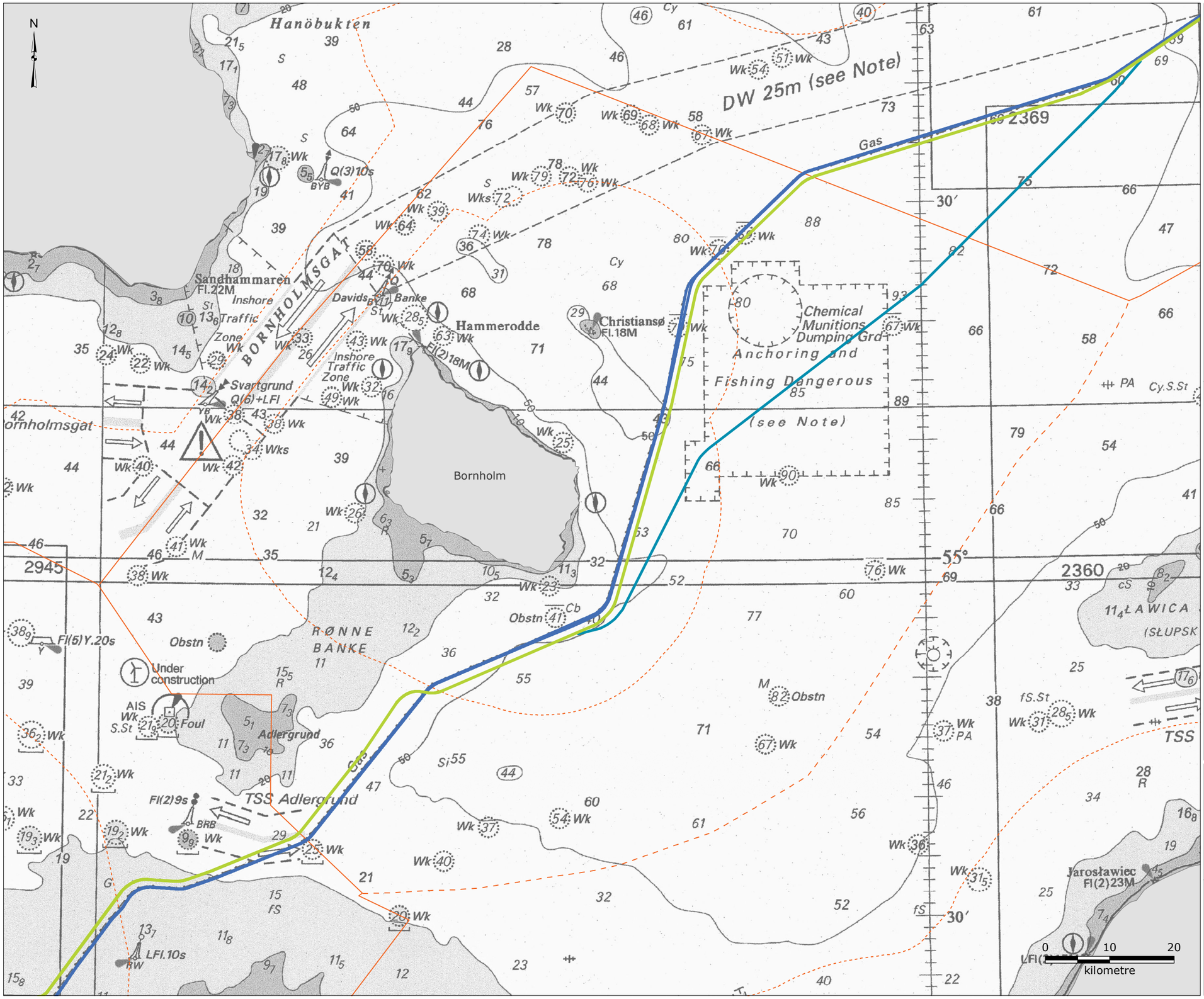
Date: 2017-03-01
Prepared: MSTB
Controlled: JCXS

PR-02-D

Preferred pipeline route and anticipated seabed intervention works

RAMBØLL



Legend:

- ES Route (proposed NSP2 Route)
- RA Route
- NSP Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Version: 12
Date: 2016-10-20
Prepared: MSTB
Controlled: JCXS

AL-01-D

Alternative pipeline routes

RAMBØLL

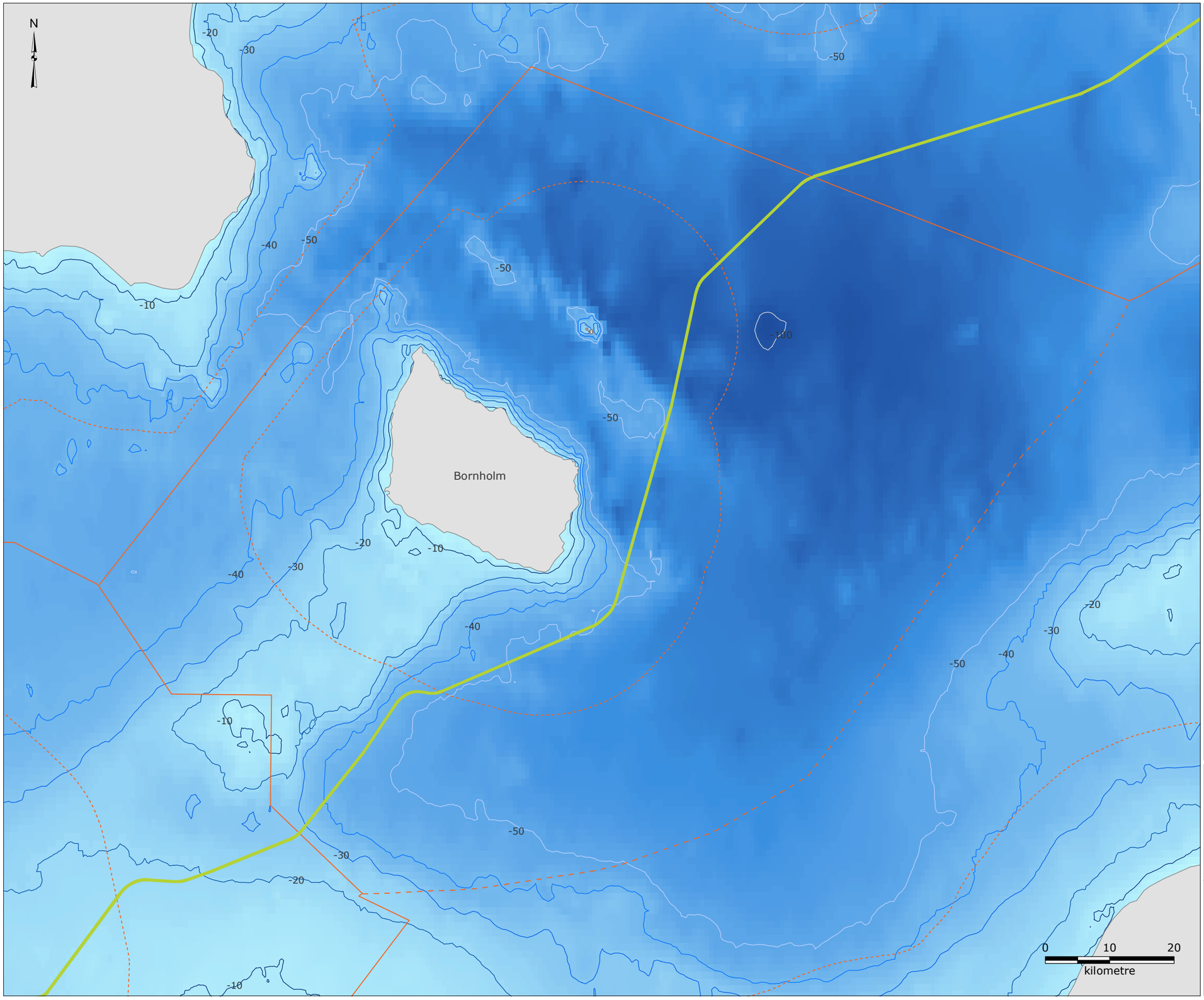
PHYSICAL-CHEMICAL ENVIRONMENT

BATHYMETRY AND HYDROGRAPHY

GEOLOGY AND SEABED

WATER QUALITY

CLIMATE



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Bathymetry [depth (m)]:

- 0
- -103

Depth contour (m):

- -10
- -20
- -30
- -40
- -50
- -100

References:
-MIKE C-map database, February 2012

Version: 11
Date: 2016-11-25
Prepared: MSTB
Controlled: KEBS

BA-01-D

Bathymetry

RAMBØLL

N

SUOMI
FINLAND

ÅLAND
ÅLAND islands

EESTI
ESTONIA

Saaremaa

SVERIGE
SWEDEN

ROSSIYA
RUSSIA

LATVIJA
LATVIA

Gotland

DANMARK
DENMARK

Bornholm

LIETUVA
LITHUANIA

ROSSIYA
RUSSIA

DEUTSCHLAND
GERMANY

POLSKA
POLAND

0 75 150
kilometre

Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Inflow of oxygen-rich water

Bathymetry [depth (m)]:

0

-430

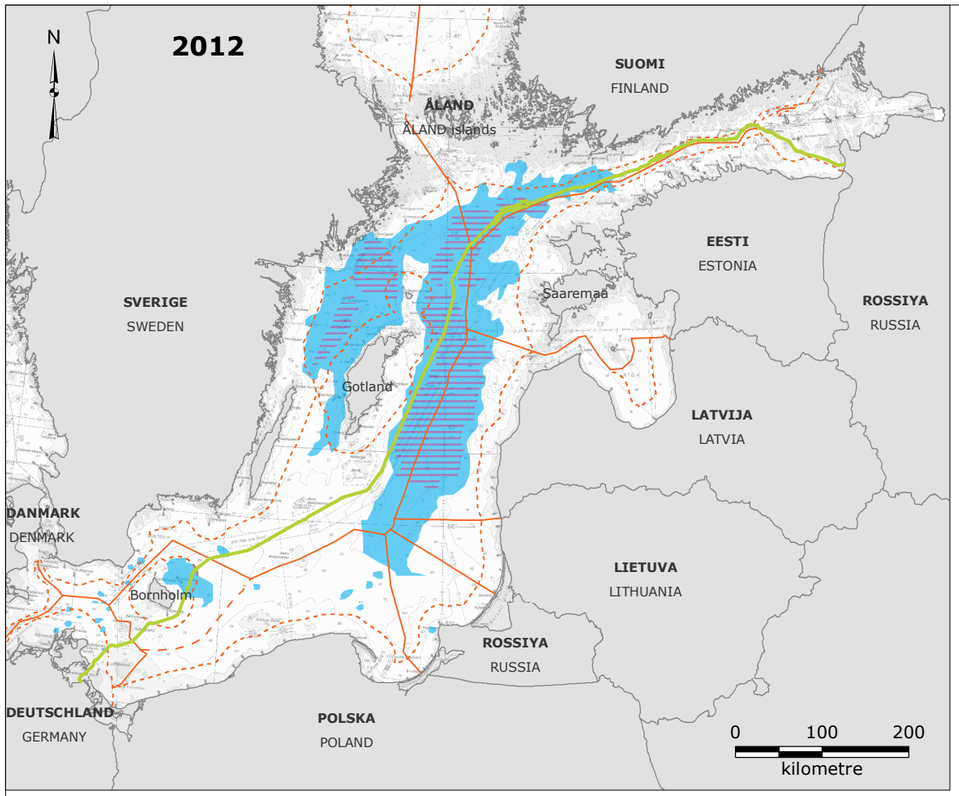
References:
- Bernes, C., 2005, "Förändringar under ytan, Monitor 19, Sveriges havsmiljö granskad på djupet", Naturvårdsverket, pp. 192
- MIKE C-map database, February 2012

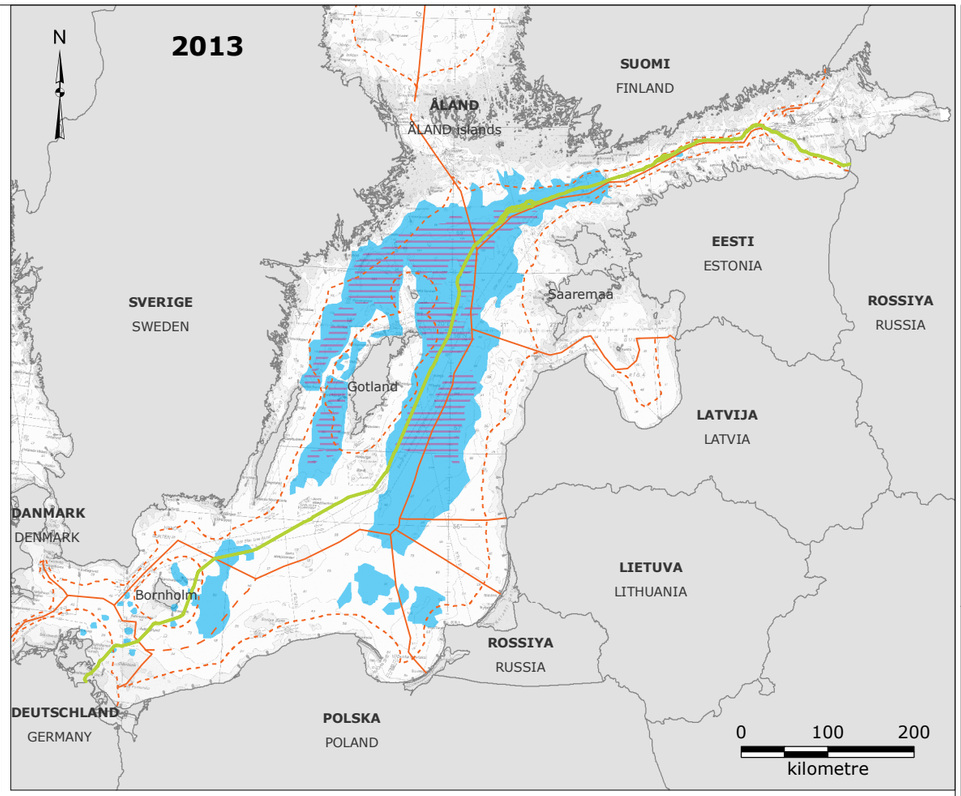
Version: 02
Date: 2017-03-02
Prepared: MSTB
Controlled: JRV

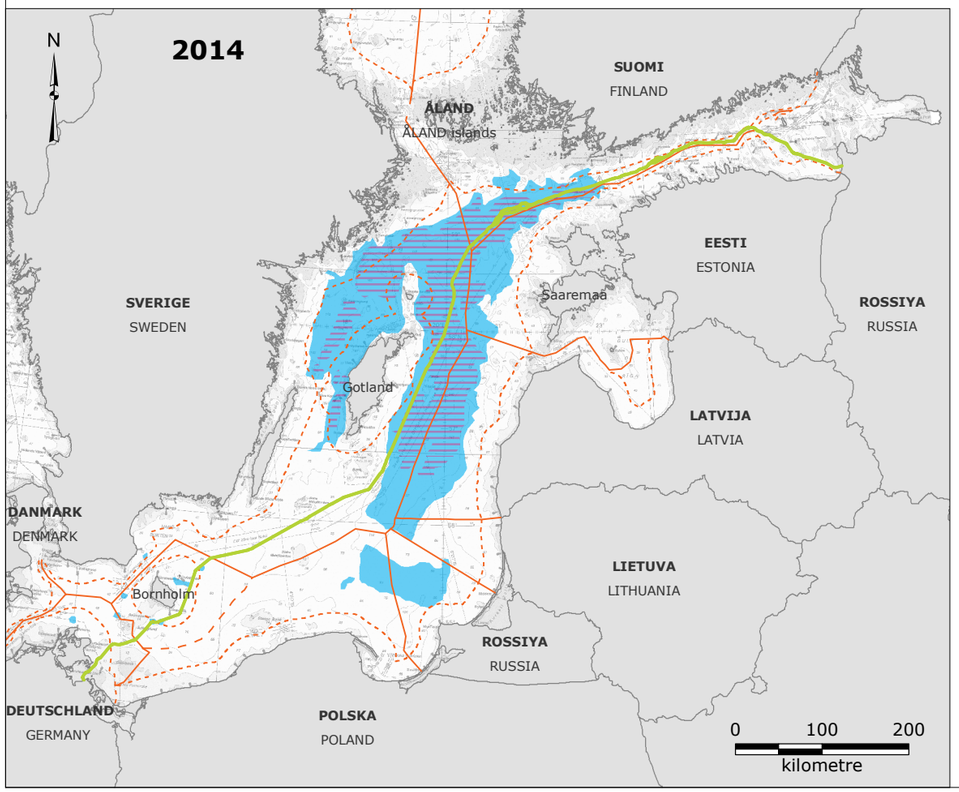
BA-02

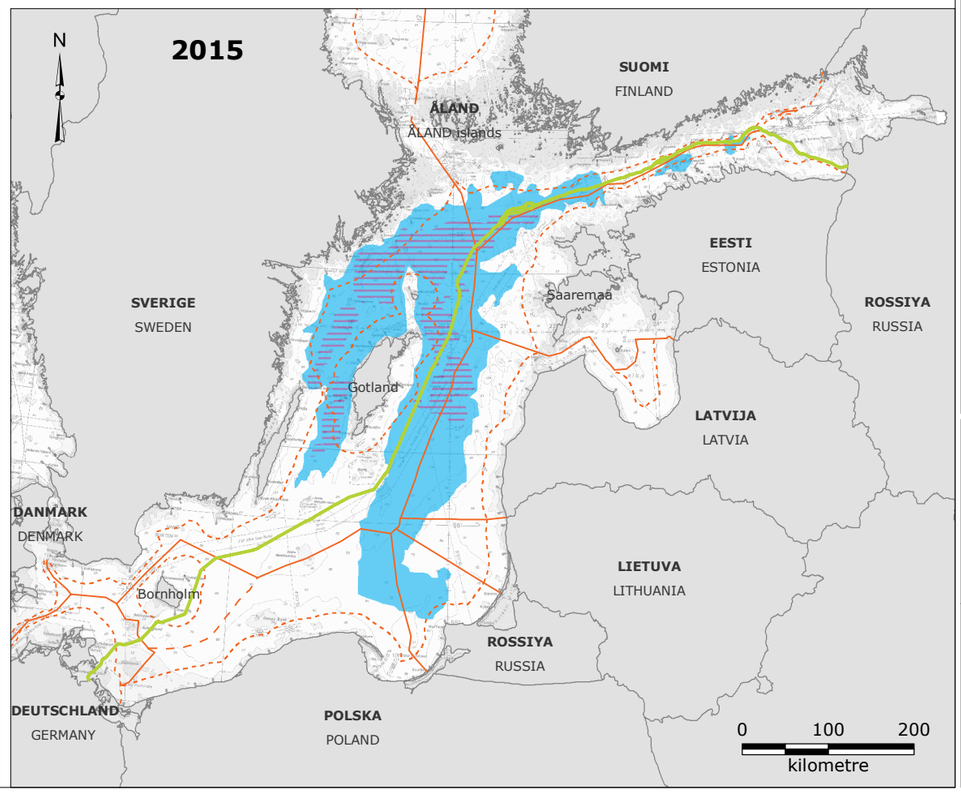
Inflow of oxygen-rich water to the Baltic Sea in 2003

RAMBØLL









Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Hypoxic (oxygen content ≤ 2 mg/l)
- Anoxic (oxygen content = 0 mg/l)

Note:
- Anoxic and hypoxic areas in the Baltic Sea, Autumn 2012, 2013, 2014 and 2015

References:

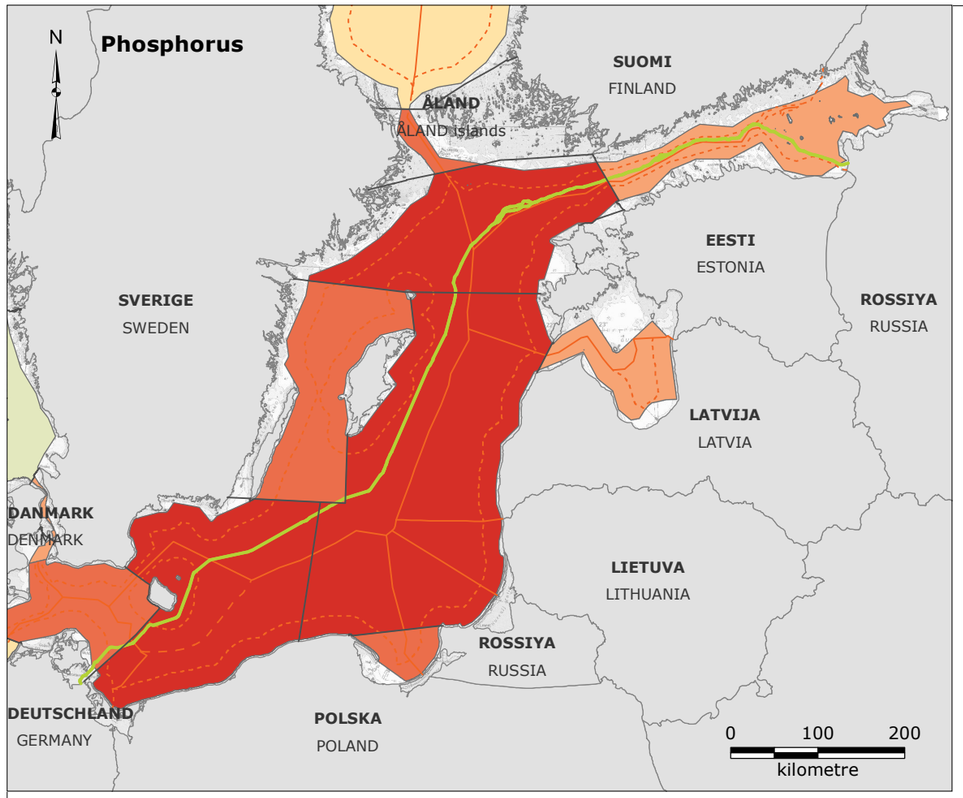
- SMHI, 2013, "Oxygen Survey in the Baltic Sea, 2013 - Extent of Anoxia and Hypoxia, 1960-2013". SMHI Report Oceanography No. 49
- SMHI, 2015, "Oxygen Survey in the Baltic Sea, 2015 - Extent of Anoxia and Hypoxia, 1960-2015". SMHI Report Oceanography No. 53

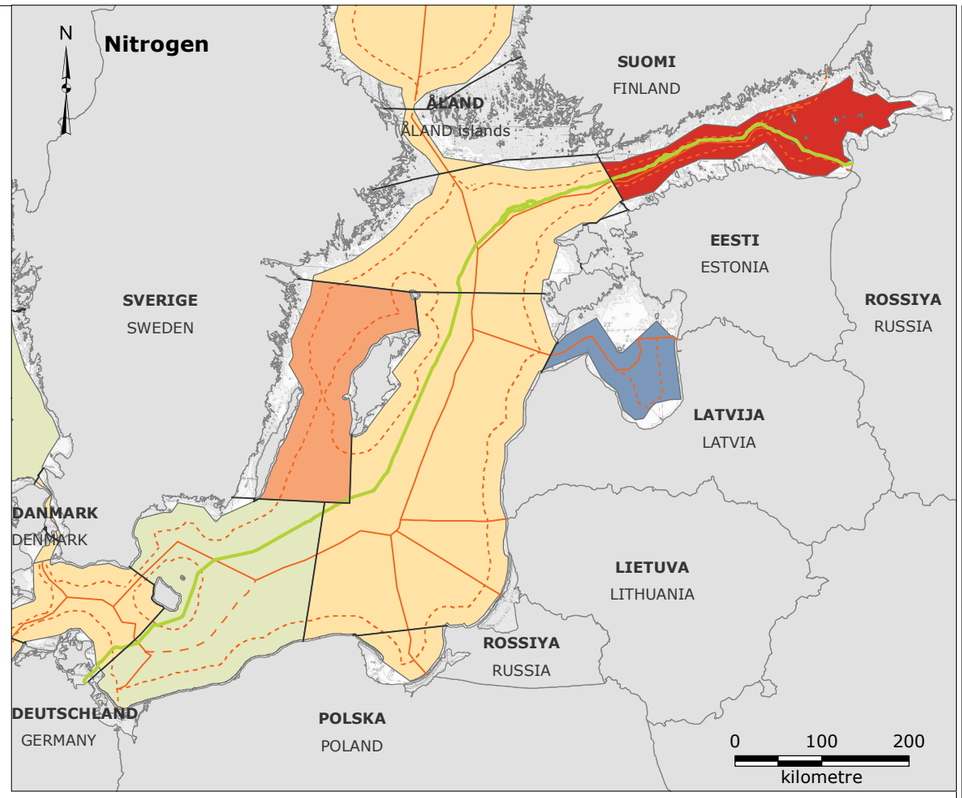
Version: 06
Date: 2016-11-24
Prepared: MSTB
Controlled: KEBS

WA-01

Anoxic and hypoxic areas

RAMBØLL





Legend:

Phosphorus status 2007-2011:

(Eutrophication Ratio)

- < 0.79
- 0.80 - 0.99
- 1
- 1.01 - 1.19
- 1.20 - 1.39
- 1.40 - 1.59
- 1.60 - 1.79
- > 1.80

Legend:

Nitrogen status 2007-2011:

(Eutrophication Ratio)

- < 0.79
- 0.80 - 0.99
- 1
- 1.01 - 1.19
- 1.20 - 1.39
- 1.40 - 1.59
- 1.60 - 1.79
- > 1.80

Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Sub-basins

Note:
- Left: Eutrophication Ratio: Concentration of Dissolved Inorganic Phosphorus (DIP) in surface water (0-10 m) as winter average 2007-2011, relative to target concentration of Good Environmental status (GES). The GES-boundary is set at ER ≤ 1.00.
- Right: Eutrophication Ratio: Concentration of Dissolved Inorganic Nitrogen (DIN) in surface water (0-10 m) as winter average 2007-2011, relative to target concentration of Good Environmental Status (GES). The GES-boundary is set at ER ≤ 1.00.

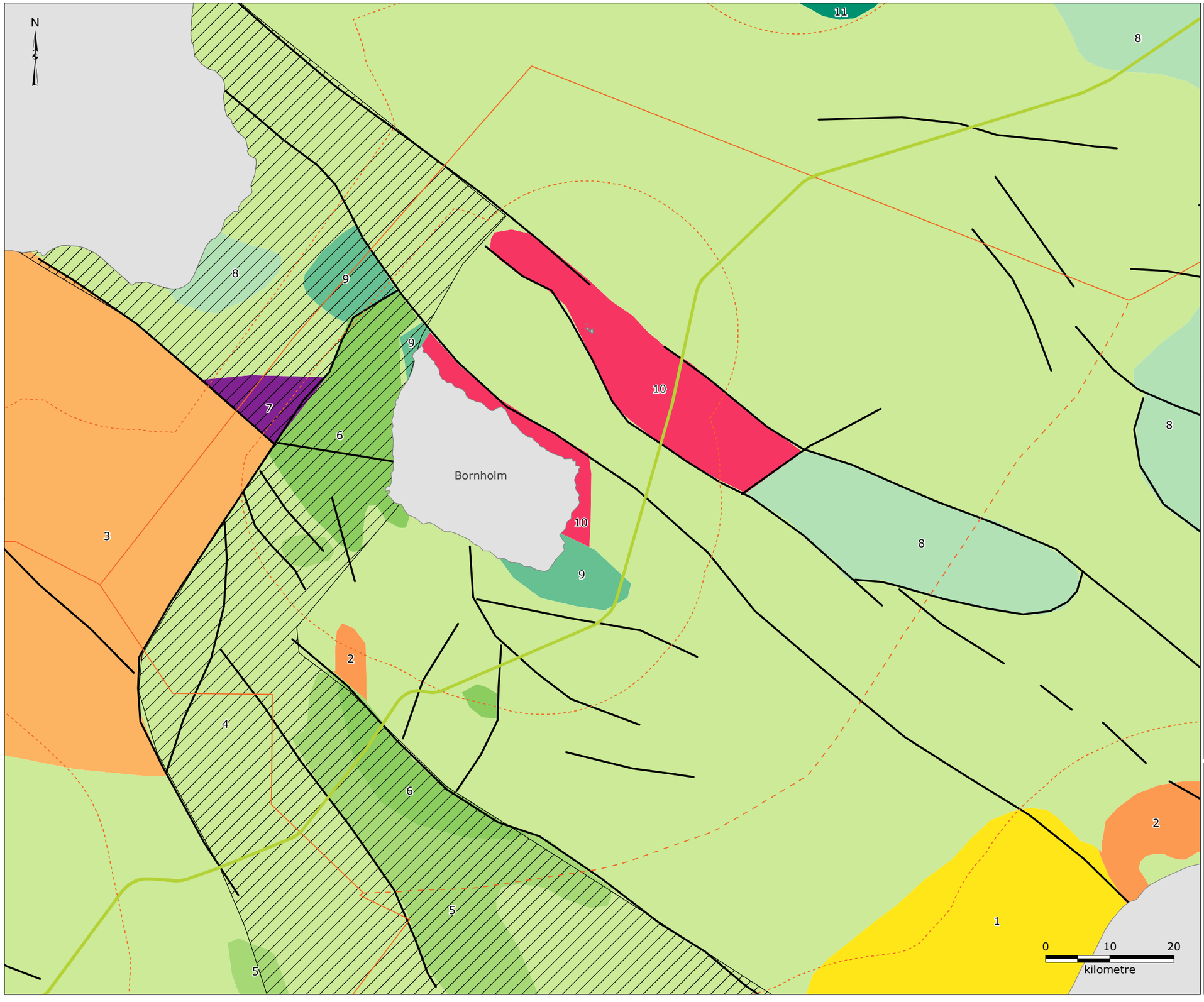
Reference:
- HELCOM, 2013, "HELCOM subbasins", http://maps.helcom.fi/website/mapservice/index.html, Date accessed: 2016-3-30
- HELCOM, 2013. "Phosphorus status distance to target 2007-2011", http://maps.helcom.fi/website/mapservice/index.html, Data accessed: 2016-05-30
- HELCOM, 2013. "Nitrogen status distance to target 2007-2011", http://maps.helcom.fi/website/mapservice/index.html, Data accessed: 2016-05-30

Version: 06
Date: 2016-11-24
Prepared: MSTB
Controlled: DMM

WA-02

Eutrophication

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Faults
- Tornquist zone

Geology:

- (1) Neogene
- (2) Paleogene
- (3) Danian limestones
- (4) Cretaceous chalk and limestones
- (5) Cretaceous mudstones and sandstones
- (6) Cretaceous; mainly sandstones and mudstones
- (7) Triassic; mainly mudstones and sandstones
- (8) Silurian; mainly limestones, marls, mudstones and shales
- (9) Cambrian-Ordovician
- (10) Precambrian crystalline basement
- (11) Ordovician limestones and shales

References:
- Per Ahlberg, 1986: "Den svenske kontinentalsockelns berggrund". Geological Survey of Sweden, Rapporter och meddelanden nr. 47.
- Curt Fredén (editor), 1994. "Berg och jord". Sveriges Nationalatlas, SNA Förlag, Stockholm, 208 pp.
- Tapio Koistinen (editor), 1994. "Precambrian basement of the Gulf of Finland and surrounding area". 1:1 mill. Geological Survey of Finland, Espoo

Version: 10
Date: 2016-12-12
Prepared: MSTB
Controlled: KEBS

GE-01-D

Geology

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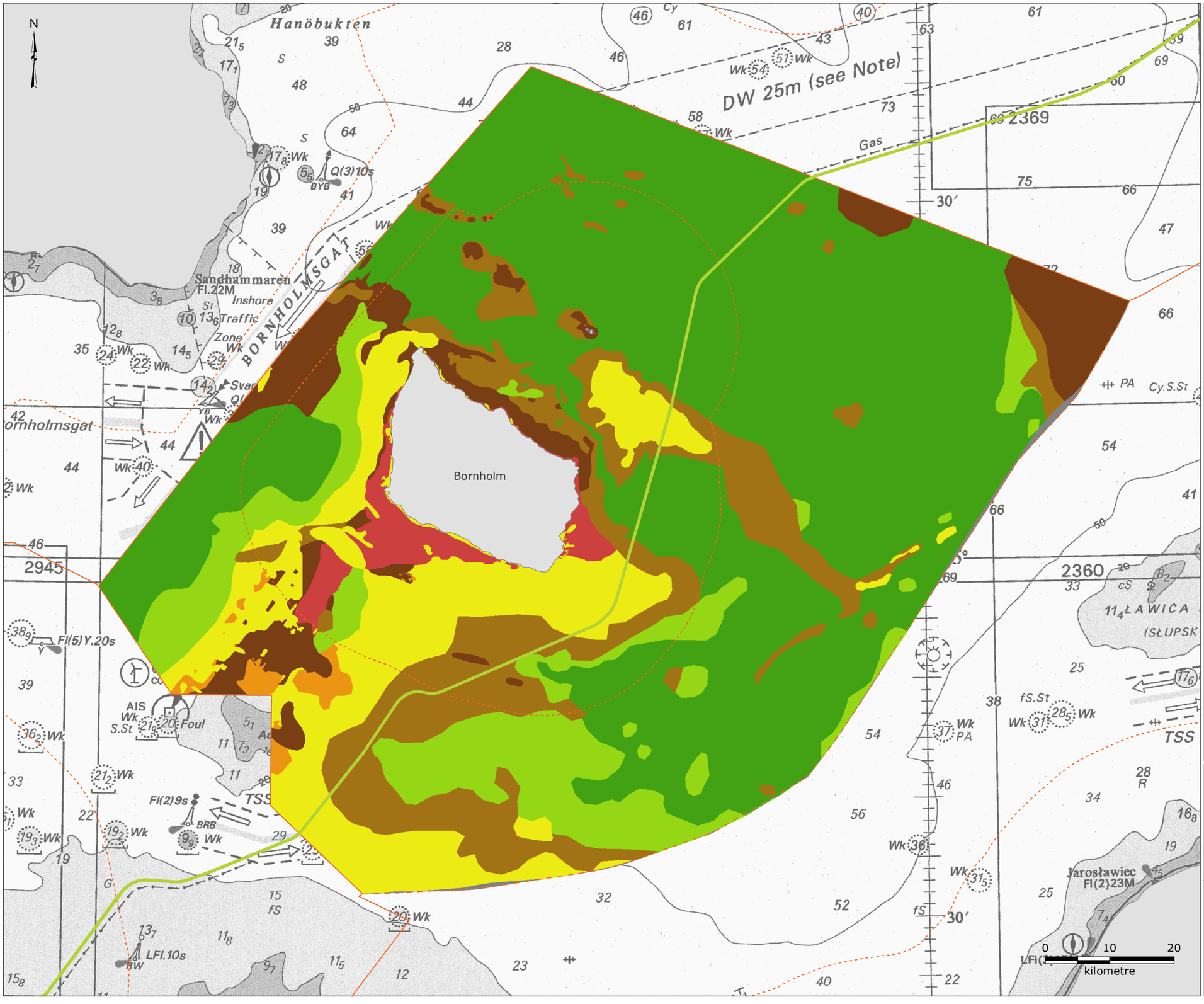


Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Sediment types:

- Mud and sandy mud
- Muddy sand
- Sand
- Gravel and coarse sand
- Till/diamicton
- Quaternary clay and silt
- Sedimentary rock
- No data available

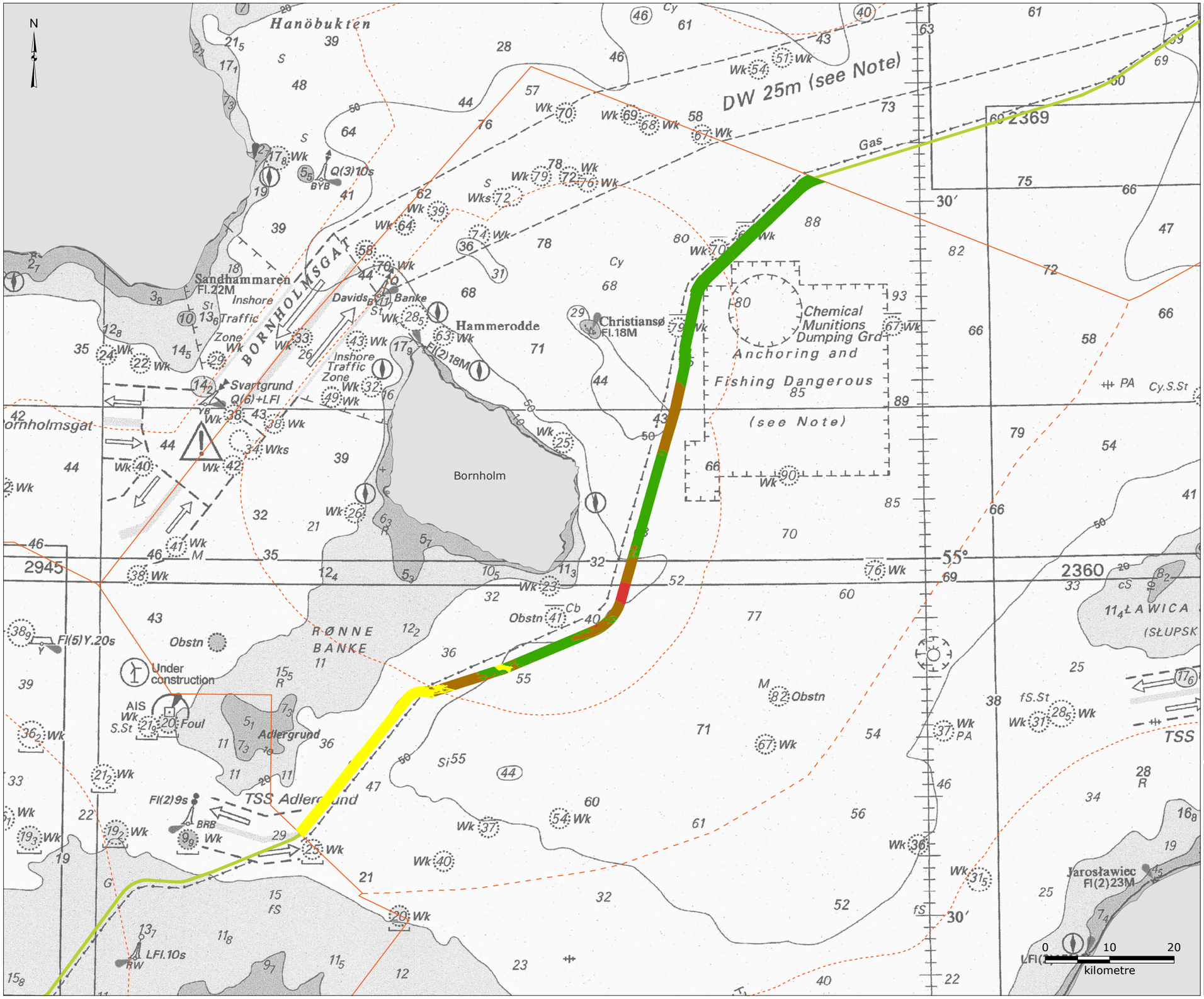
Reference:
- GEUS, 2014, "Danmarks digitale havbundssedimentkort 1:250.000", Denmark

Version: 08
Date: 2016-10-12
Prepared: MSTB
Controlled: KEBS

GE-02-D

Seabed sediments

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Seabed sediments:

- Silty sand
- Clayey sand
- Silty clay
- Sandy clay
- Rocky

Reference:
- Fugro Survey Limited, 2016, "Geophysical reconnaissance surveys reference route", Baltic Sea, Country Report Denmark. Doc. No. W-SU-REC-POF-REP-803-DEN000EN-02

Version: 07
Date: 2016-10-14
Prepared: MSTB
Controlled: KEBS

GE-03-D

Seabed sediments along the pipeline route

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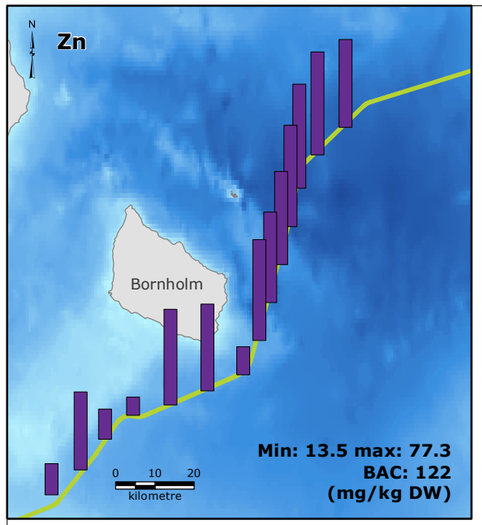

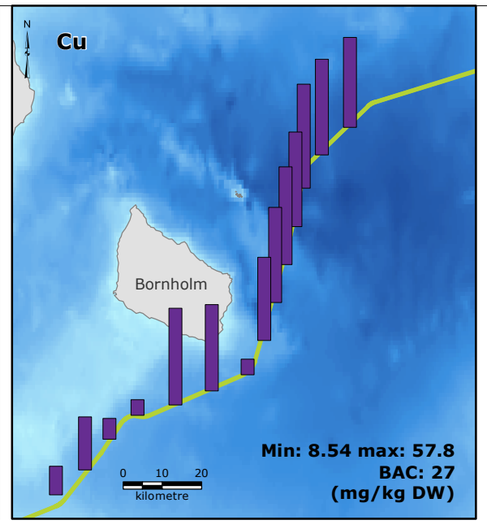

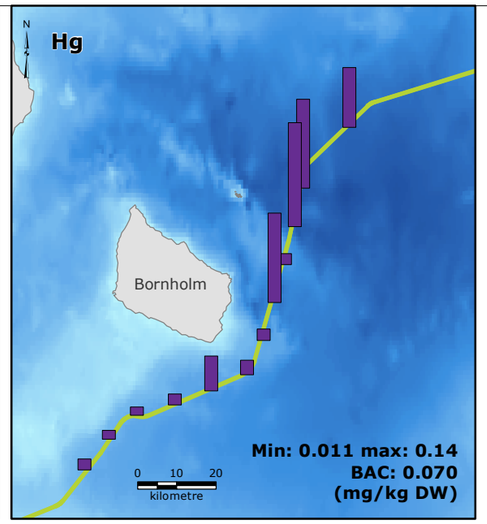

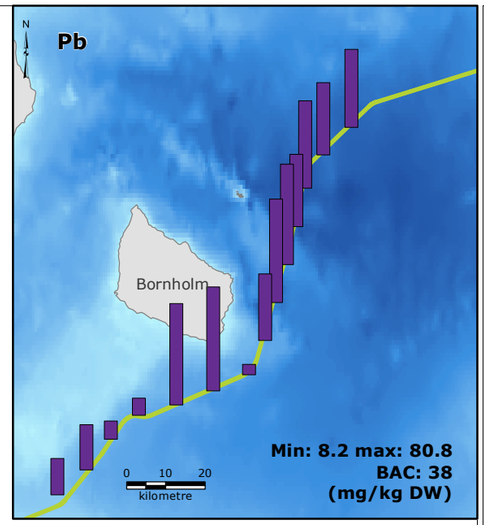

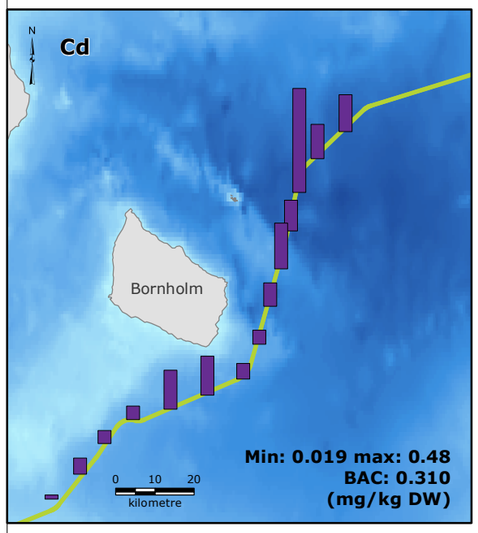

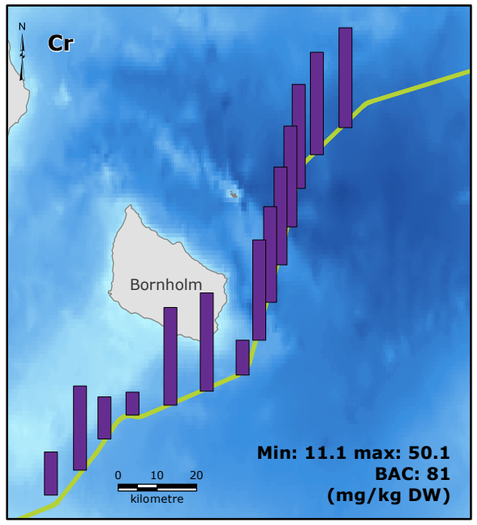

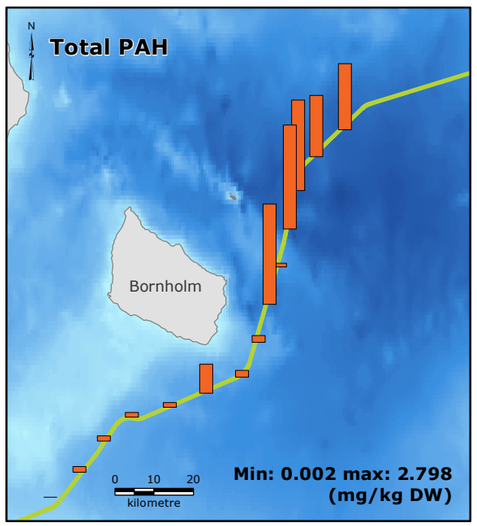

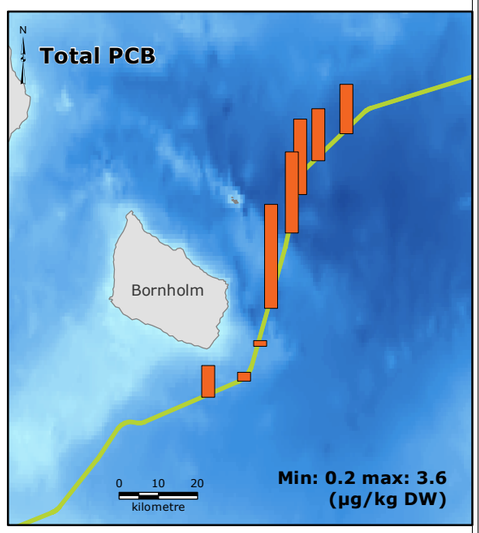

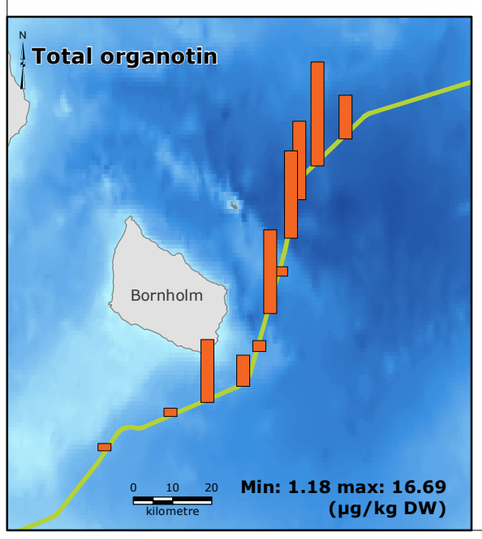

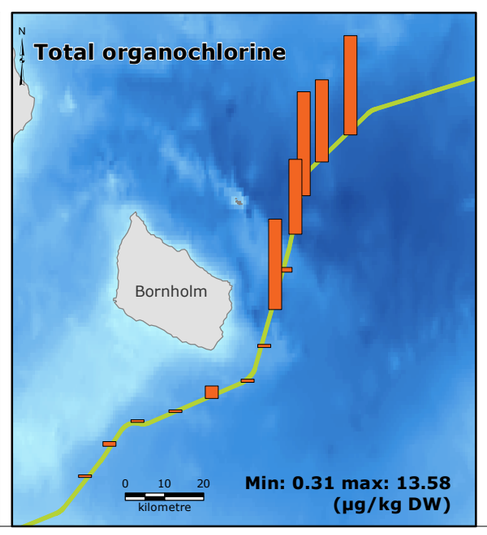

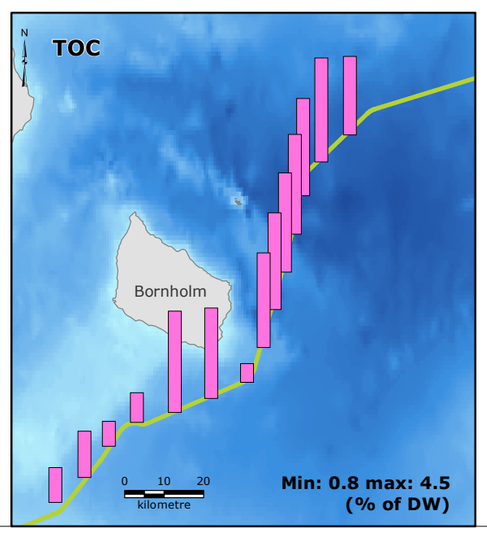

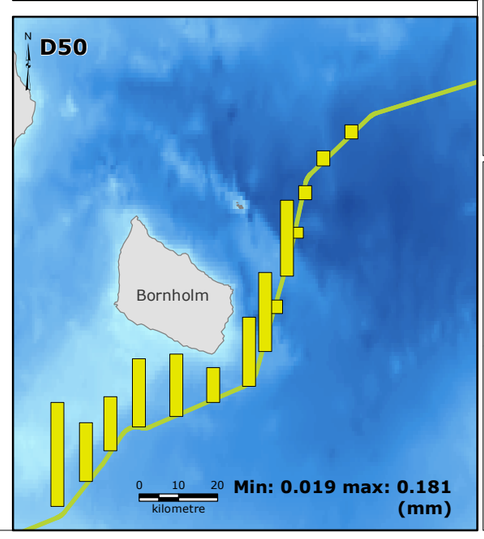

Legend:

NSP2 Route

Measured parameters:

- Metals
- Organic compounds
- Organic carbon
- Grain size

Bathymetry [depth (m)]:

- 0
- -103

Note:
- Background Assessment Concentrations (BACs) are statistical tools defined in relation to the background concentration. Comparison of observed concentrations with BAC enable statistical testing of whether they can be considered to be near background concentrations.
- BAC has been developed by OSPAR for some, but not all of the parameters

Measured parameters:
- Metal concentrations: Zn, Cu, Hg, Pb, Cd, Cr
- Organic compounds concentrations: total PAH (polycyclic aromatic hydrocarbons), total PCB (polychlorinated biphenyls), total organotin, and total organochlorine
- D50 - median grain size (mm)
- TOC - total organic carbon
- DW - dry weight

References:
DHI, 2016, "Seabed Sediments Survey Report for Danish Waters in 2015", DHI , Denmark.

Version: 11
Date: 2016-12-19
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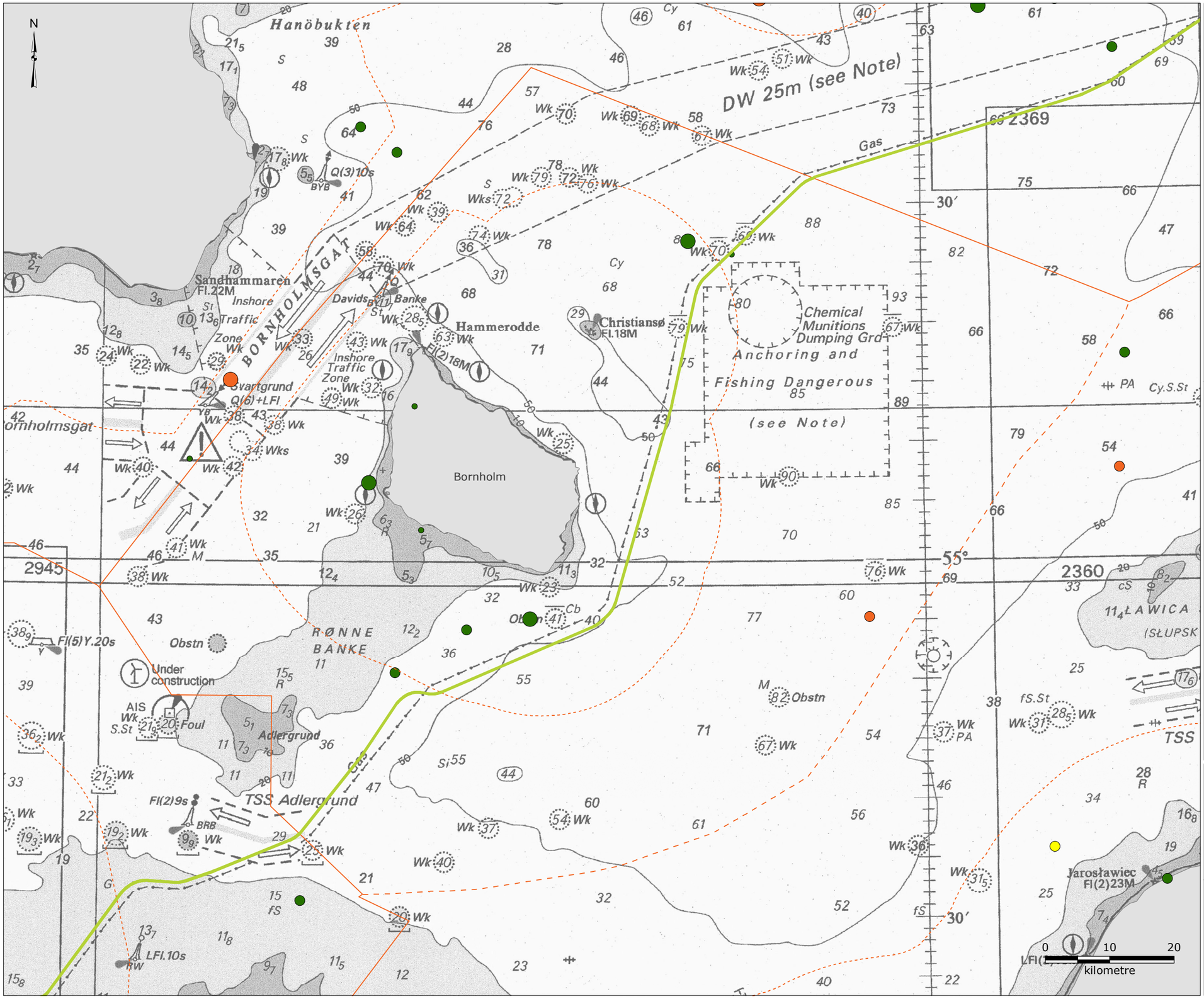
Controlled: KEBS

GE-04-D

Chemical and physical characteristics of seabed sediments

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Magnitude of earthquakes (Richter scale):

- 0 - 1
- 1 - 2
- 2 - 3

Depth of earthquakes (km):

- 0 - 35
- > 35 - 70
- > 70 - 150

Note:
- Seismic activity (epicenter of earthquake) measured in 2002-2015

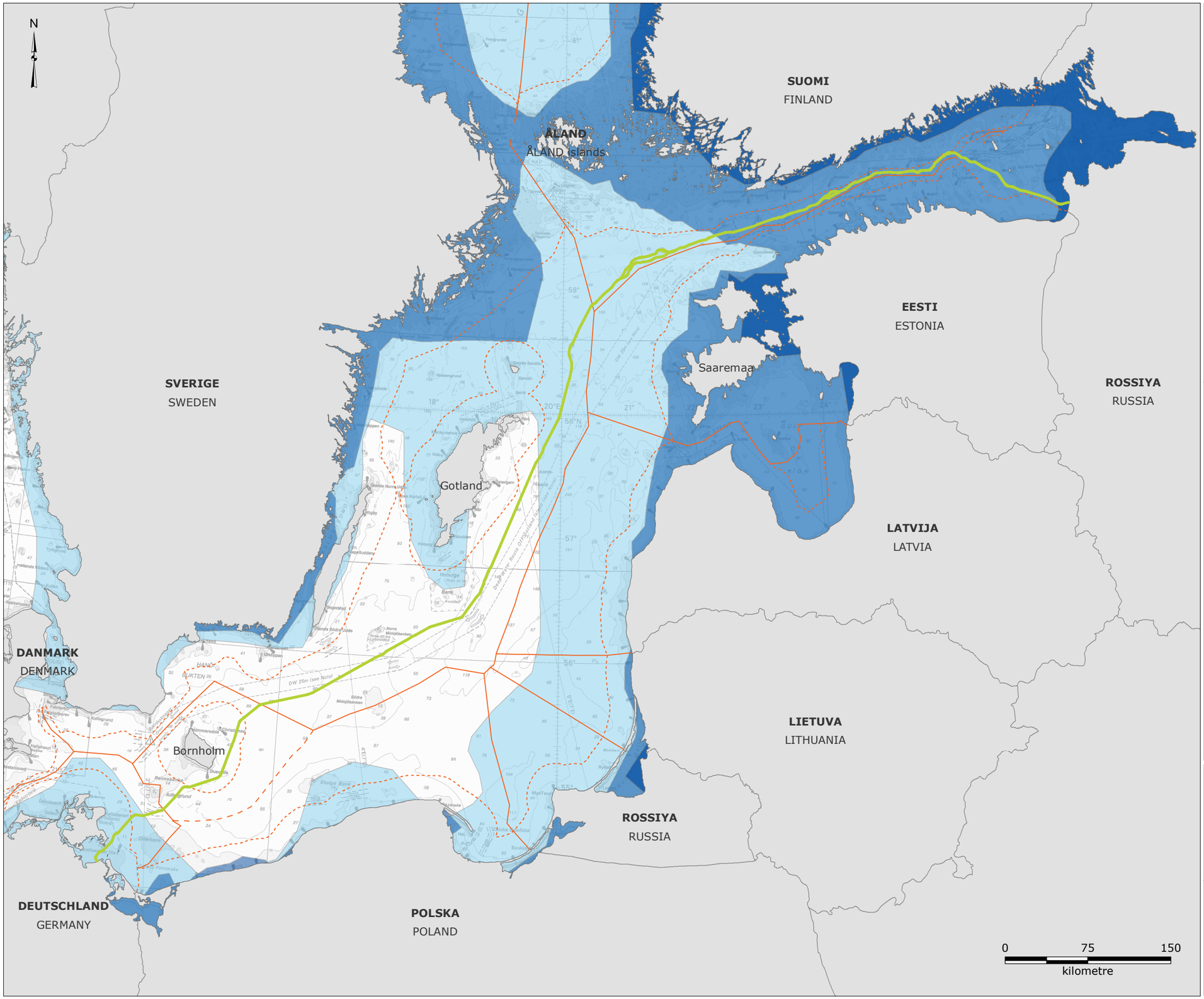
Reference:
- GEUS, 2016, "Registrerede jordskælv", http://www.geus.dk/DK/nature-climate/natural-disasters/seismology/Sider/seismo_reg-dk.aspx, Date accessed: 2016-03-21
- Ramboll, 2016, "E-mail from The Swedish National Seismic Network, Sweden", Received: 2016-05-19

Version: 13
Date: 2016-10-26
Prepared: MSTB
Controlled: KEBS

GE-05-D

Seismic activity

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Ice cover in 2014-2015 (mild winter)
- Ice cover in 2012-2013 (average winter)
- Ice cover in 2010-2011 (severe winter)

Reference:
- Finnish Meteorological Institute (FMI), http://ilmatieteenlaitos.fi/jaatalvet, Date accessed: 2016-04-14.

Version: 09
Date: 2016-10-13
Prepared: MIRS
Controlled: KEBS

CL-01

Ice cover

RAMBØLL

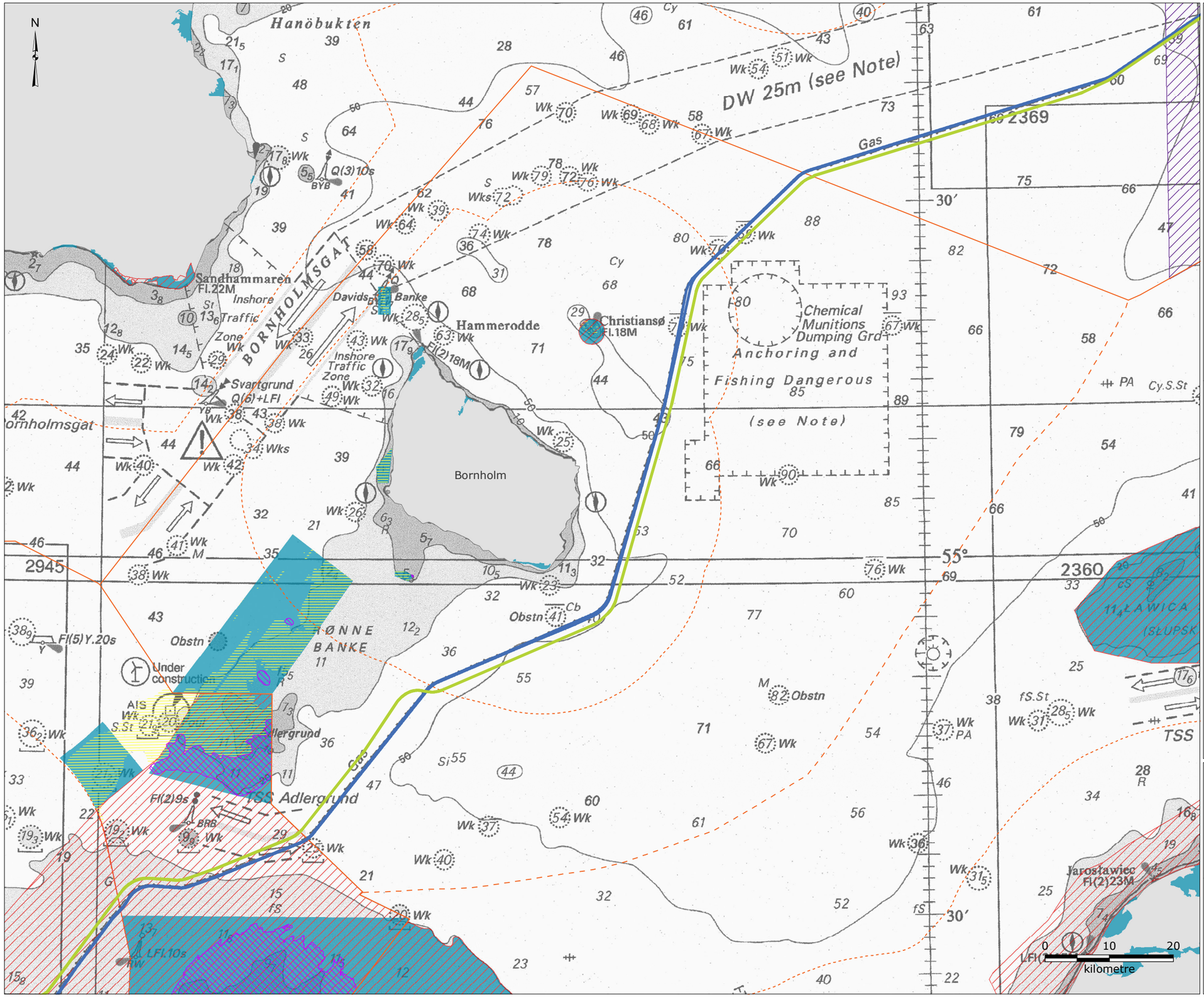
BIOLOGICAL ENVIRONMENT

PROTECTED AREAS

FISH

MARINE MAMMALS

BIRDS



Legend:

- NSP2 Route
- NSP Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Natura 2000 sites:

- Special Protection Area (SPA)
- Special Area of Conservation/ Special Conservation Interests (SAC/SCI)
- Proposed extended Natura 2000 site

Open sea and tidal area habitat types associated with Natura 2000 sites in Danish and German waters:

- Sandbanks which are slightly covered by sea water all the time
- Reefs

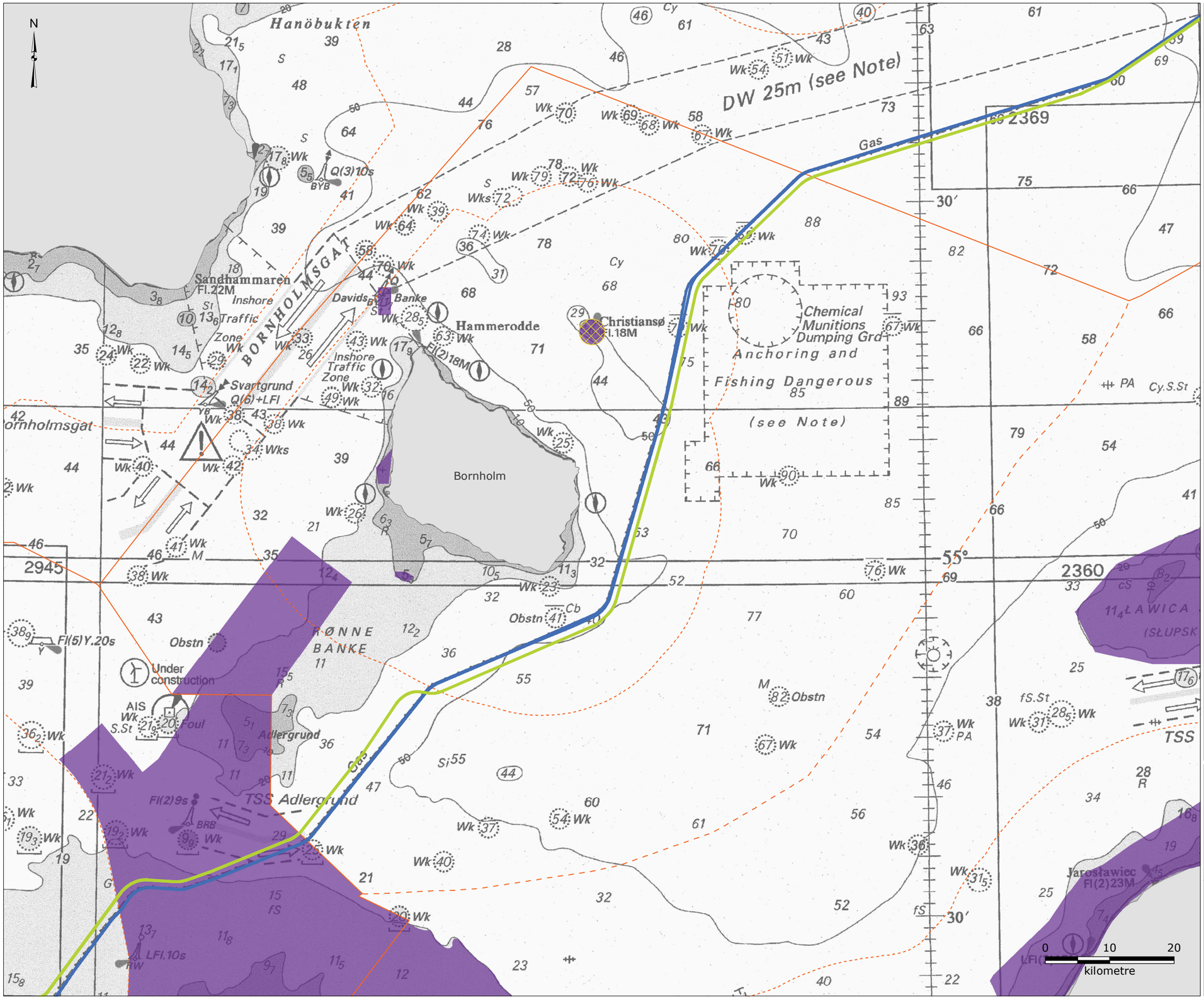
References:
- European Environment Agency, 2014, "Natura 2000 data - the European network of protected sites", http://www.eea.europa.eu/data-and-maps/data/natura-6, Date accessed: 2016-1-19
- Federal Agency for Nature Conservation (BfN), 2016. "Lebensraumtypen"
- Länsstyrelsen Gotlands Län and Kalmar Län, 2016, "M2015/02273/N m (delvis) - Förslag till nya områden för bevarande av livsmiljöer samt vilda djur och växter - SE0330308 Hoburgs bank och Midsjöbankarna", Miljö- och Energidepartementet, Regeringen
- Styrelsen for Vand og Naturforvaltning, 2016. "Forslag til Natura 2000-planer 2016-2021".

Version: 15
Date: 2017-03-02
Prepared: MSTB
Controlled: DMM

PA-01-D

Natura 2000 sites and habitat types

RAMBØLL



Legend:

- NSP2 Route
- NSP Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Ramsar site
- HELCOM MPA

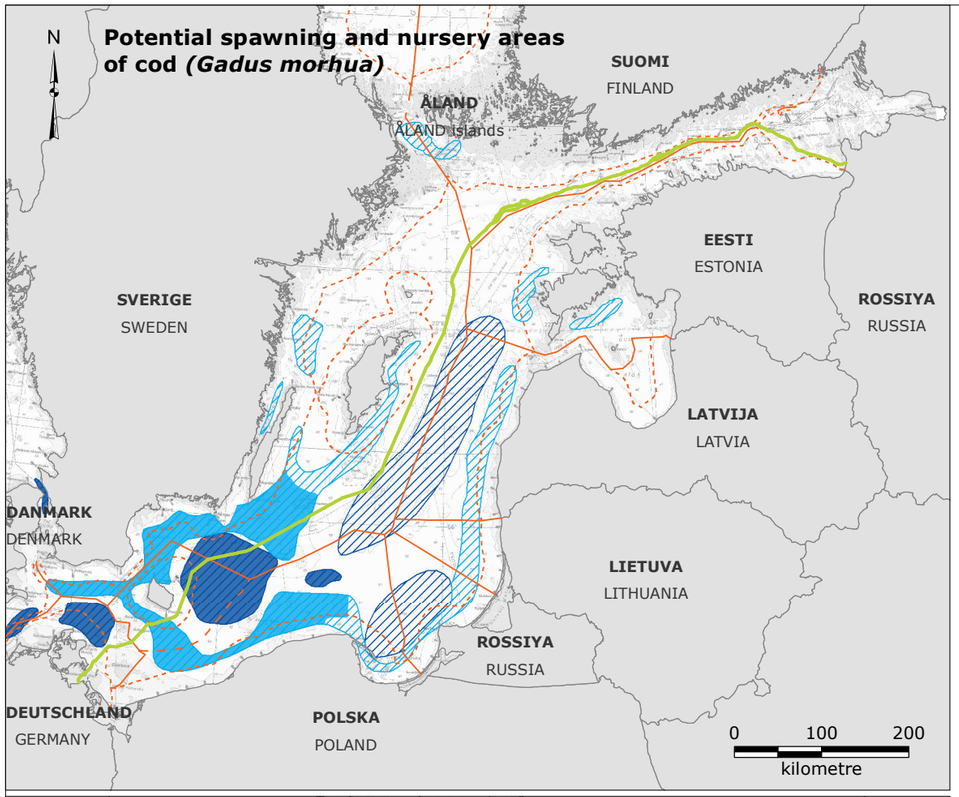
References:
- European Environment Agency and HELCOM, 2012, "Ramsar sites", http://maps.helcom.fi/website/mapservice/index.html, Data accessed: 2016-01-21
- HELCOM, 2015, "HELCOM MPAs", http://maps.helcom.fi/website/mapservice/index.html, Date accessed: 2016-01-11

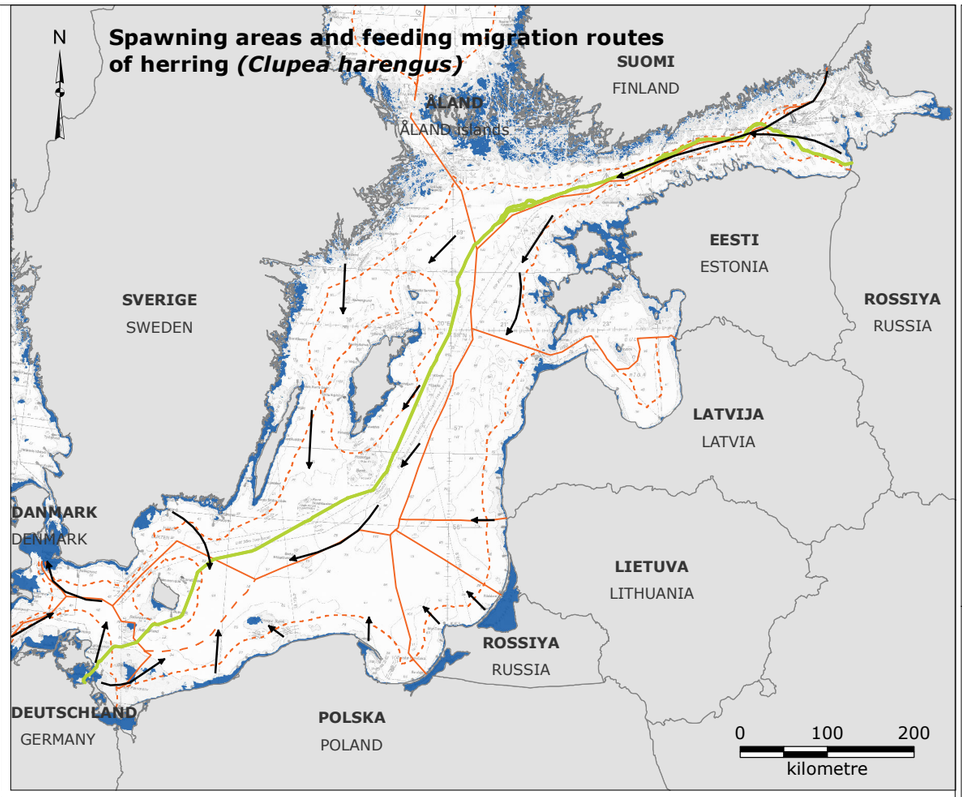
Version: 09
Date: 2016-10-19
Prepared: MSTB
Controlled: DMM

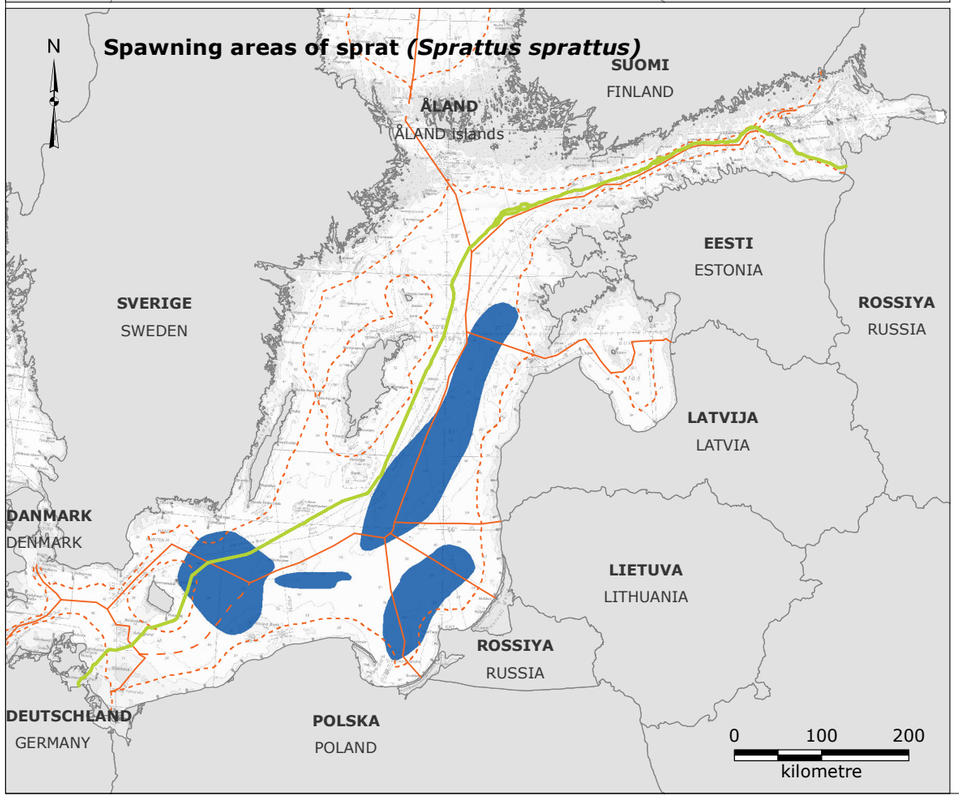
PA-02-D

Ramsar sites and Marine Protected Areas (MPA's)

RAMBØLL







Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Nursery area
- Spawning area
- Previous nursery area
- Previous spawning area
- Migration routes to feeding areas

Note:
- Where areas are referred to as 'previous', this refers to up to the year 2000 /ICES 2012/

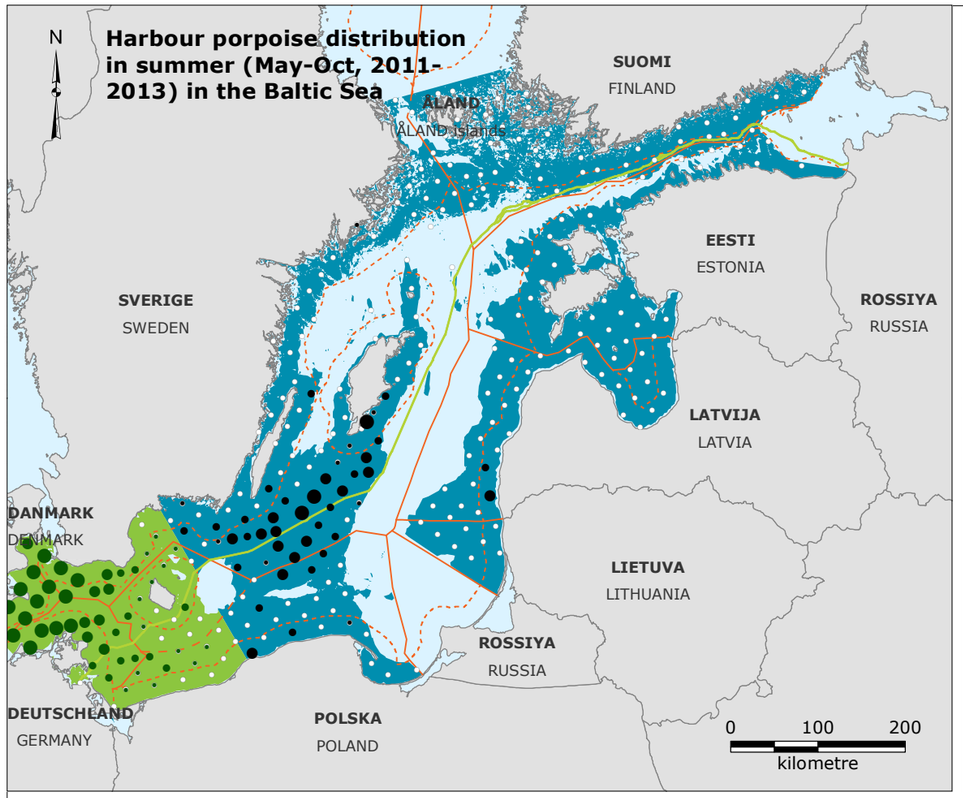
References:
- Bagge, O., Thurow, F., Steffensen, E., Bay, J. 1994. "The Baltic Cod". Dana, 10, pp. 1-28
- Cardinale, M., Svedäng, H., 2011. "The beauty of simplicty in science: Baltic cod stock improves rapidly in "cod hostile" ecosystem state". Marine Ecology Progress Series, 425, pp. 297-301
- ICES, 2012, "Report of the ICES Advisory Committee". ICES advice 2012, Book 8. ICES, Copenhagen.
- ICES, 2006. "ICES advice. Book 9. Widely distributed and Migratory stocks".
- Plikks and Aleksjevs, 1998. "Latvijas baba". Riga

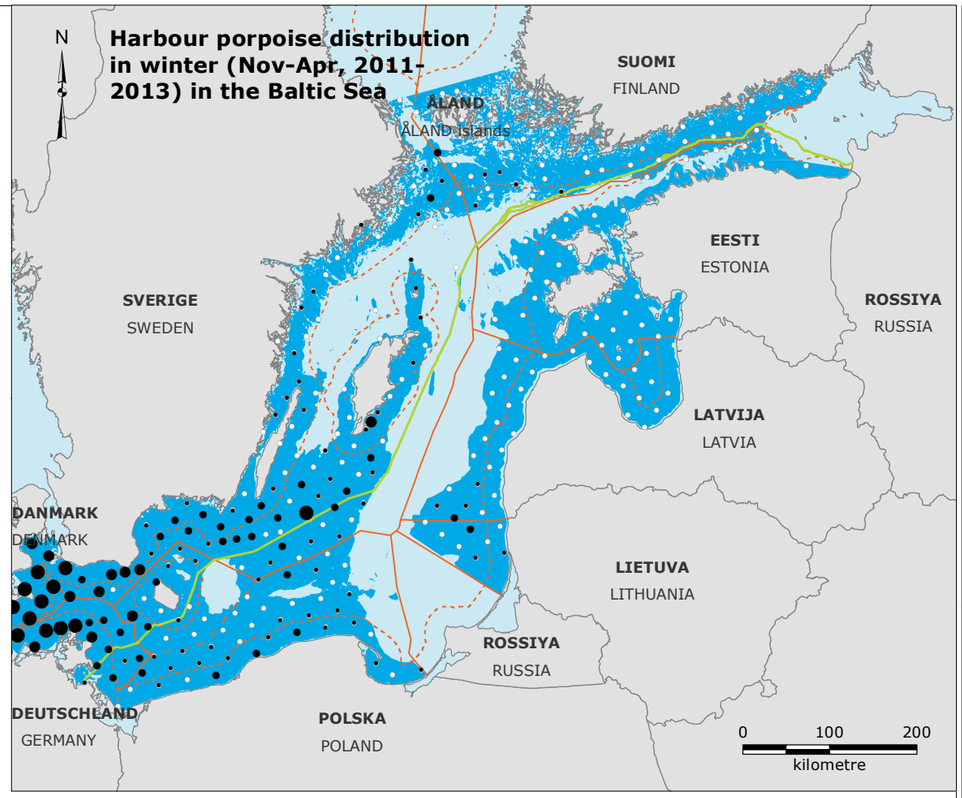
Version: 06
Date: 2016-11-24
Prepared: MSTB
Controlled: MCO

FI-01

Spawning areas of cod, herring, and sprat

RAMBØLL





Legend:

Population areas:

- Baltic
- Belt Sea
- No data available

Belt Sea, Summer (May - Oct)

Porpoise Positive Seconds per day (Belt Sea):

- 0.023 - 1
- > 1 - 10
- > 10 - 100
- > 100 - 3015
- zero detections

Baltic, Summer (May - Oct)

Porpoise Positive Seconds per day (Baltic):

- 0.002 - 0.1
- > 0.1 - 1
- > 1 - 10
- > 10 - 248
- zero detections

Legend:

Static Acoustic Monitoring of the Baltic Sea Harbour Porpoise areas:

- Data available
- No data available

Porpoise Positive Seconds per day:

- 0.003 - 1
- > 1 - 10
- > 10 - 100
- > 100 - 1856
- Zero detections

Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Notes:
- Harbour porpoise *(Phocoena phocoena)* distribution in winter (Nov-Apr) and summer (May-Oct)
- It is only possible to separate the Baltic Sea and Belt Sea harbour porpoise populations in summer
- Porpoise Positive Secounds is the encounter rate, measured as proportion of click positive seconds per second
- Data collected by CPODs under the Static Acoustic Monitoring of the Baltic Sea Harbour Porpoise project

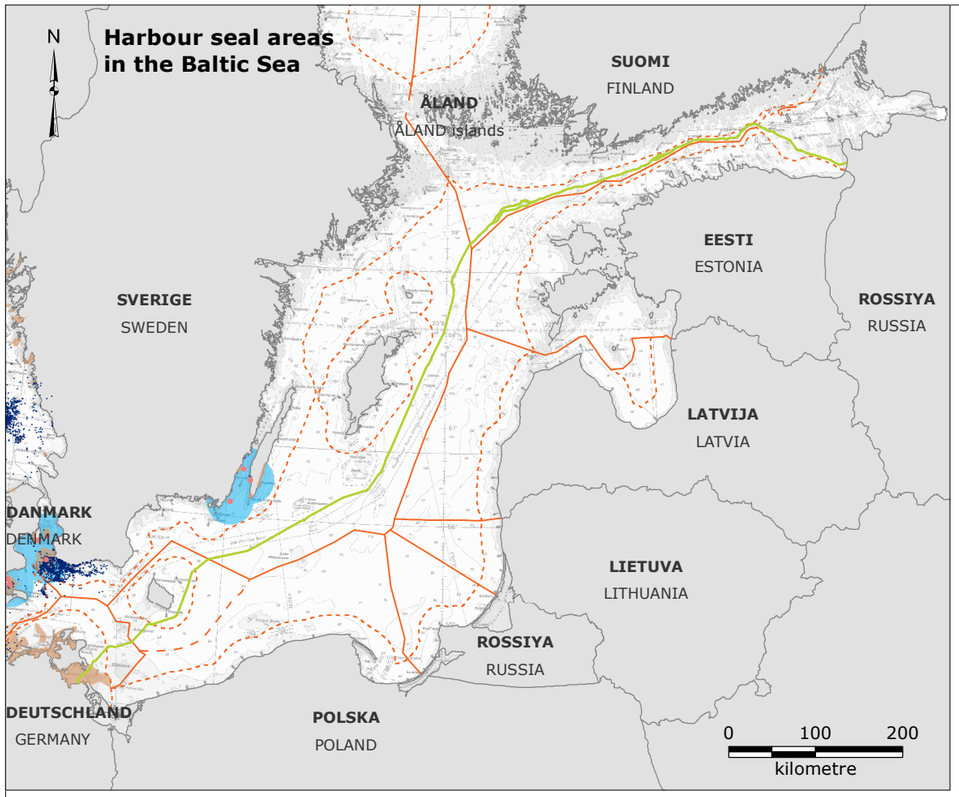
Reference:
- SAMBAH, 2016, "Static Acoustic Monitoring of the Baltic Sea Harbour Porpoise (SAMBAH). Final report under the LIFE+ project LIFE08 NAT/S/000261", Kolmårdens Djurpark AB, SE-618 92 Kolmården, Sweden. 81pp.
- Teilmann, J., Sveegaard, S., 2016. "Marine mammals in the Baltic Sea in relation to the Nord Stream 2 project – Baseline report", DCE/Institute for Bioscience, Aarhus University

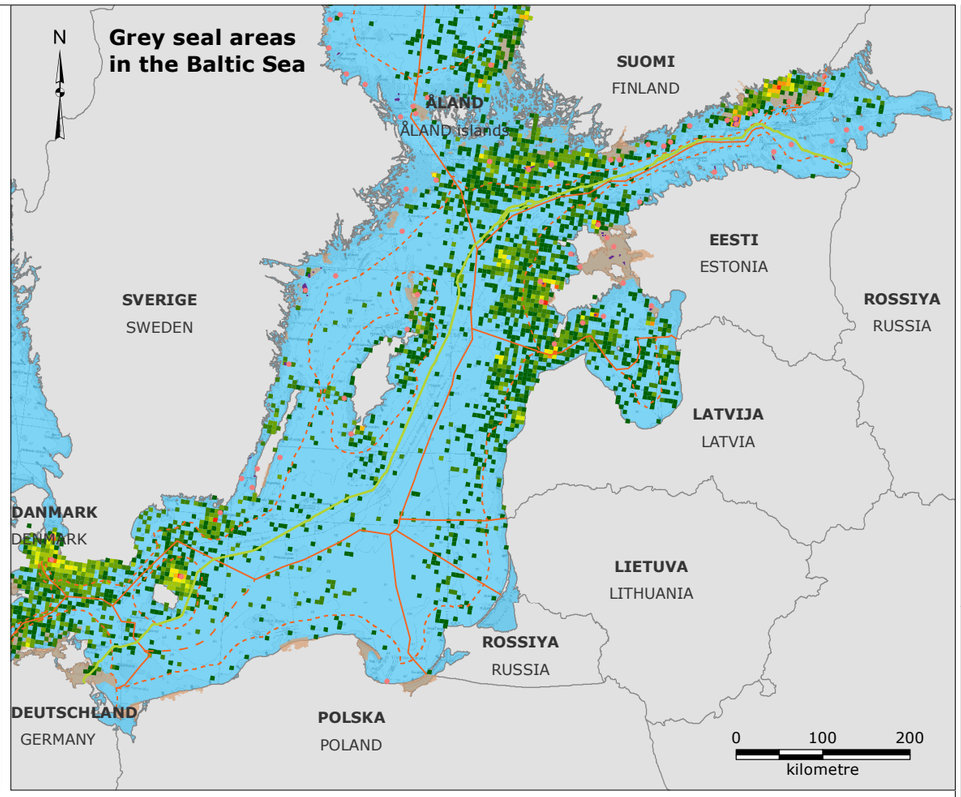
Version: 10
Date: 2017-02-01
Prepared: MSTB
Controlled: DMM

MA-01

Harbour porpoise distribution

RAMBØLL





Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Legend:

Harbour seals:

- Colonies
- Satellite tracking locations (HELCOM data, n=30)
- Harbour seal sanctuary
- Natura 2000 site designated for harbour seals
- Regular occurrence (27 km zone)

Legend:

Grey seals:

- Colonies
- Grey seal sanctuary
- Natura 2000 site designated for grey seals
- Regular occurrence (380 km zone)

Grey seal distribution in 2015:

(Number of observations)

- 1
- 2
- 3 - 6
- 7 - 11
- 12 - 17
- 18 - 25
- 26 - 45
- 46 - 77
- 78 - 113
- 114 - 432

Note:
- Satellite tracking based on number of tagged seals
- Regular occurrence represents maximum tagging distance from colony

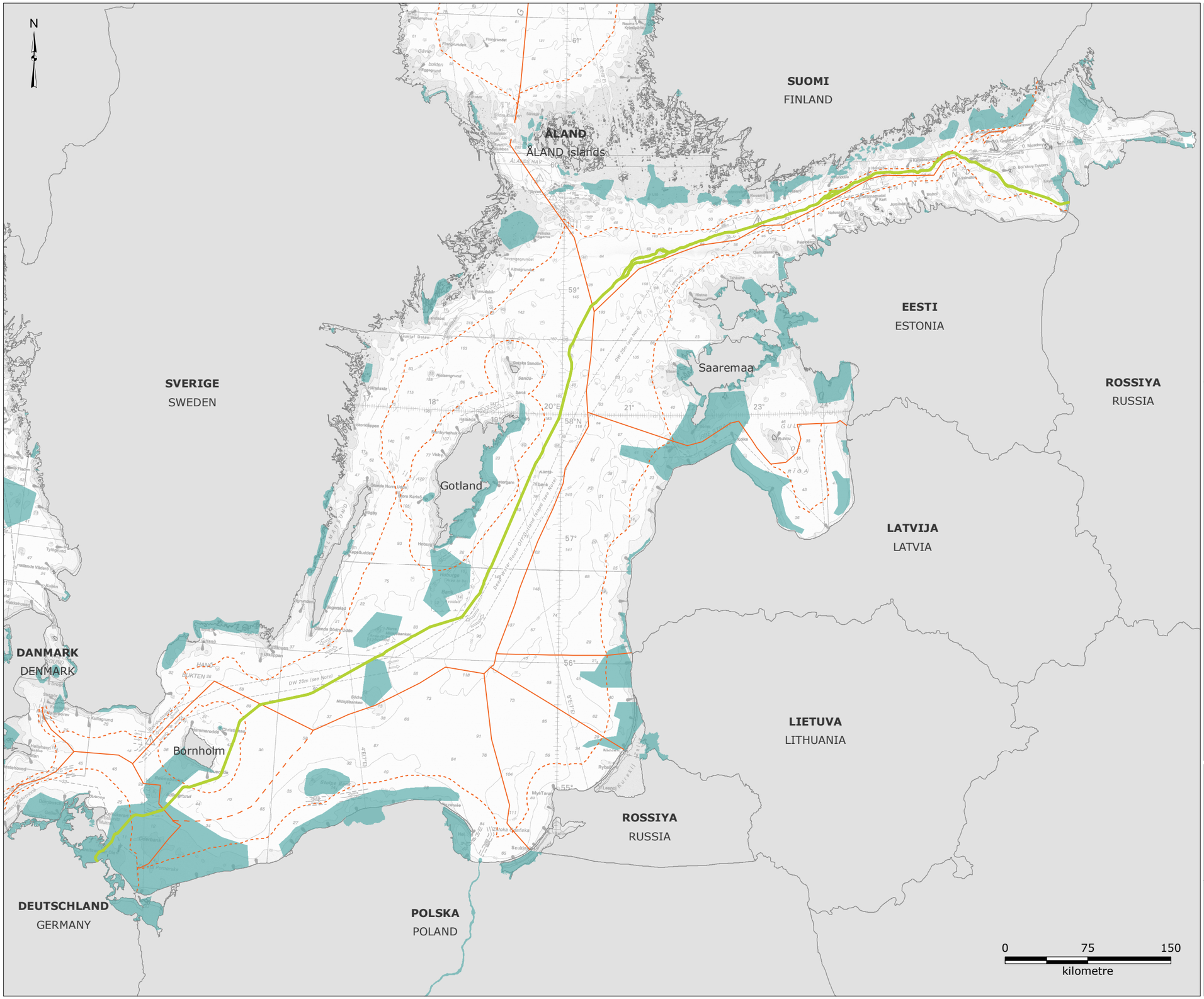
Reference:
- Eco Express, 2016, "Baseline - Book 4"
- HELCOM, BALSAM, 2015, BALSAM_GreySeal_5KGrid", http://maps.helcom.fi/website/mapservice/index.html, Date accessed: 2016-01-25
- Teilmann, J., Sveegaard, S., 2016. "Marine mammals in the Baltic Sea in relation to the Nord Stream 2 project – Baseline report", DCE/Institute for Bioscience, Aarhus University

Version: 11
Date: 2017-03-02
Prepared: MIRS
Controlled: DMM

MA-02

Harbour seal and grey seal areas

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Important Bird and Biodiversity Areas (IBA)

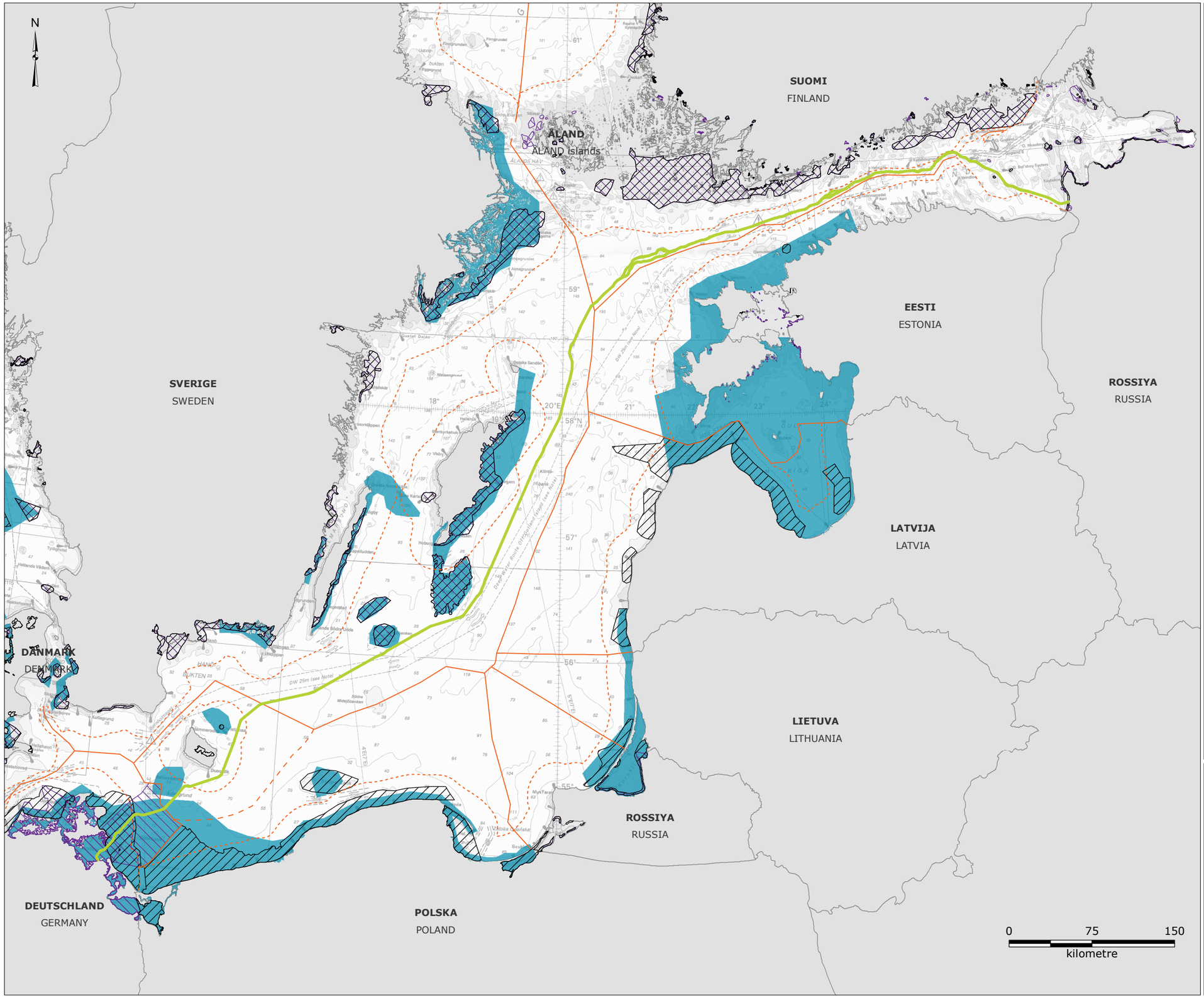
References:
- BirdLife International, 2016, "Marine IBA e-atlas", http://maps.birdlife.org/marineIBAs/default.html, Date accessed: 2016-03-01
- BirdLife Finland, 2016, http://www.birdlife.fi/suojelu/paikat/iba/iba-suomen-tarkeat-lintualueet.shtml, Date accessed: 2016-09-15
- HELCOM, 2003, "Important Bird Areas - digital map", http://maps.helcom.fi/website/Biodiversity/index.html, Date accessed: 2015-06-11

Version: 09
Date: 2016-12-15
Prepared: MSTB
Controlled: SSB

BI-01

Important Bird and Biodiversity Areas (IBA's)

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Waterbirds during migration (spring and autumn)
- Waterbirds during breeding season (spring and summer)
- Waterbirds during winter

References:
- COWI, 2010, "Sub-Regional risk of spill of oil and hazardous substances in the Baltic Sea (BRISK)", Data Collection Report, Denmark.
- Sonntag, N., Mendel, B., Garthe, S., 2006, "Distribution of seabirds and waterbirds in the German Baltic Sea throughout the year". Vogelwarte 44, pp. 81-112
- Skov, H., Vaitkus, G., Flensted, K.N., Grishanov, G., Kalamees, A., Kondratyev, A., Leivo, M., Luigujõe, L., Mayr, C., Rasmussen, J.F., Raudonikis, L., Scheller, W., Sidlo, P.O., Stipniece, A., Struwe-Juhl, B., Welander, B., 2000, "Inventory of Coastal and marine Important Bird Areas in the Baltic Sea". BirdLife International, Cambridge, 287 pp.
- Heath, M.F., Evans, M.I. (eds.), 2000, "Important Bird Areas in Europe: priority sites for conservation". Vol. 1: Northern Europe. BirdLife Conservation Series No. 9, BirdLife International
- Skov, H., Durinck, J., Leopold, M.F., Tasker, M.L., 2007. "A quantitative method for evaluating the importance of marine areas for conservation of birds". Biological Conservation, 136, pp. 362-371",
http://maps.helcom.fi/website/Biodiversity/index.html,
Date accessed: 2015-06-11

Version: 06
Date: 2016-10-20
Prepared: MSTB
Controlled: SSB

BI-02

Bird wintering and staging areas during migration

RAMBØLL

SOCIO-ECONOMIC ENVIRONMENT

MILITARY AREAS

INFRASTRUCTURE

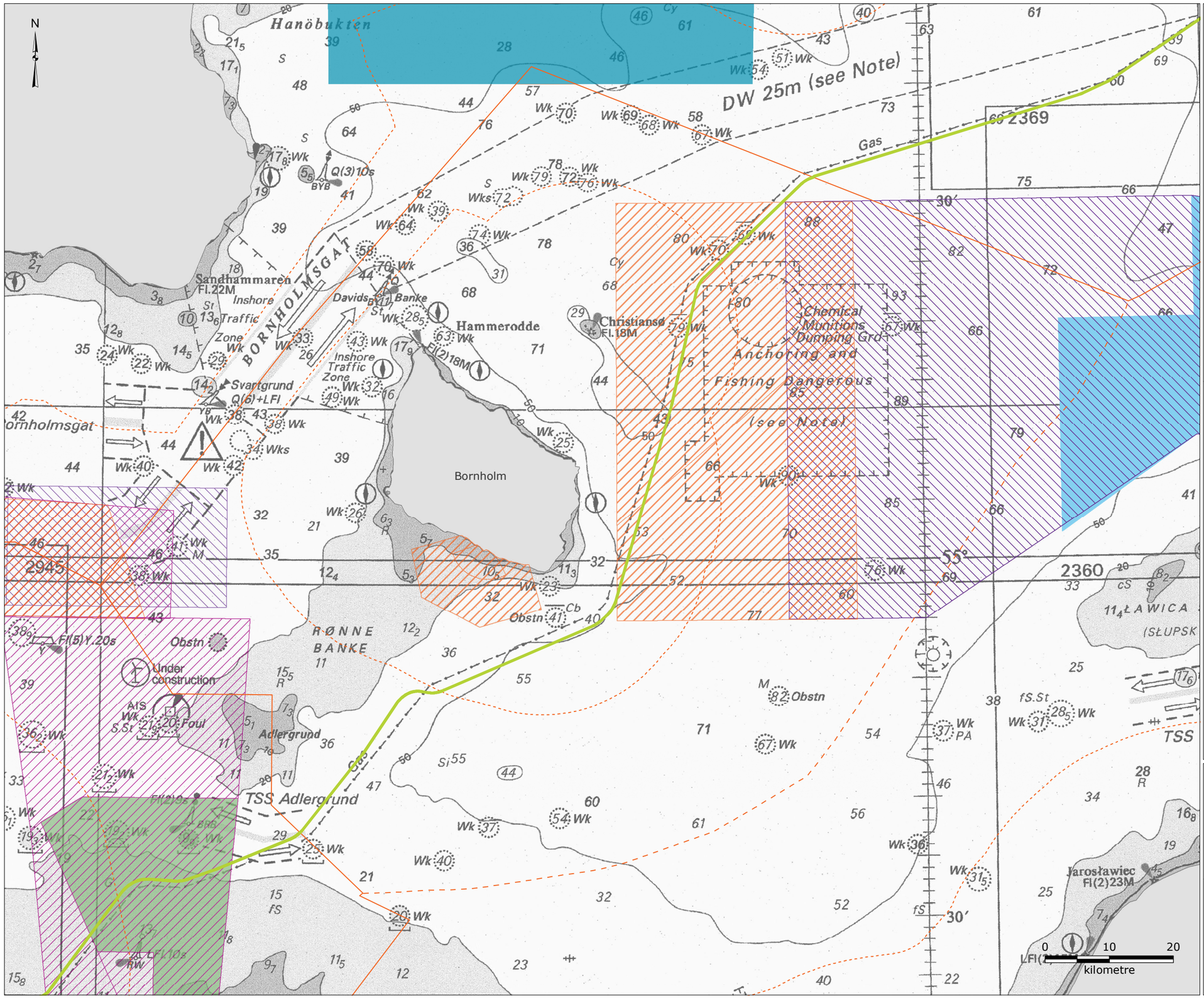
MUNITIONS, CONVENTIONAL/CHEMICAL

FISHERY

SHIP TRAFFIC

TOURISM

CULTURAL HERITAGE



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Firing danger area
- Other military exercise area
- Submarine exercise area
- Safe Bottoming Areas
- Other live firing exercise area
- Artillery firing exercise area

References:

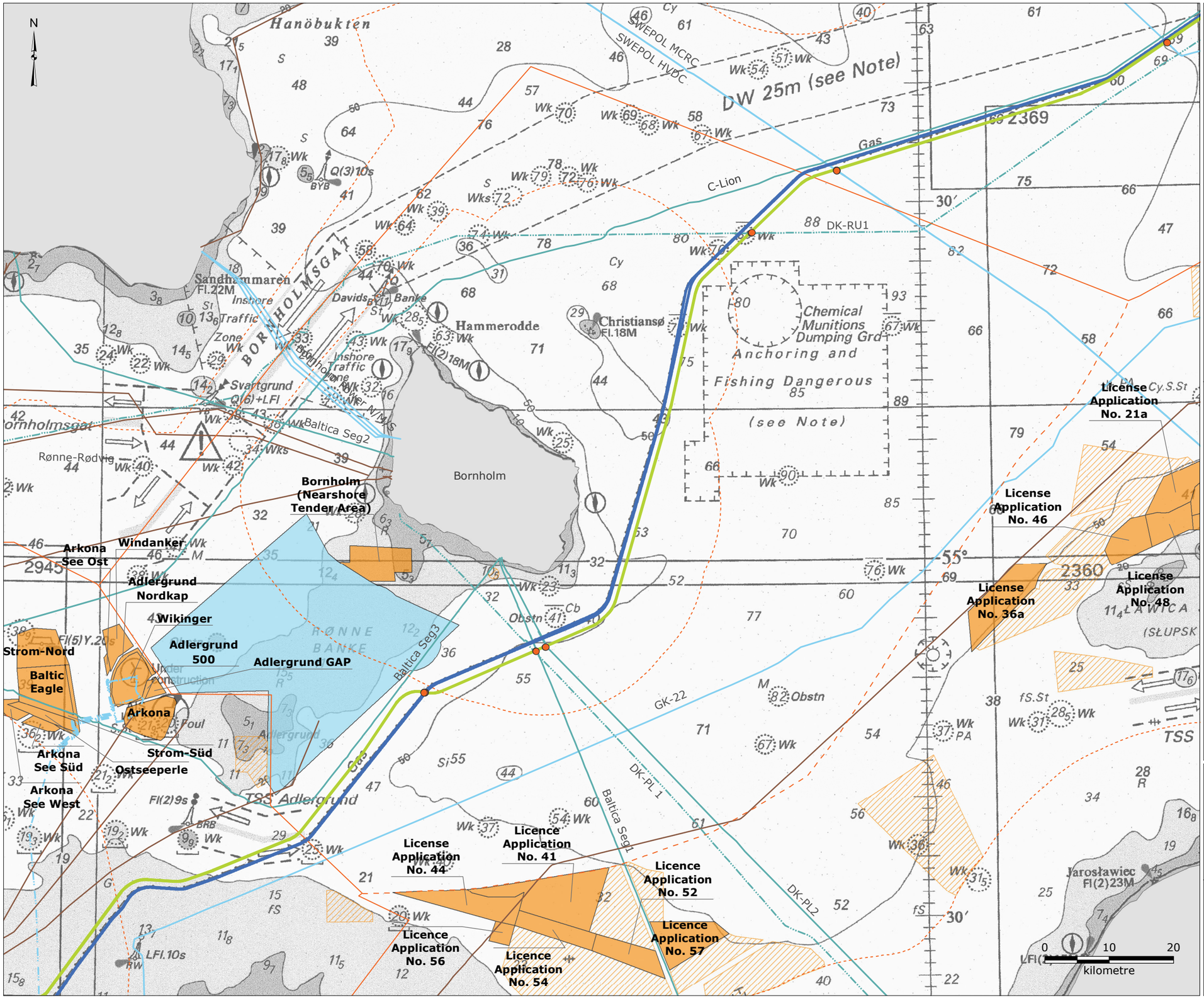
- Försvarsmakten, 2015, "Redovisning av riksinteressen och områden av betydelse för totalförsvarets militära del enligt 3 kap §9 Miljöbalken i Kalmar Län", Sweden
- Letter from Federal Office for Infrastructure, Environmental Protection and Services of The German Armed Forces, 23 March 2016
- Ramboll, 2013, "E-mail from Forsvarets Bygnings- & Etablissementstjeneste, Denmark", Received: 2013-06-27
- Ramboll, 2017, "E-mail from IfAÖ GmbH, Germany", Received: 2017-03-01
- UKHO, 2007, "British Admiralty Nautical Chart 2816: Baltic Sea, Southern Sheet", United Kingdom Hydrographic Office

Version: 11
Date: 2017-03-03
Prepared: MSTB
Controlled: ANL

MI-01-D

Military practice areas

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Pipeline / cable crossing for existing infrastructure

Cables:

- Power - active
- Power - planned
- Telecom - active
- Telecom - inactive
- Unknown

Pipelines:

- NSP Route

Wind farms:

- Planned Area
- Reserved Area
- Potential Area

Note:
- Planned refers to areas where there currently are planned projects in various stages
- Reserved area refers to areas that are reserved for wind farms by authorities
- Potential areas refers to areas where there at some point in time has been planned projects that have been cancelled, however the areas could potentially house future projects involving windfarms

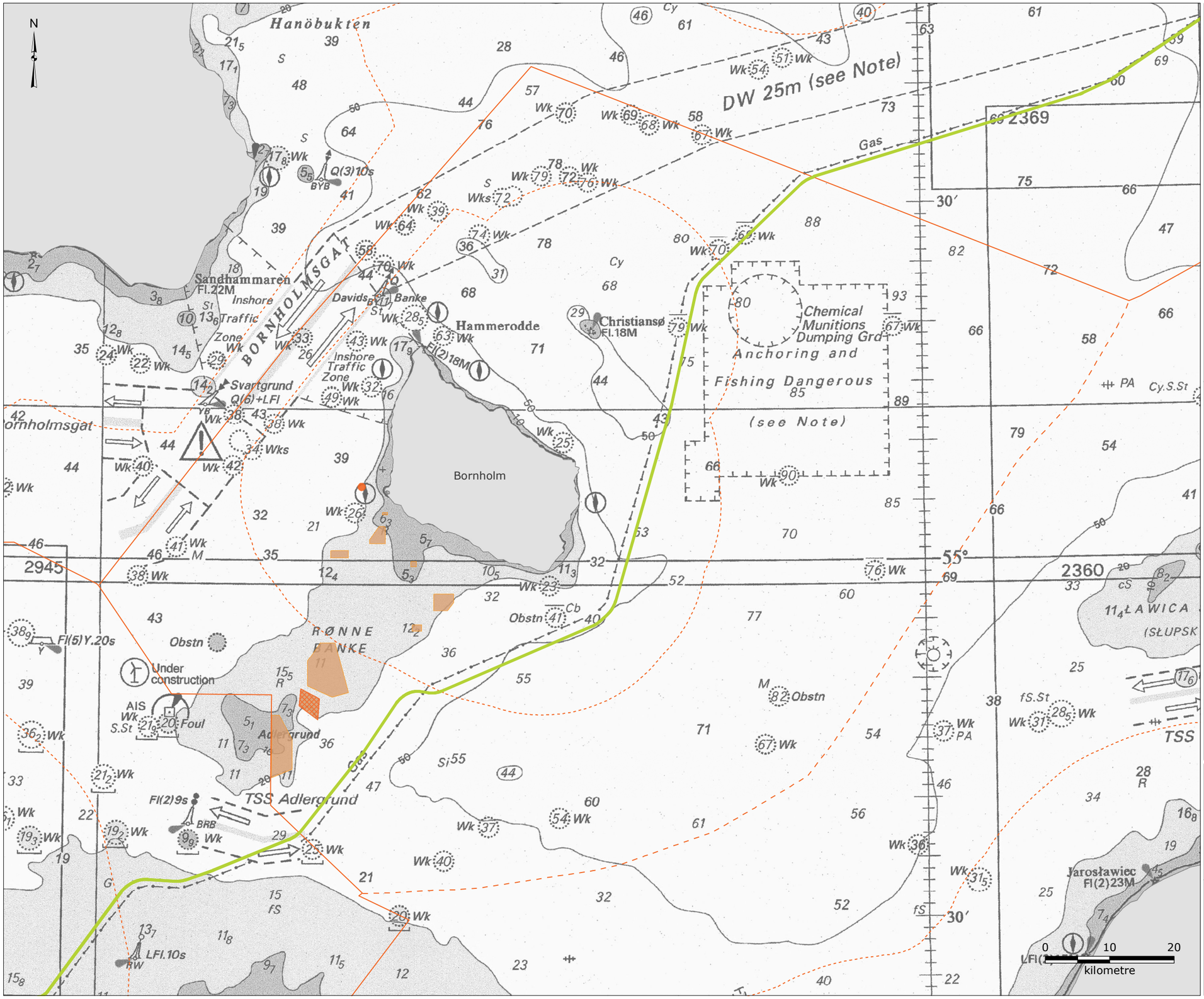
References:
- 4C Offshore, http://www.4coffshore.com/offshorewind/, Date accessed: 2016-08-04
- Cable data received from Nord Stream 2 AG 20 January 2017

Version: 15
Date: 2016-03-22
Prepared: MSTB
Controlled: ANL

IN-01-D

Infrastructure, existing and planned

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Raw materials extraction area
- Sediment dumping site
- Reserved, potential future resource extraction

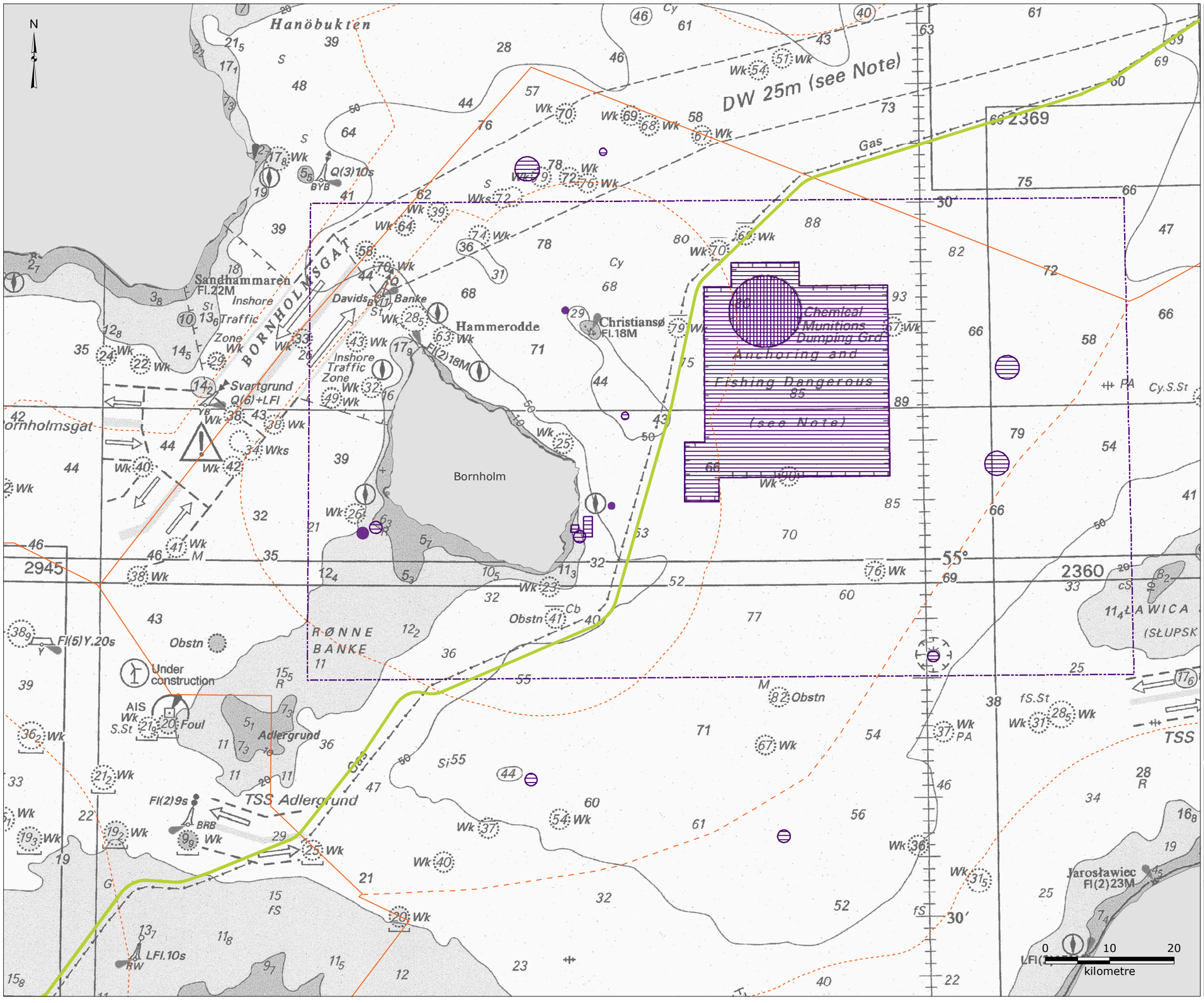
References:
- Naturstyrelsen, 2016, "Råstofindvinding på havet - Reservationsområder", http://miljoegis.mim.dk/cbkort?profile=miljoegis-raastofferhavet, Miljøministeriet, Date accessed: 2016-01-06
- Naturstyrelsen, 2016, "Restriktive områder - Klappladser", http://miljoegis.mim.dk/cbkort?profile=miljoegis-raastofferhavet, Miljøministeriet, Date accessed: 2016-01-06
- Naturstyrelsen, 2016, "Råstofindvinding på havet - Fællesområder", http://miljoegis.mim.dk/cbkort?profile=miljoegis-raastofferhavet, Miljøministeriet, Date accessed: 2016-01-06

Version: 09
Date: 2016-10-13
Prepared: MSTB
Controlled: ANL

IN-02-D

Resource extraction areas

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Emergency dumping area
- Chemical munitions dumping site
- Bottom trawling, anchoring and seabed intervention works discouraged
- Risk area in which fishing vessels are required to have first aid gas equipment on board

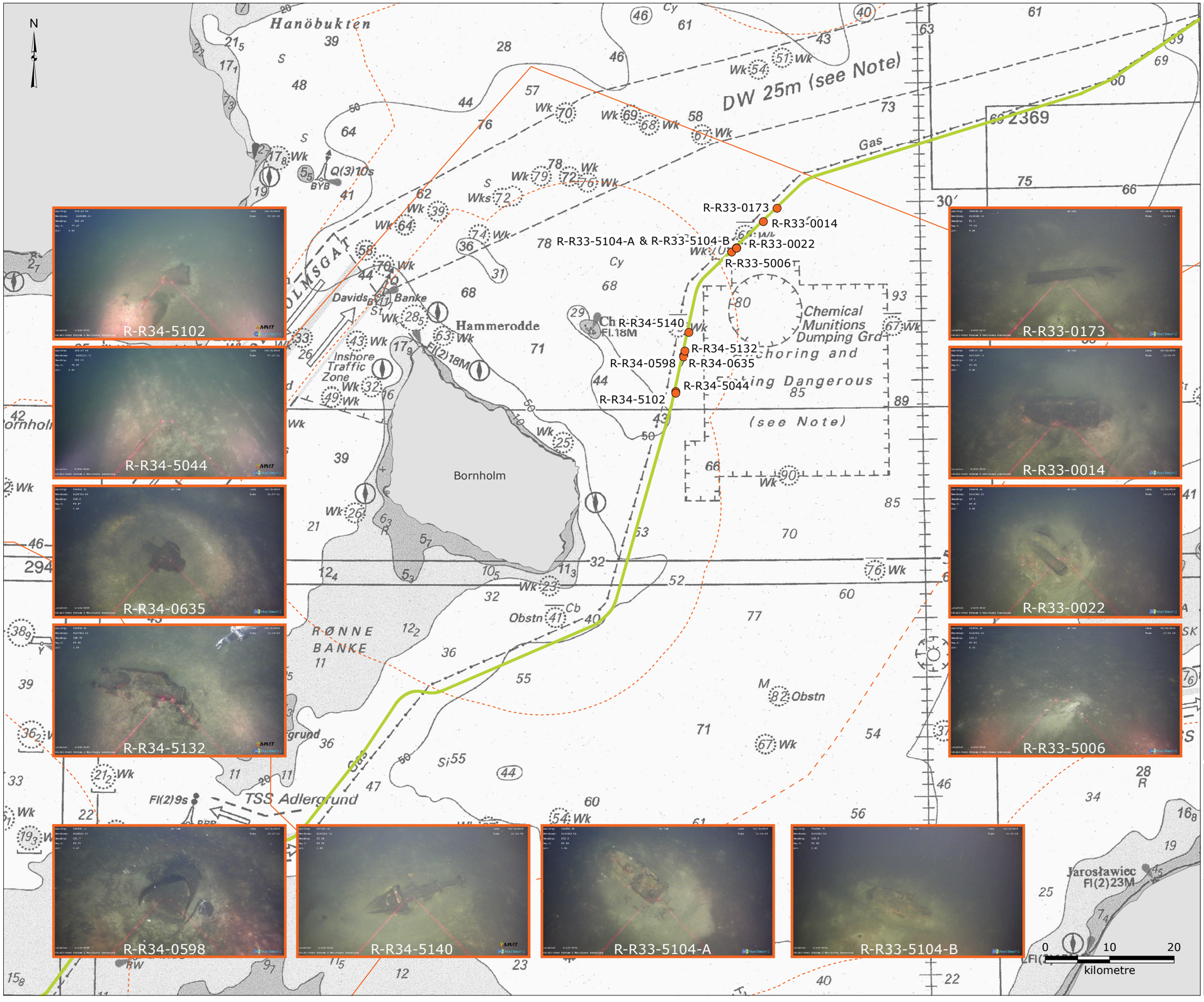
References:
- Fiskeriministeriet, 2007, "Fiskeriårbogen 2007 (årgang 114)", Iver C. Weilbach & co., pp. 944
- Kort og Matrikelstyrelsen, 2010, "Ny udgave af kort 188 - Østersøen omkring Bornholm, 5th edition
- Ministry of Business and Growth, 2005, "Bekendtgørelse om forbud mod sejlads, ankring og fiskeri mv. i visse områder i danske farvande", BEK nr. 135 af 04/03/2005
- UKHO, 2007, "British Admiralty Nautical Chart 2816: Baltic Sea, Southern Sheet", United Kingdom Hydrographic Office

Version: 08
Date: 2016-11-18
Prepared: MSTB
Controlled: JCXS

MU-01-D

Areas with chemical munitions

RAMBØLL



Legend:

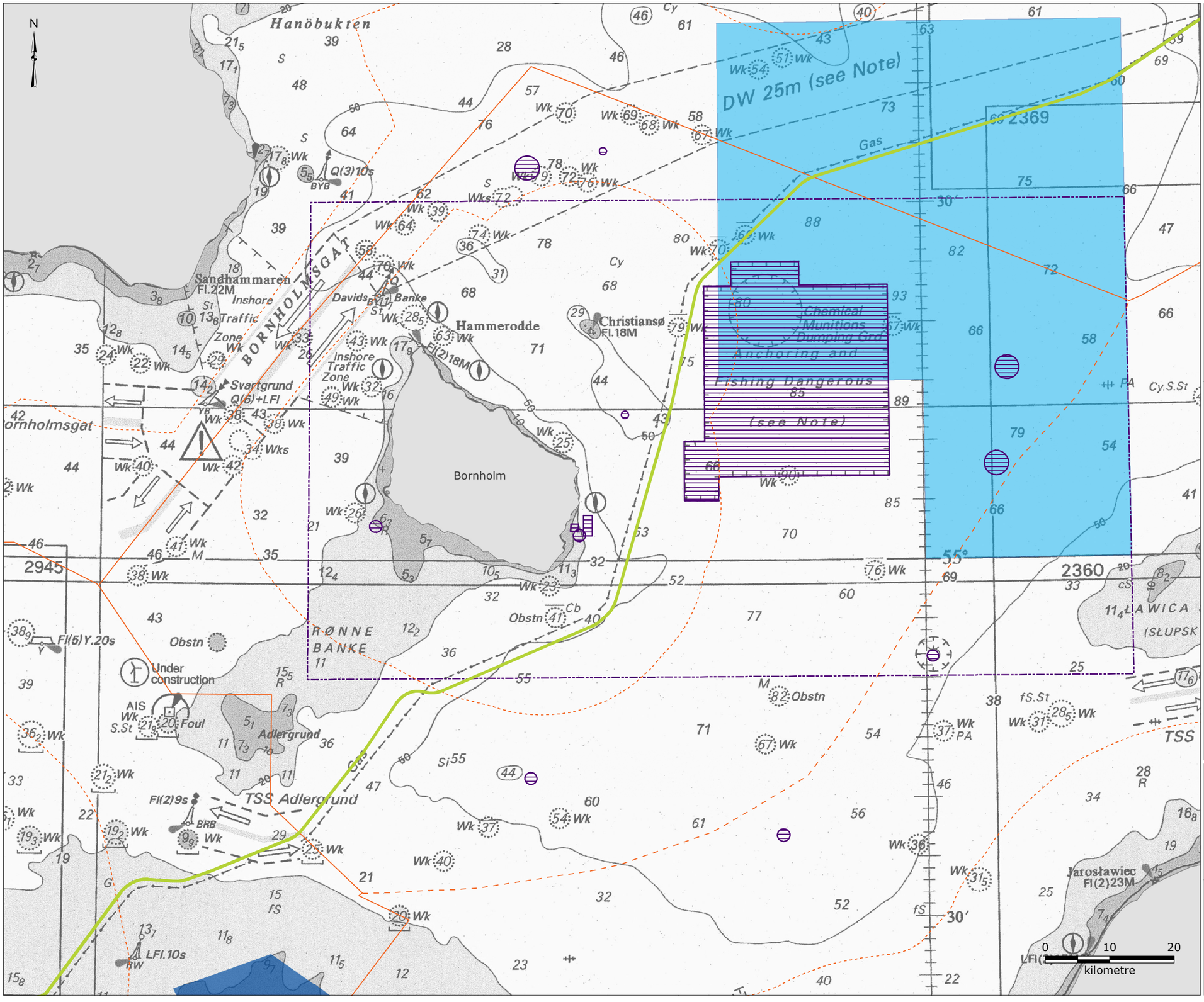
- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Chemical munitions

Version: 07
Date: 2016-10-26
Prepared: MIRS
Controlled: AGS

MU-02-D

Chemical munitions identified during NSP2 munition screening survey

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Area closed to cod (*Gadus morhua*) fishery from May 1 to October 31
- Area permanently closed to fisheries with active gear year around
- Bottom trawling, anchoring and seabed intervention works discouraged
- Risk area in which fishing vessels are required to have first aid gas equipment on board

Note:
- Closed for fishery in order to enable undisturbed spawning conditions for the eastern cod population /(CES 2014/

References:

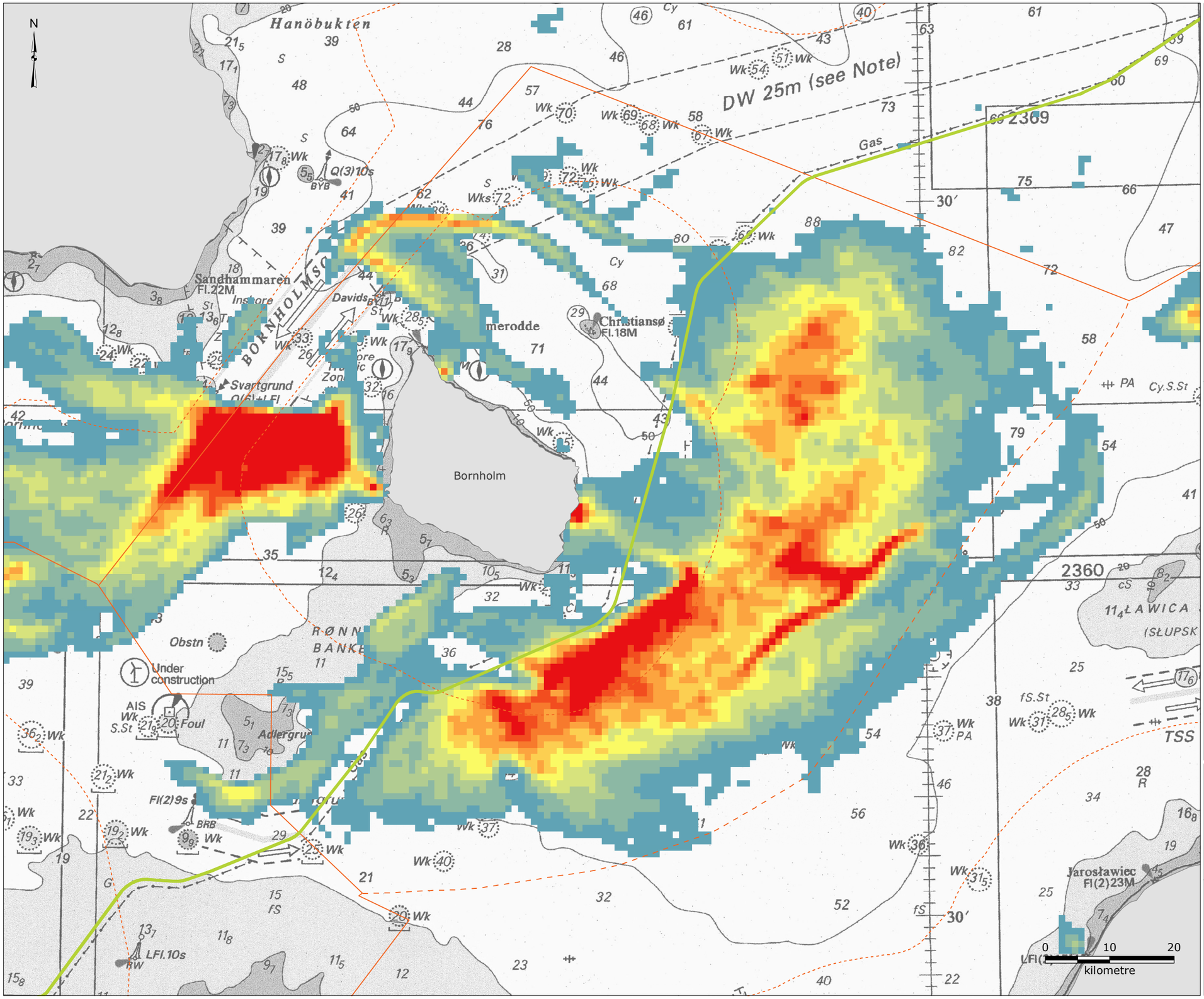
- Council Regulation (EC) No 1098/2007 of 18 September 2007 establishing a multiannual plan for the cod stocks in the Baltic Sea and the fisheries exploiting those stocks, amending Regulation (EEC) No 2847/93 and repealing Regulation (EC) No 779/97
- Council Regulation (EC) No 2187/2005 of 21 December 2005 for the conservation of fishery resources through technical measures in the Baltic Sea, the Belts and the Sound, amending Regulation (EC) No 1434/98 and repealing Regulation (EC) No 88/98
- Fiskeriministeriet, 2007, "Fiskeriårbogen 2007 (årgang 114)", Iver C. Weilbach & co., pp. 944
- HELCOM, 2013, "Baltic Sea fisheries closure" http://maps.helcom.fi/website/mapservice/index.html, Data accessed: 2016-2-24
-HELCOM, 2013, "Cod fisheries closures" http://maps.helcom.fi/website/mapservice/index.html, Data accessed: 2016-2-24
- ICES. 2014. "Report of the Baltic Fishery Assessment Working Group (WGBFAS)", April 2014, ICES HQ, Copenhagen, Denmark. ICES CM 2014/ACOM:10
- Kort og Matrikelstyrelsen, 2010, "Ny udgave af kort 188 - Østersøen omkring Bornholm, 5th edition
- Ministry of Business and Growth, 2005, "Bekendtgørelse om forbud mod sejlads, ankring og fiskeri mv. i visse områder i danske farvande", BEK nr. 135 af 04/03/2005
- UKHO, 2007, "British Admiralty Nautical Chart 2816: Baltic Sea, Southern Sheet", United Kingdom Hydrographic Office

Version: 09
Date: 2016-10-13
Prepared: MSTB
Controlled: MIBR

FC-01-D

Areas where commercial fishery is prohibited

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Calculated bottom trawling density (Danish fishing vessels):

(Total number of trawl tracks from 2010-2014 based on VMS-data)

- 0 - 10
- > 10 - 20
- > 20 - 30
- > 30 - 40
- > 40 - 50
- > 50 - 60
- > 60 - 70
- > 70 - 80
- > 80 - 90
- > 90 - 100
- > 100

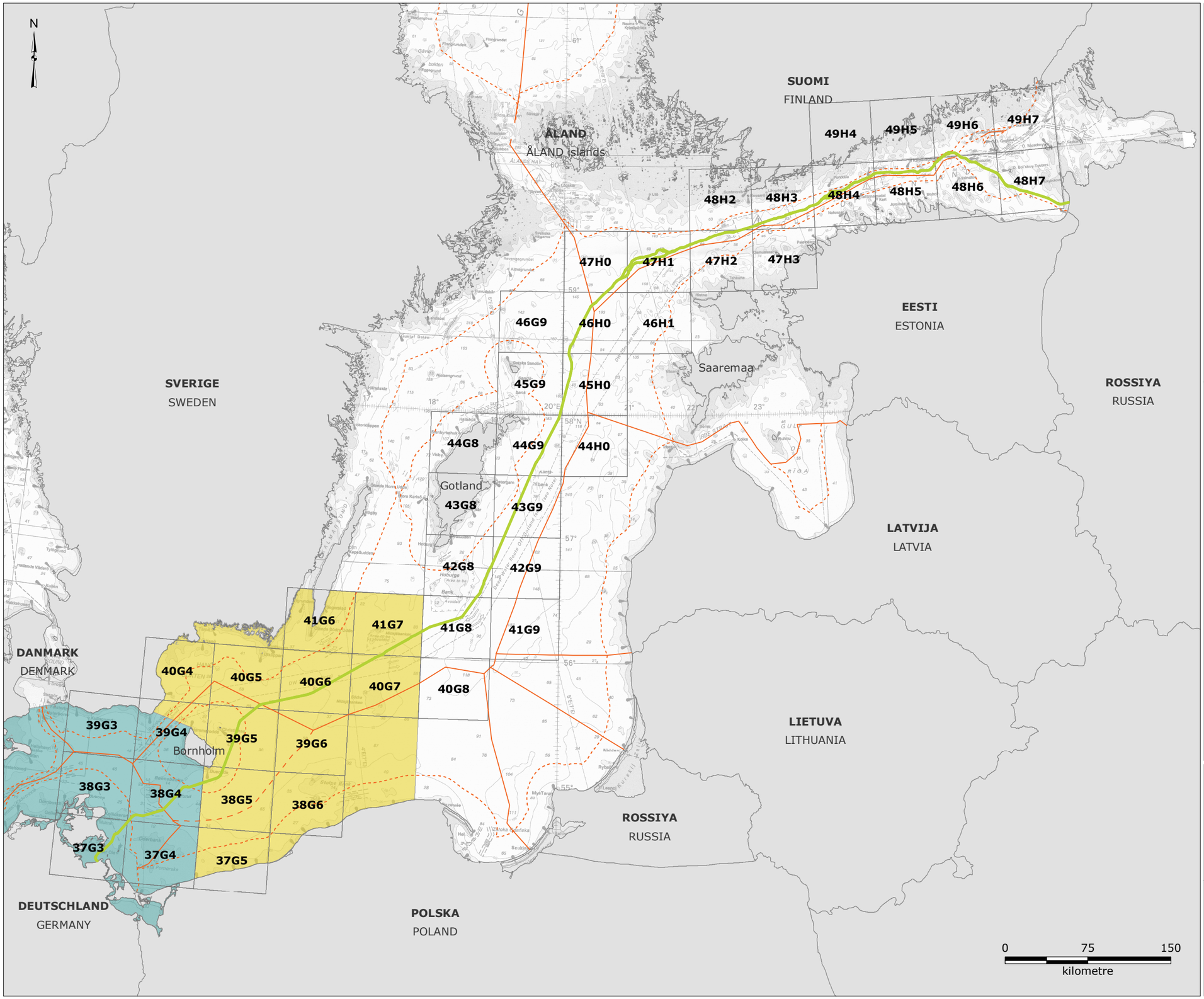
Reference:
- Density data were derived from VMS data points of Danish fishing vessels fishing in the Baltic in 2010-2014. Only vessels with speed between 0-5 knots are shown, as it is estimated that bottom trawling is undertaken at this speed interval. Background data obtained from The Danish Agrifish Agency

Version: 07
Date: 2016-10-26
Prepared: MIRS
Controlled: MIBR

FC-02-D

Bottom trawling density

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- ICES statistical rectangles

ICES subdivisions:

- 24
- 25

Note:
- ICES subdivisions are only shown for Denmark

References:

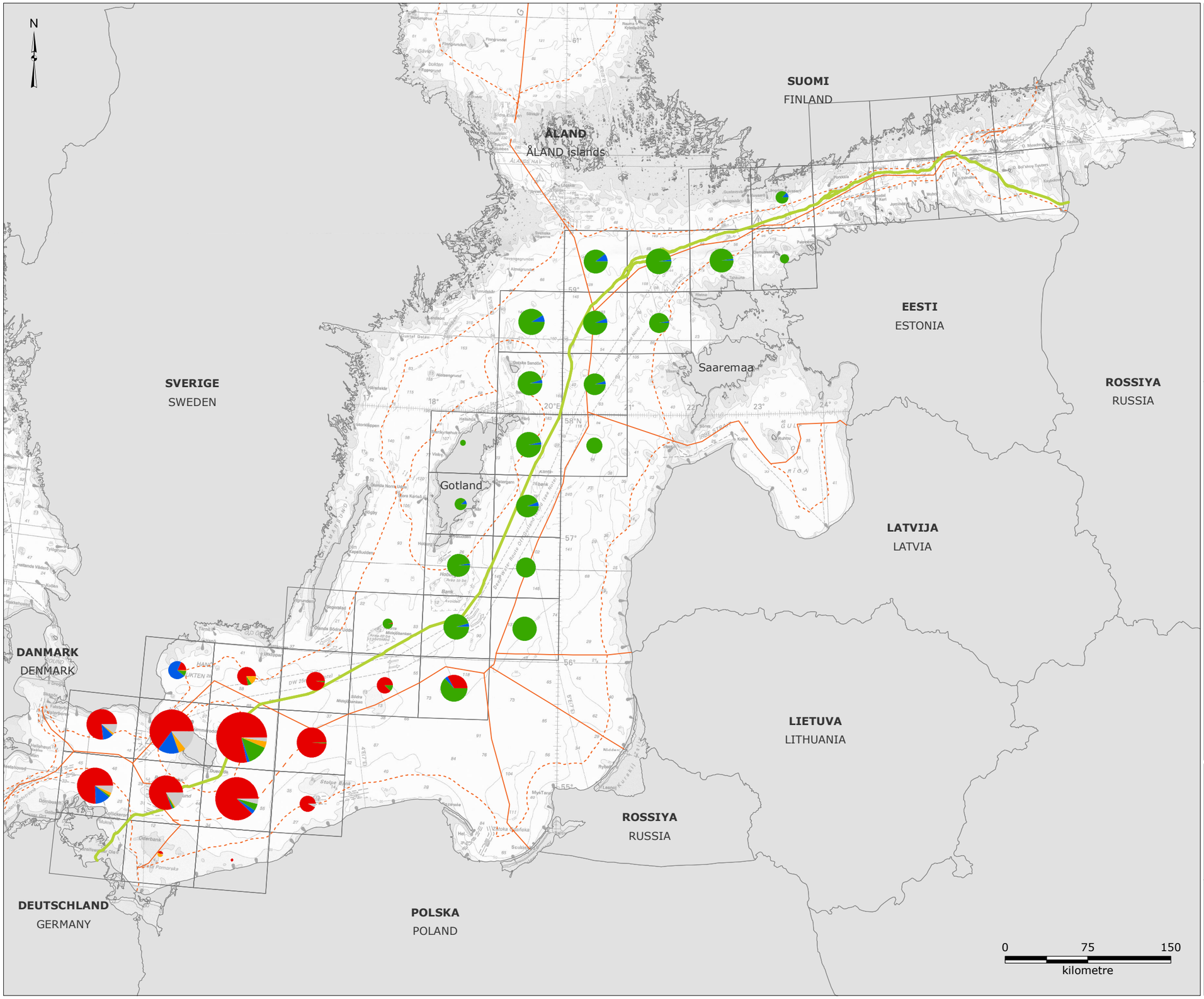
- HELCOM, 2013, "HELCOM subbasins", http://maps.helcom.fi/website/mapservice/index.html, Date accessed: 2016-3-30
- Orbicon, 2016, " Nord Stream 2 – Baltic fisheries along the pipeline transect", Note, 2016-06-09

Version: 06
Date: 2016-10-26
Prepared: MSTB
Controlled: MIBR

FC-03

ICES statistical rectangles and subdivisions

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Fishery mean value (euro):

- Cod
- Herring
- Sprat
- Flounder
- Other

Pie areas scaled according to square root of values in euros:

- 1,000,000 euro
- 250,000 euro
- 50,000 euro

Note:
- Based on data for 2010-2014

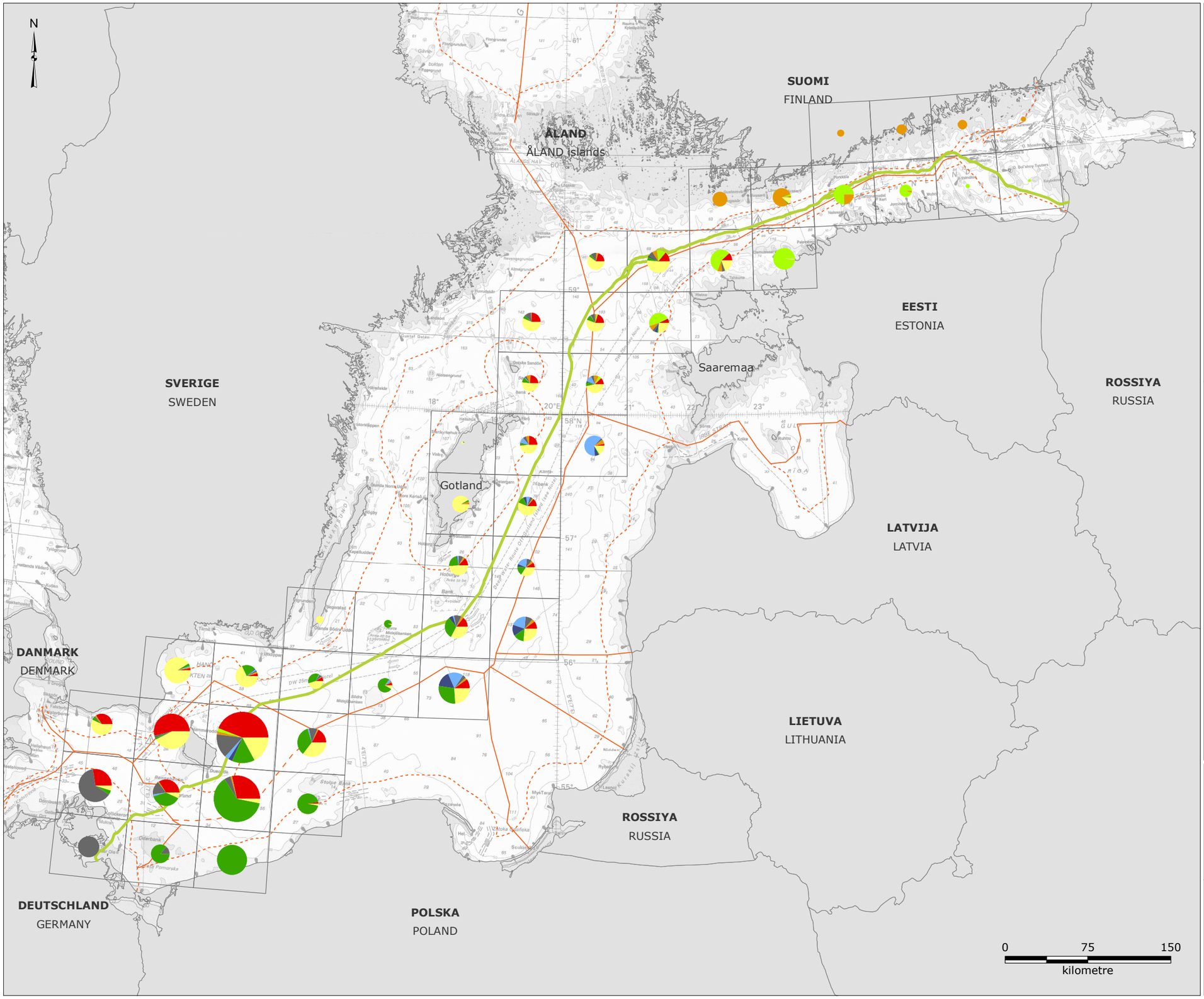
Reference:
- Orbicon, 2016, "Nord Stream 2 – Baltic fisheries along the pipeline transect", Note, 2016-06-09

Version: 09
Date: 2016-10-13
Prepared: MIRS
Controlled: MIBR

FC-04

Mean value of catches according to species by Danish fishery

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Fishery mean value (euro):

- Denmark
- Estonia
- Finland
- Germany
- Latvia
- Lithuania
- Poland
- Sweden

Pie areas scaled according to real values:

- 10,000,000 euro
- 5,000,000 euro
- 1,500,000 euro

Note:
- Based on data for 2010-2014.
- Data provided from Poland for 2009-2013
- Russia is not included (no data available)

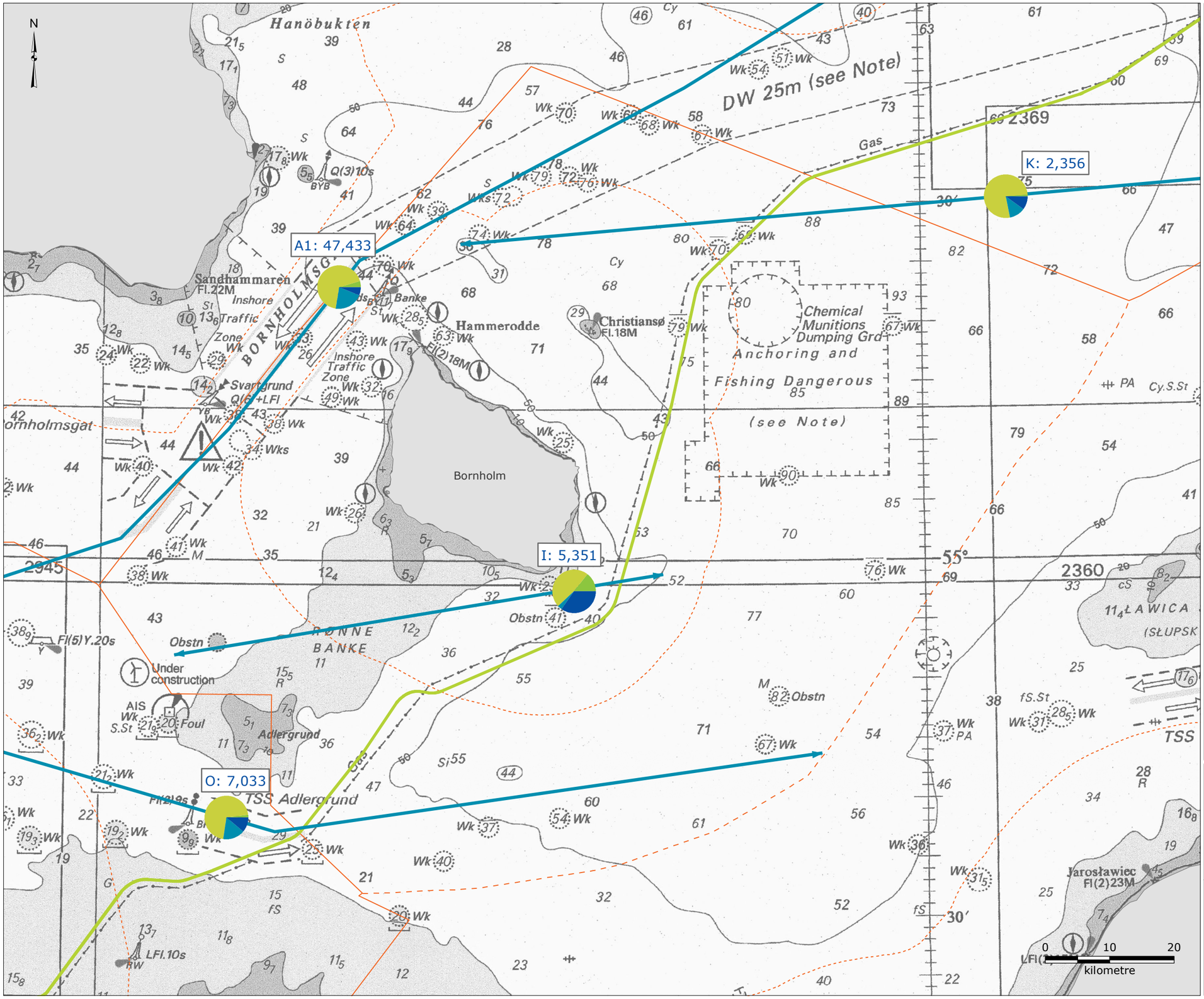
References:
- Orbicon, 2016, "Nord Stream 2 – Baltic fisheries along the pipeline transect", Note, 2016-06-09

Version: 09
Date: 2016-10-13
Prepared: MIRS
Controlled: MIBR

FC-05

Mean value of catches by country

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Primary ship traffic routes

Ship types:

- Passenger
- Cargo
- Tanker
- Other

Note:
- The labels show number of ship movements on primary ship traffic routes in 2014
- Letters represent the name of the location where data was measured
- Ship statistics at certain points of interest are based on data concerning ships that cross a defined line on a shipping route. The lines are drawn approximately perpendicularly to the shipping route direction.
- The relevant major/minor ship traffic routes have been selected from the Baltic area in connection to the two Nordstream pipelines.

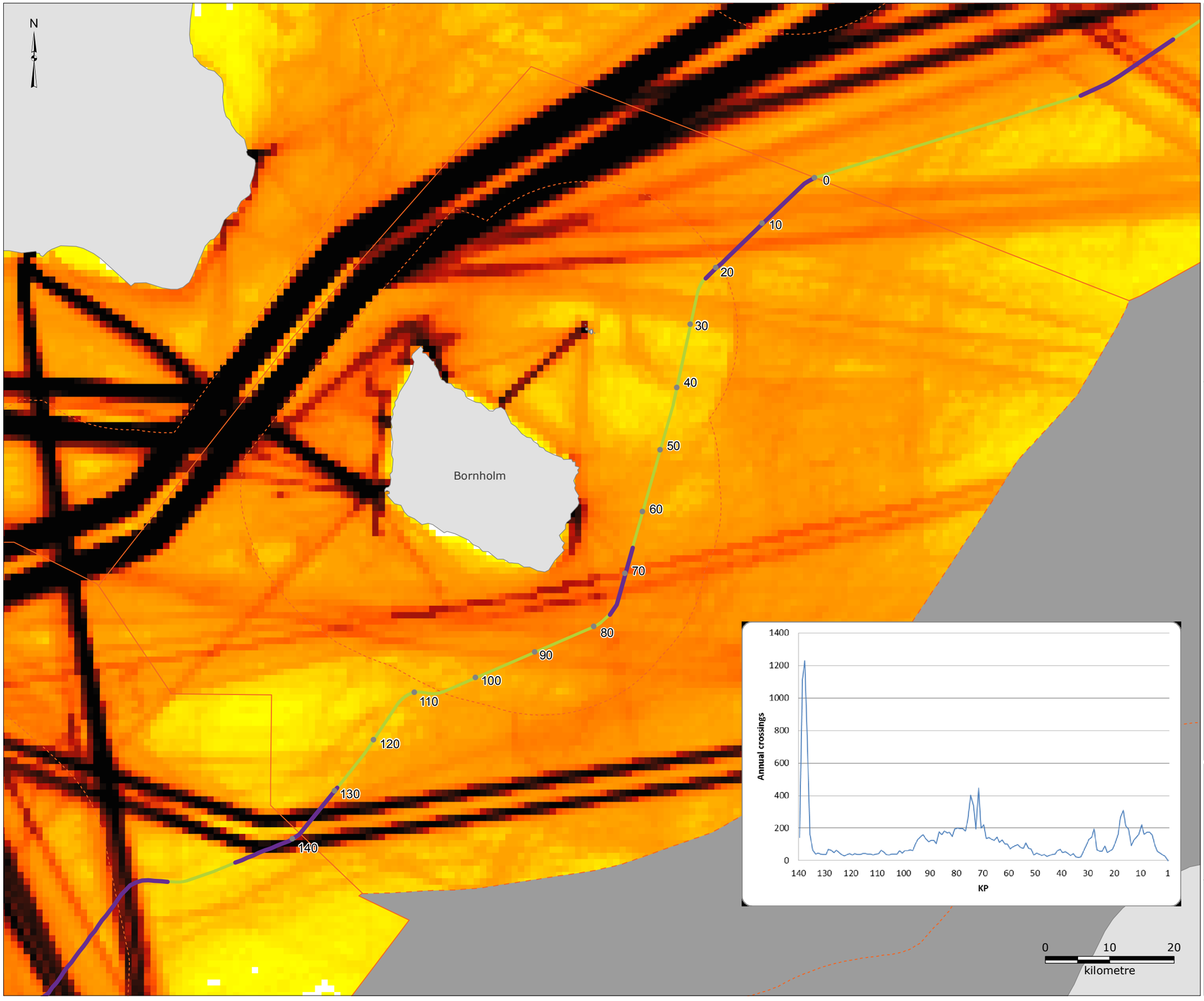
Reference:
- The Danish Maritime Authority (DMA), 2014, Automatic Identification System (AIS) data 2014

Version: 08
Date: 2016-11-12
Prepared: MIRS
Controlled: FMR

SH-01-D

Primary ship traffic routes

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Locations where primary ship traffic routes cross NSP2 pipelines

Ship density (2014):

- 0 - 1
- > 1 - 100
- > 100 - 500
- > 500 - 600
- > 600 - 1,000
- > 1,000 - 1,500
- > 1,500
- No data available (Poland)
- KP (Kilometre Point, 10 km intervals)

Note:
- There is no permission from Poland to show AIS data

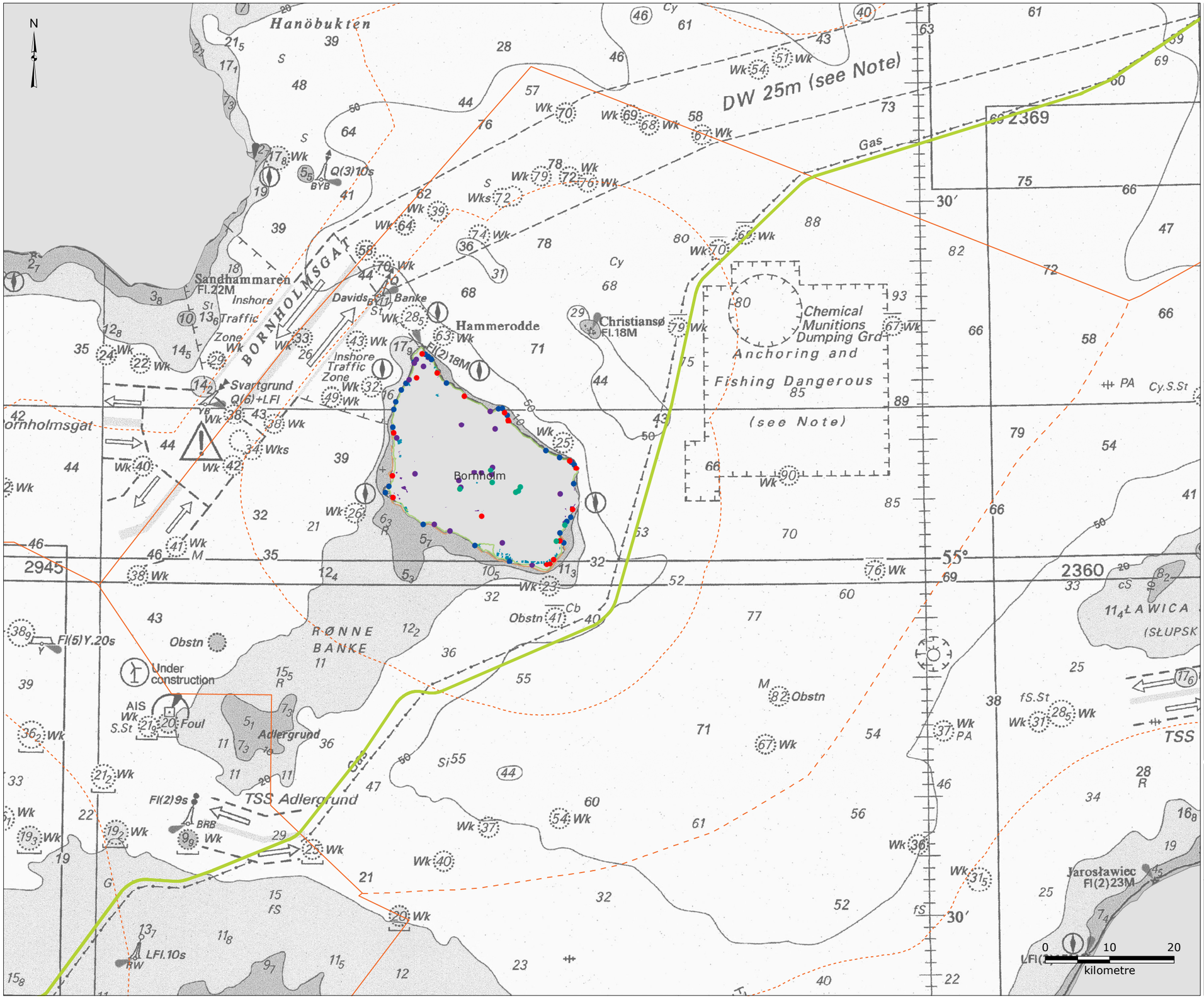
Reference:
- The Danish Maritime Authority (DMA), 2014, Automatic Identification System (AIS) data 2014.
- Ramboll, 2016, "Ship traffic background report", W-PE-EIA-POF-REP-805-060100EN, Ramboll, Denmark

Version: 09
Date: 2016-10-20
Prepared: MIRS
Controlled: FMR

SH-02-D

NSP2 crossings of primary ship traffic routes

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Coastal trails
- Particularly good beaches
- Recreation areas
- Summer cottage areas
- Birdwatching tower
- Campsite
- Primitive campsite and shelter
- Harbour

Note:
Tourist facilities are only shown for Bornholm

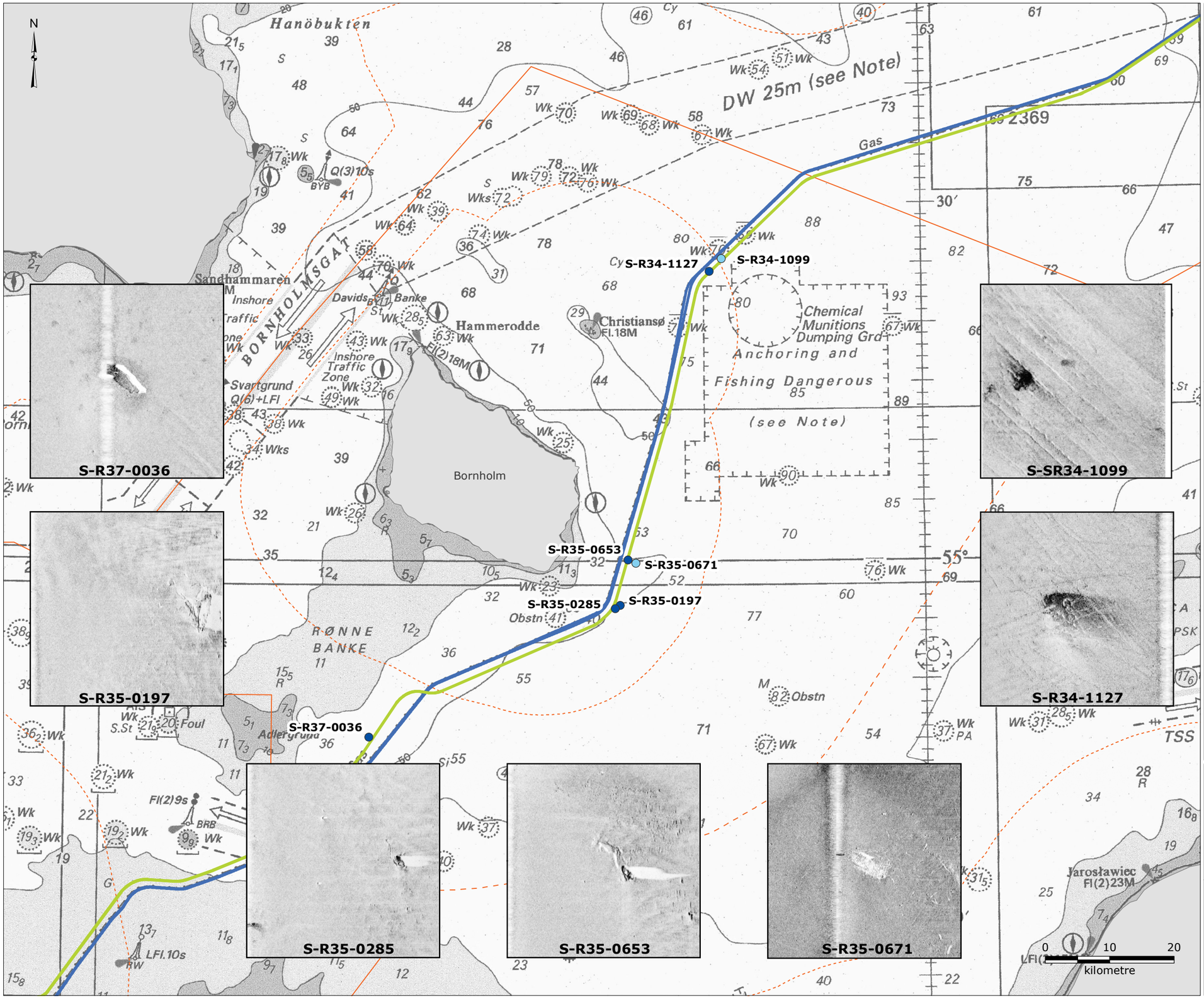
References:
- Ramboll, 2016, "E-mail from Bornholms Kommune, Denmark", Received: 2016-04-20

Version: 08
Date: 2016-12-19
Prepared: MSTB
Controlled: STHA

TO-01-D

Tourist facilities

RAMBØLL



Legend:

- NSP2 Route
- NSP Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Identified possible ship wrecks from NSP2 investigations
- Identified ship wrecks from NSP investigations

Note:
- Potential ship wreck findings are from NSP2 investigations. Findings are to be verified further by the Viking Ship Museum and The Heritage Agency of Denmark.

References:

- Fugro Survey Limited, 2016, "Geophysical reconnaissance surveys reference route", Baltic Sea, Country Report Denmark. Doc.No. W-SU-REC-POF-REP-803-DEN000EN-02

Version: 12
Date: 2016-10-26
Prepared: MIRS
Controlled: AGS

CU-01-D

Potential ship wrecks along the NSP2 route

RAMBØLL

MATHEMATICAL MODELLING

NOISE MODELLING

SEDIMENT MODELLING

N

SUOMI
FINLAND

ÅLAND
ÅLAND Islands

EESTI
ESTONIA

Saaremaa

SVERIGE
SWEDEN

ROSSIYA
RUSSIA

Gotland

LATVIJA
LATVIA

LIETUVA
LITHUANIA

Bornholm

ROSSIYA
RUSSIA

DEUTSCHLAND
GERMANY

POLSKA
POLAND

0 75 150
kilometre

Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

SPL(dB re 1µPa)

140
135
130
125
120
115
110
105
100
95
90
85
80
75
70
65
60

Note:
- Time period: 2014 March
- Centre Frequency: 125 Hz third octave band
- Depth interval: 0 - 15 m
- Exceeded Sound level: L10 (10% of time)
- SPL: Sound Pressure Level

- White portions along the coast are probably missing data and therefore should be treated as such.

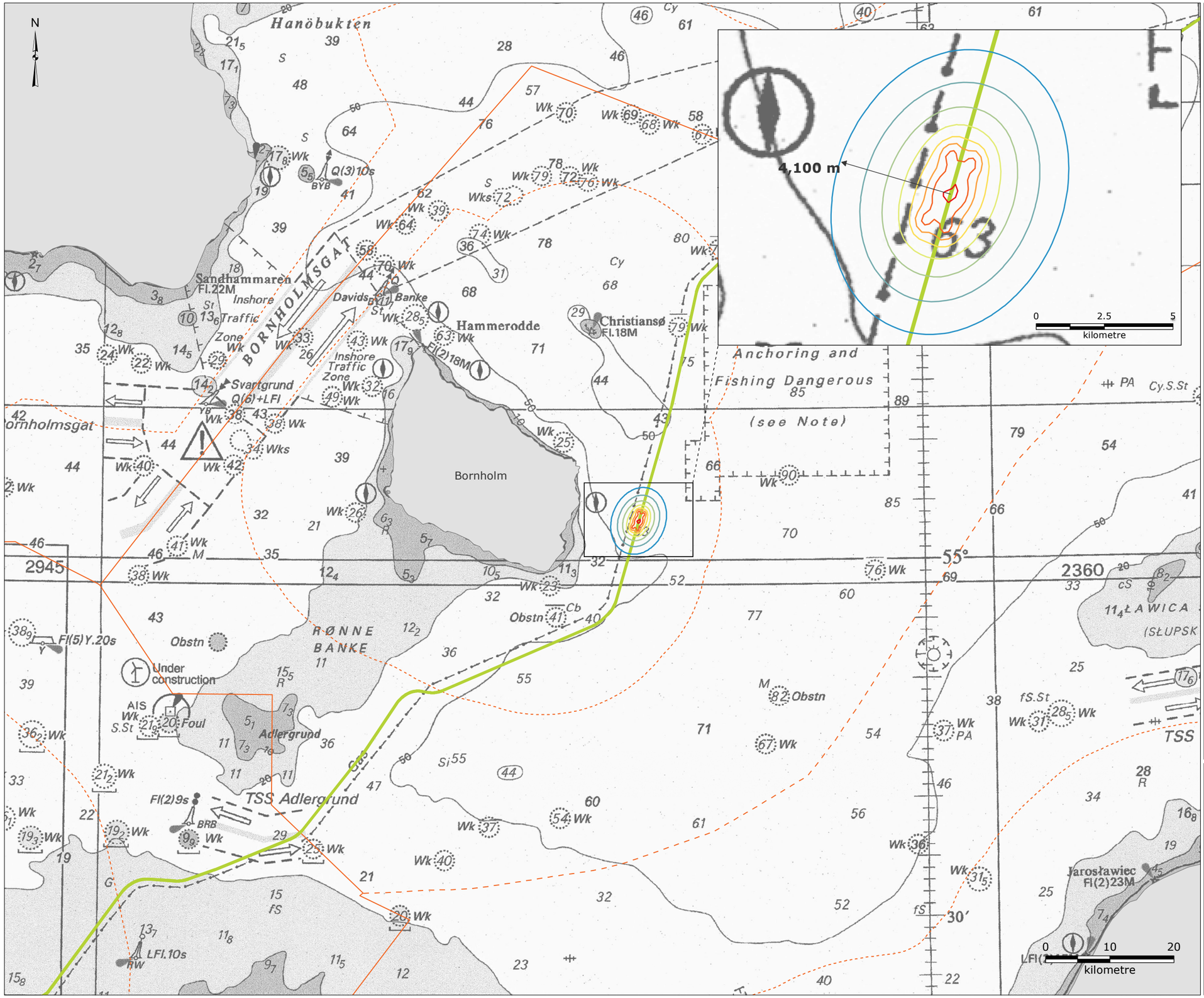
Reference:
- These results have been extracted with help of the BIAS soundscape planning tool, which was prepared within the EU LIFE project Baltic Sea Information on the Acoustic Soundscape (BIAS LIFE11 ENV/SE 841); www.bias-project.eu.

Version: 03
Date: 2016-11-14
Prepared: FLAV
Controlled: DMM

NM-01

Baltic Sea underwater soundscape

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Noise distribution (db):

- 33
- 36
- 39
- 42
- 45
- 48
- 51
- 57

Note:
- Atmospheric noise modelling assuming one anchored pipe-laying vessel, one supply vessel, and four tug vessels

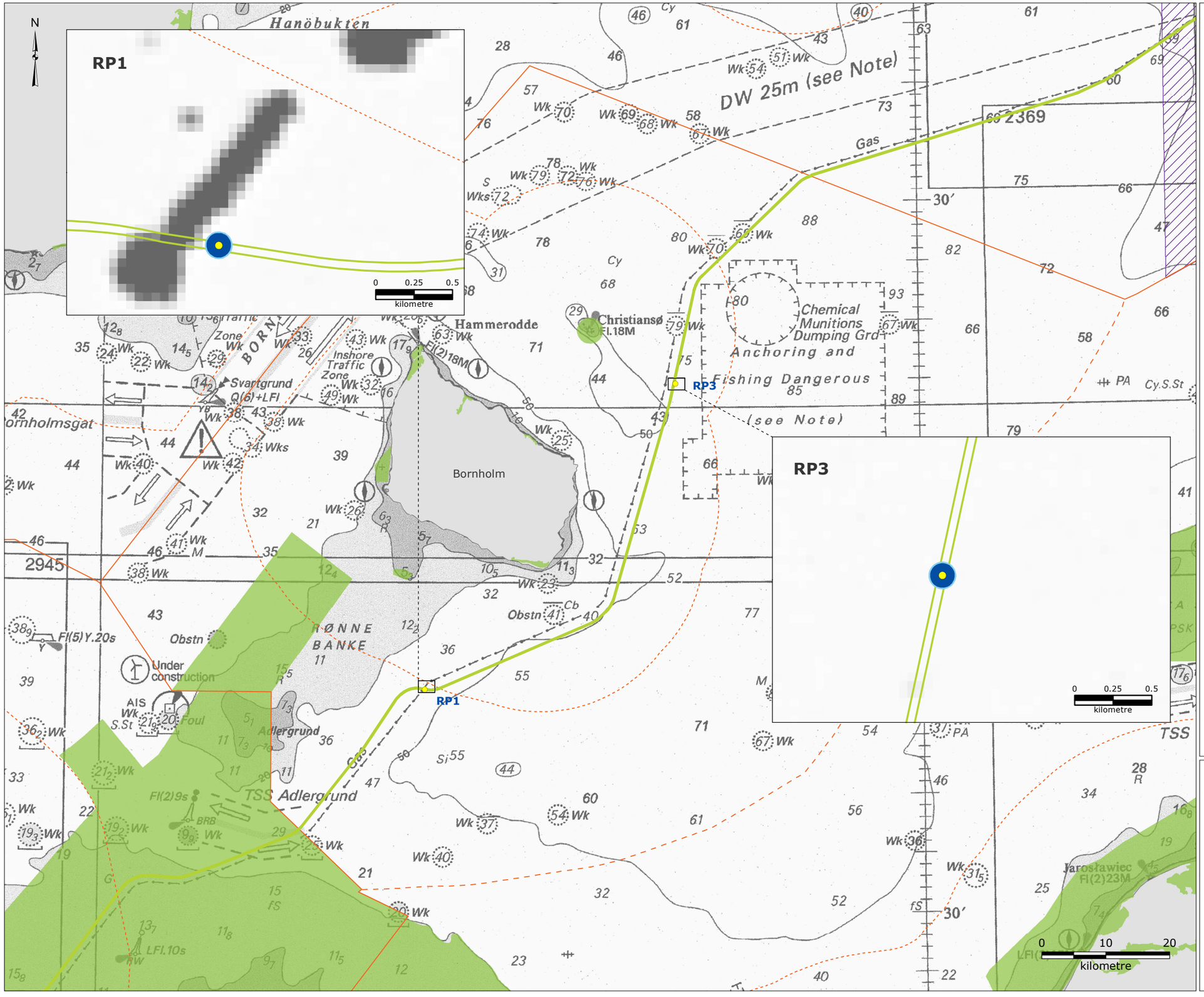
Reference:
- Calculations according to Miljøstyrelsen, 1993, "Beregning af støj fra virksomheder. Fælles nordisk beregningsmetode", in Vejledning fra Miljøstyrelsen Nr. 5/1993
- Nord Stream AG, 2008, Offshore pipeline through the Baltic Sea, Memo no. 4.3Q, Noise, June 2008. Doc. No. G-PE-PER-EIA-100-43Q00000-A

Version: 05
Date: 2016-10-20
Prepared: MSTB
Controlled: JCXS

NM-02-D

Airborne noise propagation modelling results

RAMBØLL



Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Natura 2000 site
- Proposed extended Natura 2000 site
- Noise modelling location

Rock placement, winter

Cumulative SEL (linear, two-hour), dB re 1µPa²s

- Marine mammals (188 dB - TTS)
- Fish (186 dB - TTS)

Note:
- The cumulative SEL levels are related to threshold levels used in the assessment to evaluate impact on biological environment
- Underwater noise propagation from rock placement is shown for the winter conditions as the worst case scenario

Exposure to sound may result in permanent hearing impairments (permanent threshold shift, PTS) or temporary hearing impairments (temporary threshold shift, TTS). The modelling results show that exceedance of TTS occurs only in the vicinity of the pipeline (less than 90 m). Underwater noise from rock placement does not exceed threshold levels causing PTS.

References:

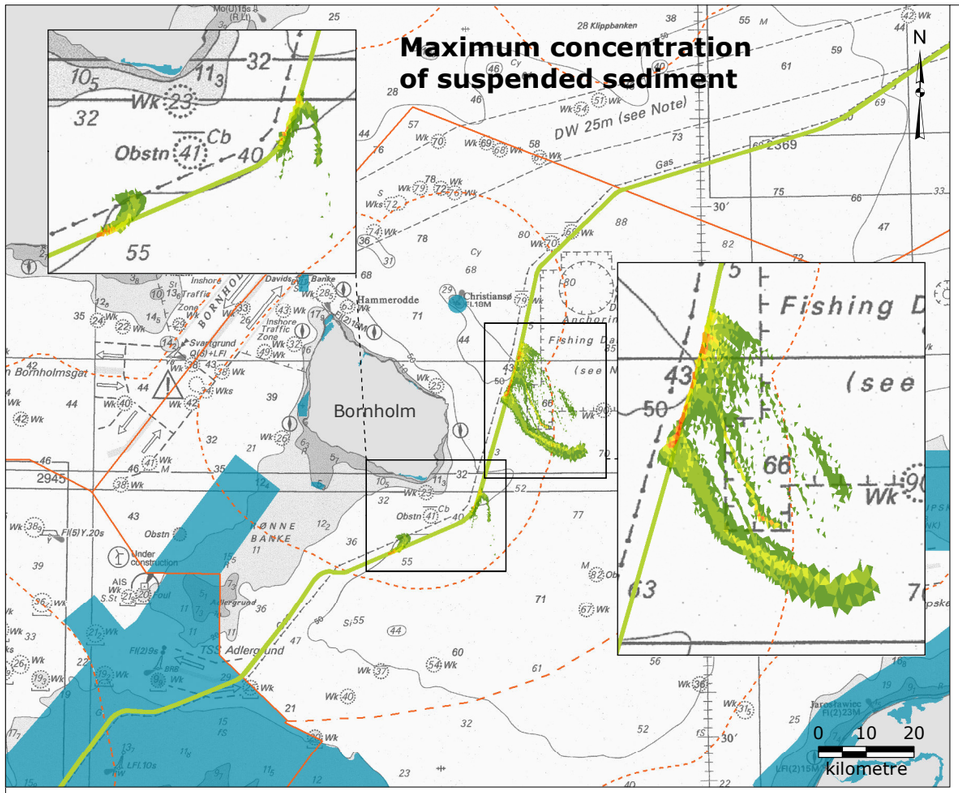
- European Environment Agency, 2014, "Natura 2000 data - the European network of protected sites", http://www.eea.europa.eu/data-and-maps/data/natura-6, Date accessed: 2016-01-19
- Länsstyrelsen Gotlands Län and Kalmar Län, 2016, "M2015/02273/N m (delvis) - Förslag till nya områden för bevarande av livsmiljöer samt vilda djur och växter - SE0330308 Hoburgs bank och Midsjöbankarna", Miljö- och Energidepartementet, Regeringen
- Rambøll, 2016, "Nord Stream Pipeline 2. Underwater noise modelling, Denmark". Doc. No. W-PE-EIA-PDK-REP-805-010300EN-01

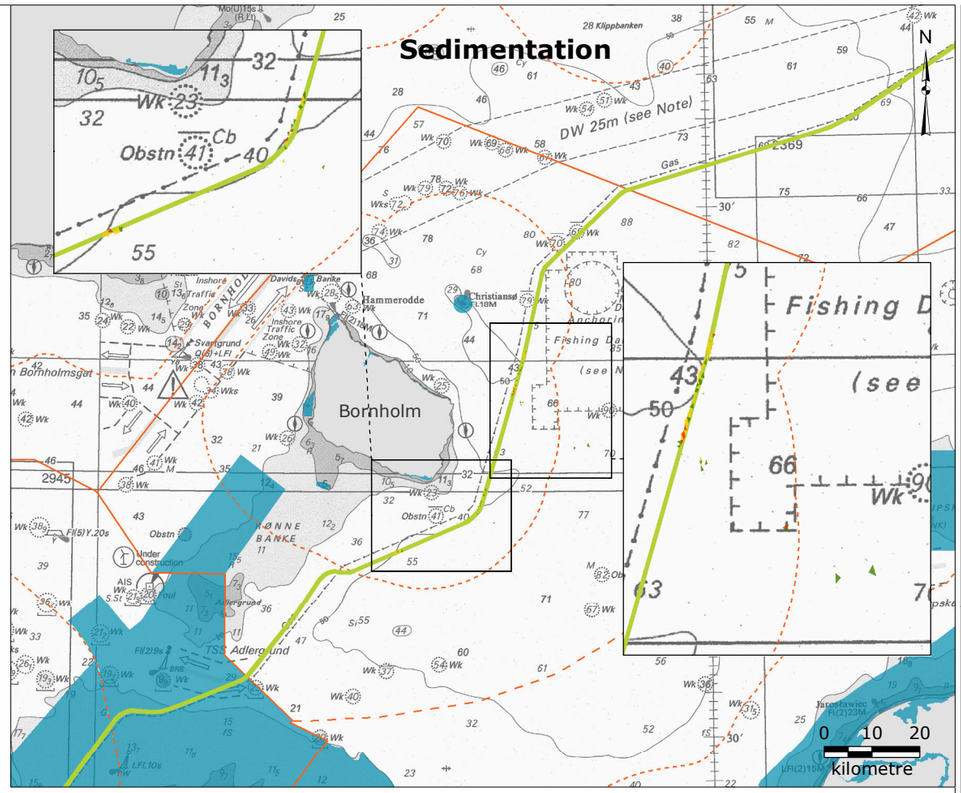
Version: 06
Date: 2017-03-02
Prepared: MIRS
Controlled: DMM

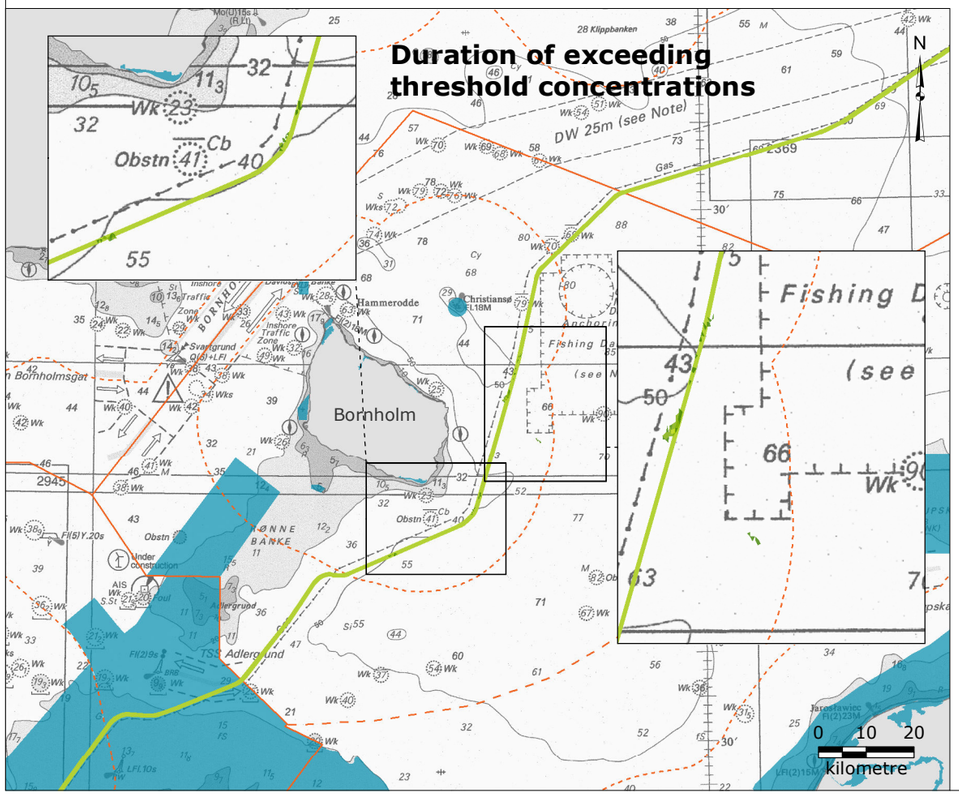
NM-03-D

Sound exposure levels

RAMBØLL







Legend:

Maximum concentration of suspended sediment (mg/l):

- 0 - 2
- > 2 - 5
- > 5 - 10
- > 10 - 15
- > 15 - 20
- > 20 - 25
- > 25 - 50
- > 50 - 100

Sedimentation (g/m²):

- 0 - 50
- > 50 - 100
- > 100 - 200
- > 200 - 500

Duration of exceeding threshold concentrations (10 mg/l) in hours:

- 0 - 1
- > 1 - 3
- > 3 - 6
- > 6 - 9

Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Natura 2000 site

Note:
- Duration of exceeding threshold concentration is shown for 10 mg/l (avoidance reactions in fish)
- Winter scenario refers to a period with winter hydrographic conditions with respect to flow velocities and stratification
- Redistribution of sediments for winter scenario is shown

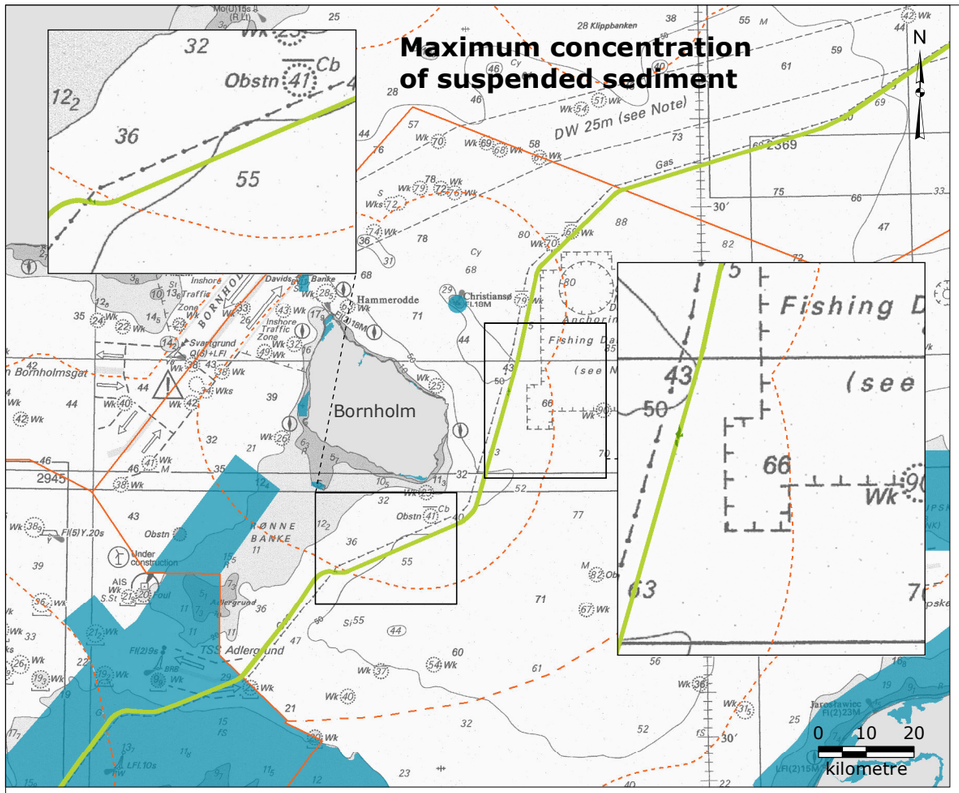
Reference:
- Rambøll, 2015, "Nord Stream Pipeline 2. Modelling of sediment spill in Denmark". Doc. no. W-PE-EIA-PDK-REP-805-010200EN

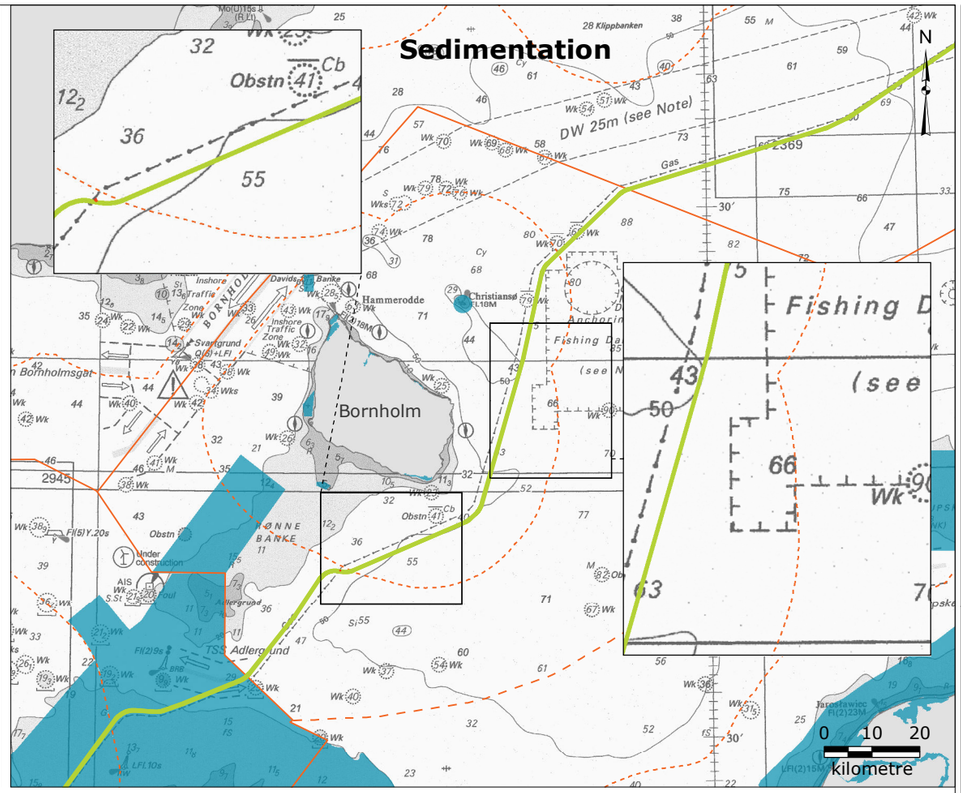
Version: 14
Date: 2016-11-11
Prepared: MSTB
Controlled: JCXS

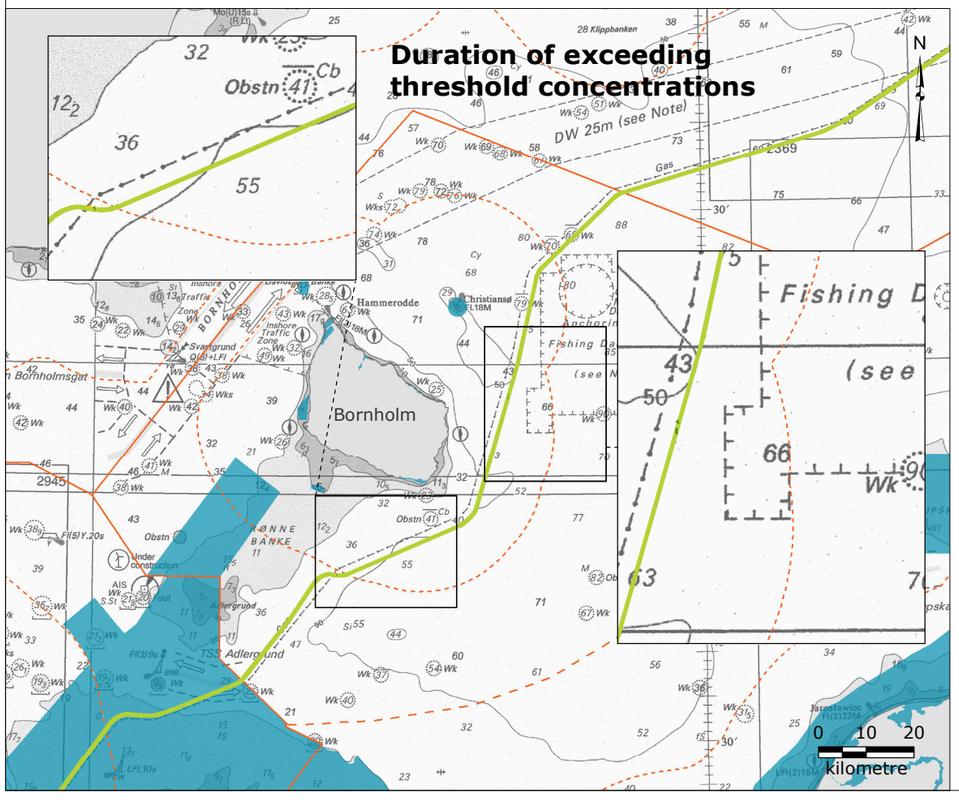
SM-01-D

Suspended sediments – trenching

RAMBØLL







Legend:

Maximum concentration of suspended sediment (mg/l):

- 0 - 2
- > 2 - 5
- > 5 - 10

Duration of exceeding threshold concentrations (2 mg/l) in hours:

- 0 - 1
- > 1 - 3
- > 3 - 6
- > 6 - 9
- > 9 - 12
- > 12 - 24

Sedimentation (g/m²):

- 0 - 50
- > 50 - 100
- > 100 - 200
- > 200 - 500

Legend:

- NSP2 Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Natura 2000 site

Note:
- Duration of exceeding threshold concentration is shown for 2 mg/l since concentration of 10mg/l (avoidance reactions in fish) for rock placement would not be visible on the map
- Winter scenario refers to a period with winter hydrographic conditions with respect to flow velocities and stratification
- Redistribution of sediments for winter scenario is shown

Reference:
- Rambøll, 2015, "Nord Stream Pipeline 2. Modelling of sediment spill in Denmark". Doc. no. W-PE-EIA-PDK-REP-805-010200EN

Version: 08
Date: 2016-11-11
Prepared: MSTB
Controlled: JCXS

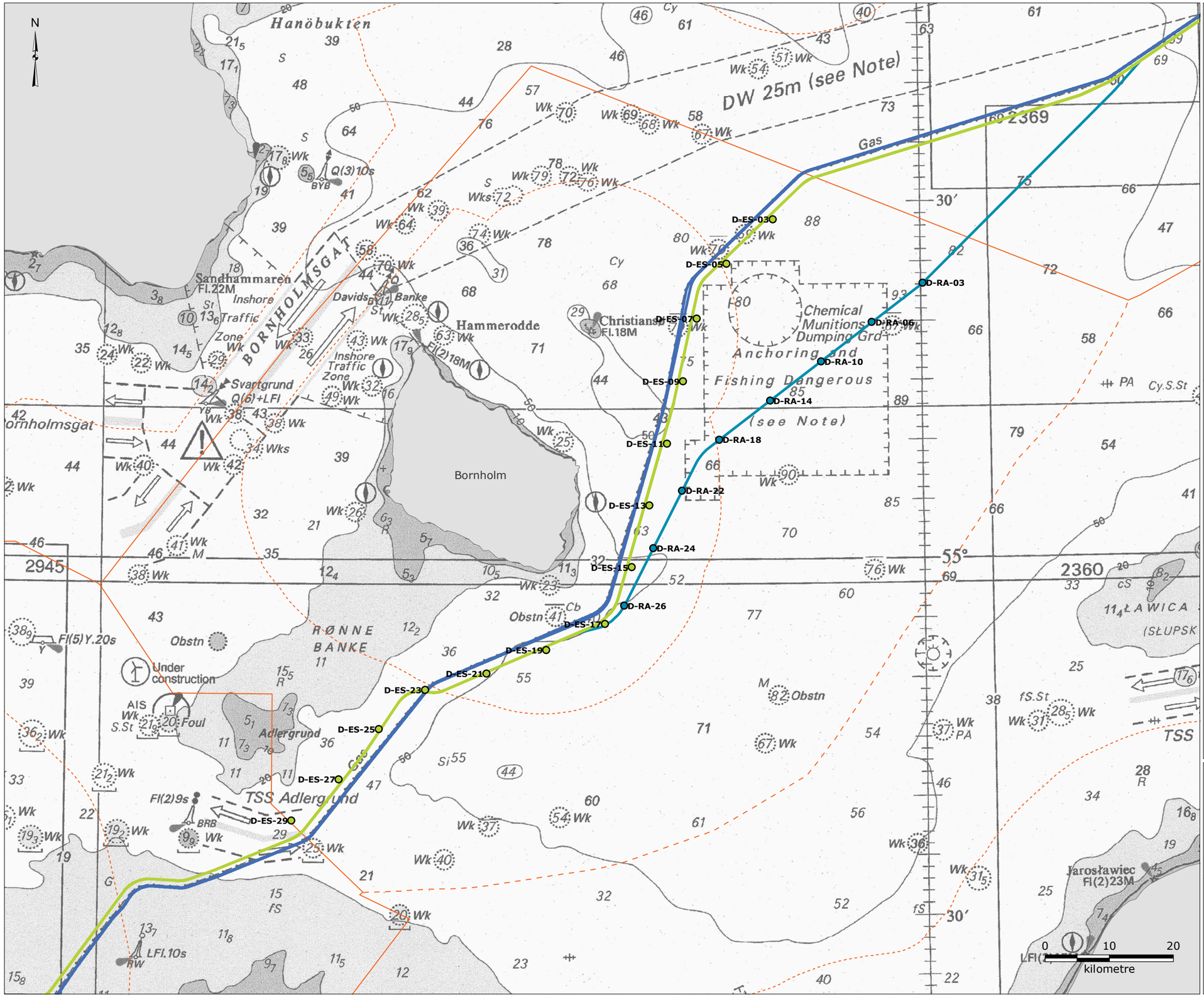
SM-02-D

Suspended sediments – rock placement

RAMBØLL

ENVIRONMENTAL SURVEY STATIONS

ENVIRONMENTAL SURVEY STATIONS



Legend:

- ES Route (proposed NSP2 Route)
- RA Route
- NSP Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland

Physical, chemical and infauna stations:

- Stations along D-ES route
- Stations along D-RA route

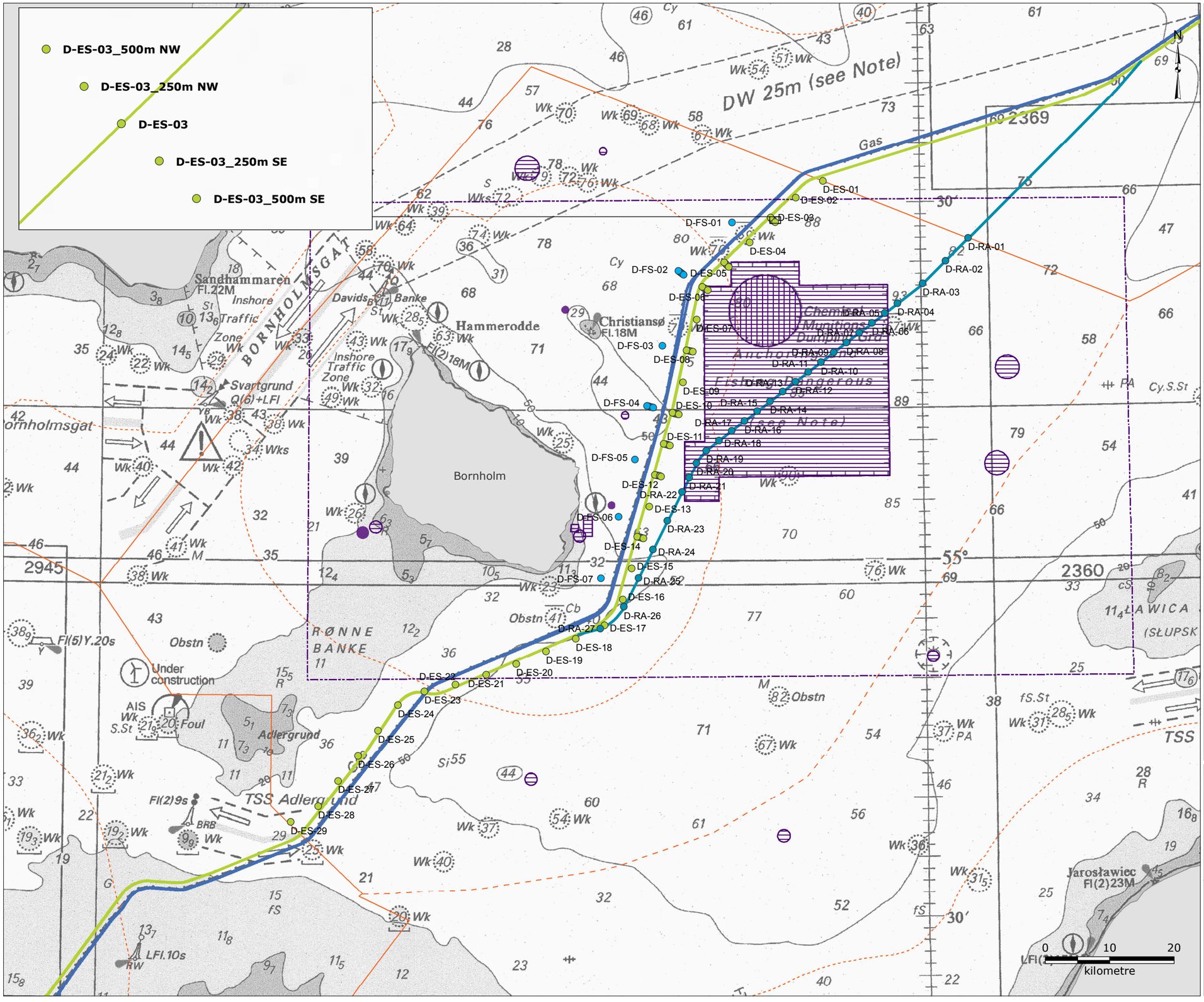
References:
- DHI, 2016, "Infauna report for Danish Waters in 2015", Doc. No. W-PE-EIA-PDK-REP-810-BLINFAEN-02

Version: 11
Date: 2017-03-02
Prepared: MSTB
Controlled: JCXS

SS-01-D

Survey stations for water column and seabed conditions

RAMBØLL



Legend:

- ES Route (proposed NSP2 Route)
- RA Route
- NSP Route
- Territorial water border
- EEZ border
- Midline between Denmark and Poland
- Emergency dumping area
- Chemical munitions dumping site
- Bottom trawling, anchoring and seabed intervention works discouraged
- Risk area in which fishing vessels are required to have first aid kit equipment on board

CWA stations:

- Stations along D-ES route
- Stations along D-FS route
- Stations along D-RA route

Note:
- Lateral transects were undertaken at 10 locations along the D-FS and D-ES routes, comprising 5 sampling stations (example shown in inset map). The 10 locations were chosen for more extensive investigation due to the relative proximity to the chemical munitions dumping site. A greater proportion of the locations (8/10) were along the D-ES route given that it is the proposed route.

References:

- DHI, 2016, Chemical warfare Agents Report for Danish Waters in 2015". Doc. No. W-PE-EIA-PDK-REP-810-BLCWAREN-06
- Fiskeriministeriet, 2007, "Fiskeriårbogen 2007 (årgang 114)", Iver C. Weilbach & co., pp. 944
- Kort og Matrikelstyrelsen, 2010, "Ny udgave af kort 188 - Østersøen omkring Bornholm, 5th edition
- Ministry of Business and Growth, 2005, "Bekendtgørelse om forbud mod sejlads, ankring og fiskeri mv. i visse områder i danske farvande", BEK nr. 135 af 04/03/2005
- UKHO, 2007, "British Admiralty Nautical Chart 2816: Baltic Sea, Southern Sheet", United Kingdom Hydrographic Office

Version: 14
Date: 2016-11-11
Prepared: MSTB
Controlled: JCXS

SS-02-D

Survey stations for chemical warfare agents

RAMBØLL