






ATLAS

Environmental Impact Assessment Report
Finnish section

Nord Stream 2

April 2017

W-PE-EIA-PFI-DWG-805-030100EN-09

RAMBØLL

A NATURAL GAS PIPELINE THROUGH THE BALTIC SEA

ATLAS

Environmental Impact Assessment
Finnish section

Nord Stream 2

April 2017

Prepared by: Ramboll Finland Oy
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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.

Nord Stream 2 AG is a project company established for planning, construction and subsequent operation of the Nord Stream 2 Pipeline. The company is based in Zug, Switzerland and is owned by PJSC Gazprom. A structure of equal EU and Russian interests in the project is envisaged, which reflects the significance of this new infrastructure for Europe's future energy supply needs.

Atlas maps

This ATLAS is part of the Environmental Impact Assessment (EIA) for the Finnish section of the planned Nord Stream 2 pipeline system. The purpose of this ATLAS is to describe the general geographical distribution of physical-chemical, biotic and socio-economic parameters in the Baltic Sea around the planned offshore pipeline, mainly focusing on the Finnish section.

When reading the Finnish Environmental Impact Assessment Report 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, 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. For most of the ATLAS maps the pipeline route is presented.

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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3. BATHYMETRY AND HYDROGRAPHY
4. GEOLOGY AND SEABED SURFACE SEDIMENT
5. CLIMATE
6. WATER QUALITY
7. MARINE MAMMALS
8. BIRDS
9. PROTECTED AREAS
10. SHIP TRAFFIC
11. FISHERY
12. MILITARY AREAS
13. INFRASTRUCTURE
14. SCIENTIFIC HERITAGE
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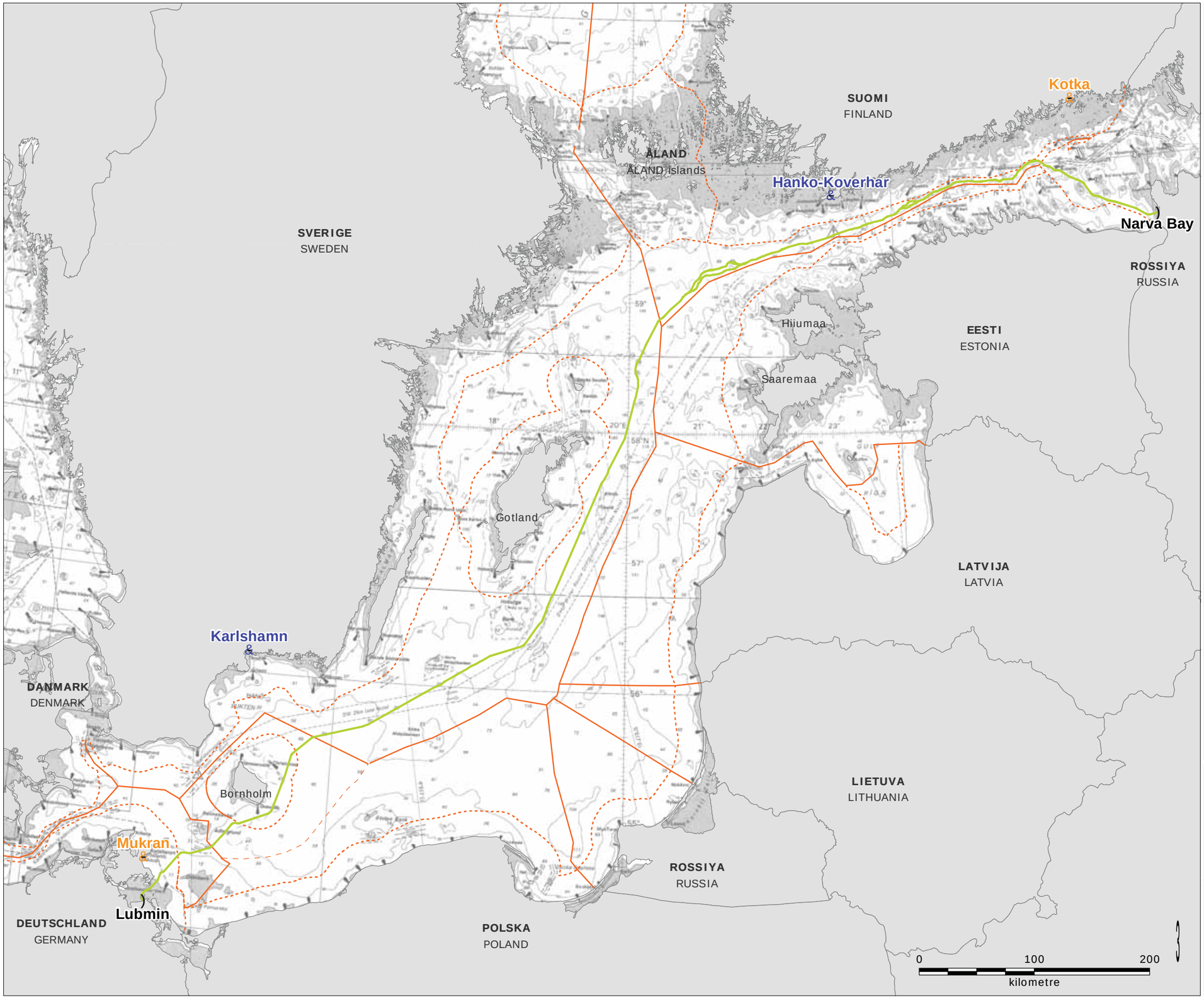
16. MATHEMATIC MODELLING

PROJECT DESCRIPTION

PROJECT DESCRIPTION (PR)



Legend:

- Pipeline route
- Territorial water border
- Åland border
- EEZ border
- Midline between Denmark and Poland
- Landfall

Storage yards:

- Pipe coating plant / pipe storage yard
- Pipe storage yard

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Controlled: SURH

PR-01-F

Pipeline route and onshore facilities

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Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- KP (Kilometre Point)
- Territorial water border
- Åland border
- EEZ border

Version: 09
Date: 2016-12-19
Prepared: ATTM
Controlled: SURH

PR-02-F

Pipeline route in the Finnish EEZ with kilometre points

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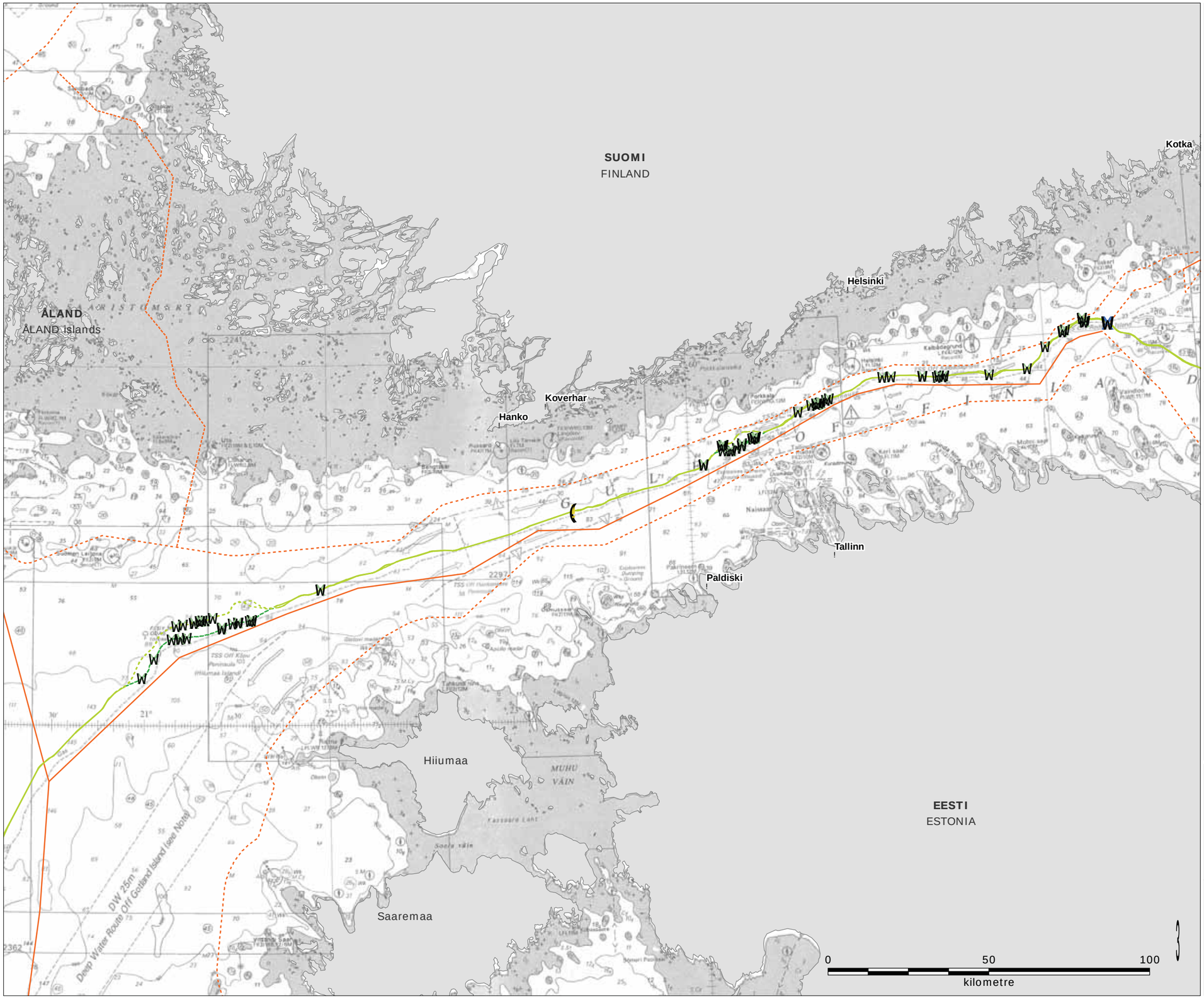

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border

Rock placement

- W Pre-lay
- W Crossing with NSP
- (Tie-in location

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PR-03-F

Rock placement locations - pre-lay

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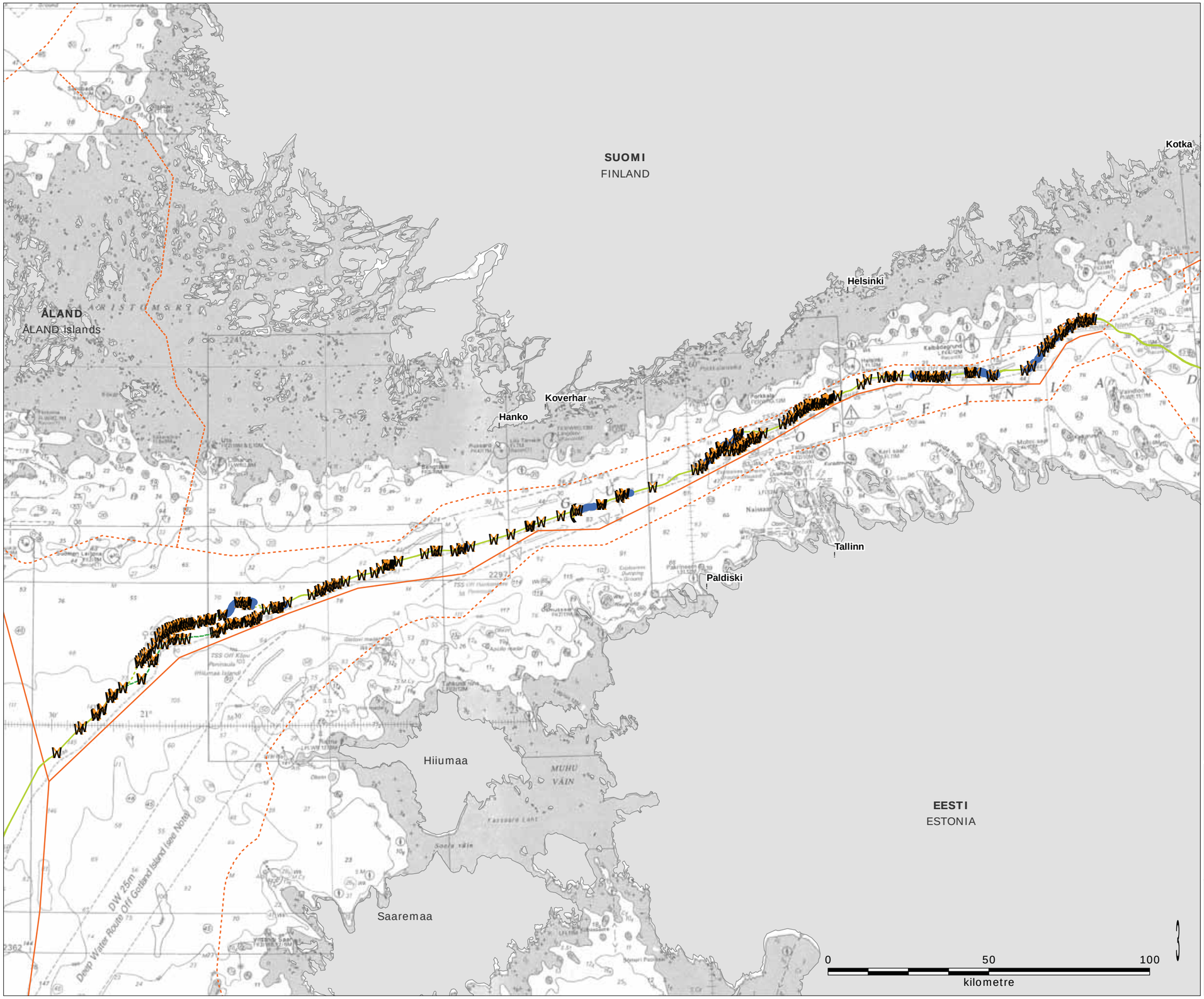

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border

Rock placement

- Post-lay
- ISB rock placement
- Tie-in location

Notes:
ISB, In-Service Buckling
to prevent lateral movement of the pipeline

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PR-04-F

Rock placement locations - post-lay

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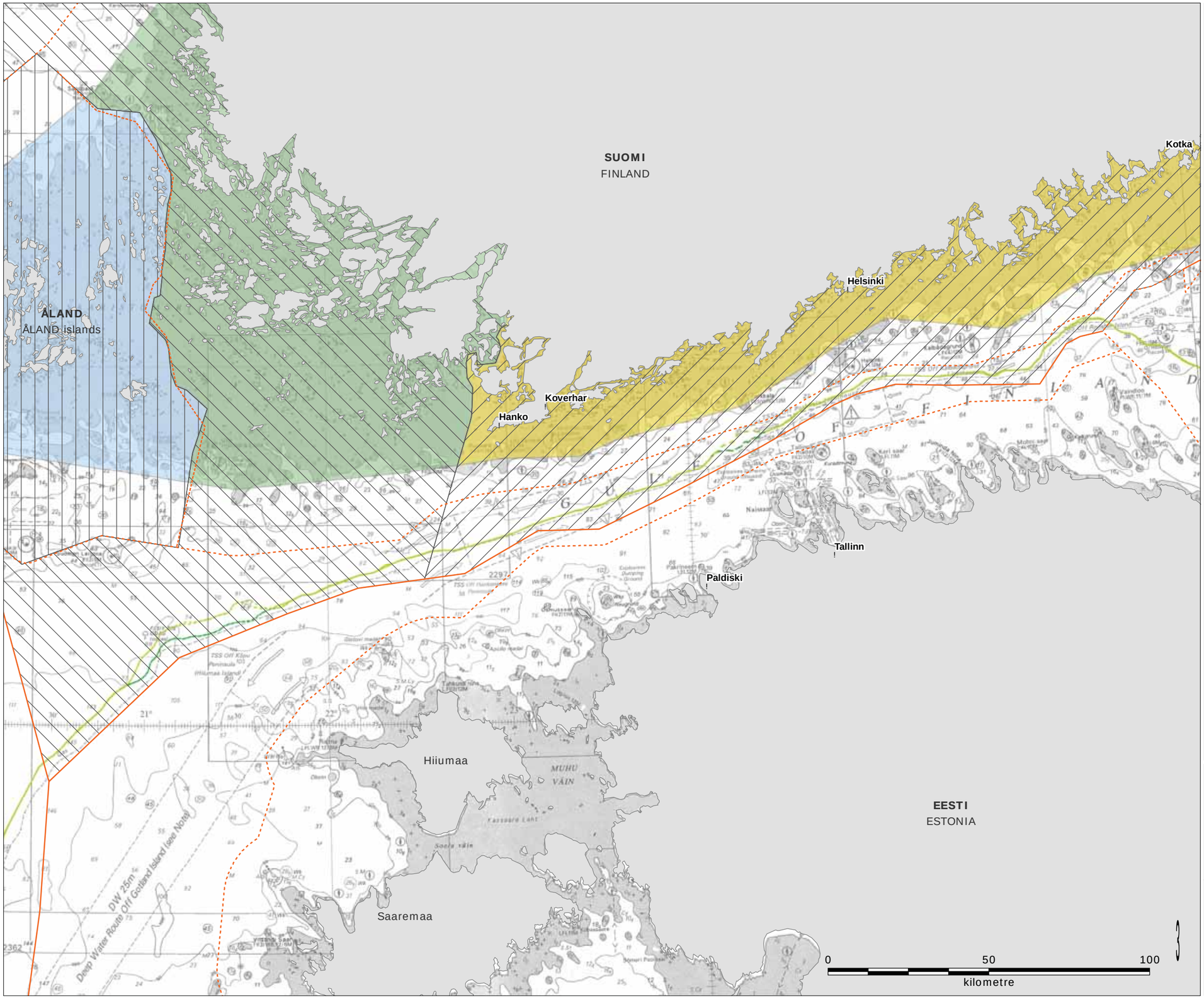
MARITIME SPATIAL PLANNING

MARITIME SPATIAL PLANNING (MP)



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border

River basin districts

- Kokemäenjoki - Archipelago Sea - Bothnian Sea
- Kymijoki - Gulf of Finland
- Åland

Maritime spatial planning, responsible authorities

- Helsinki-Uusimaa Regional Council and Regional council of Kymenlaakso
- The Regional Council of Satakunta and Regional Council of Southwest Finland
- Åland

References:
- SYKE / Ministry of the Environment of Finland (January 2016)

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MP-01-F

Maritime spatial planning - river basin districts

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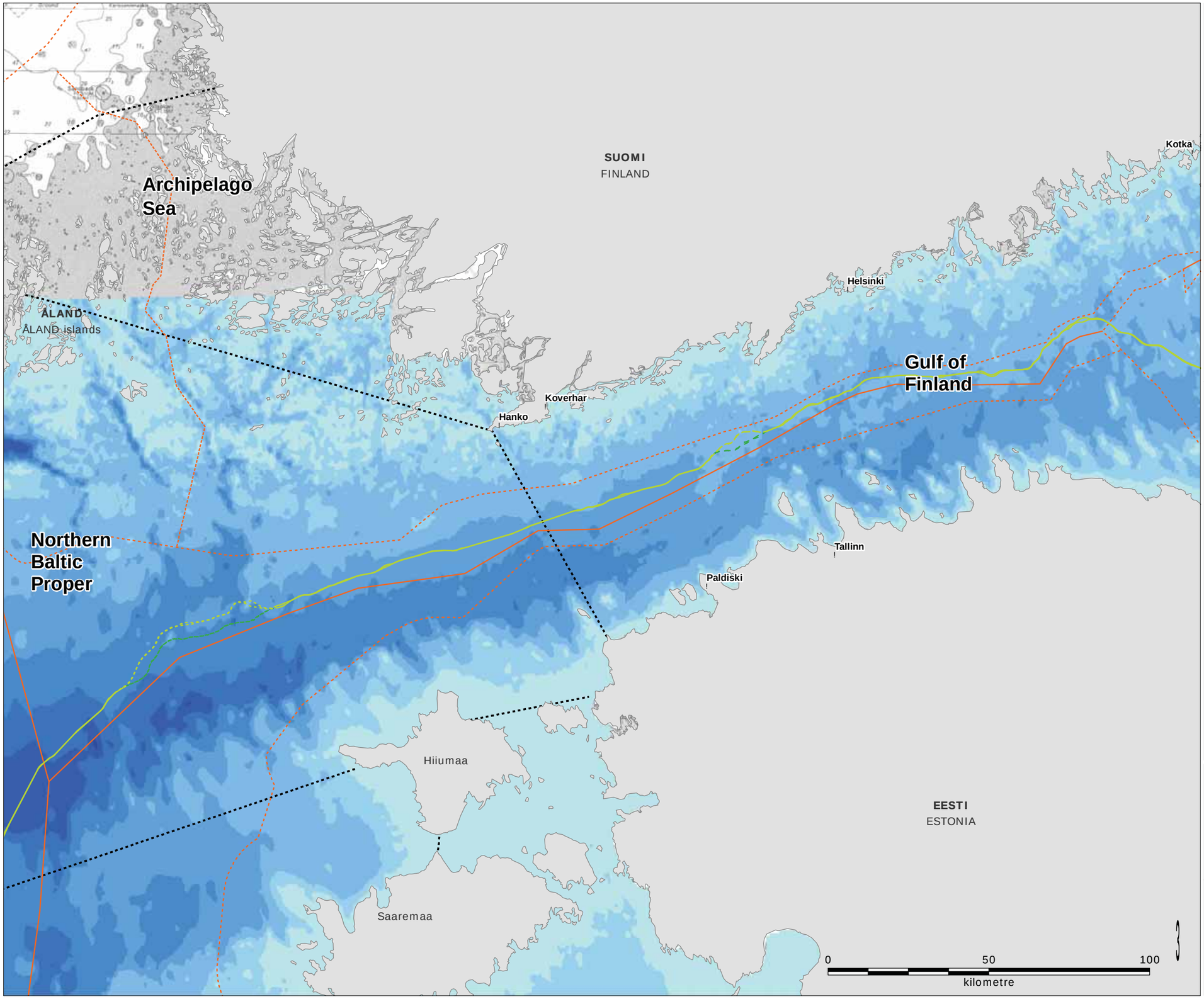
PHYSICAL-CHEMICAL ENVIRONMENT

BATHYMETRY AND HYDROGRAPHY (BA)

GEOLOGY AND SEABED SURFACE SEDIMENT (GE)

CLIMATE (CL)

WATER QUALITY (WA)



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Sub-basin border

Bathymetry, m

- -220 - -190
- -190 - -150
- -150 - -120
- -120 - -90
- -90 - -60
- -60 - -30
- -30 - -15
- -15 - 0

References:
- MIKE C-map database, February 2012
- HELCOM

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Date: 2016-12-20
Prepared: ATTM
Controlled: SURH

BA-01-F

Bathymetry

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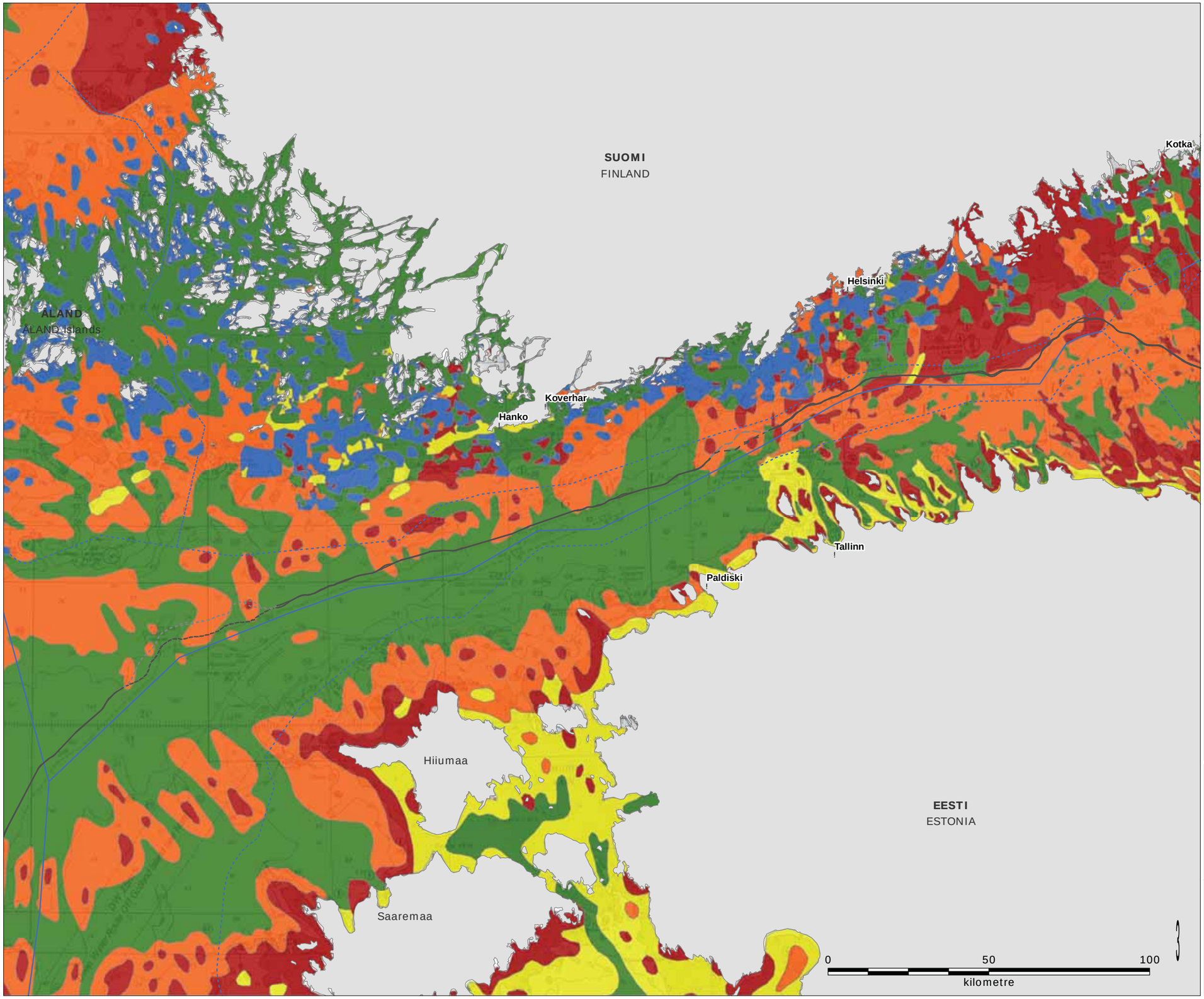

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Bedrock
- Hard bottom complex
- Sand
- Hard clay
- Mud

Notes:

I. Bedrock
II. Hard bottom complex, includes patchy hard surfaces and coarse sand (sometimes also clay) to boulders.
III. Sand including fine to coarse sand (with gravel exposures).
IV. Hard clay sometimes/often/possibly exposed or covered with a thin layer of sand/gravel.
V. Mud including gyttja-clay to gyttja-silt.

References:
- Geological Survey of Finland, GTK. EU Balance project

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GE-01-F

Seabed sediments

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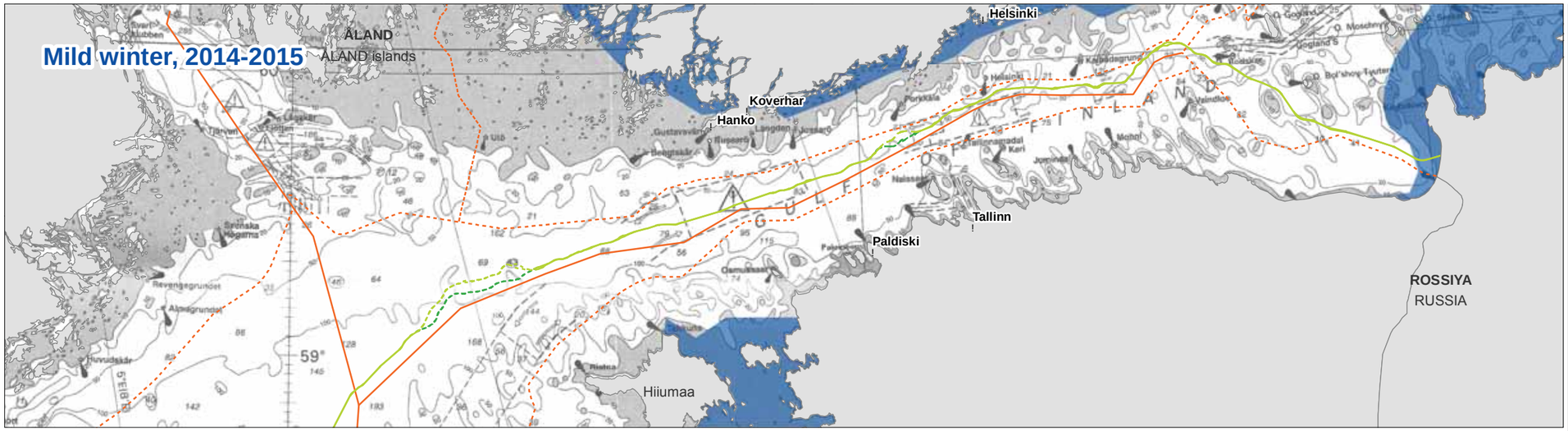

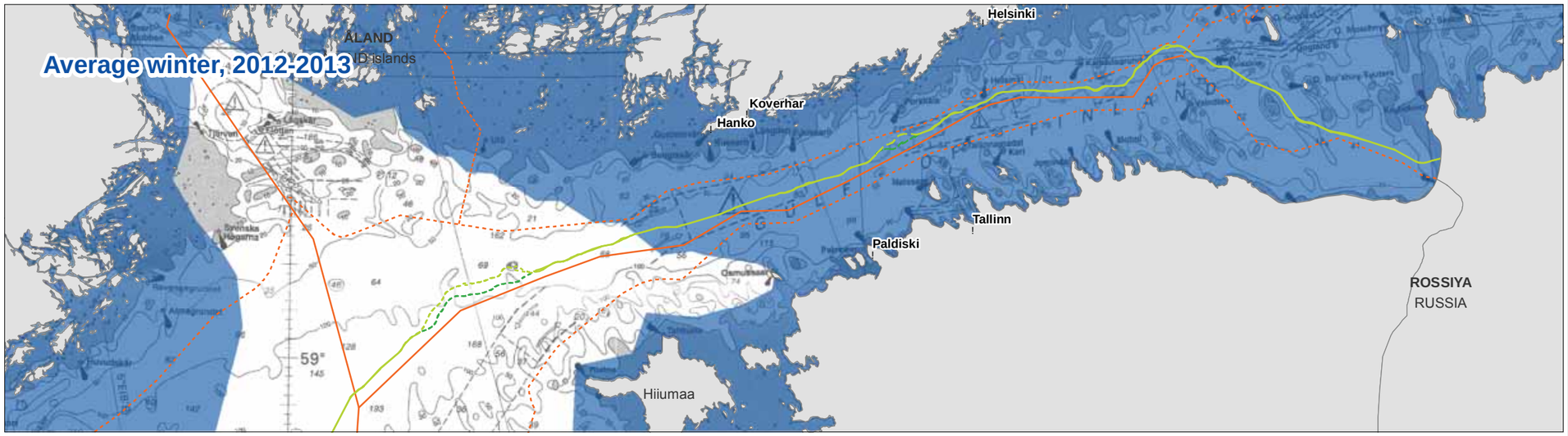

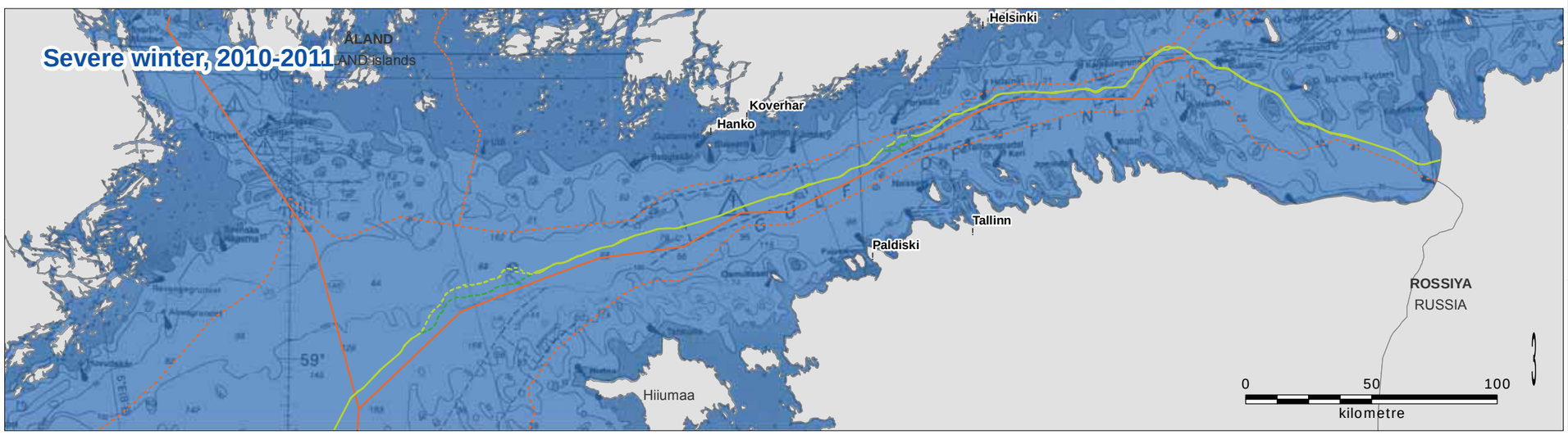

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Maximum ice cover

Notes:
Ice cover examples of mild, average and severe winter

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

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CL-01-F

Ice cover during 3 winters 2010 - 2015

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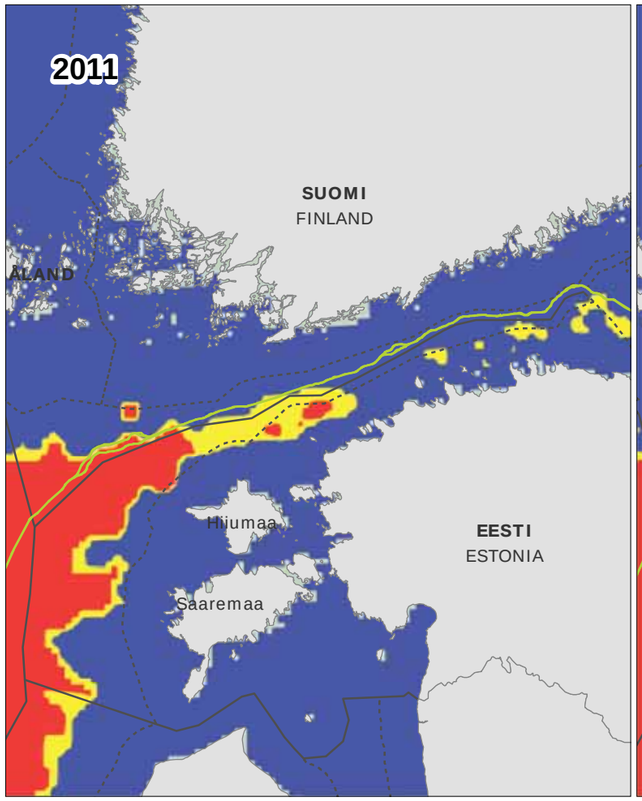
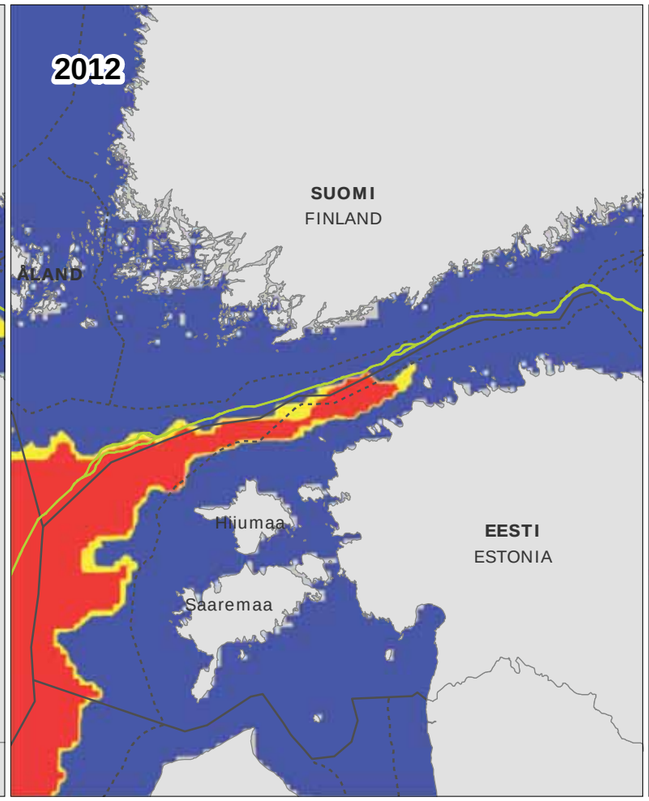
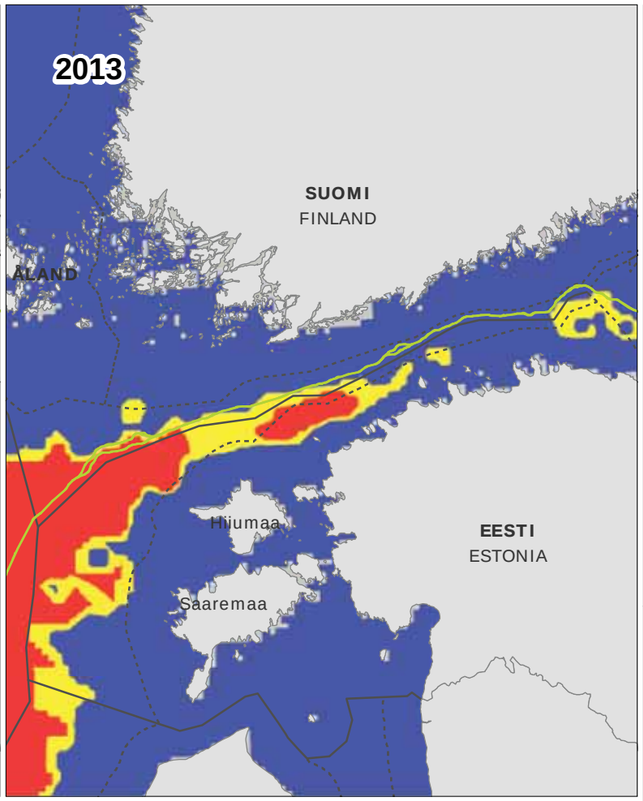
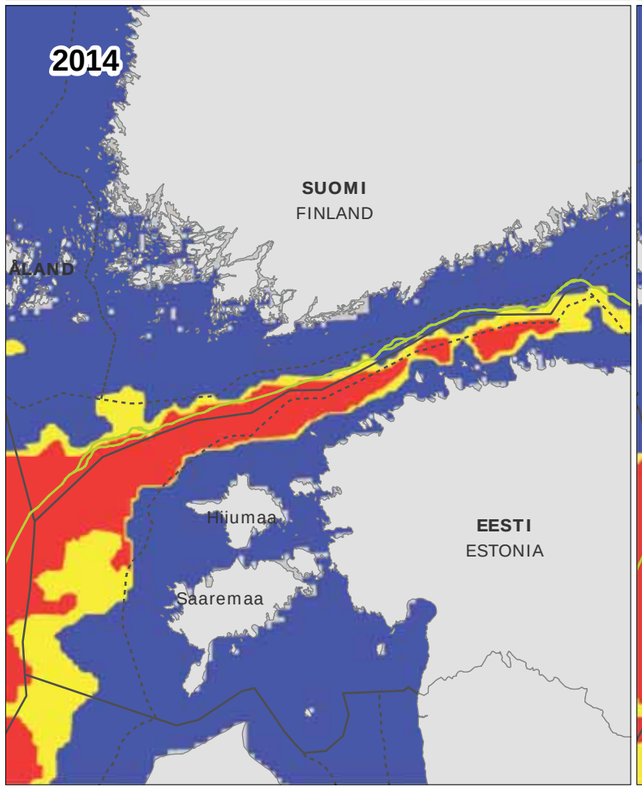
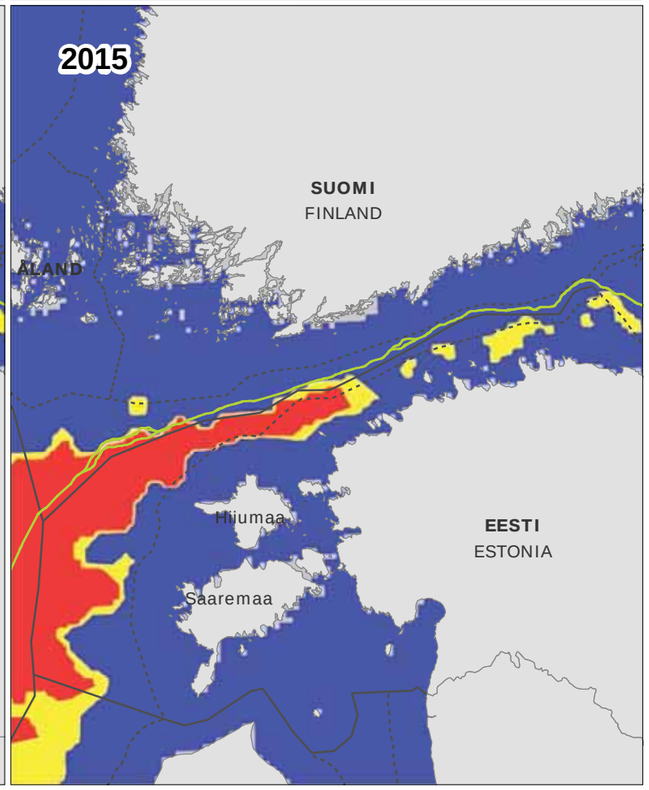






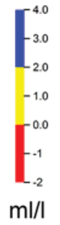




Legend:

- NSP2 Route
- Territorial water border
- Åland border
- EEZ boundary

Oxygen level:
oxygen < 0 ml/l: areas of hydrogen sulphide



0 25 50 75 100
kilometre

Notes:
Oxygen conditions near the seabed in late summer 2011–2015 in the Northern Baltic Sea according to the Finnish Environment Institute (SYKE). Red areas refer to anoxic and yellow areas to hypoxic conditions.

References:
- Finnish Environmental Institute, SYKE

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WA-01-F

Oxygen levels - 2011 - 2015

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BIOLOGICAL ENVIRONMENT

MARINE MAMMALS (MA)

BIRDS (BI)

PROTECTED AREAS (PA)

SUOMI
FINLAND

ÅLAND
ÅLAND islands

Kotka
Helsinki
Koverhar
Hanko
Tallinn
Paldiski

Hiiumaa
Saaremaa

EESTI
ESTONIA

Deep Water Route Off Gotland Island (see No

0 50 100
kilometre

Notes:
Mean porpoise detection seconds per month:
This is mean time per month that acoustic recorders have detected harbour porpoise signals in the area. This does not tell the real number of individuals, but can be used as a comparative index when estimating harbour porpoise distribution and abundance in the Baltic Sea.
Maximum recorded value in the Baltic Sea is 4: >50 000 detections, located in Southern Baltic Sea near Denmark.

Survey period: 1.5.2011 - 30.4.2013

References:
- HELCOM, Sambah-project
- Turku University

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border

Harbour porpoise sightings 2014-2015
Groupsize
- 1
- 2
- 4

Harbour porpoise sightings 2011-2013
Groupsize
- 1
- 2
- 3

Harbour porpoise sightings 2000-2010
Groupsize
- 1
- 2
- 3
- 4
- 6

Harbour porpoise:
relative density (0 - 5): mean porpoise detection seconds per month
- 0: no detections
- 1: 1 - 5 000 detections

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MA-01-F

Harbour porpoise *(Phocoena phocoena)* observations

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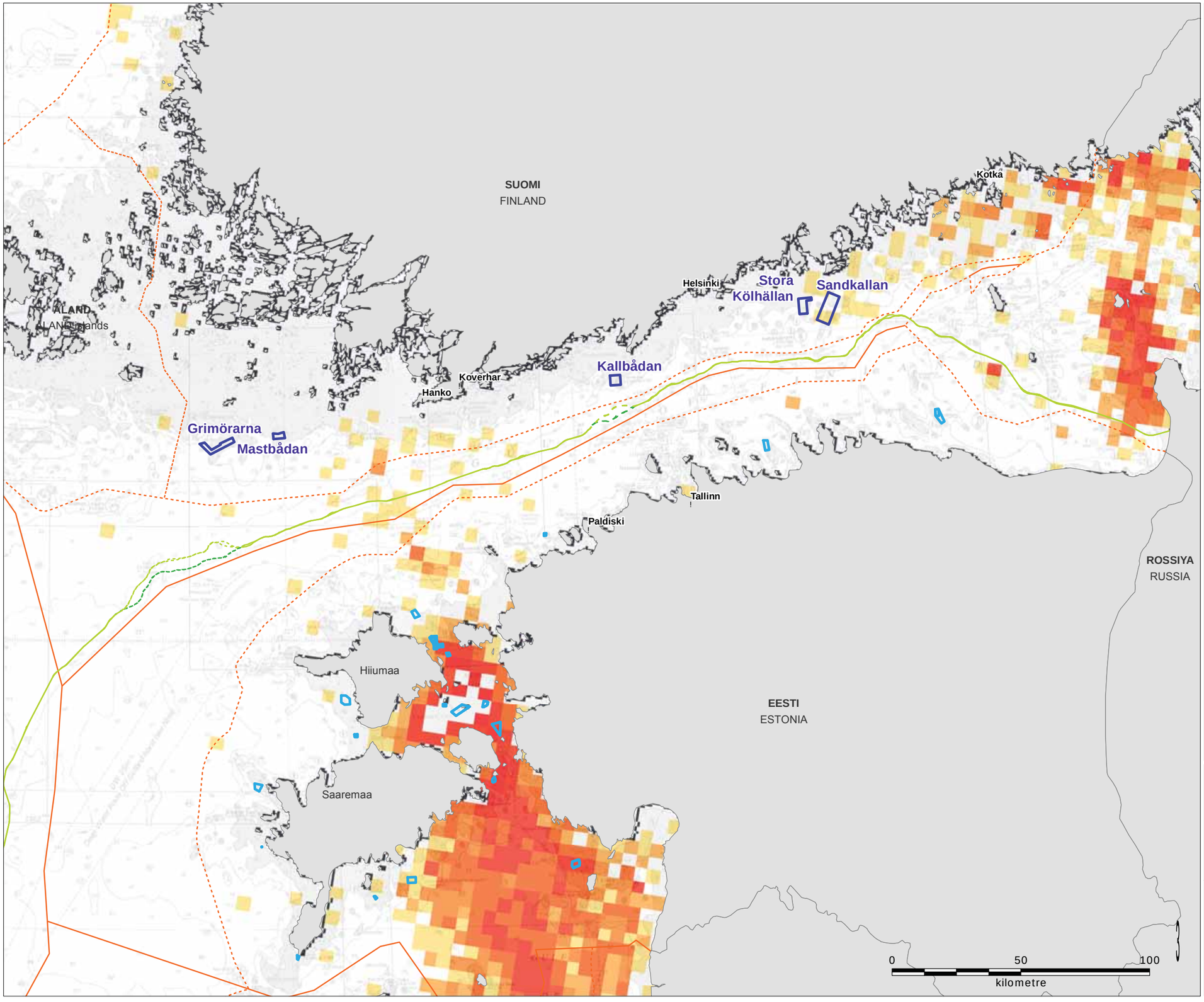

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Seal sanctuary
- Seal protection area, Estonia

Distribution observations (based on GPS tracks)

Ringed Seal

- 0
- 1
- 2
- 3 - 4
- 5 - 10
- 11
- 12 - 30
- 31 - 62

Notes:
Data shows all available tracking observations.
It shows only rough distribution of species during recent years, and the number of observations does not tell the number of individuals.

The data period is:
- Finland: 2000 - 9.2.2015
- Estonia: end of 1990 - 2014
- Data is presented in 5 km grid

References:
- HELCOM, Balsam-project, data accessed 27.1.2017 (http://www.helcom.fi/baltic-sea-trends/data-maps/biodiversity/seals/)
- Metsähallitus, Finland
- Estonian Nature Information System (EELIS)

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MA-02-F

Ringed seal *(Pusa hispida botnica)* distribution

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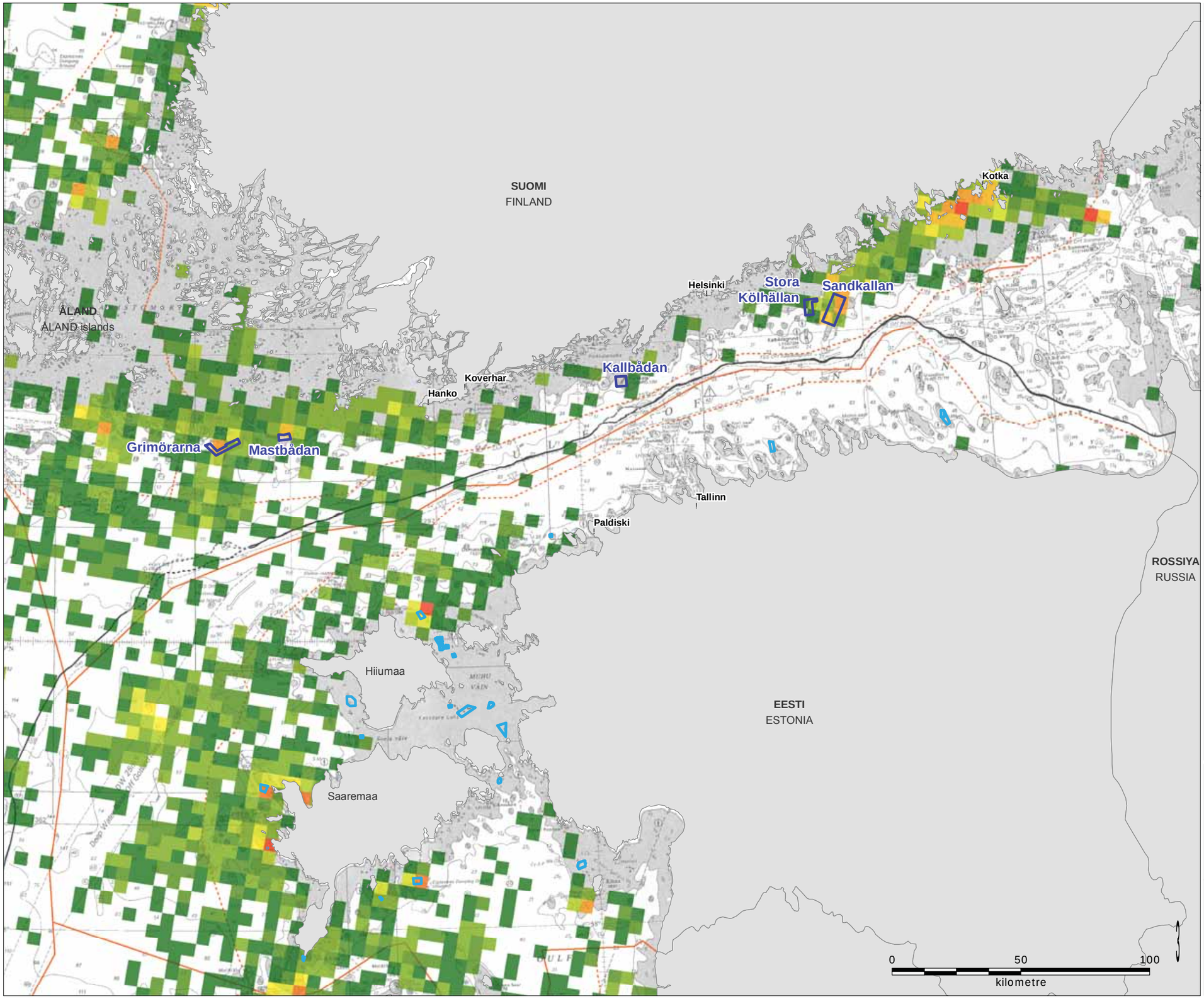

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Seal sanctuary
- Seal protection area, Estonia

Number of GPS detections

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

Notes:
Data shows all available tracking observations. It shows only rough distribution of species during recent years, and the number of observations does not tell the number of individuals.

The data period is:
- Finland: 2000 - 9.2.2015
- Estonia: end of 1990 - 2014
- Data is presented in 5 km grid

References:
- HELCOM, Balsam-project
- Metsähallitus, Finland
- Estonian Nature Information System (EELIS)

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MA-03-F

Grey seal *(Halichoerus grypus)* distribution

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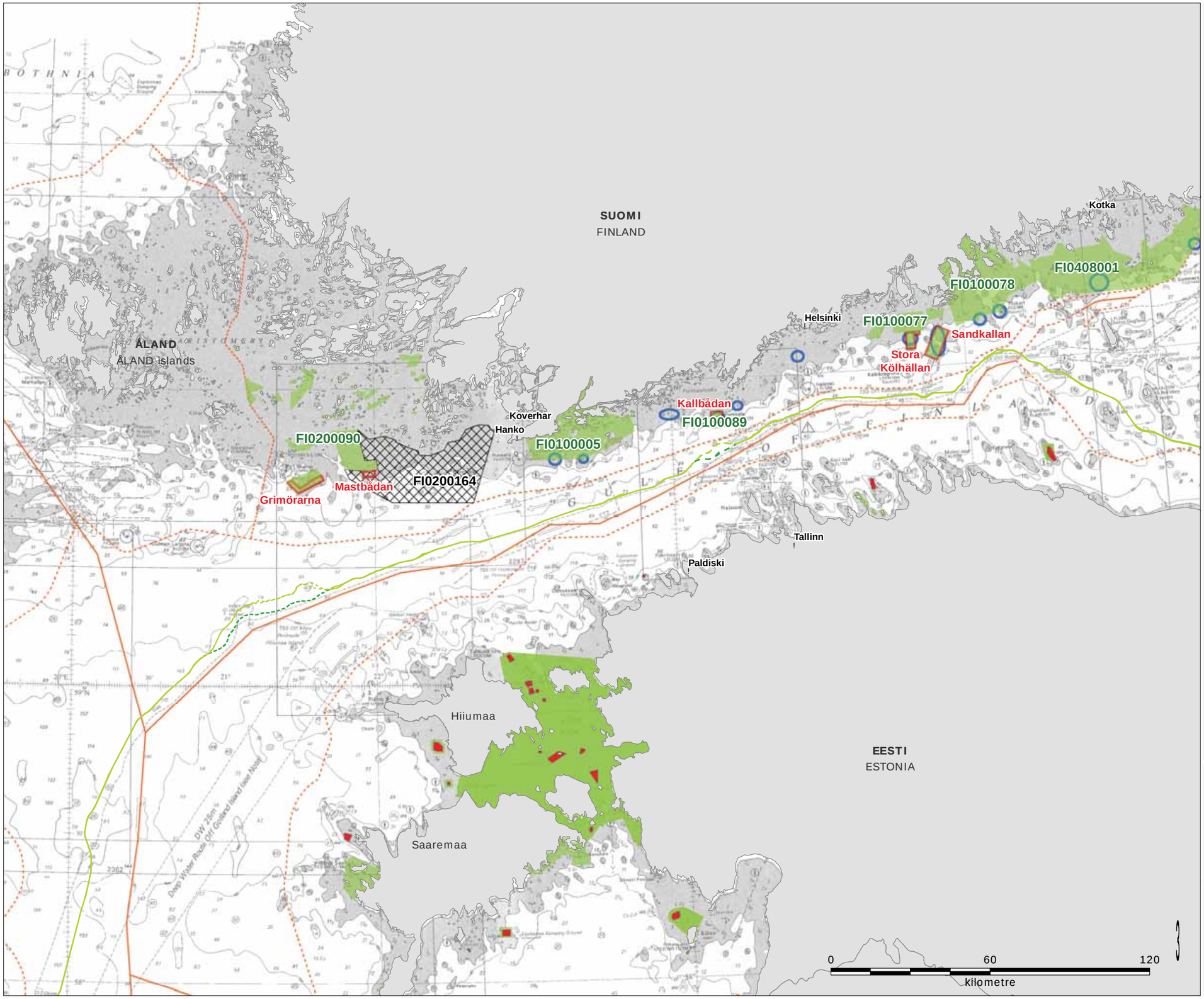

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Seal sanctuary
- Natura 2000 site designated for seals
- Proposed Natura 2000 extension
- Important grey seal area (resting site)
- Seal protection area, Estonia

References:

- Metsähallitus, Finland
- European Environment Agency, downloaded 19/01/2016, http://www.eea.europa.eu/data-and-maps/data/natura-6
- 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
- Estonian Nature Information System (EELIS)

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MA-04-F

Seal areas

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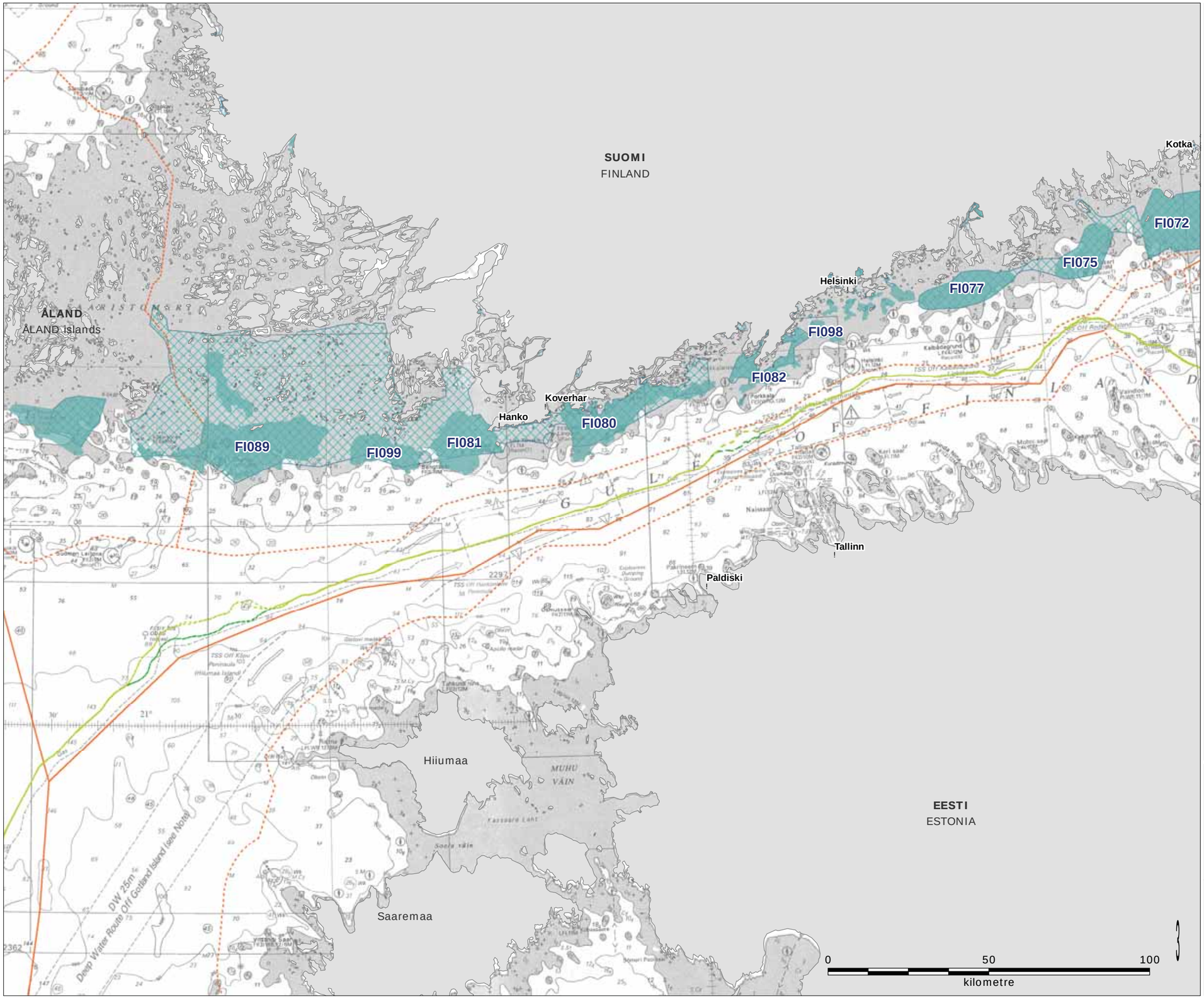

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Important Bird and Biodiversity Area (IBA)
- Finnish Important Bird Area (FINIBA)

References:
- BirdLife Finland, 2016, http://www.birdlife.fi/suojelu/paikat/iba/iba-suomen-tarkeat-lintualueet.shtml, Date accessed: 2016-09-15

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BI-01-F

Important Bird and Biodiversity Areas (IBA) and Finnish Important Bird Areas (FINIBA)

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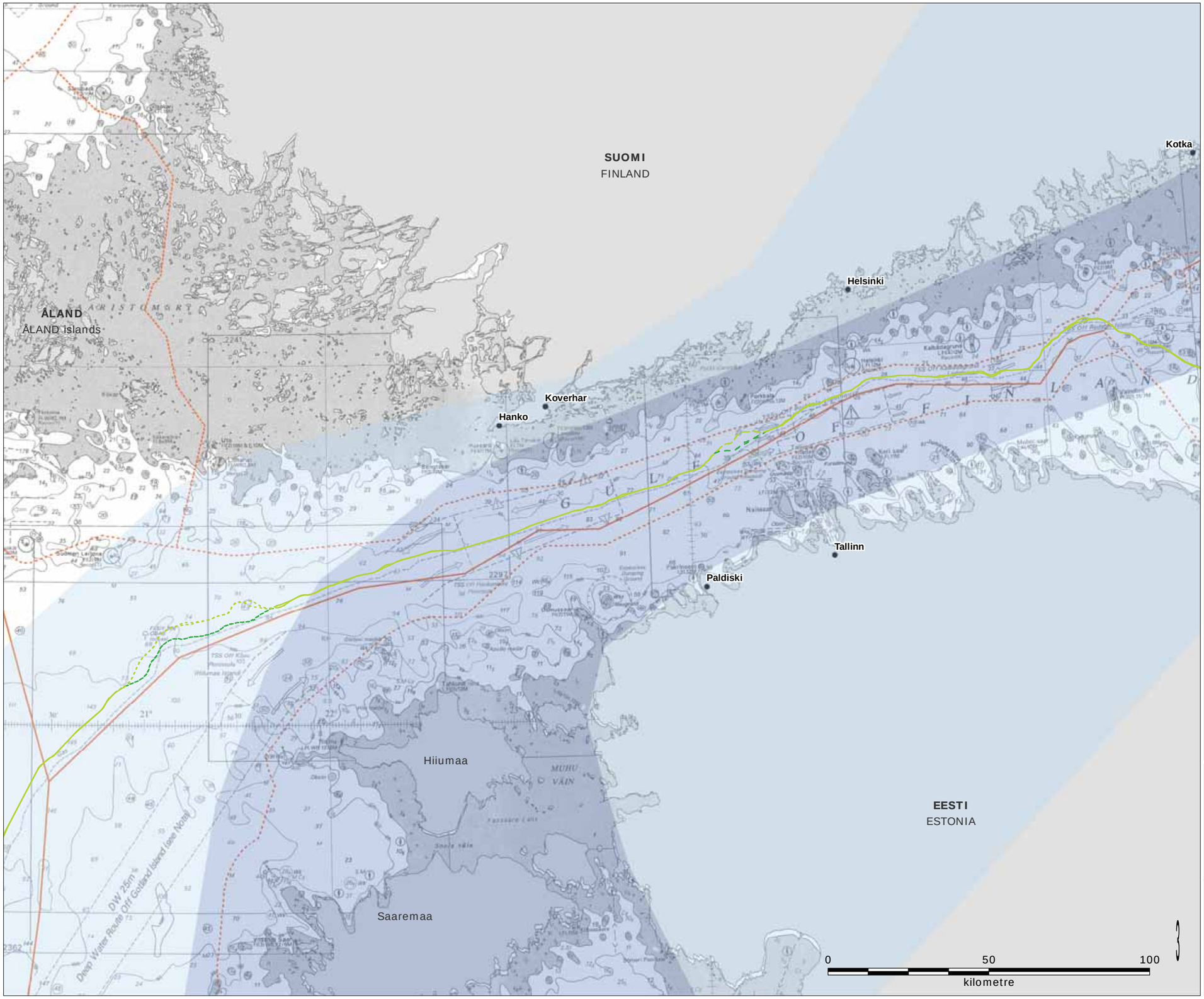

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Heavily used part of the flyway of arctic birds
- Less used part of the flyway of arctic birds

References:
- Migratory flyway: Birdlife Finland, Tringa ry, PSLY ry
  Migratory routes comprised based on several species flyway routes by Ramboll bird expert.

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BI-02-F

Migratory flyway of arctic birds

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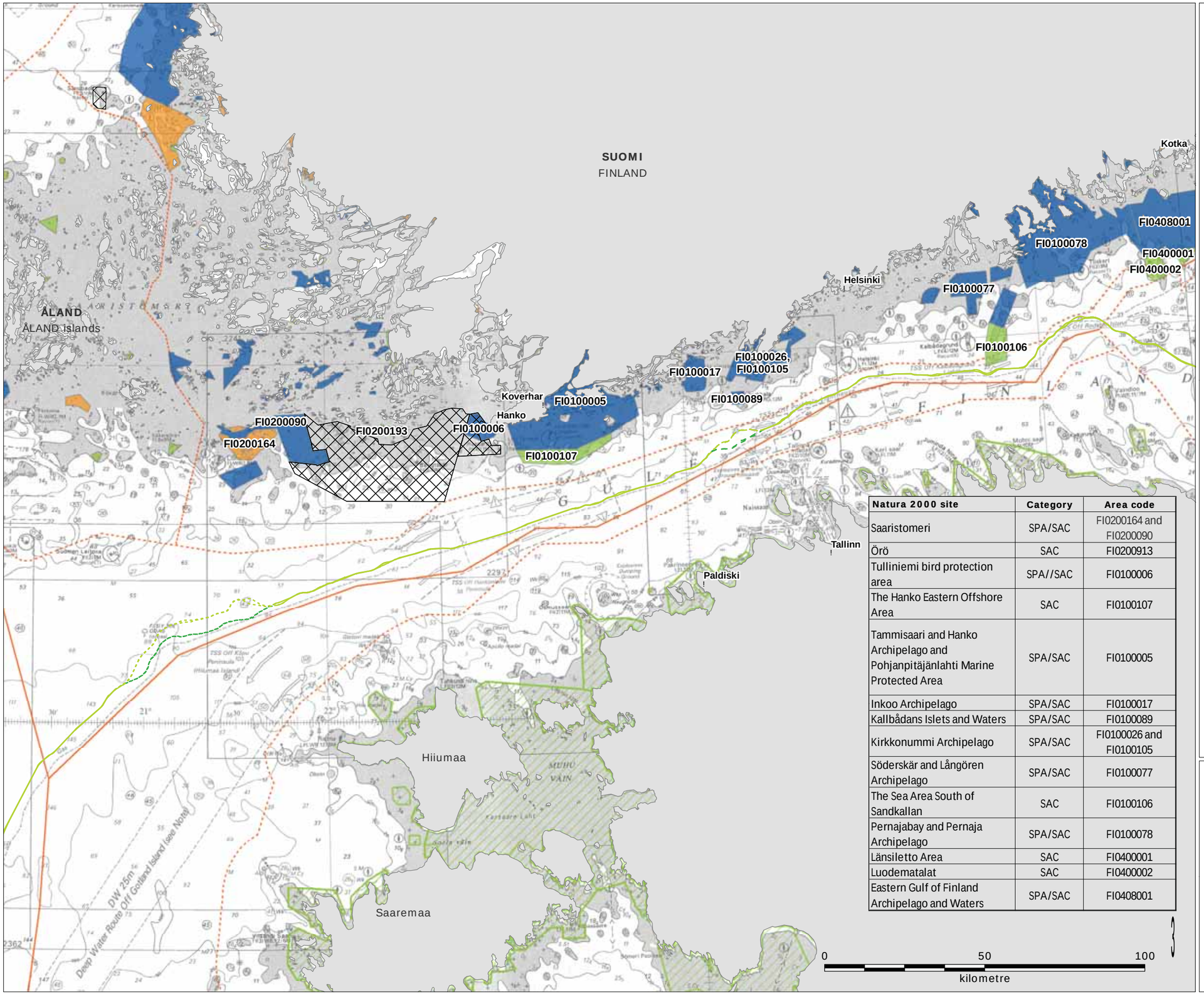


Natura 2000 site	Category	Area code
Saaristomeri	SPA/SAC	FI0200164 and FI0200090
Örö	SAC	FI0200913
Tulliniemi bird protection area	SPA//SAC	FI0100006
The Hanko Eastern Offshore Area	SAC	FI0100107
Tammisaari and Hanko Archipelago and Pohjanpitäjänlahti Marine Protected Area	SPA/SAC	FI0100005
Inkoo Archipelago	SPA/SAC	FI0100017
Kallbådans Islets and Waters	SPA/SAC	FI0100089
Kirkkonummi Archipelago	SPA/SAC	FI0100026 and FI0100105
Söderskär and Långören Archipelago	SPA/SAC	FI0100077
The Sea Area South of Sandkallan	SAC	FI0100106
Pernajabay and Pernaja Archipelago	SPA/SAC	FI0100078
Länsiletto Area	SAC	FI0400001
Luodematalat	SAC	FI0400002
Eastern Gulf of Finland Archipelago and Waters	SPA/SAC	FI0408001

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Natura 2000 site, SAC
- Natura 2000 site, SPA
- Natura 2000 site, SPA/SAC
- Proposed Natura 2000 extensions
- Natura 2000 site, Estonia

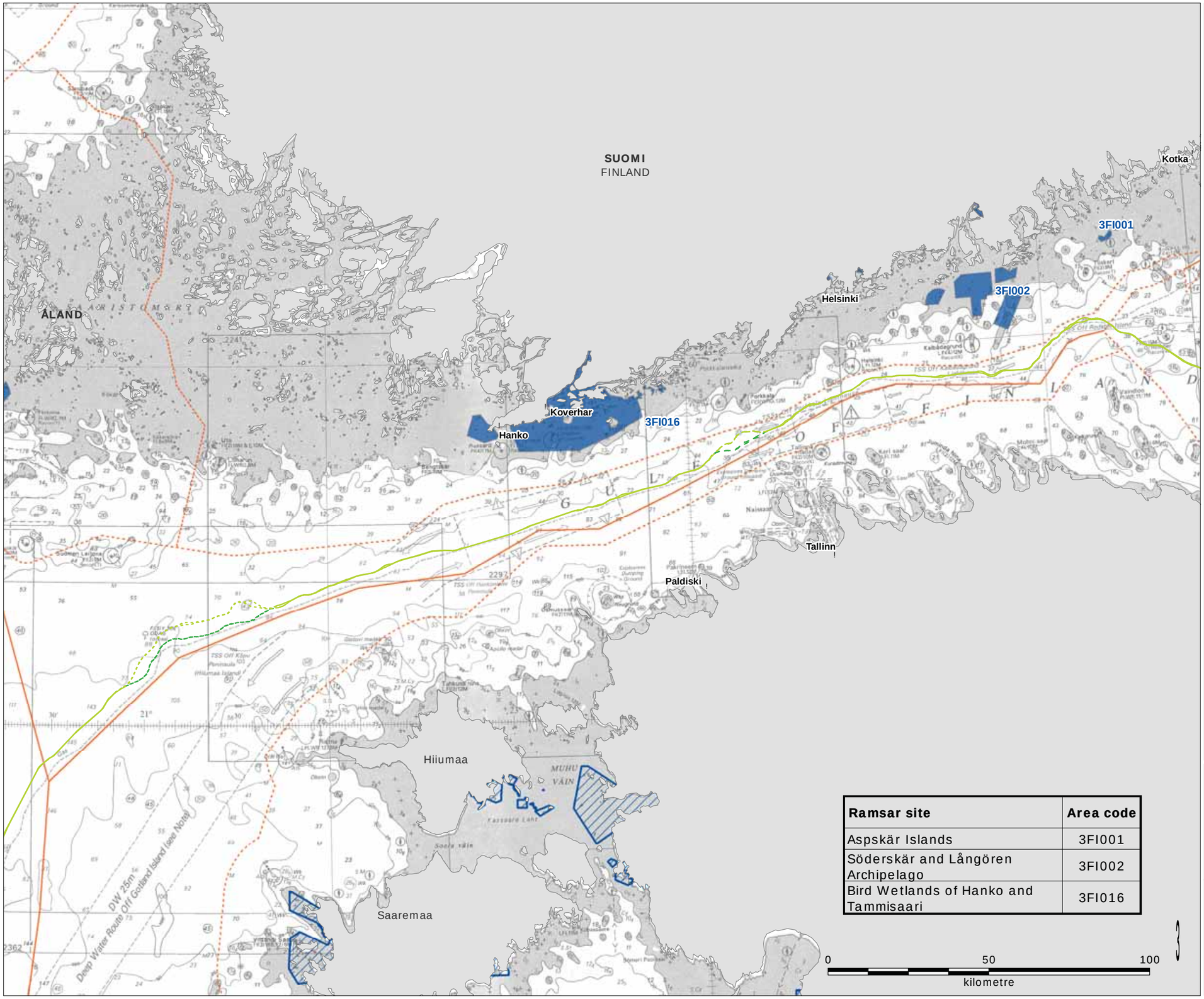
References:
- Natura 2000: Finnish Environment Institute, SYKE, data downloaded January 2016 / extensions received September 2016
  Estonian Nature Information System (EELIS)

Version: 09
Date: 2016-11-26
Prepared: ATTM
Controlled: SURH

PA-01-F

Natura 2000 sites

RAMBØLL



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Ramsar site
- Ramsar site, Estonia

Ramsar site	Area code
Aspskär Islands	3FI001
Söderskär and Långören Archipelago	3FI002
Bird Wetlands of Hanko and Tammisaari	3FI016

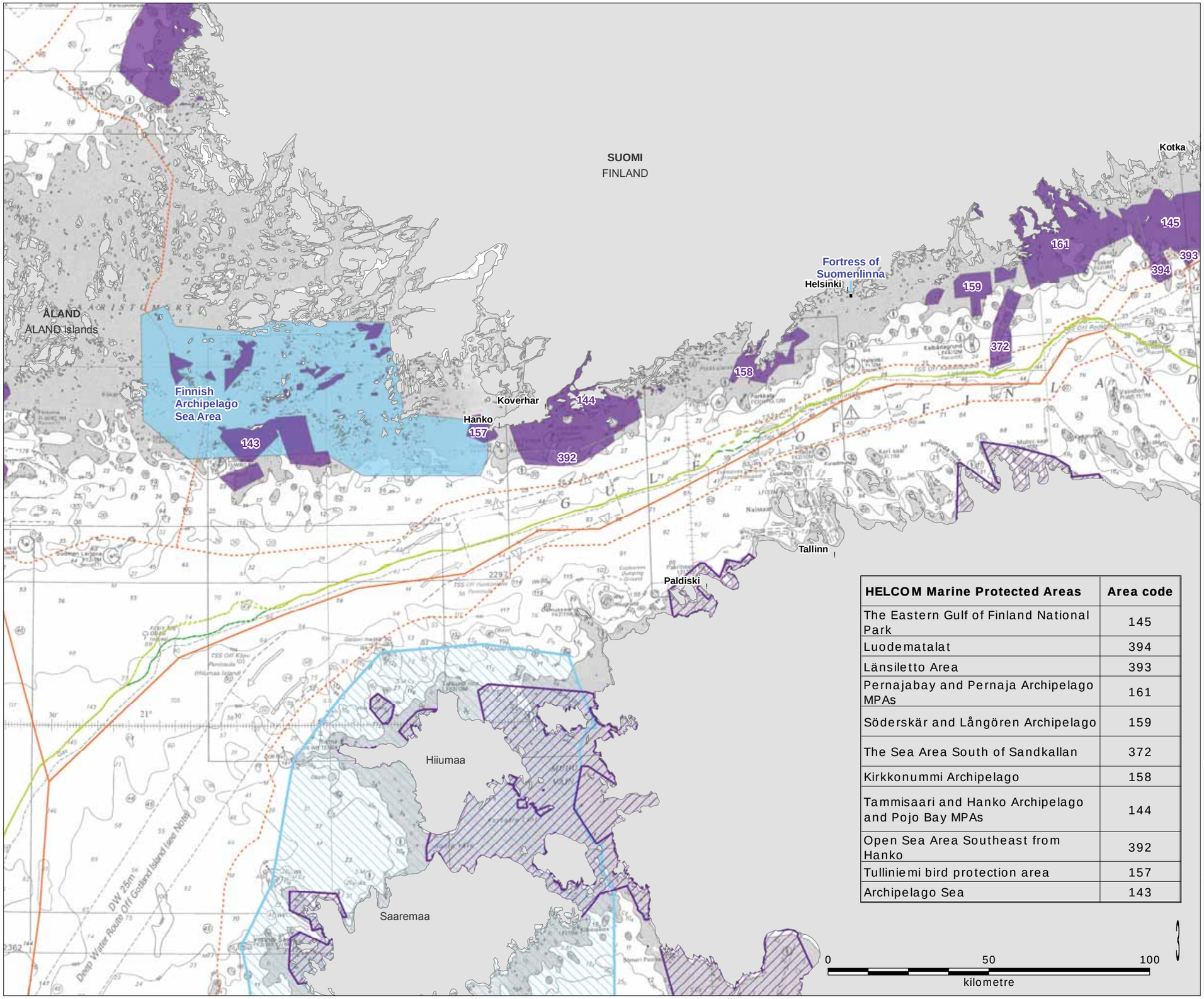
References:
- European Environment Agency and HELCOM, 2012, "Ramsar sites", http://maps.helcom.fi/website/mapservice/index.html, Data accessed: 2016-1-21

Version: 09
Date: 2016-11-26
Prepared: ATTM
Controlled: SURH

PA-02-F

Ramsar sites

RAMBØLL



HELCOM Marine Protected Areas	Area code
The Eastern Gulf of Finland National Park	145
Luodematalat	394
Länsiletto Area	393
Pernajabay and Pernaja Archipelago MPAs	161
Söderskär and Långören Archipelago	159
The Sea Area South of Sandkallan	372
Kirkkonummi Archipelago	158
Tammisaari and Hanko Archipelago and Pojo Bay MPAs	144
Open Sea Area Southeast from Hanko	392
Tulliniemi bird protection area	157
Archipelago Sea	143

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- HELCOM MPA (Marine Protected Area)
- UNESCO site
- UNESCO site
- HELCOM MPA (Marine Protected Area), Estonia
- UNESCO site, Estonia

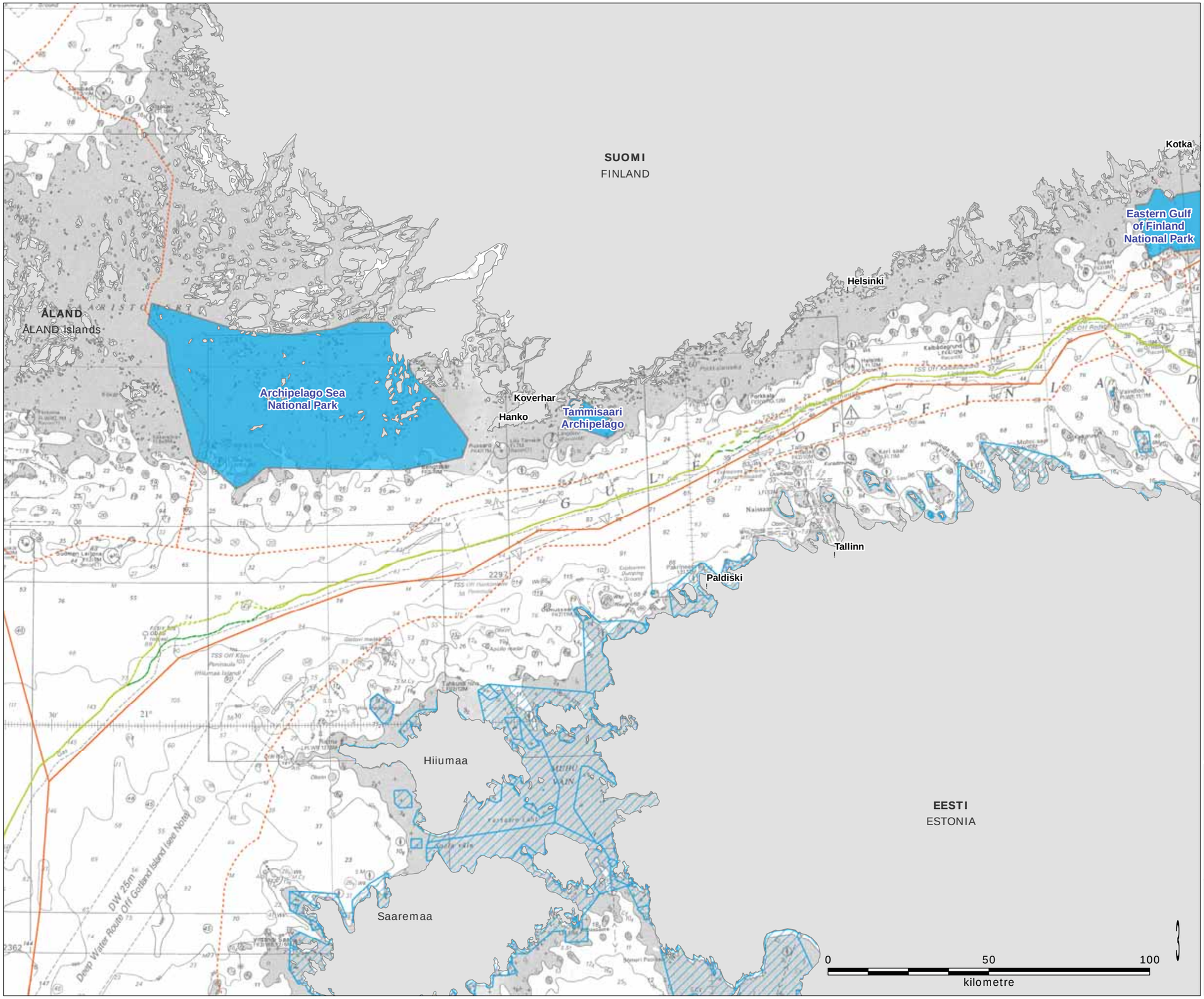
References:
- HELCOM, 2015, "HELCOM MPAs", http://maps.helcom.fi/website/mapservice/index.html, Date accessed: 2016-01-11
- HELCOM, European Commission and UNESCO, 1998, "UNESCO sites", http://maps.helcom.fi/website/mapservice/index.html, Date accessed: 2015-11-12

Version: 09
Date: 2016-11-26
Prepared: ATTM
Controlled: SURH

PA-03-F

HELCOM Marine Protected Areas (MPA) and UNESCO sites

RAMBØLL



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- National park
- National protection area in Estonia

References:
- Finnish Environment Institute, SYKE, January 2016
- Estonian Nature Information System (EELIS)

Version: 09
Date: 2016-11-26
Prepared: ATTM
Controlled: SURH

PA-04-F

Marine national parks

RAMBØLL

SOCIO-ECONOMIC ENVIRONMENT

SHIP TRAFFIC (SH)

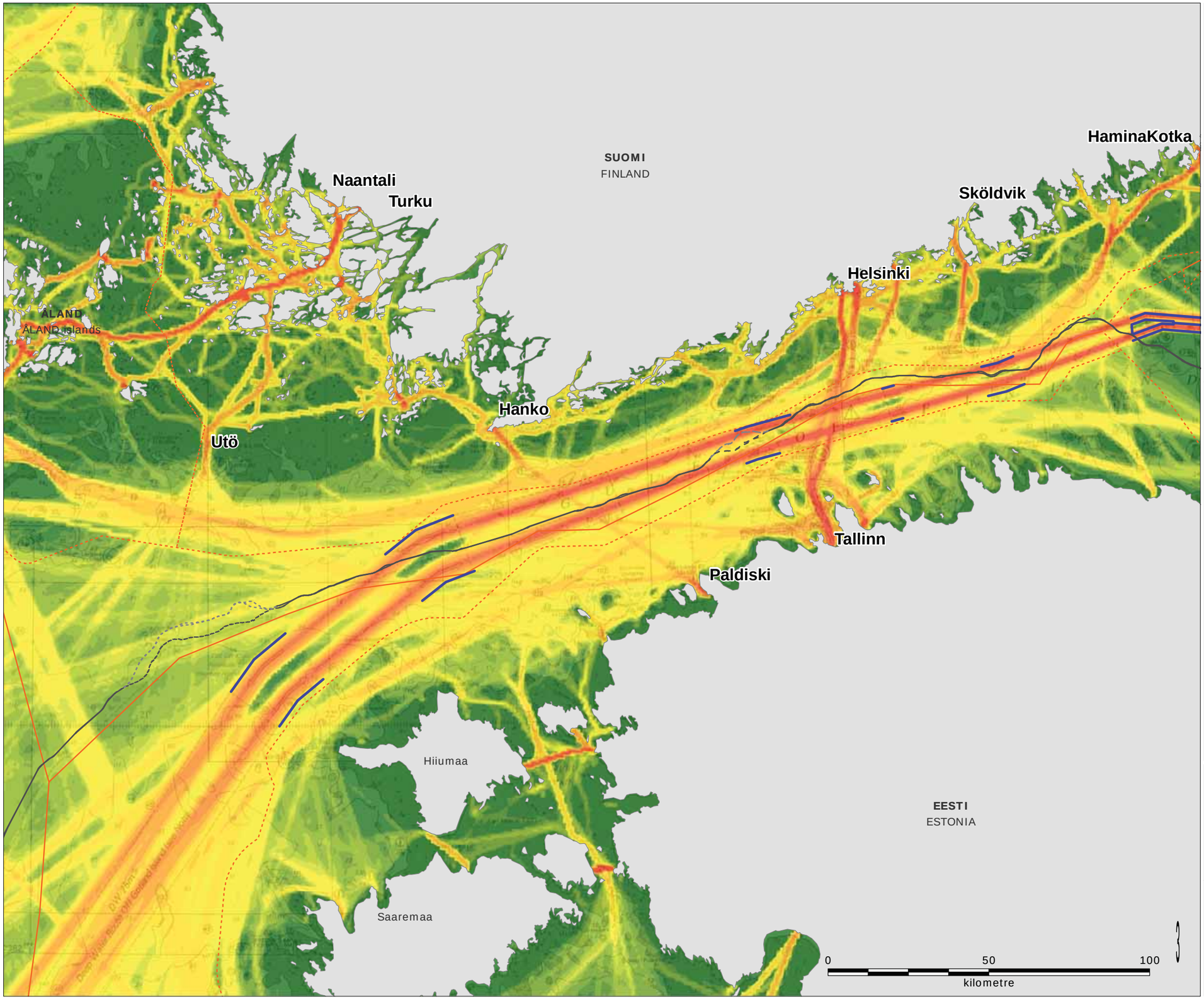
FISHERY (FC)

MILITARY AREAS (MI)

INFRASTRUCTURE (IN)

SCIENTIFIC HERITAGE (SC)

CULTURAL HERITAGE (CU)



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- TSS border

Ship density (2014)

- 0 - 5
- 6 - 10
- 10 - 25
- 26 - 50
- 50 - 75
- 76 - 100
- 100 - 250
- 251 - 500
- 501 - 1 000
- 1 001 - 2 000
- 2 001 - 3 000
- 3 001 - 4 000
- greater than 4000

Notes:
- AIS data covers the year 2014

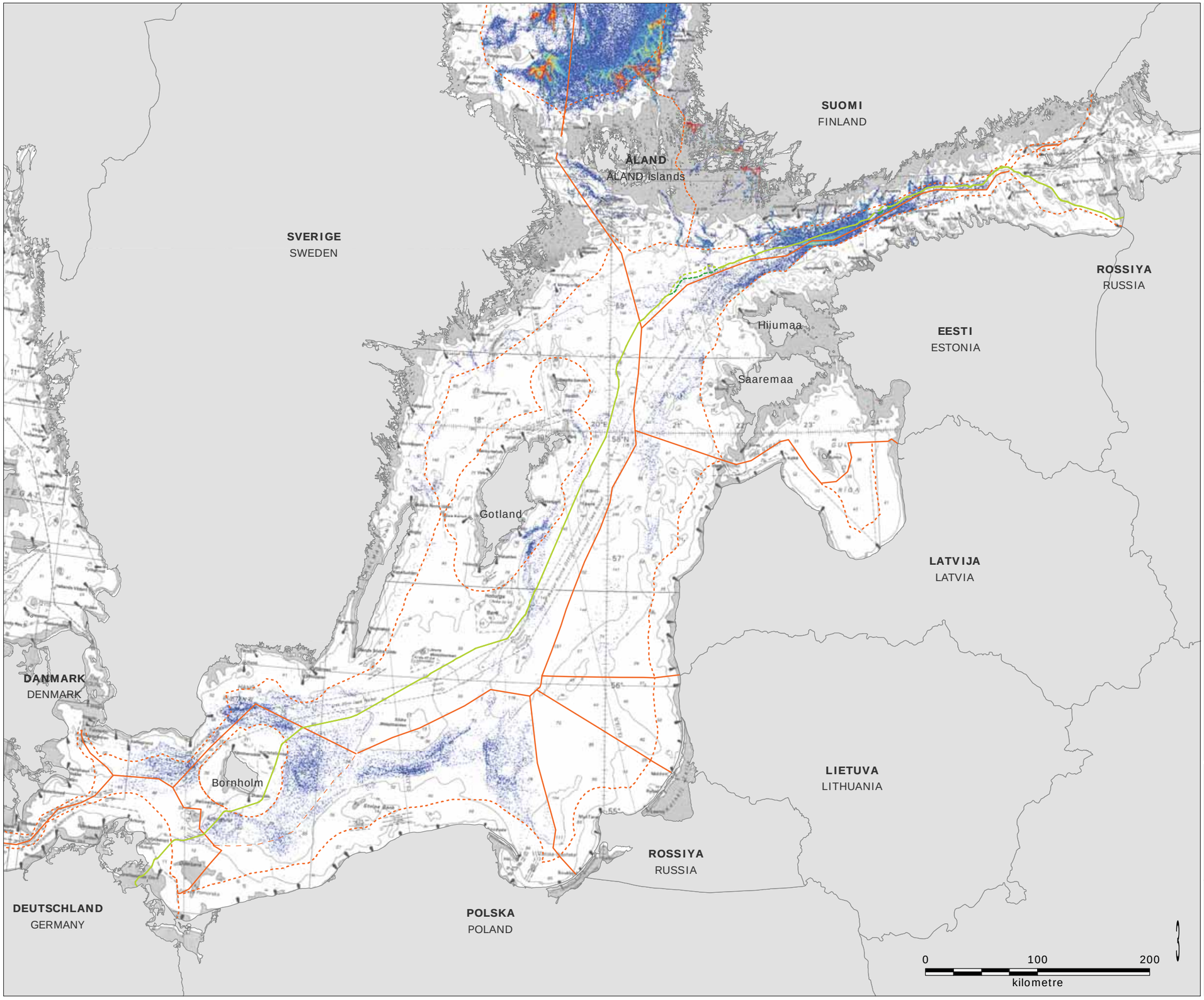
General
- Ship density data provided by the Danish Marine Authority (DMA)

Version: 09
Date: 2016-11-26
Prepared: ATTM
Controlled: SURH

SH-01-F

Ship density - AIS 2014

RAMBØLL



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Midline between Denmark and Poland

Number of observations:

934

1

Notes:
- Data covers years 2010 - 2015
- Data in 500 x 500 m grid

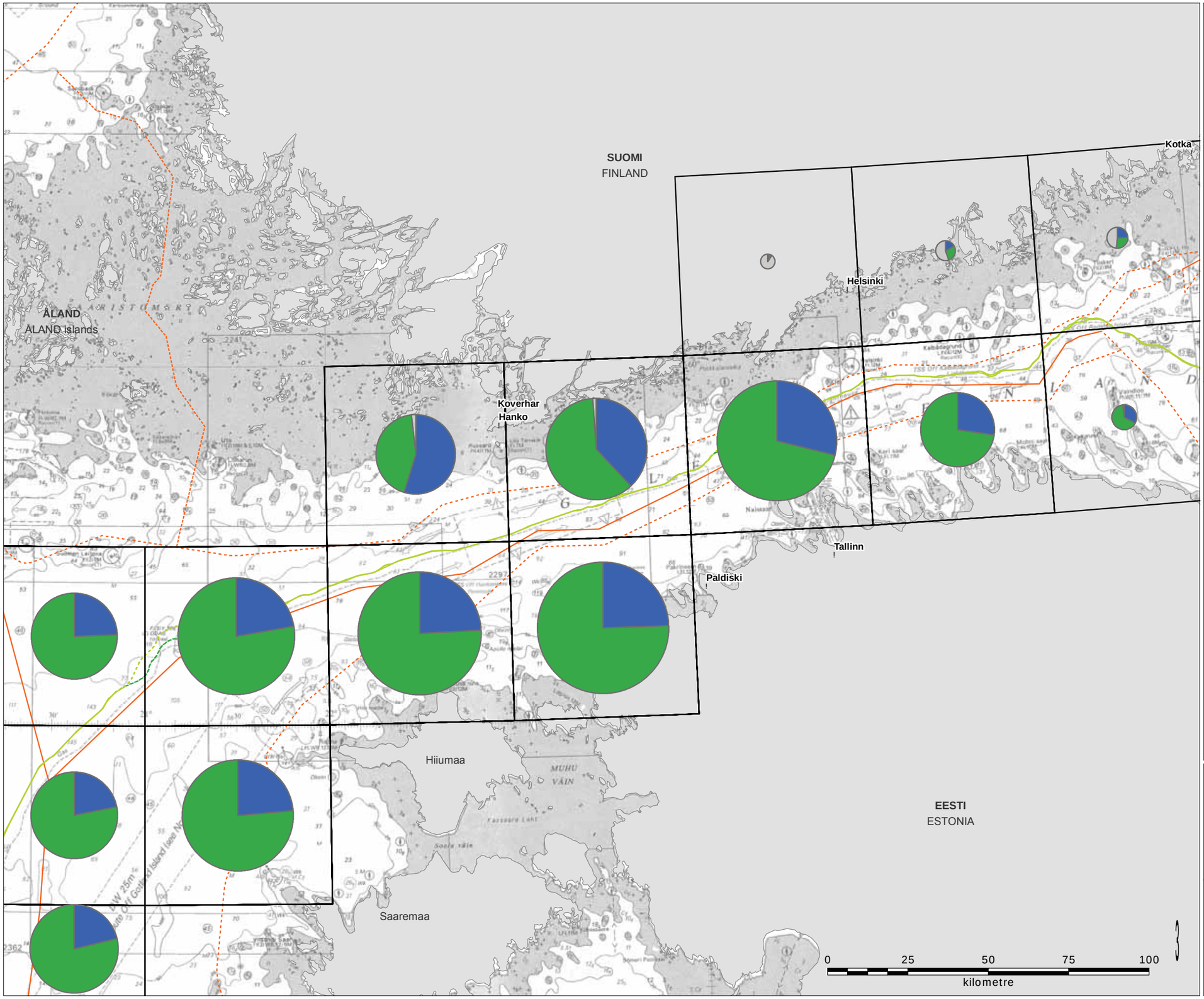
References:
- Centre for Economic Development, Transport and the Environment. Data received 1.9.2016

Version: 09
Date: 2016-12-20
Prepared: ATTM
Controlled: SURH

FC-01-F

Trawling intensity - Finnish trawlers

RAMBØLL



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- ICES statistical rectangles

Total catch by species, tonnes
pie area represents the value

1 400

- Cod *(Gadus morhua)*
- Baltic herring *(Clupea harengus membras)*
- Sprat *(Sprattus sprattus)*
- Flounder *(Platichthys flesus)*
- Other

Note:
- Based on data from 2010-2014, annual average
- Russian data not included

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

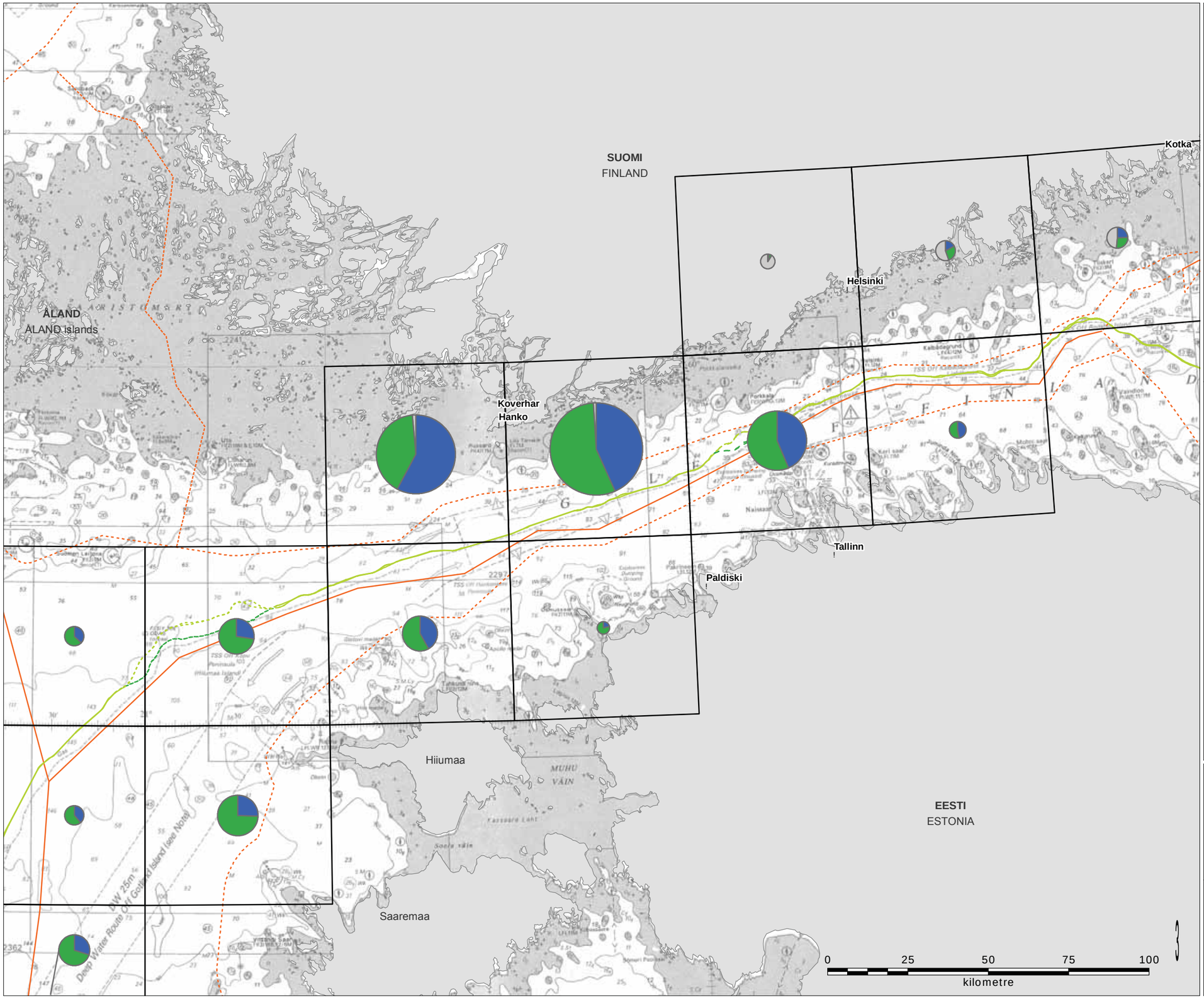
Version: 09
Date: 2016-12-20
Prepared: ATTM
Controlled: SURH

FC-02-F

Total catch by species

RAMBØLL

Part of the Finnish EIA Atlas: W-PE-EIA-PFI-DWG-805-030100EN-09



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- ICES statistical rectangles

Total catch by species, tonnes
pie area represents the value

1 400

- Cod *(Gadus Morhua)*
- Baltic herring *(Clupea harengus membras)*
- Sprat *(Sprattus sprattus)*
- Flounder *(Platichthys flesus)*
- Other

Note:
- Based on data from 2010-2014, annual average by Finnish trawlers

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

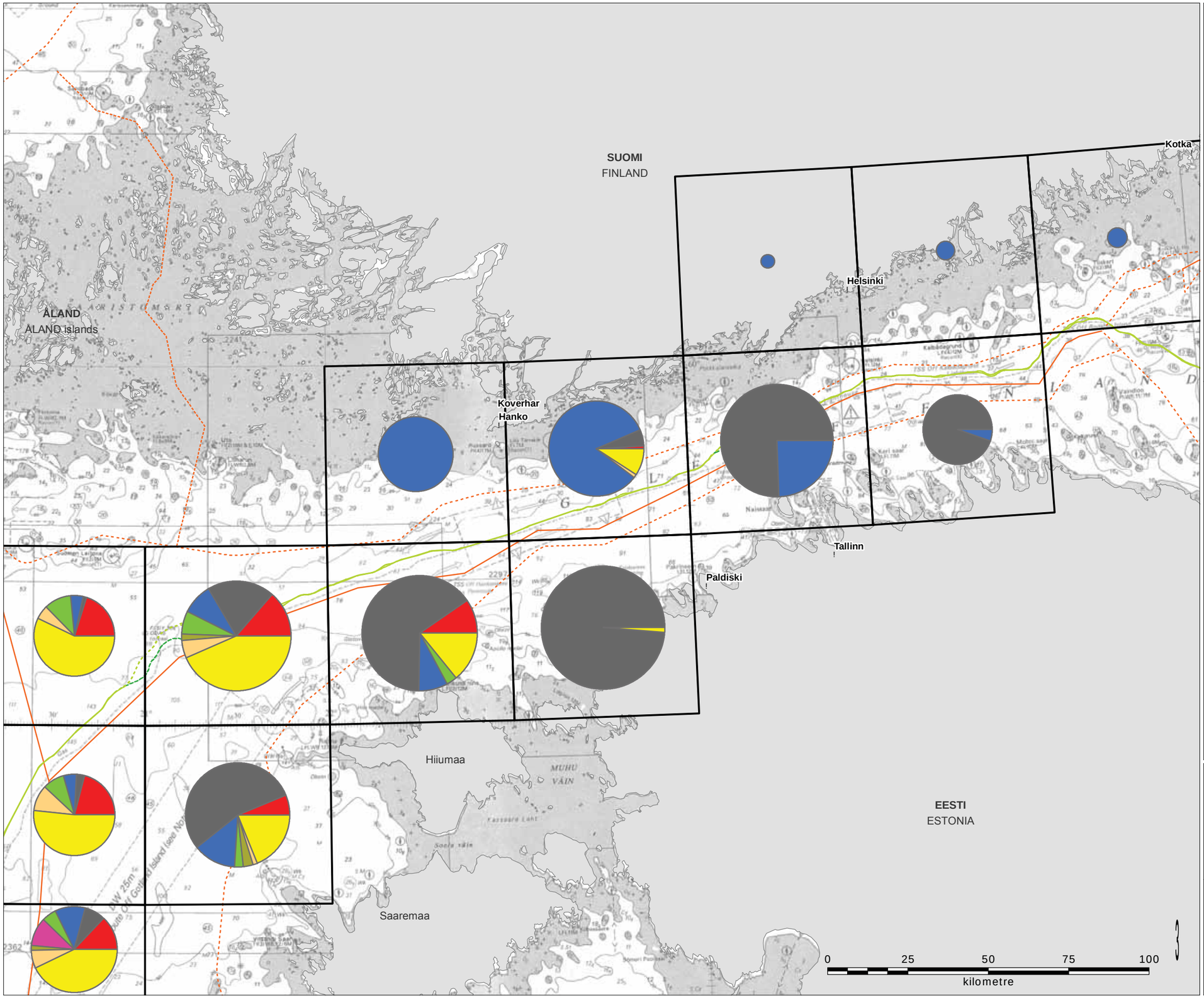
Version: 09
Date: 2016-12-20
Prepared: ATTM
Controlled: SURH

FC-03-F

Total catch by species, Finnish vessels

RAMBØLL

Part of the Finnish EIA Atlas: W-PE-EIA-PFI-DWG-805-030100EN-09



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- ICES statistical rectangles

Total catch, tonnes
Pie area represents the value

1 600

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

Note:
- Based on data from 2010-2014, annual average
- Russian data not included

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

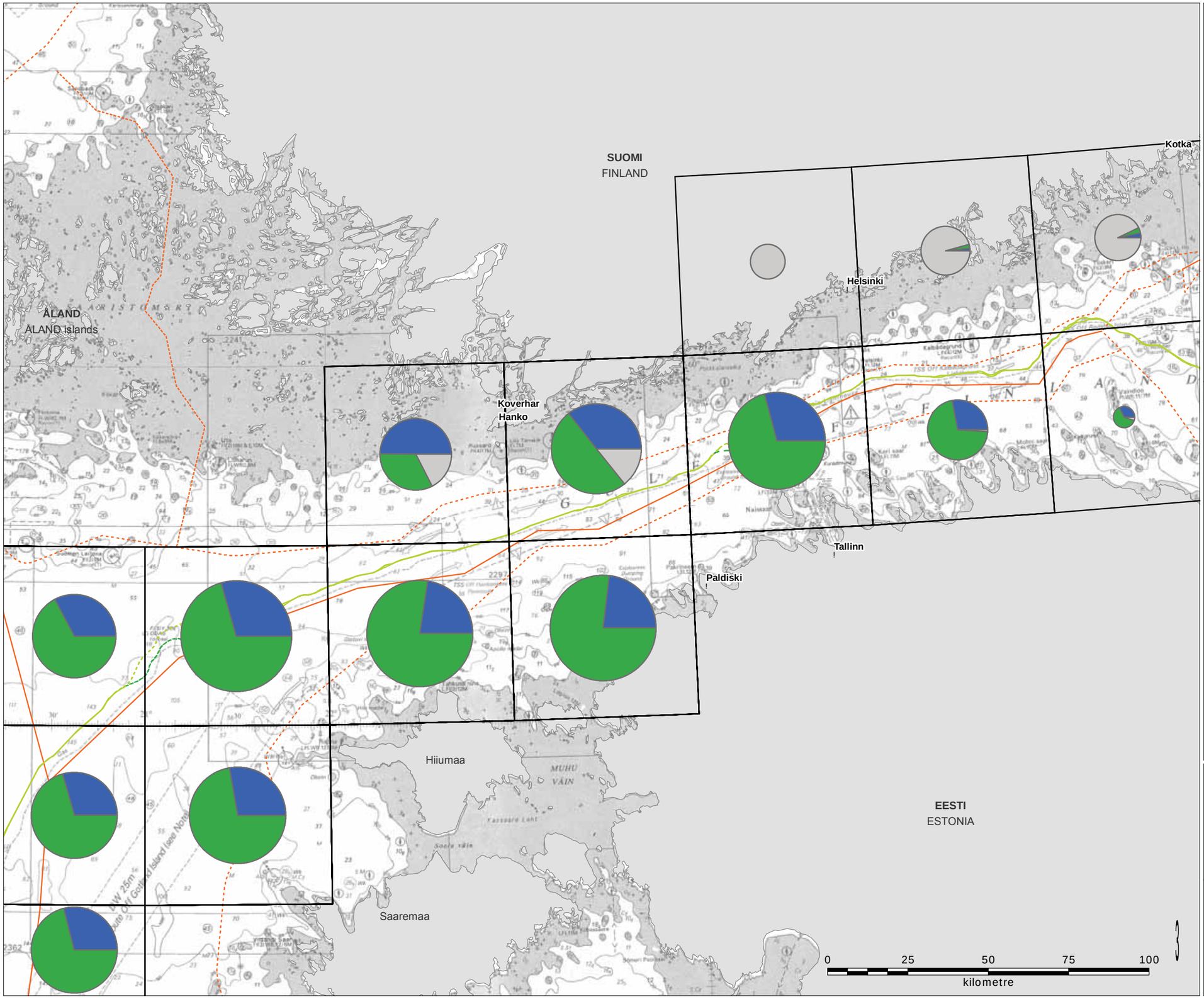
Version: 09
Date: 2016-12-20
Prepared: ATTM
Controlled: SURH

FC-04-F

Total catch by country

RAMBØLL

Part of the Finnish EIA Atlas: W-PE-EIA-PFI-DWG-805-030100EN-09



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- ICES statistical rectangles

Total catch by species, euro
pie area represents the value

400 000

- Cod *(Gadus Morhua)*
- Baltic herring *(Clupea harengus membras)*
- Sprat *(Sprattus sprattus)*
- Flounder *(Platichthys flesus)*
- Other

Note:
- Based on data from 2010-2014, annual average
- Russian data not included

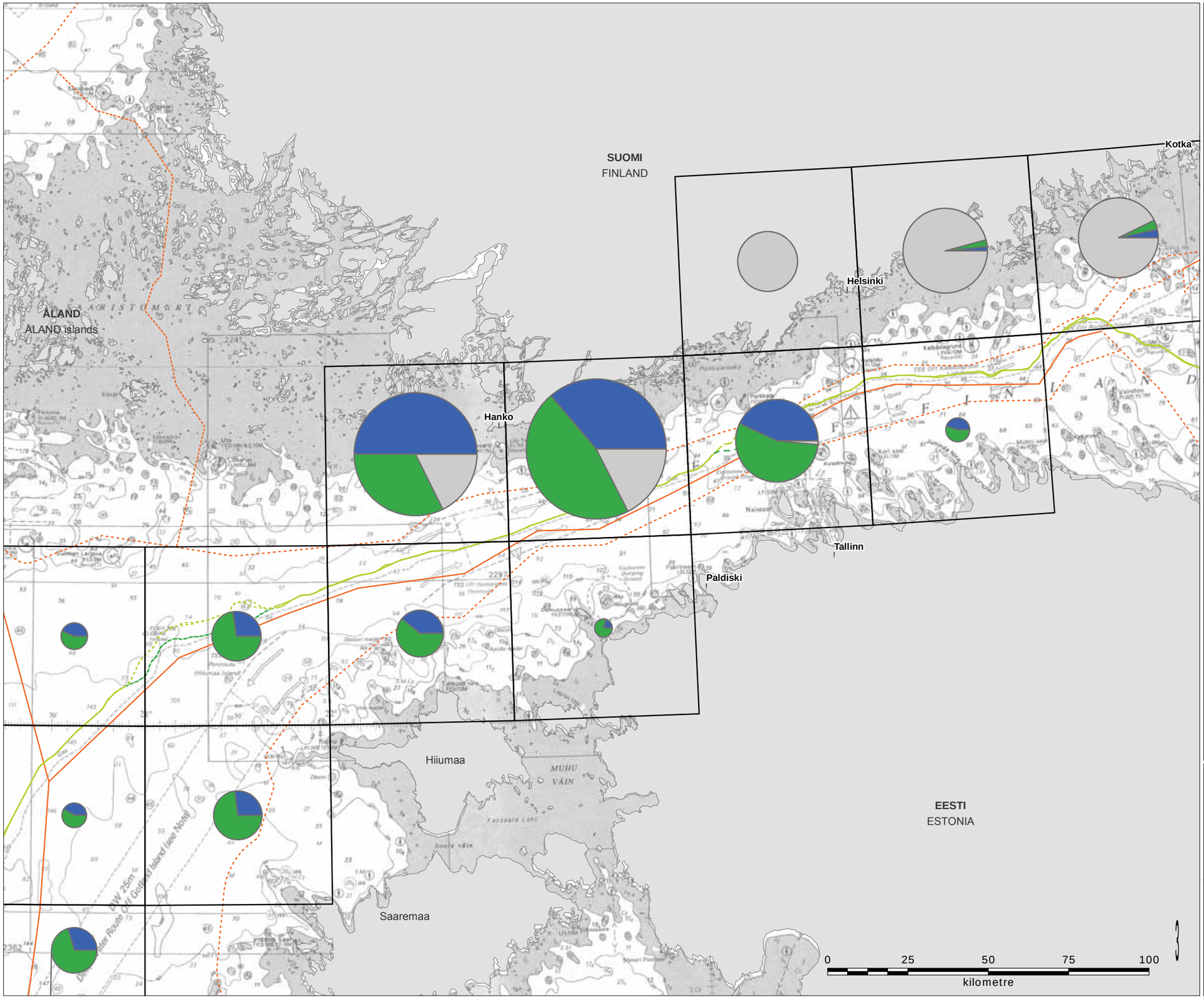
Reference:
- Orbicon, 2016, "Nord Stream 2 – Baltic fisheries along the pipeline transect", Note, 2016-06-09

Version: 09
Date: 2016-12-20
Prepared: ATTM
Controlled: SURH

FC-05-F

Total catch by species - euros

RAMBØLL



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- ICES statistical rectangles

Total catch by species, euro
pie area represents the value

130 000

- Cod *(Gadus Morhua)*
- Baltic herring *(Clupea harengus membras)*
- Sprat *(Sprattus sprattus)*
- Flounder *(Platichthys flesus)*
- Other

Note:
- Based on data from 2010-2014, annual average by Finnish trawlers

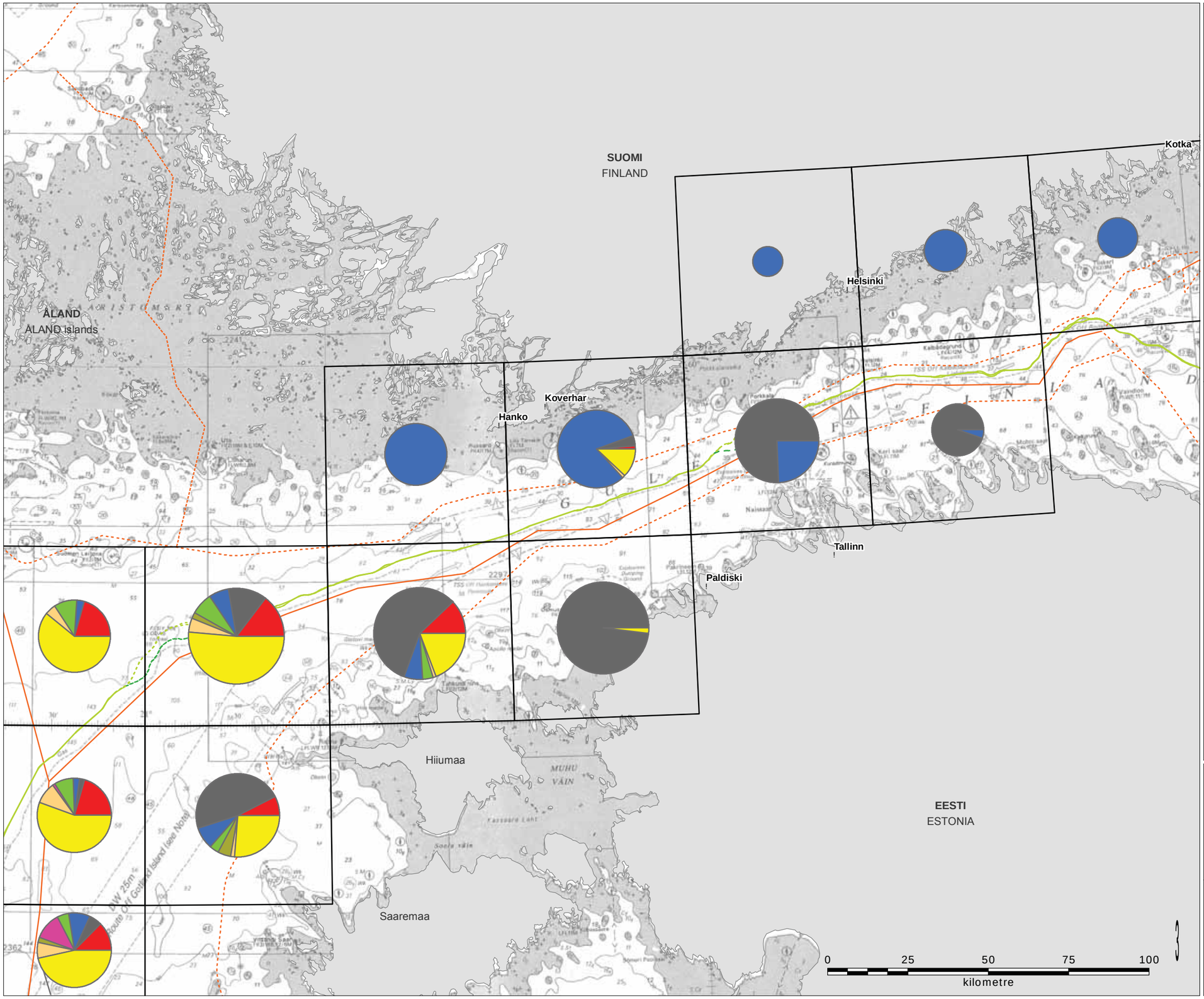
Reference:
- Orbicon, 2016, "Nord Stream 2 – Baltic fisheries along the pipeline transect", Note, 2016-06-09

Version: 09
Date: 2016-12-20
Prepared: ATTM
Controlled: SURH

FC-06-F

Total catch by species, Finnish vessels - euros

RAMBØLL



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- ICES statistical rectangles

Total catch, euro
Pie area represents the value

530 000

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

Note:
- Based on data from 2010-2014, annual average
- Russian data not included

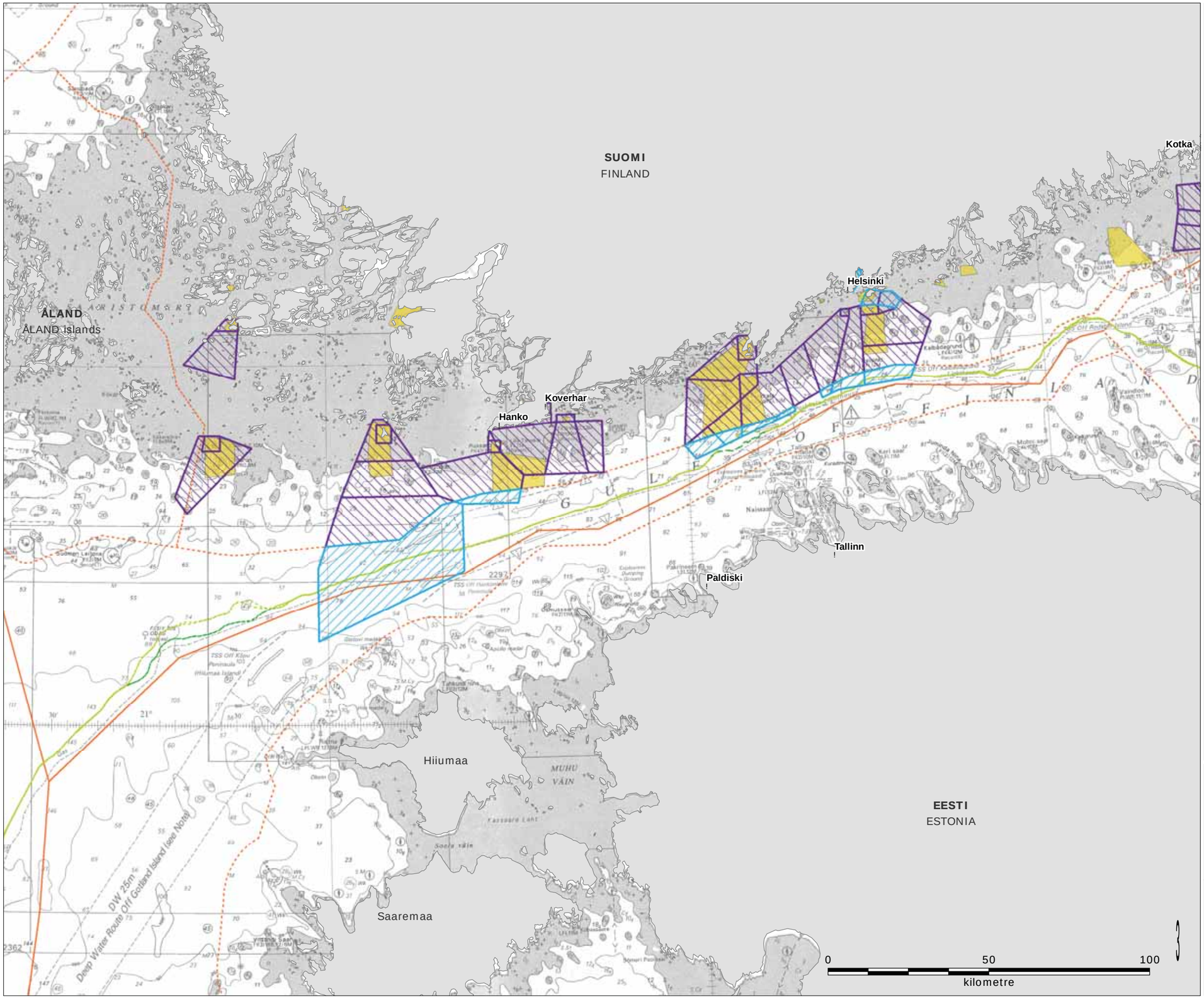
Reference:
- Orbicon, 2016, "Nord Stream 2 – Baltic fisheries along the pipeline transect", Note, 2016-06-09

Version: 09
Date: 2016-12-20
Prepared: ATTM
Controlled: SURH

FC-07-F

Total catch by country - euros

RAMBØLL



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- D area, Danger area where activities dangerous to aircraft may occur
- R area, Restricted area within the Finnish airspace
- Restricted area by the Finnish Navy

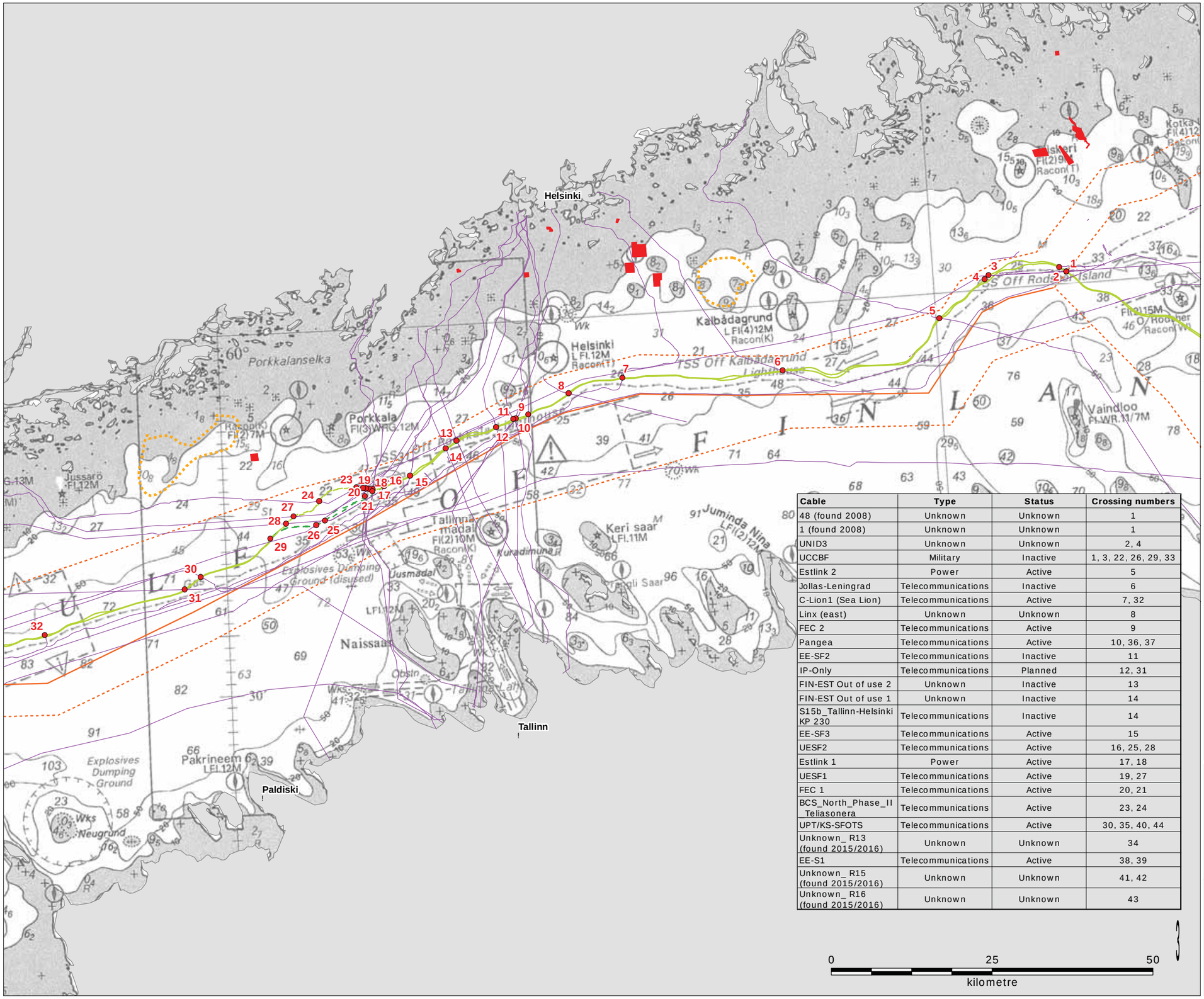
References:
- FINLEX, http://www.finlex.fi, accessed 28.5.2012
- Trafi, http://www.finlex.fi/fi, accessed 28.5.2012

Version: 09
Date: 2016-11-26
Prepared: ATTM
Controlled: SURH

MI-01-F

Military areas

RAMBØLL

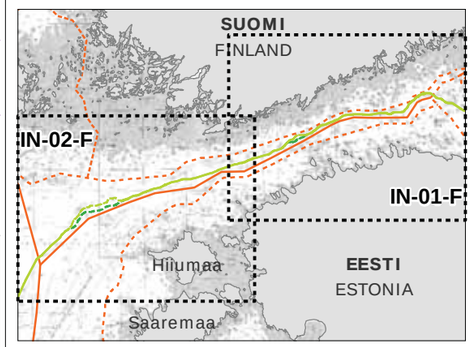


Cable	Type	Status	Crossing numbers
48 (found 2008)	Unknown	Unknown	1
1 (found 2008)	Unknown	Unknown	1
UNID3	Unknown	Unknown	2, 4
UCCBF	Military	Inactive	1, 3, 22, 26, 29, 33
Estlink 2	Power	Active	5
Jollas-Leningrad	Telecommunications	Inactive	6
C-Lion1 (Sea Lion)	Telecommunications	Active	7, 32
Linx (east)	Unknown	Unknown	8
FEC 2	Telecommunications	Active	9
Pangea	Telecommunications	Active	10, 36, 37
EE-SF2	Telecommunications	Inactive	11
IP-Only	Telecommunications	Planned	12, 31
FIN-EST Out of use 2	Unknown	Inactive	13
FIN-EST Out of use 1	Unknown	Inactive	14
S15b_Tallinn-Helsinki KP 230	Telecommunications	Inactive	14
EE-SF3	Telecommunications	Active	15
UESF2	Telecommunications	Active	16, 25, 28
Estlink 1	Power	Active	17, 18
UESF1	Telecommunications	Active	19, 27
FEC 1	Telecommunications	Active	20, 21
BCS_North_Phase_II _Teliasonera	Telecommunications	Active	23, 24
UPT/KS-SFOTS	Telecommunications	Active	30, 35, 40, 44
Unknown_ R13 (found 2015/2016)	Unknown	Unknown	34
EE-S1	Telecommunications	Active	38, 39
Unknown_ R15 (found 2015/2016)	Unknown	Unknown	41, 42
Unknown_ R16 (found 2015/2016)	Unknown	Unknown	43

0 25 50
kilometre

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- Territorial water border
- EEZ border
- Cable crossings
- Cable
- Potential wind power area
- Extraction and spoil dump site



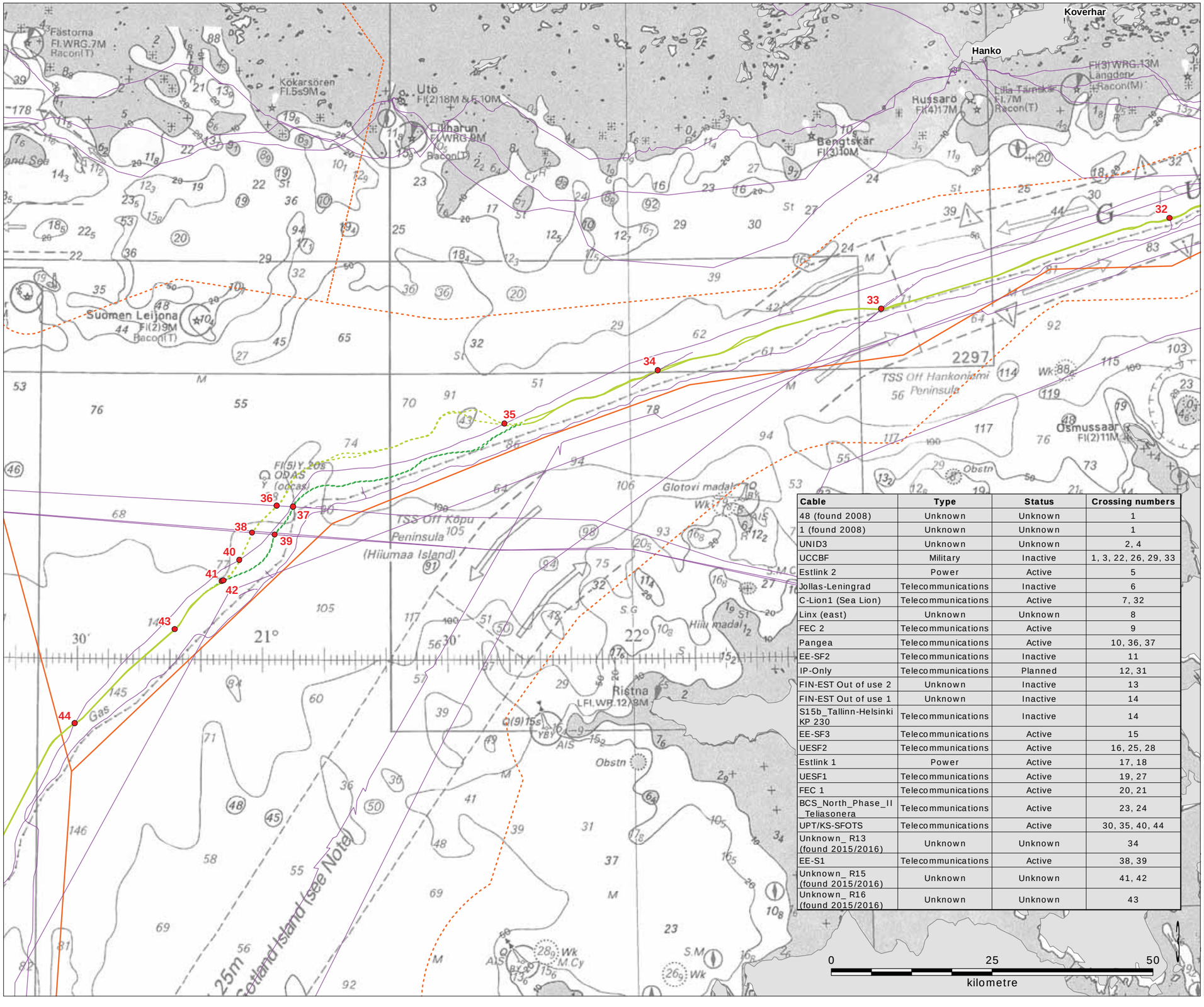
References:
- Cables: FTA / NORD STREAM
- Wind power: Uusimaa Regional plan - 4th phase proposall
- Spoil dump / extraction sites: Morenia, Port of Helsinki Regional State Administrative Agencies

Version: 09
Date: 2017-03-22
Prepared: ATTM
Controlled: SURH

IN-01-F

Existing and planned infrastructure - eastern part

RAMBØLL

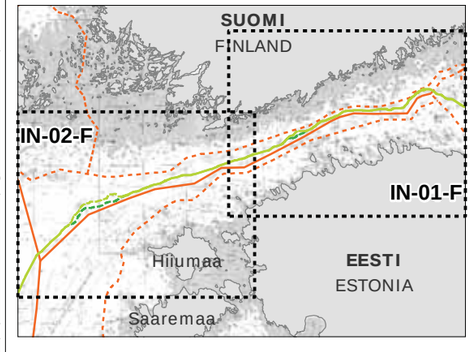


Legend:

- NSP2 Route
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Cable crossings
- Cable

Cable	Type	Status	Crossing numbers
48 (found 2008)	Unknown	Unknown	1
1 (found 2008)	Unknown	Unknown	1
UNID3	Unknown	Unknown	2, 4
UCCBF	Military	Inactive	1, 3, 22, 26, 29, 33
Estlink 2	Power	Active	5
Jollas-Leningrad	Telecommunications	Inactive	6
C-Lion1 (Sea Lion)	Telecommunications	Active	7, 32
Linx (east)	Unknown	Unknown	8
FEC 2	Telecommunications	Active	9
Pangea	Telecommunications	Active	10, 36, 37
EE-SF2	Telecommunications	Inactive	11
IP-Only	Telecommunications	Planned	12, 31
FIN-EST Out of use 2	Unknown	Inactive	13
FIN-EST Out of use 1	Unknown	Inactive	14
S15b_Tallinn-Helsinki KP 230	Telecommunications	Inactive	14
EE-SF3	Telecommunications	Active	15
UESF2	Telecommunications	Active	16, 25, 28
Estlink 1	Power	Active	17, 18
UESF1	Telecommunications	Active	19, 27
FEC 1	Telecommunications	Active	20, 21
BCS_North_Phase_II _Teliasonera	Telecommunications	Active	23, 24
UPT/KS-SFOTS	Telecommunications	Active	30, 35, 40, 44
Unknown_ R13 (found 2015/2016)	Unknown	Unknown	34
EE-S1	Telecommunications	Active	38, 39
Unknown_ R15 (found 2015/2016)	Unknown	Unknown	41, 42
Unknown_ R16 (found 2015/2016)	Unknown	Unknown	43

0 25 50
kilometre



References:
- Cables: FTA / NORD STREAM
- Wind power: Uusimaa Regional plan - 4th phase proposall
- Spoil dump / extraction sites: Morenia, Port of Helsinki Regional State Administrative Agencies

Version: 09
Date: 2017-03-22
Prepared: ATTM
Controlled: SURH

IN-02-F

Existing and planned infrastructure - western part

RAMBØLL

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Nord Stream pipeline
- Balticconnector pipeline, planned route

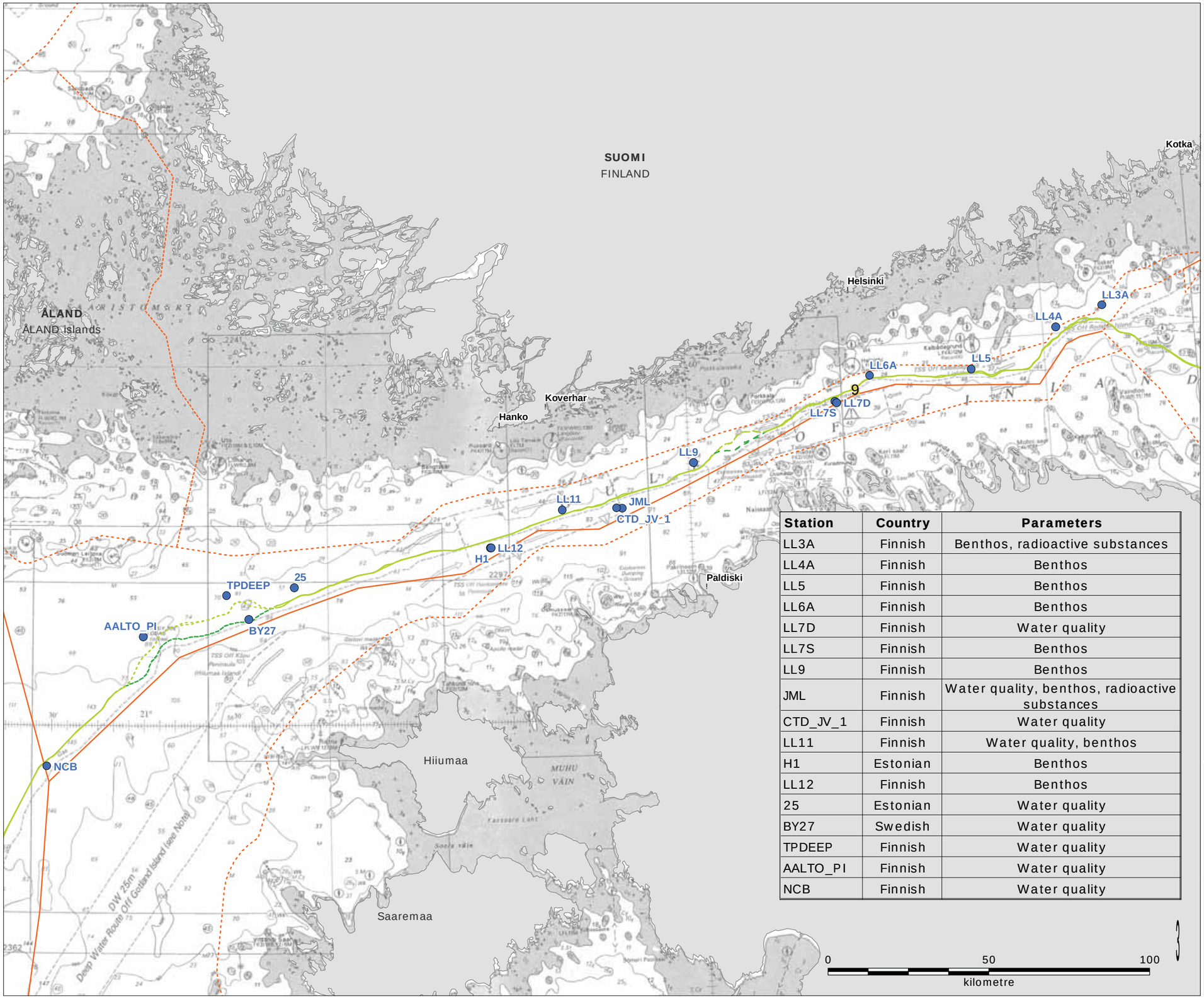
References:
- Nord Stream: Nord Stream AG
- Balticconnector: Ramboll

Version: 09
Date: 2016-02-15
Prepared: ATTM
Controlled: SURH

IN-03-F

Existing and planned pipelines

RAMBØLL



Station	Country	Parameters
LL3A	Finnish	Benthos, radioactive substances
LL4A	Finnish	Benthos
LL5	Finnish	Benthos
LL6A	Finnish	Benthos
LL7D	Finnish	Water quality
LL7S	Finnish	Benthos
LL9	Finnish	Benthos
JML	Finnish	Water quality, benthos, radioactive substances
CTD_JV_1	Finnish	Water quality
LL11	Finnish	Water quality, benthos
H1	Estonian	Benthos
LL12	Finnish	Benthos
25	Estonian	Water quality
BY27	Swedish	Water quality
TPDEEP	Finnish	Water quality
AALTO_PI	Finnish	Water quality
NCB	Finnish	Water quality

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Long term monitoring station within 5 km distance from the Pipeline route
- 9 Whale remains

References:
- Nord Stream
- Finnish Environmental Institute, SYKE
- HELCOM

Version: 09
Date: 2016-11-26
Prepared: ATTM
Controlled: SURH

SC-01-F

Long term monitoring stations and whale remains

RAMBØLL

SUOMI
FINLAND

ÅLAND
ÅLAND Islands

Kotka
Helsinki
Koverhar
Hanko
Tallinn
Paldiski
Hiiumaa
Saaremaa

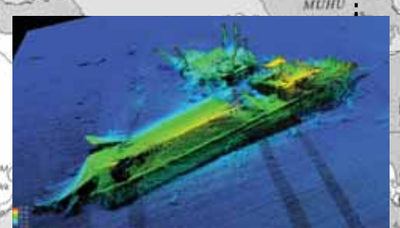
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16

Block R5:
S-R05-7978

Block R9:
S-R09-09806

Block R11:
S-R11-2395

Block R15:
S-R15-02960

0 50 100
kilometre

Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Block border
- Block containing cultural heritage or World War historical site
- R — Estonia wreck

Notes:
- Significant underwater cultural heritage and World War II historical sites insidethe +/- 250 m corridor

References:
- Nord Stream 2
- Nord Stream

Version: 09
Date: 2016-12-19
Prepared: ATTM
Controlled: SURH

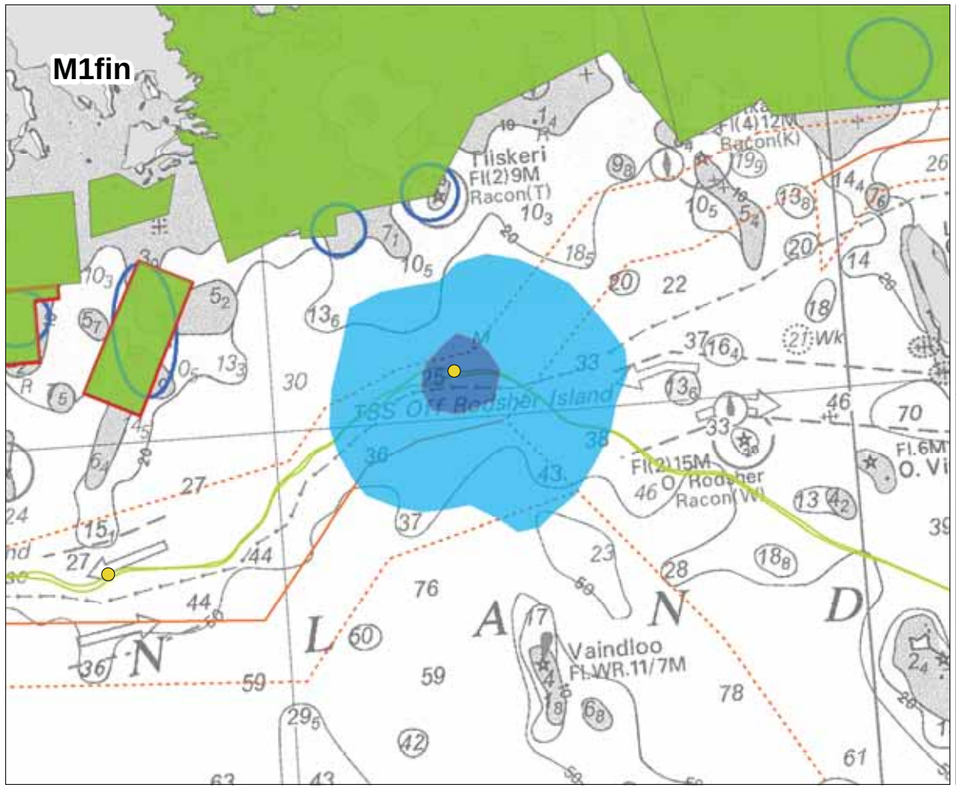
CU-01-F

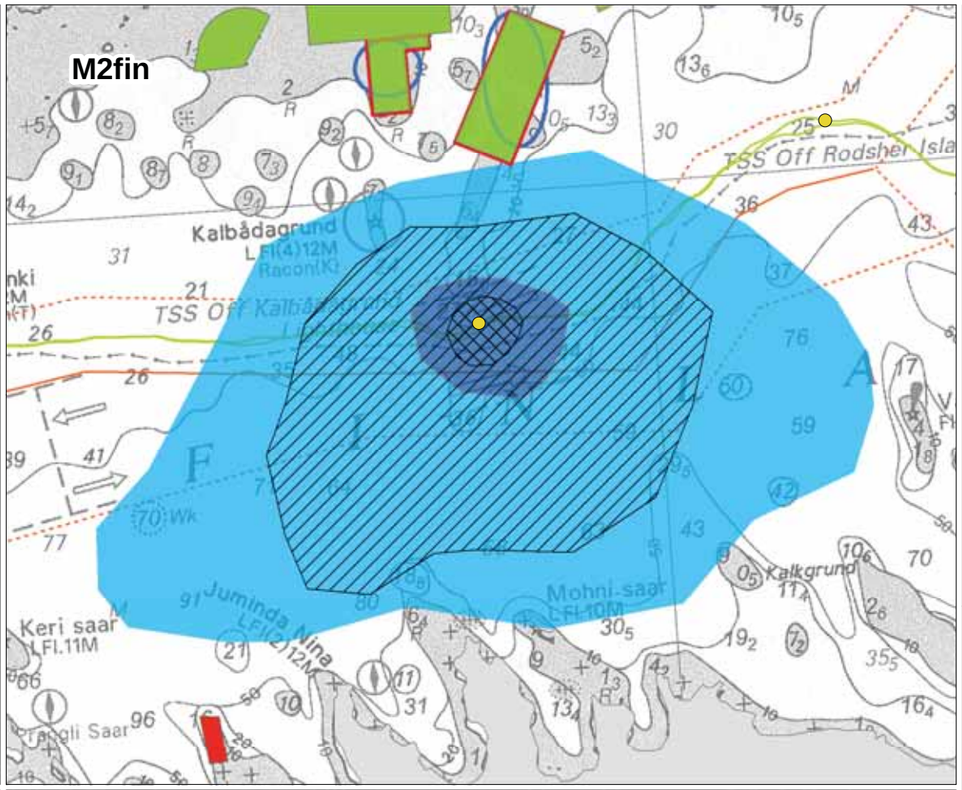
Significant underwater cultural heritage and World War II historical sites

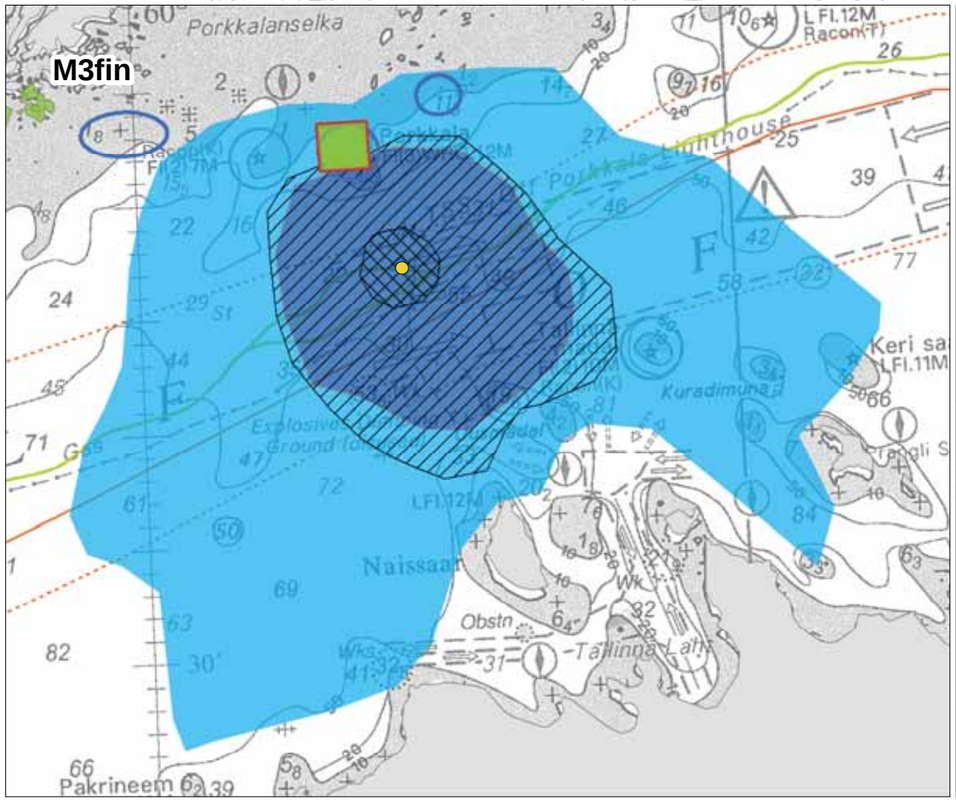
RAMBØLL

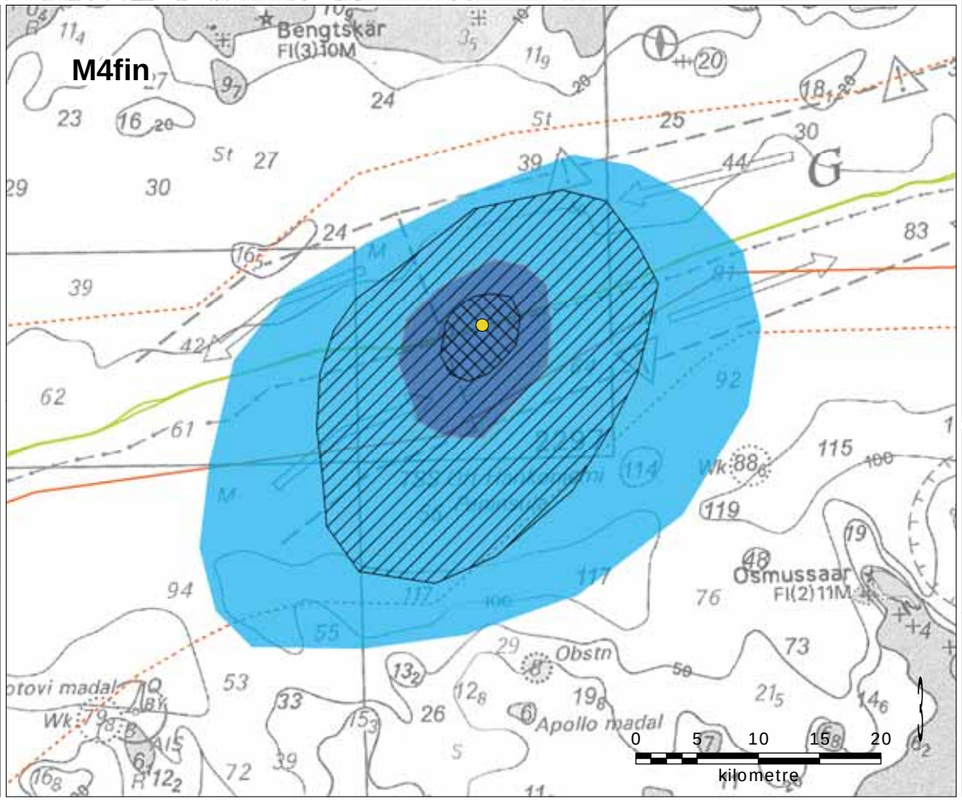
MATHEMATICAL MODELLING

MODELLING (MO)









Legend:

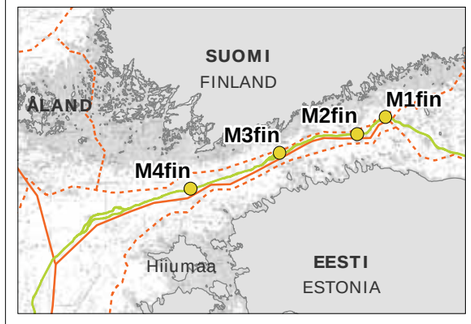
- NSP2 Route
- Territorial water border
- Åland border
- EEZ border
- Modelling locations - munitions clearance
- Natura 2000 site designated for seals
- Seal sanctuary
- Important grey seal area (resting site)
- Seal protection area, Estonia

SEL (linear), dB re. 1µPa2s, average

- 164 dB
- 179 dB

SEL (linear), dB re. 1µPa2s, maximum

- 164 dB
- 179 dB



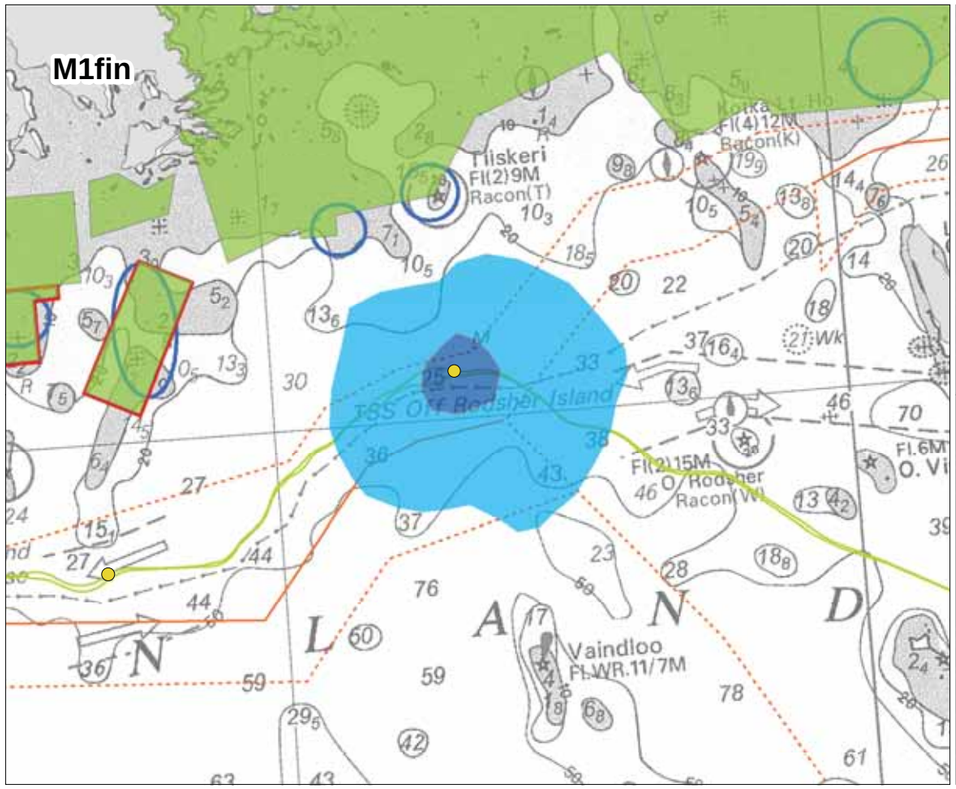
Notes:
- M1fin represents both average and maximum
- Modelling for four selected locations

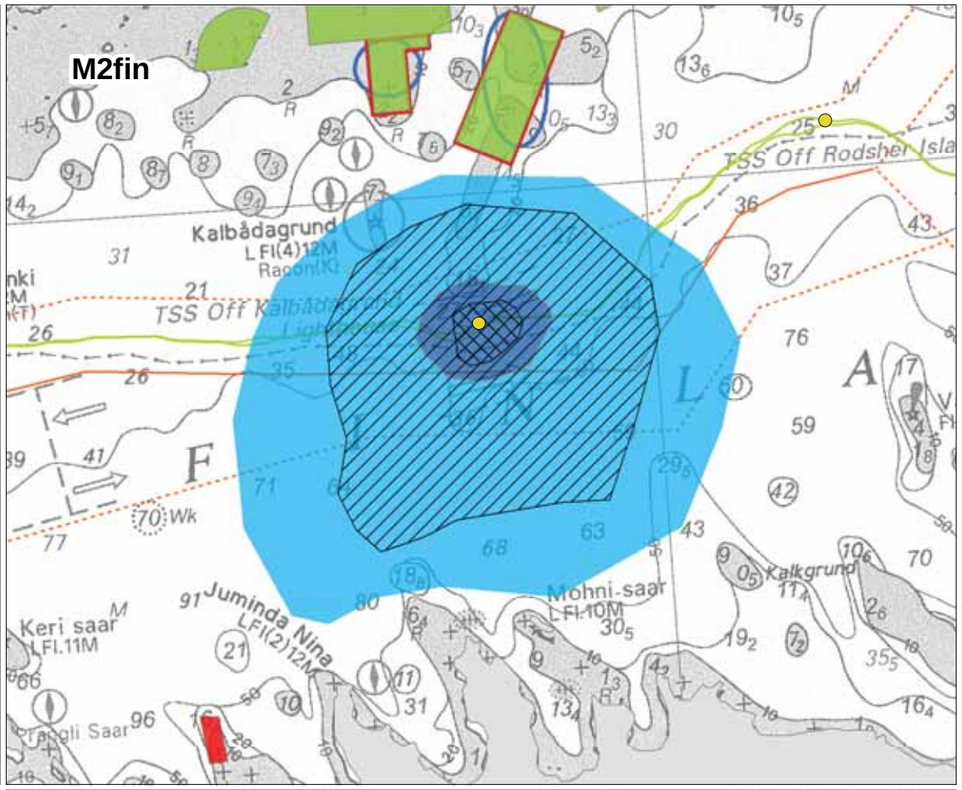
Version: 09
Date: 2016-12-19
Prepared: ATTM
Controlled: SURH

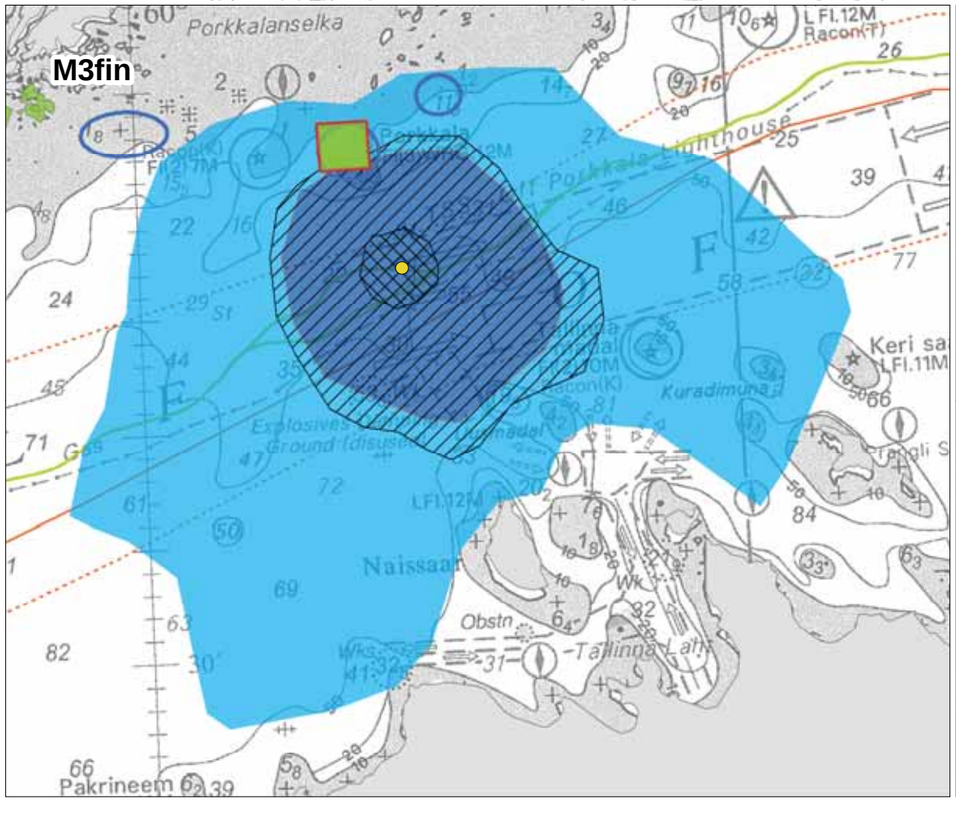
MO-01-F

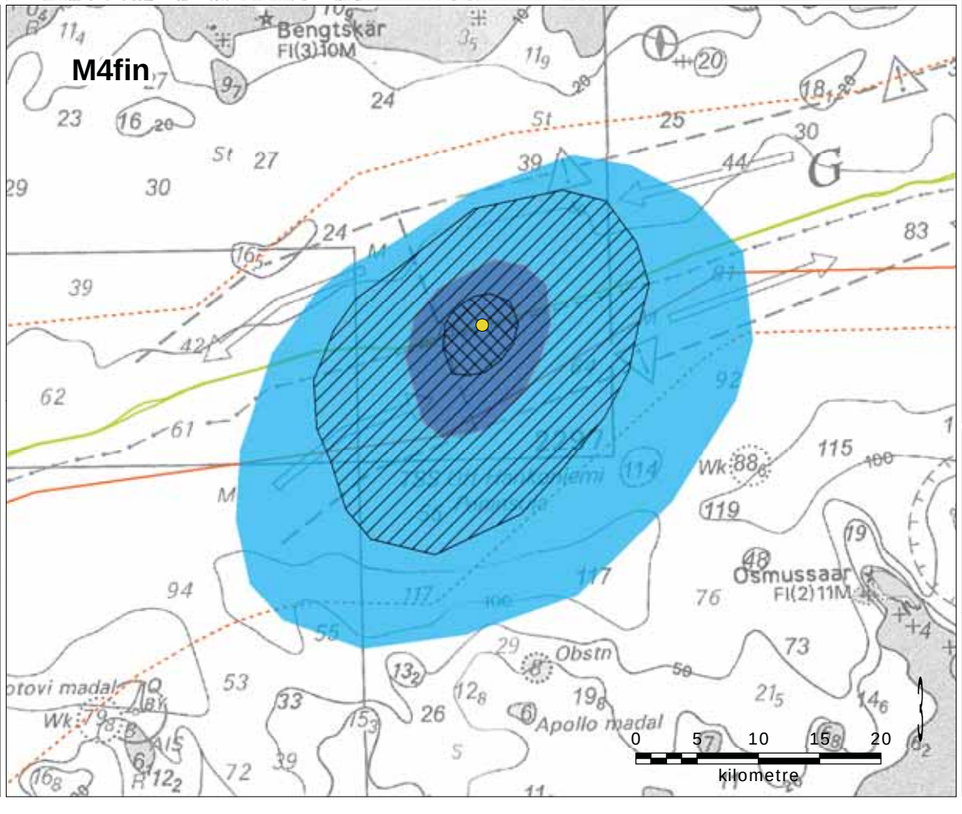
Underwater noise modelling - munitions clearance, summer

RAMBØLL









Legend:

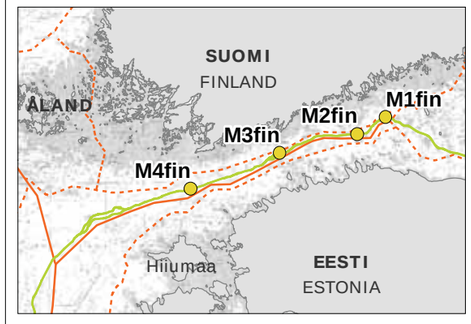
- NSP2 Route
- Territorial water border
- Åland border
- EEZ border
- Modelling location - munitions clearance
- Natura 2000 site designated for seals
- Seal sanctuary
- Important grey seal area (resting site)
- Seal protection area, Estonia

SEL (linear), dB re. 1µPa2s, average

- 164 dB
- 179 dB

SEL (linear), dB re. 1µPa2s, maximum

- 164 dB
- 179 dB



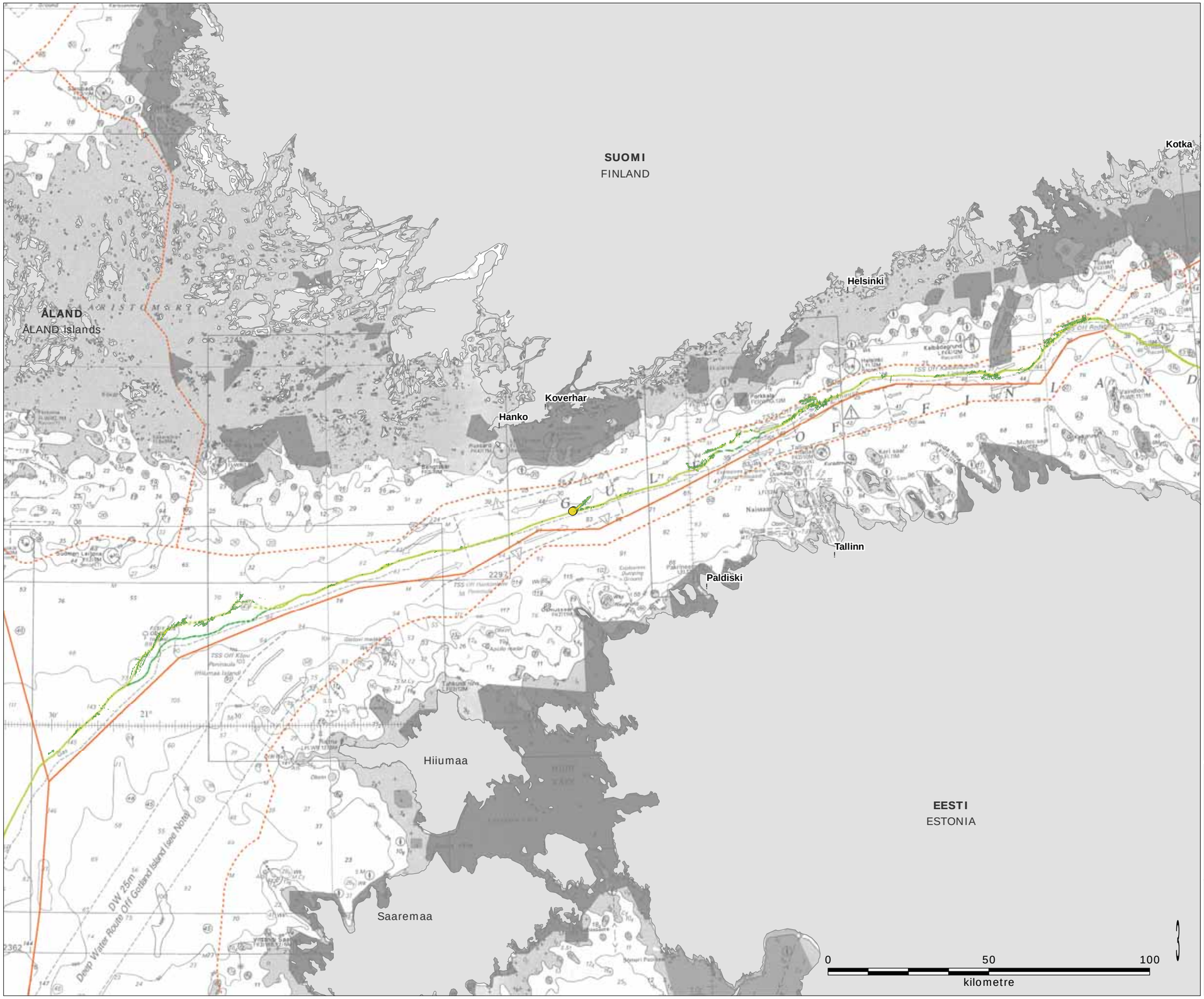
Notes:
- M1fin represents both average and maximum
- Modelling for four selected locations

Version: 09
Date: 2016-12-19
Prepared: ATTM
Controlled: SURH

MO-02-F

Underwater noise modelling - munitions clearance, winter

RAMBØLL



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Natura 2000 site
- Potential tie-in

Rock placement - calm conditions
Maximum concentration of suspended sediment (mg/l), 0-10 m above the seabed

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

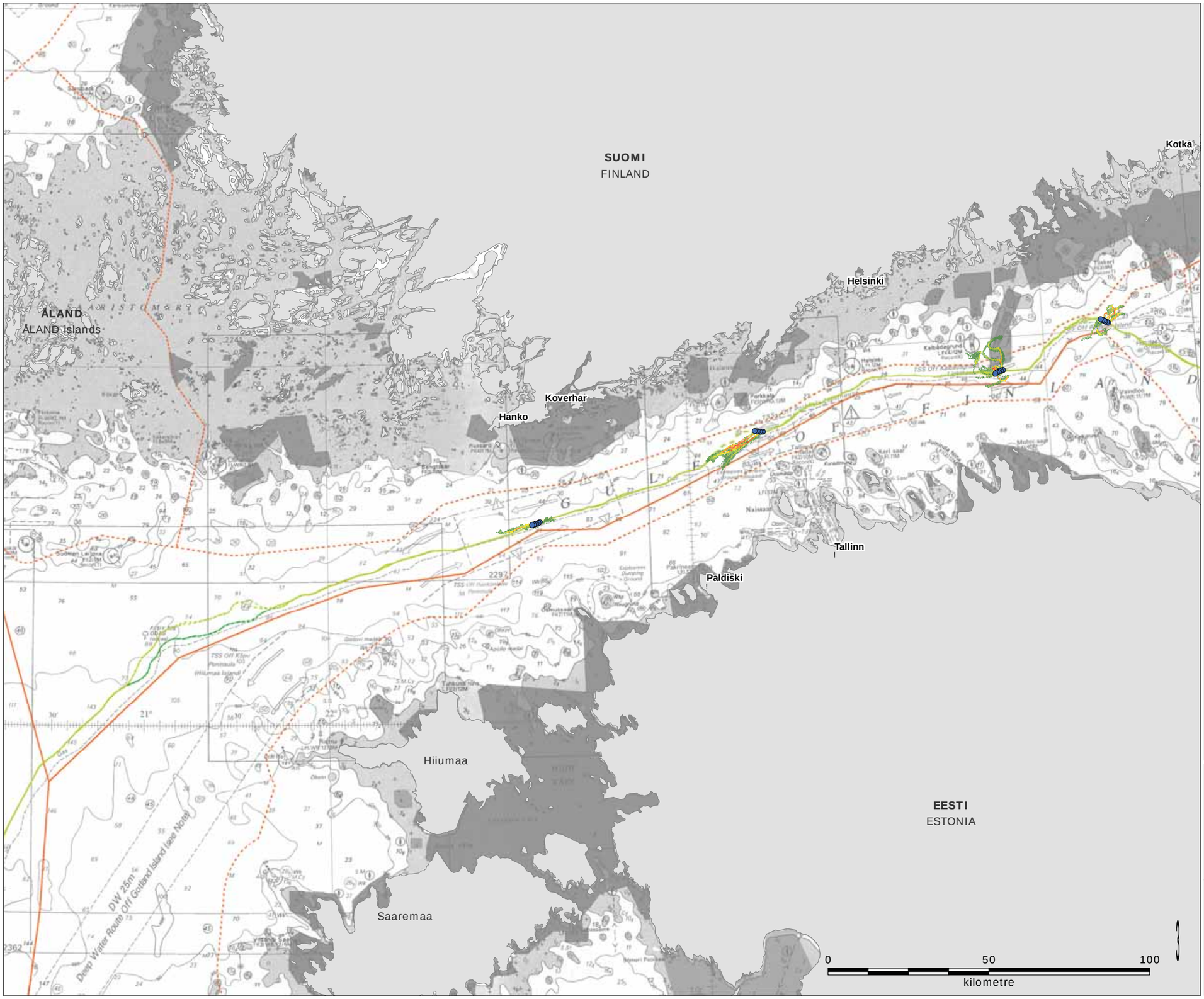
Note:
- Modelling for Line A, sub-alternative E2 and W2 not modelled

Version: 09
Date: 2016-12-20
Prepared: ATTM
Controlled: SURH

MO-03-F

Modelling of sediment spreading - rock placement

RAMBØLL



Legend:

- NSP2 Route
- ALT E1
- ALT E2
- ALT W1
- ALT W2
- Territorial water border
- Åland border
- EEZ border
- Sediment modelling location
- Natura 2000 site

Munitions clearance - calm conditions
Maximum concentration of suspended sediment (mg/l), 0-10 m above the seabed

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

Note:
- Modelling for four selected locations

Version: 09
Date: 2016-12-19
Prepared: ATTM
Controlled: SURH

MO-04-F

Modelling of sediment spreading - munitions clearance

RAMBØLL

Current traffic

NSP2 rock transport, estimate

Current traffic + NSP2 rock transport, estimate

Legend:

- Residential building
- Industrial, office or public building
- Summer cottage
- Other building
- Noise protection wall / berm (current)

Noise calculations, dB

- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65

0 1 2 kilometre

Notes:
- Calculations for the year 2015
- Day time results presented

References:
- Noise calculations: Ramboll Finland
  Noise calculation information:
  - Software: SoundPLAN 7.4
  - Model: RTN 1996
  - Reflection order: 1
  - Ground absorption: landcover 1 / road, water 0
  - Calculation grid: 10 m x 10 m
  - Height above ground: 2 m

Version: 09
Date: 2016-12-19
Prepared: ATTM
Controlled: SURH

MO-05-F

Noise modelling for the route from Highway 7 to Mussalo - harbour

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