Bellrock Offshore Wind Farm

Bellrock Wind Farm Development Area

Scoping Report (Appendices)

Date: 22nd March 2024

Document Number: BFR_BEL_CST_REP_0003

Revision Number: 1

Classification: Public

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Revision History

Rev.	Prepared By	Checked by	Approved by	Description	Date
1	RHDHV	ES	BM	Submission to MD-LOT	22/03/2024

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Bellrock OFFSHORE WIND

Appendix 1: Figures

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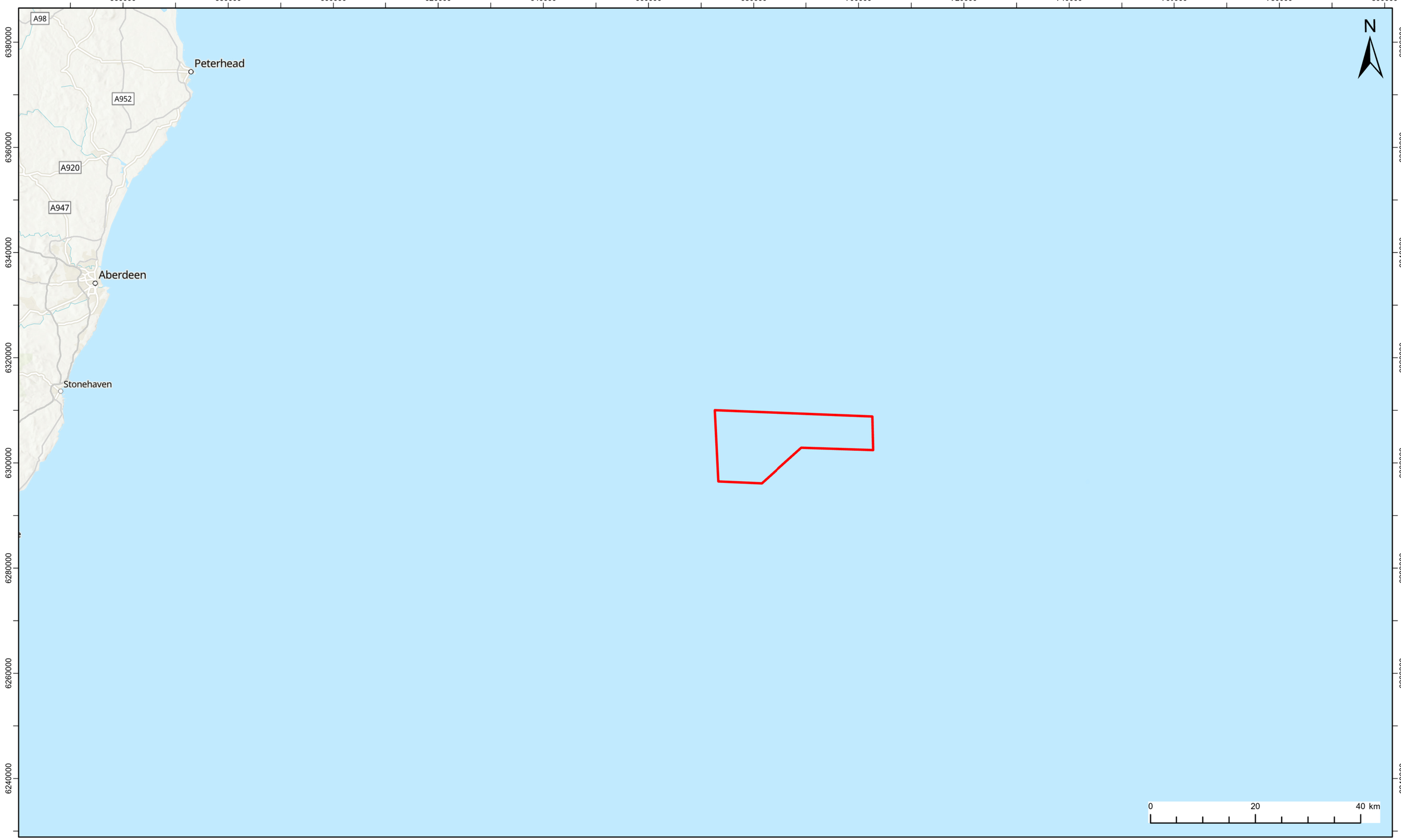


Legend:

Bellrock WFDA Scoping Boundary

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3

1:650,000

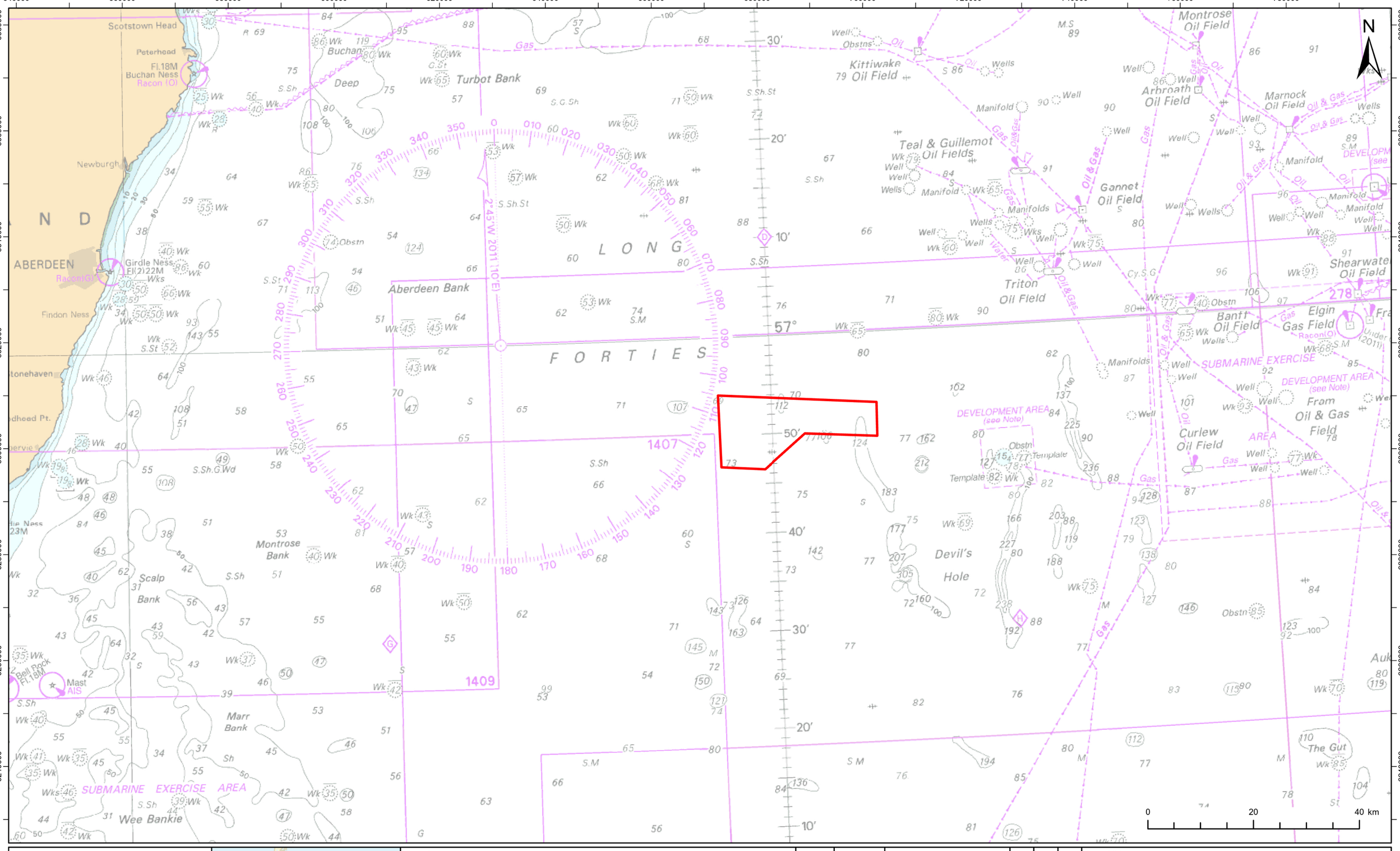
Figure Title: **Bellrock WFDA Scoping Boundary**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0001

Figure 1.1



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Legend:

Bellrock WFDA Scoping Boundary

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: © British Crown and OceanWise, 2023. All rights reserved.License No. EMS-EK001-820003. Not to be used for Navigation.Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:650,000

Figure Title:
Bellrock WFDA Scoping Boundary

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0033

Figure 1.2

640000
660000
680000
700000
720000
6320000
6300000
6280000
N
0
5
10 km

Legend:

- Bellrock WFDA Scoping Boundary
- Marine Geology, Oceanography and Physical Processes Study Area (10 km)

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Esri, Ordnance Survey, NASA, NGA, USGS

Scale @ A3
1:250,000

Figure Title:
Marine Geology, Oceanography and Physical Processes Study Area

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0004

Figure 5.1

640000
660000
680000
700000
720000
6320000
6300000
6280000
N
0
5
10 km
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Bellrock
Thurso
Wick
Gairloch
Elgin
Banff
Fraserburgh
Inverness
Peterhead
Aberdeen
Scotland
Perth
Dundee
Oban
Edinburgh
Nort
Legend:
Marine Geology, Oceanography and Physical Processes Study Area (10 km)
Bellrock WFDA Scoping Boundary
Bathymetry Depth (m)
200 >
150 - 200
100 - 150
90 - 100
80 - 90
70 - 80
60 - 70

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: EMODnet 2023, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS

Scale @ A3
1:250,000

Figure Title:
Bathymetry of the Marine Geology, Oceanography and Physical Processes Study Area

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0005

Figure 5.2

640000
660000
680000
700000
720000
6320000
6300000
6280000
N
0
5
10 km

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Legend:

- Bellrock WFDA Scoping Boundary
- Marine Geology, Oceanography and Physical Processes Study Area (10 km)

Quaternary lithologies

- Firm to hard interbedded
- Sand and gravel
- Undifferentiated

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Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: BGS 2023,Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:250,000

Figure Title: **Shallow (Quaternary) Geology of the Marine Geology, Oceanography and Physical Processes Study Area**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0006

Figure 5.3

660000
680000
700000
720000
740000
6320000
6300000
6280000
N
0 5 10 km

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Legend:
- Bellrock WFDA Scoping Boundary
- Marine Geology, Oceanography and Physical Processes Study Area (10 km)

Spring Peak Flow (m/s)
- 0.11 - 0.25
- 0.26 - 0.50
- 0.51 - 0.75

REV	DATE	STATUS	DRW	CHK	APR
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Coordinate System: WGS 1984 UTM Zone 30N

Source: ABPmer 2023, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Esri, Ordnance Survey, NASA, NGA, USGS

Scale @ A3
1:250,000

Figure Title:
Peak Flow for a Mean Spring Tide across the Marine Geology, Oceanography and Physical Processes Study Area

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0007

Figure 5.4

640000
660000
680000
700000
720000
6320000
6300000
6280000
N
0
5
10 km

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Legend:
- Bellrock WFDA Scoping Boundary
- Marine Geology, Oceanography and Physical Processes Study Area (10 km)

Annual Mean Significant Wave Height (m)
- 1.76 - 2.00
- 2.01 - 2.25

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: ABPmer 2023, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Esri, Ordnance Survey, NASA, NGA, USGS

Scale @ A3
1:250,000

Figure Title:
Annual Mean Significant Wave Height across the Marine Geology, Oceanography and Physical Processes Study Area

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0008

Figure 5.5

640000 660000 680000 700000 720000

6320000 6300000 6280000

N

0 5 10 km

Legend:

- Bellrock WFDA Scoping Boundary
- Marine Geology, Oceanography and Physical Processes Study Area (10 km)

Seabed Sediments

- Gravelly sand
- Mud
- Muddy sand
- Sand
- Sandy gravel
- Slightly gravelly sand

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: BGS 2023, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/ NASA, USGS

Scale @ A3
1:250,000

Figure Title: **Seabed Sediments across the Marine Geology, Oceanography and Physical Processes Study Area**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0009

Figure 5.6

640000 660000 680000 700000 720000

6320000 6300000 6280000

N

0 5 10 km

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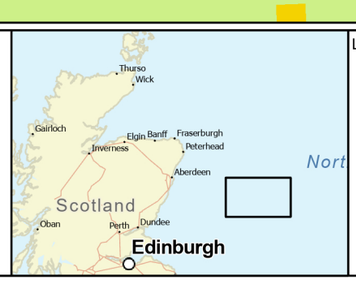


Legend:

- Bellrock WFDA Scoping Boundary
- Marine Geology, Oceanography and Physical Processes Study Area (10 km)

Average suspended sediment concentrations (mg/l)

- 0.401 - 0.6
- 0.601 - 0.8
- 0.801 - 1

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Cefas 2023, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Esri, Ordnance Survey, NASA, NGA, USGS

Scale @ A3
1:250,000

Figure Title:
Average Suspended Sediment Concentrations across the Marine Geology, Oceanography and Physical Processes Study Area

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0010

Figure 5.7

640000
660000
680000
700000
720000
6320000
6300000
6280000

0 5 10 km

Legend:

- Bellrock WFDA Scoping Boundary
- Benthic Study Area (10 km)

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Esri, Ordnance Survey, NASA, NGA, USGS

Scale @ A3
1:250,000

Figure Title:
Benthic Study Area

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0002

Figure 6.1

640000 660000 680000 700000 720000 740000

6320000

6300000

6280000

0 5 10 km

Legend:

- Bellrock WFDA Scoping Boundary
- Benthic Study Area (10 km)

Seabed Sediments (BGS)

- Gravelly sand
- Mud
- Muddy sand
- Sand
- Sandy gravel
- Slightly gravelly sand

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Esri, Ordnance Survey, NASA, NGA, USGS

Scale @ A3
1:250,000

Figure Title:
Benthic Habitats (BGS) within the Benthic Study Area

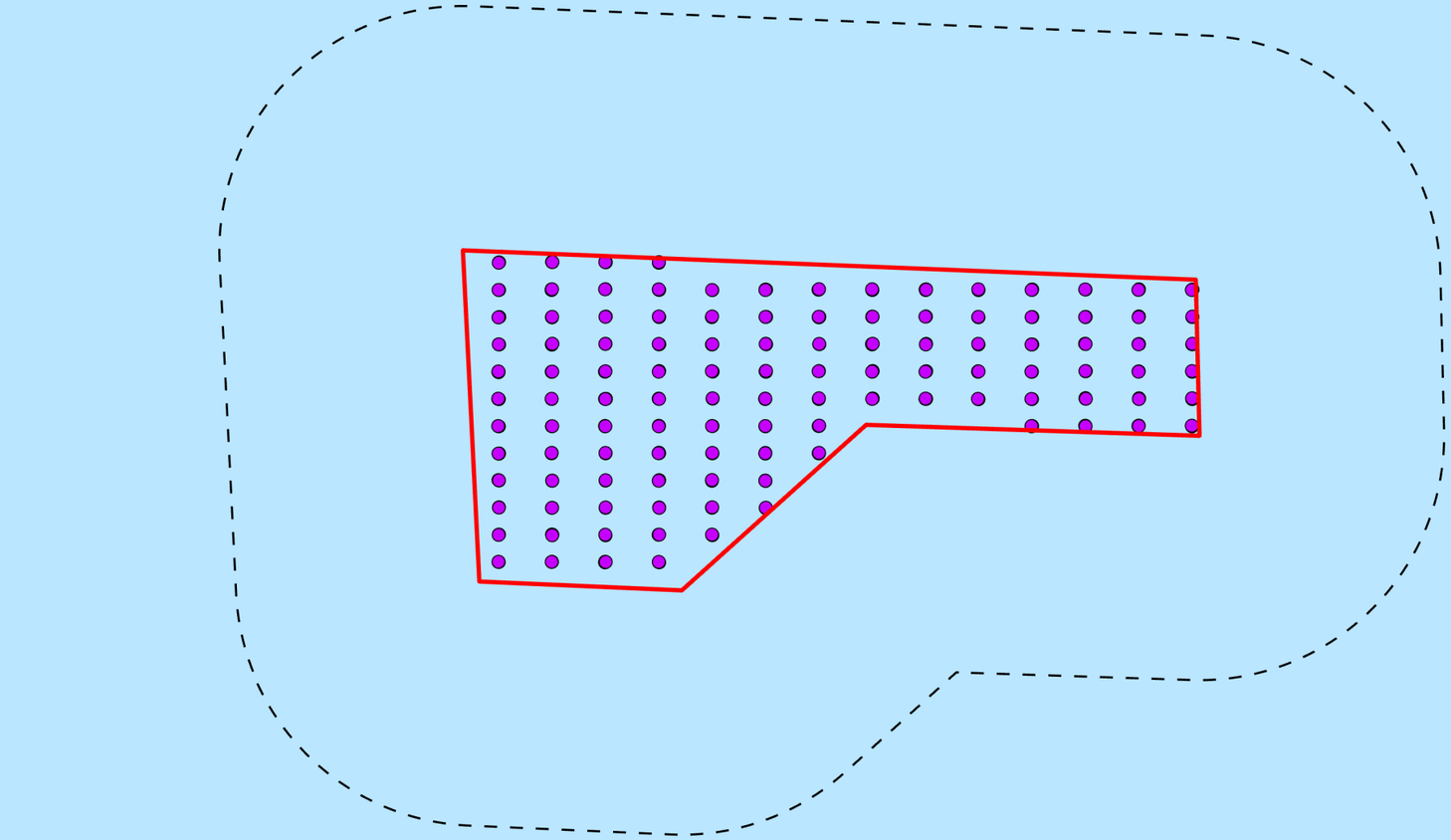
Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0003

Figure 6.2

640000
660000
680000
700000
720000
6320000
6300000
6280000



0 5 10 km

Legend:

- Bellrock WFDA Scoping Boundary
- Benthic Study Area (10 km)

Benthic Sampling Locations

- Drop-down Camera

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Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Esri, Ordnance Survey, NASA, NGA, USGS

Scale @ A3
1:250,000

Figure Title:
Benthic Survey Sampling Locations

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0022

Figure 6.3

560000 580000 600000 620000 640000 660000 680000 700000 720000 740000

6360000 6340000 6320000 6300000 6280000 6260000

0 10 20 km

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Legend:

- Bellrock WFDA Scoping Boundary
- Benthic Study Area (10 km)

Arctica suitable habitat

High : 0.684805

Low : 0.000196496

× Absence

Arctica count

- 0 - 1
- 2 - 5
- 6 - 11
- 12 - 19
- 20 - 39

Rev 1	12/03/2024	Final	GC	HF	JM
REV	DATE	STATUS	DRW	CHK	APR

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:500,000

Figure Title:

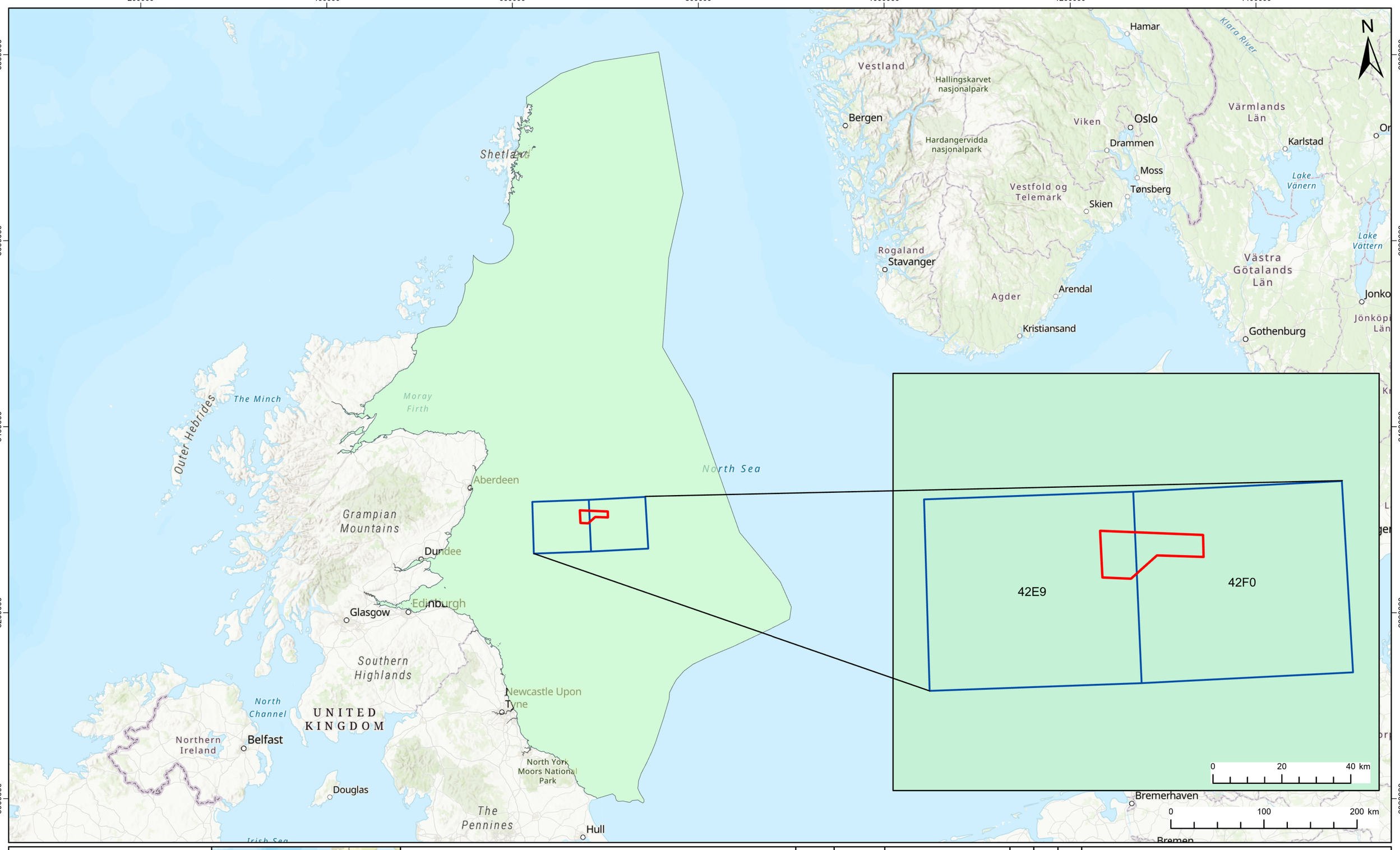
Ocean Quahog Suitability Habitat Map

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0071

Figure 6.4



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Legend:

- Bellrock WFDA Scoping Boundary
- Fish and Shellfish Study Area (International Council for the Exploration of the Sea (ICES) Rectangle 42E9 and 42F0)
- Northern North Sea Study Area (based on Northern North Sea Charting Progress 2 (CP2) Reporting Region)

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Coordinate System: WGS 1984 UTM Zone 30N

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Scale @ A3
1:3,700,000

Figure Title:
Fish and Shellfish Study Area and Northern North Sea Study Area

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0025

Figure 7.1

400000 600000 800000

6400000 6200000

N

River Borgie SAC 345 km
River Thurso SAC 301 km
River Naver SAC 344 km
A838
A99
Stornoway
River Oykel SAC 259 km
Berriedale and Langwell Waters SAC 246 km
590 m
The Minch
Outer Hebrides
Little Gruinard River SAC 480 km
River Evelix SAC 259 km
Highlands
Moray Firth
Southern Trench MPA 78 km
Fraserburgh
River Kerry SAC 533 km
Elgin
River Spey SAC 211 km
A96
A87
Turbot Bank MPA 60 km
River Moriston SAC 285 km
A97
River Dee SAC 117 km
Aberdeen
East of Gannet and Montrose Fields MPA 47 km
North Sea
Highlands
Grampian Mountains
The Mounth
Scotland
Fort William
Loch Shiel
River South Esk SAC 139 km
River Tay SAC 159 km
Inner Hebrides
Loch Tay
A92
Dundee
Firth of Tay and Eden Estuary SAC 158 km
Oban
Perth
Firth of Forth Banks Complex MPA 64 km
River Teith SAC 227 km
The Loch Lomond and the Trossachs National Park
Firth of Lorn
A83
Stirling
Falkirk
Greenock
Edinburgh
785 m
Glasgow
A1
Berwick-upon-Tweed
874 m
Kilmarnock
River Tweed SAC 160 km
Ayr
Hawick
Southern Highlands
The Cheviot Hills
Ballycastle

0 50 100 km

NORWAY
St
UNITED KINGDOM
London
GERMANY

Legend:
- Bellrock WFDA Scoping Boundary
- Special Area of Conservation (SAC)
- Nature Conservation Marine Protected Area (NCMPA)

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: JNCC, NatureScotEsri, TomTom, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, USGS

Scale @ A3
1:1,750,000

Figure Title:
Sites Designated for Fish and Shellfish Species Scoped in for Further Assessment

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0072

Figure 7.2

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600000 620000 640000 660000 680000 700000 720000 740000 760000 780000

6360000 6340000 6320000 6300000 6280000 6260000

N

0 10 20 km

Legend:

- Bellrock WFDA Scoping Boundary

Grey Seal Mean at-sea Density per 25 km²

- 0.000 - 0.002
- 0.002 - 0.010
- 0.010 - 0.025
- 0.025 - 0.050

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:500,000

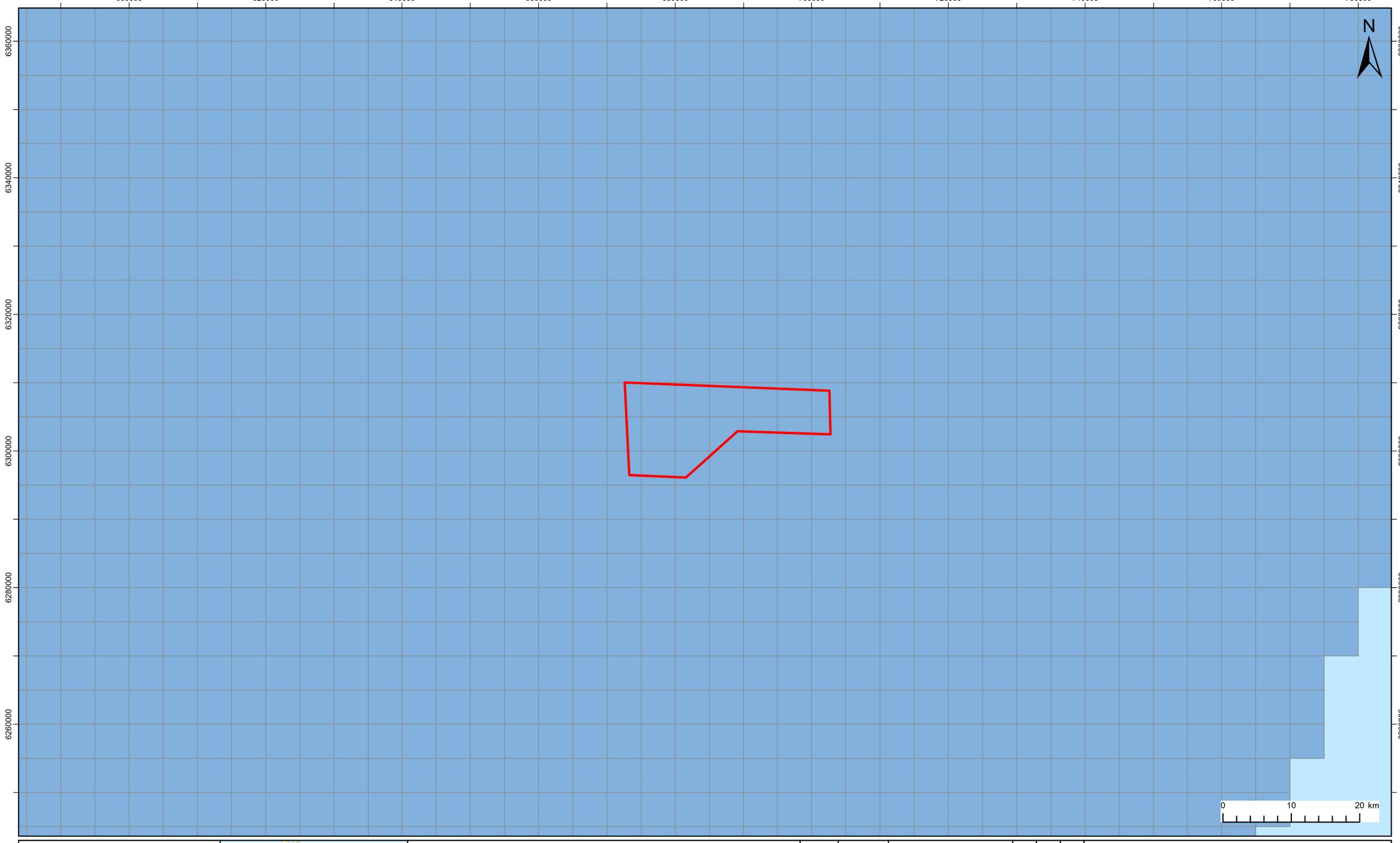
Figure Title:
Grey Seal Densities

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0026

Figure 8.1



Legend:

Bellrock WFDA Scoping Boundary

Harbour Seal Mean at-sea Density per 25 km²

0.000 - 0.001

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3

1:500,000

Figure Title:

Harbour Seal Densities

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0027

Figure 8.2

660000
680000
700000
720000
6320000
6300000
6280000
N
0
5
10 km

Legend:
- Bellrock WFDA Scoping Boundary
- Offshore Aerial Survey Area (4 km)

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: HiDef, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS

Scale @ A3
1:200,000

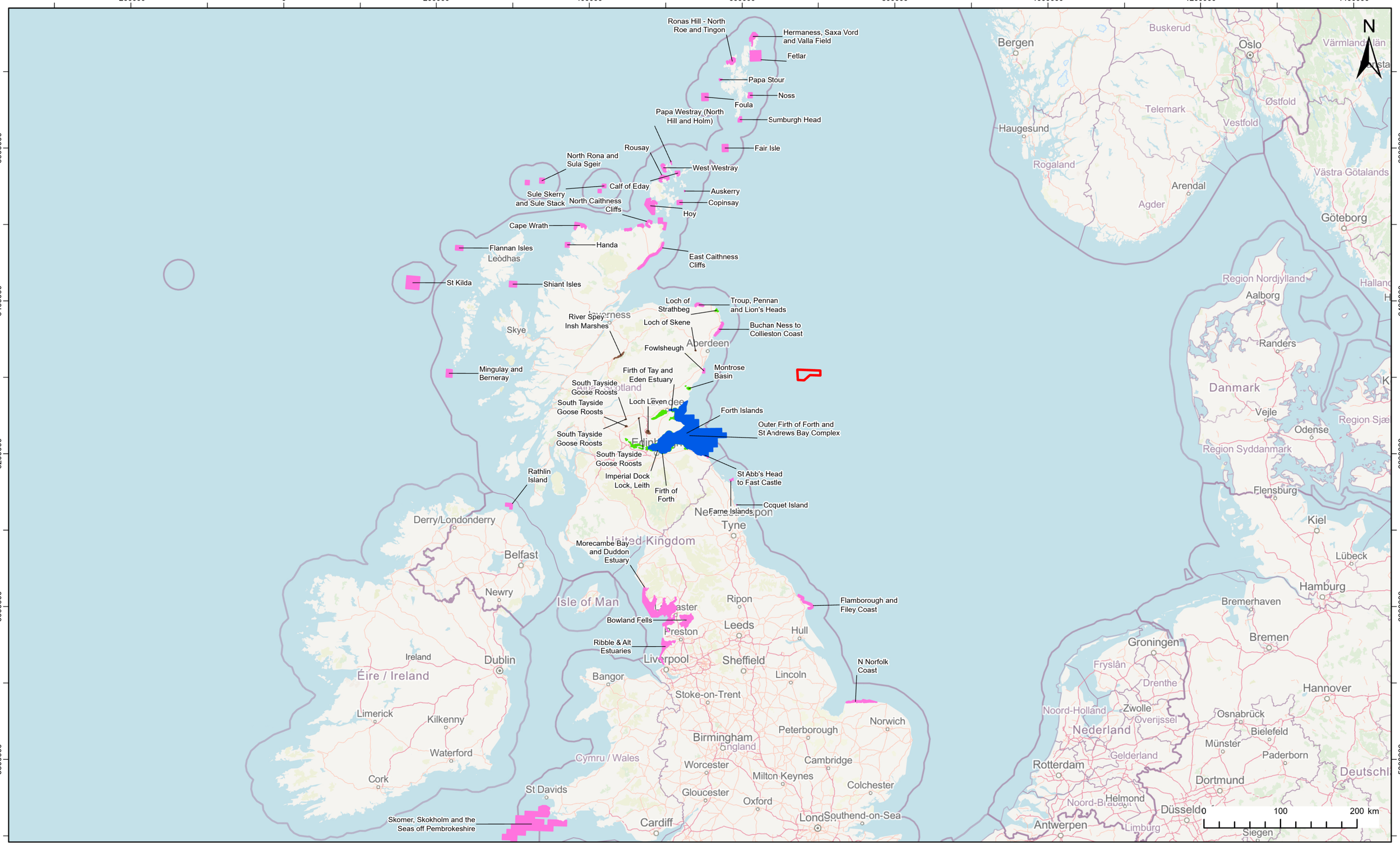
Figure Title: **Offshore Aerial Survey Area**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0017

Figure 9.1



Legend:

- Bellrock WFDA Scoping Boundary
- Breeding Seabird Colony Sites
- Migratory Non-Seabird Sites (Estuarine)
- Migratory Non-Seabird Sites (Inland Waterbodies)
- Marine SPAs

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: NatureScot 2024, Esri, TomTom, FAO, NOAA, USGS, Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri

Scale @ A3
1:4,500,000

Figure Title: **Location of Special Protection Areas (SPAs)**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0024

Figure 9.2

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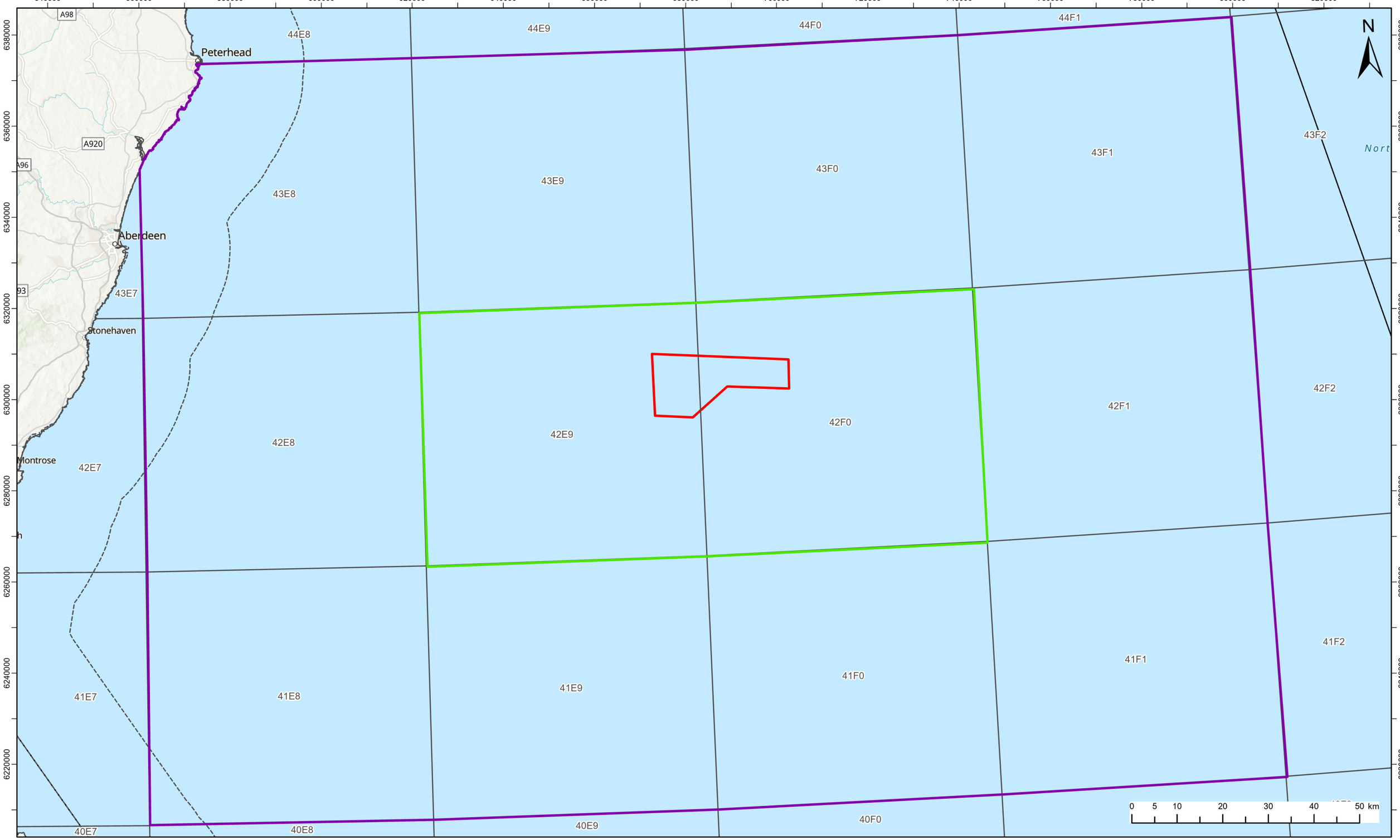

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Legend:

- Bellrock WFDA Scoping Boundary
- Commercial Fisheries Local Study Area
- Commercial Fisheries Regional Study Area
- 12 nm Limit
- International Council for the Exploration of the Seas Statistical Rectangles (Including Codes)

REV	DATE	STATUS	DRW	CHK	APR
Rev1	27/11/2023	Final	FN	SM	JM

Coordinate System: WGS 1984 UTM Zone 30N

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Scale @ A3
1:750,000

Figure Title:
Commercial Fisheries Local and Regional Study Areas

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0071

Figure 10.1

Fishing Vessel Route Density (2022)
(Routes per Square km^2 per Year)

- 0 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 100
- 101 - 150
- 151 - 200
- 201 - 250
- 251 - 16,363

44E7 44E8 44E9 44F0 44F1 44F2 44F3
43E7 43E8 43E9 43F0 43F1 43F2
42E7 42E8 42E9 42F0 42F1 42F2
41E7 41E8 41E9 41F0 41F1 41F2
40E7 40E8 40E9 40F0 40F1 40F2

Brechin
A941
A1

0 10 20 40 60 km

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Legend:
- Bellrock WFDA Scoping Boundary
- Commercial Fisheries Local Study Area
- Commercial Fisheries Regional Study Area
- 12 nm Limit
- International Council for the Exploration of the Seas Statistical Rectangles (Including Codes)

REV	DATE	STATUS	DRW	CHK	APR
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Scale @ A3
1:900,000

Figure Title:
Fishing Vessel Route Density Routes per km^2 per Year (2022)

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0072

Figure 10.2

Demersal Otter Trawl (EU and UK Vessels

Average Annual Surface Swept Area Ratio

- 0.0 - 0.6
- 0.7 - 1.3
- 1.4 - 1.9
- 2.0 - 2.6
- 2.7 - 3.2
- 3.3 - 3.9
- 4.0 - 4.5
- 4.6 - 5.1
- 5.2 - 5.8
- 5.9 - 6.4
- 6.5 - 7.1
- 7.2 - 7.7
- 7.8 - 8.4
- 8.5 - 9.0
- 9.1 - 23.2

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000 700000 720000 740000 760000 780000 800000 820000

6380000 6360000 6340000 6320000 6300000 6280000 6260000 6240000 6220000 6200000 6180000

N

0 10 20 40 60 km

Legend:

- Bellrock WFDA Scoping Boundary
- Commercial Fisheries Local Study Area
- Commercial Fisheries Regional Study Area
- 12 nm Limit
- International Council for the Exploration of the Seas Statistical Rectangles (Including Codes)

Rev1	27/11/2023	Final	FN	SM	JM
REV	DATE	STATUS	DRW	CHK	APR

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Contains OS data © Crown Copyright and database right 2022, Esri UK, Esri, TomTom, Garmin,

Scale @ A3

1:900,000

Figure Title: **Demersal Otter Trawl Average Swept Area Ratio for EU and UK Vessels 12 m and Over (2016-2020)**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0073

Figure 10.3

Demersal Otter Trawl 2020 (UK vessels ≥15m)
First Sales Value

Total value, £
- £0.02 - £5,000.00
- £5,000.01 - £10,000.00
- £10,000.01 - £25,000.00
- £25,000.01 - £50,000.00
- £50,000.01 - £75,000.00
- £75,000.01 - £595,000.00

Legend:
- Bellrock WFDA Scoping Boundary
- Commercial Fisheries Local Study Area
- Commercial Fisheries Regional Study Area
- 12 nm Limit
- International Council for the Exploration of the Seas Statistical Rectangles (Including Codes)

Rev1	27/11/2023	Final	FN	SM	JM
REV	DATE	STATUS	DRW	CHK	APR

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, USGS

Scale @ A3
1:900,000

Figure Title:
UK Demersal Otter Trawl Vessel Monitoring System Data for Vessels 15 m and Over (2020)

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0074

Figure 10.4

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Dredge (EU and UK vessels ≥12m)

Average Annual Surface Swept Area Ratio

- 0.0 - 0.1
- 0.2 - 0.5
- 0.6 - 0.8
- 0.8 - 1.0
- 1.1 - 2.0
- 2.1 - 2.5
- 2.6 - 3.8

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000 700000 720000 740000 760000 780000 800000 820000

6380000 6360000 6340000 6320000 6300000 6280000 6260000 6240000 6220000 6200000 6180000

44E6 44E7 44E8 44E9 44F0 44F1 44F2

43E7 43E8 43E9 43F0 43F1 43F2

42E7 42E8 42E9 42F0 42F1 42F2

41E6 41E7 41E8 41E9 41F0 41F1 41F2

40E6 40E7 40E8 40E9 40F0 40F1 40F2

Elgin Buckie A98 A920 A917 A1 Stonehaven Brechin Montrose Arbroath Carnoustie Dundee Perth Blairgowrie Strathmore Sidlaw Hills The Mounth 1155 m 939 m River Esk Kirkcaldy Edinburgh Tweed

N

0 10 20 40 60 km

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Legend:

- Bellrock WFDA Scoping Boundary
- Commercial Fisheries Local Study Area
- Commercial Fisheries Regional Study Area
- 12 nm Limit
- International Council for the Exploration of the Seas Statistical Rectangles (Including Codes)

REV	DATE	STATUS	DRW	CHK	APR
Rev1	27/11/2023	Final	FN	SM	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, USGS

Scale @ A3
1:900,000

Figure Title:
Dredge Average Swept Area Ratio for EU and UK Vessels 12 m and Over (2016-2020)

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0073

Figure 10.5

Dredge 2016 (UK vessels ≥15m)

First Sales Value

Total value, £

- £0.91 - £5,000.00
- £5,000.01 - £10,000.00
- £10,000.01 - £25,000.00
- £25,000.01 - £50,000.00
- £50,000.01 - £75,000.00
- £75,000.01 - £280,000.00

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000 700000 720000 740000 760000 780000 800000 820000

6380000 6360000 6340000 6320000 6300000 6280000 6260000 6240000 6220000 6200000 6180000

N

0 10 20 40 60 km

Legend:

- Bellrock WFDA Scoping Boundary
- Commercial Fisheries Local Study Area
- Commercial Fisheries Regional Study Area
- 12 nm Limit
- International Council for the Exploration of the Seas Statistical Rectangles (Including Codes)

REV	DATE	STATUS	DRW	CHK	APR
Rev1	27/11/2023	Final	FN	SM	JM

Coordinate System: WGS 1984 UTM Zone 30N

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Scale @ A3 1:900,000

Figure Title: **UK Dredge Vessel Monitoring System Data for Vessels 15 m and Over (2016)**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0076

Figure 10.6

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Pelagic Trawl 2018 (UK vessels ≥15m)

First Sales Value

Total value, £

- £0.02 - £5,000.00
- £5,000.01 - £10,000.00
- £10,000.01 - £25,000.00
- £25,000.01 - £50,000.00
- £50,000.01 - £75,000.00
- £75,000.01 - £251,000.00

Legend:

- Bellrock WFDA Scoping Boundary
- Commercial Fisheries Local Study Area
- Commercial Fisheries Regional Study Area
- 12 nm Limit
- International Council for the Exploration of the Seas Statistical Rectangles (Including Codes)

Rev1	27/11/2023	Final	FN	SM	JM
REV	DATE	STATUS	DRW	CHK	APR

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3

1:900,000

Figure Title: **UK Pelagic Otter Trawl Vessel Monitoring System Data for Vessels 15 m and Over (2018)**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0077

Figure 10.7

Potting 2020 (UK vessels ≥15m)

First Sales Value

Total value, £

- £0.01 - £5,000.00
- £5,000.01 - £10,000.00
- £10,000.01 - £25,000.00
- £25,000.01 - £50,000.00
- £50,000.01 - £75,000.00
- £75,000.01 - £145,000.00

Legend:

- Bellrock WFDA Scoping Boundary
- Commercial Fisheries Local Study Area
- Commercial Fisheries Regional Study Area
- 12 nm Limit
- International Council for the Exploration of the Seas Statistical Rectangles (Including Codes)

REV	DATE	STATUS	DRW	CHK	APR
Rev1	27/11/2023	Final	FN	SM	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3

1:900,000

Figure Title:

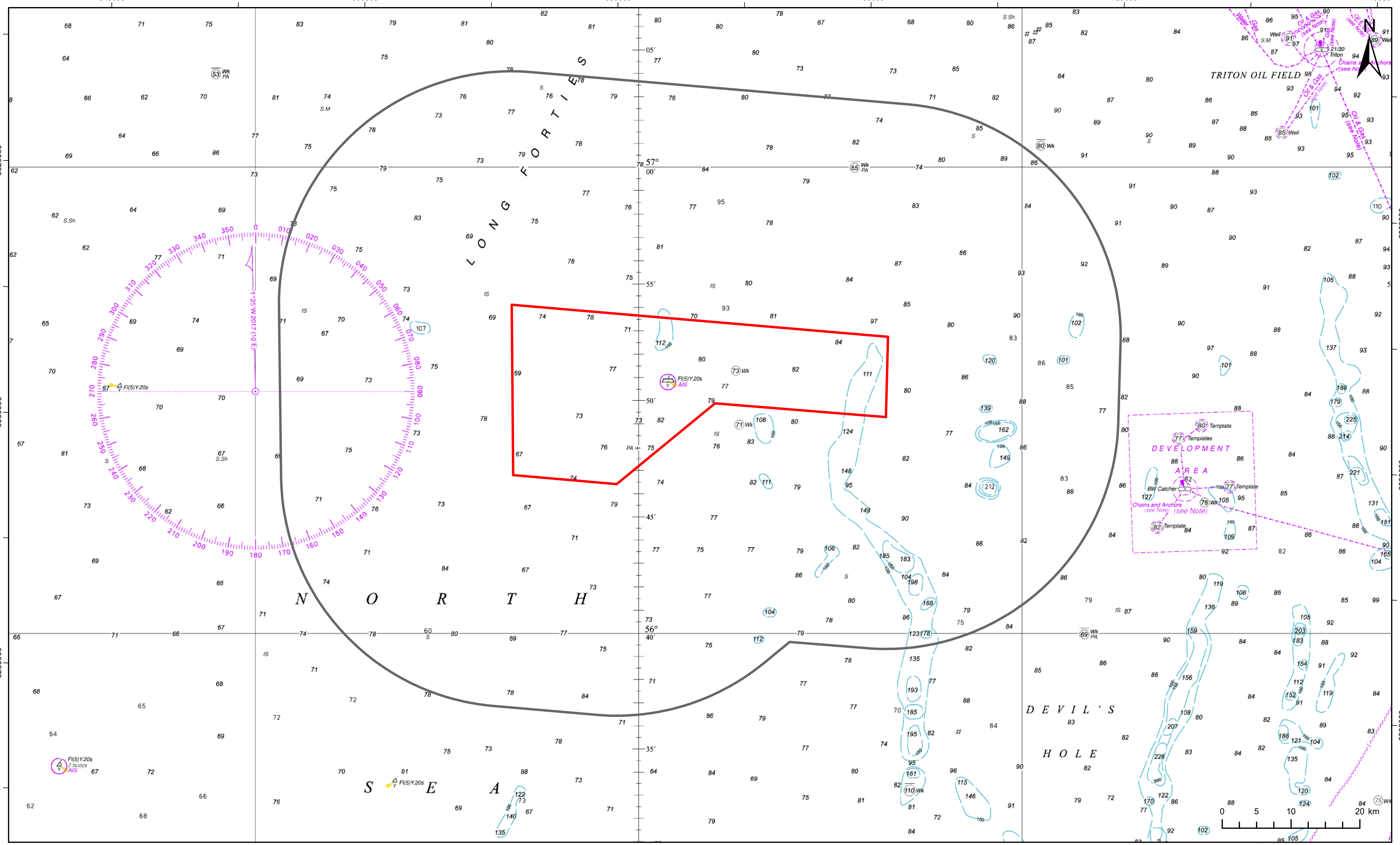
UK Potting
Vessel Monitoring System Data
for Vessels 15 m and Over (2020)

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0077

Figure 10.8



Legend:

- Bellrock WFDA Scoping Boundary
- Shipping and Navigation Study Area (10 nm buffer)

Rev	Date	Status	DRW	CHK	APR
1	12/02/2024	Final	DS	RR	SW

Coordinate System: WGS 1984 World Mercator

Source: Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGSReproduced by permission of The Keeper of Public Records and the UK Hydrographic Office (www.GOV.uk/UKHO).'

Scale @ A3 1:500,000

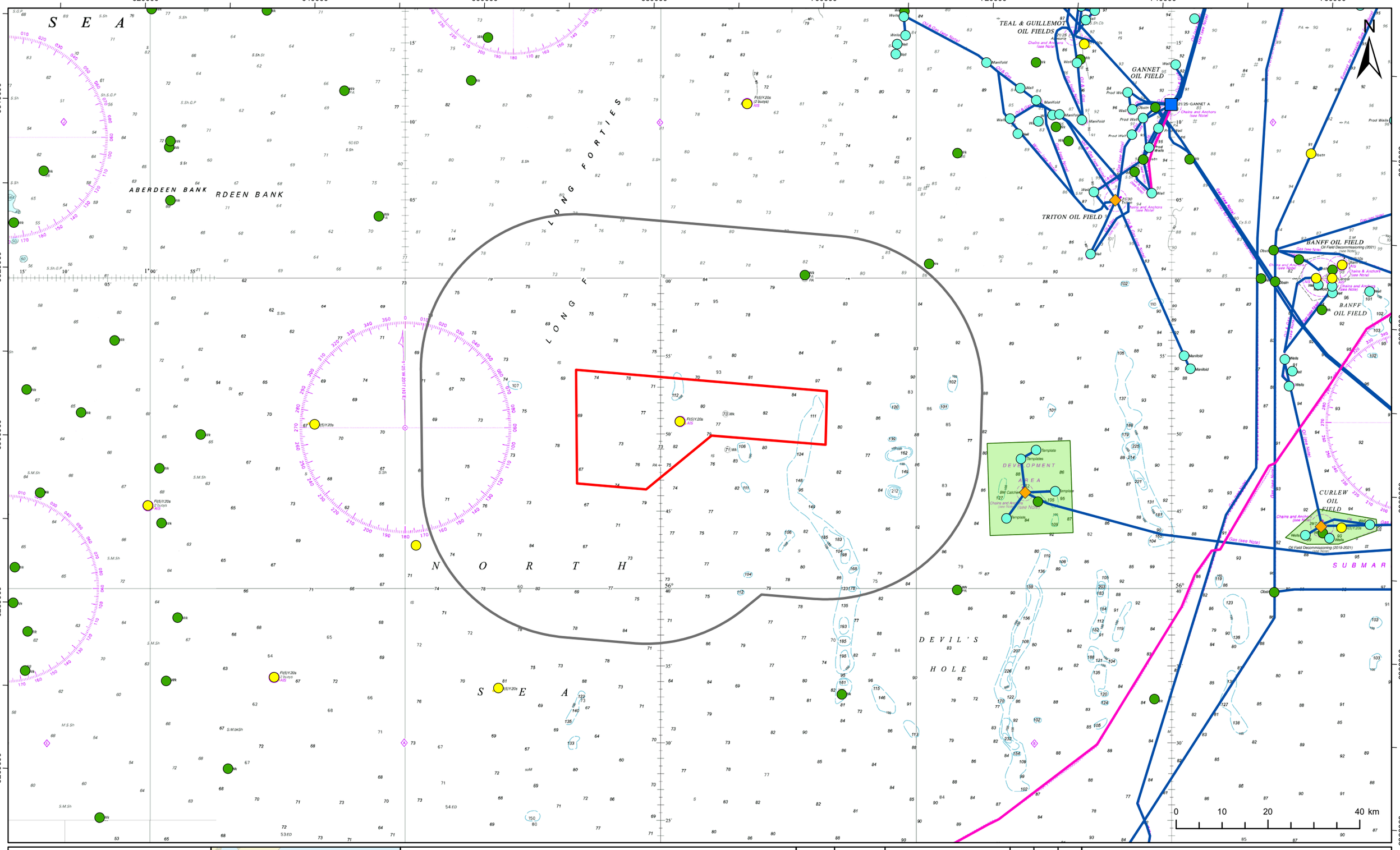
Figure Title: **Overview of the Shipping and Navigation Study Area**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0091

Figure 11.1



Legend:

- Bellrock WFDA Scoping Boundary
- Shipping and Navigation Study Area (10 nm buffer)
- Aid to Navigation
- Floating Production Storage and Offloading
- Surface Platform
- Subsea Infrastructure
- Charted Wreck or Obstruction
- Subsea Cable
- Subsea Pipeline
- Oil and Gas Development Area

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/02/2024	Final	DS	RR	SW

Coordinate System: WGS 1984 World Mercator

Source: Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS Reproduced by permission of The Keeper of Public Records and the UK Hydrographic Office (www.GOV.uk/UKHO).'

Scale @ A3 1:750,000

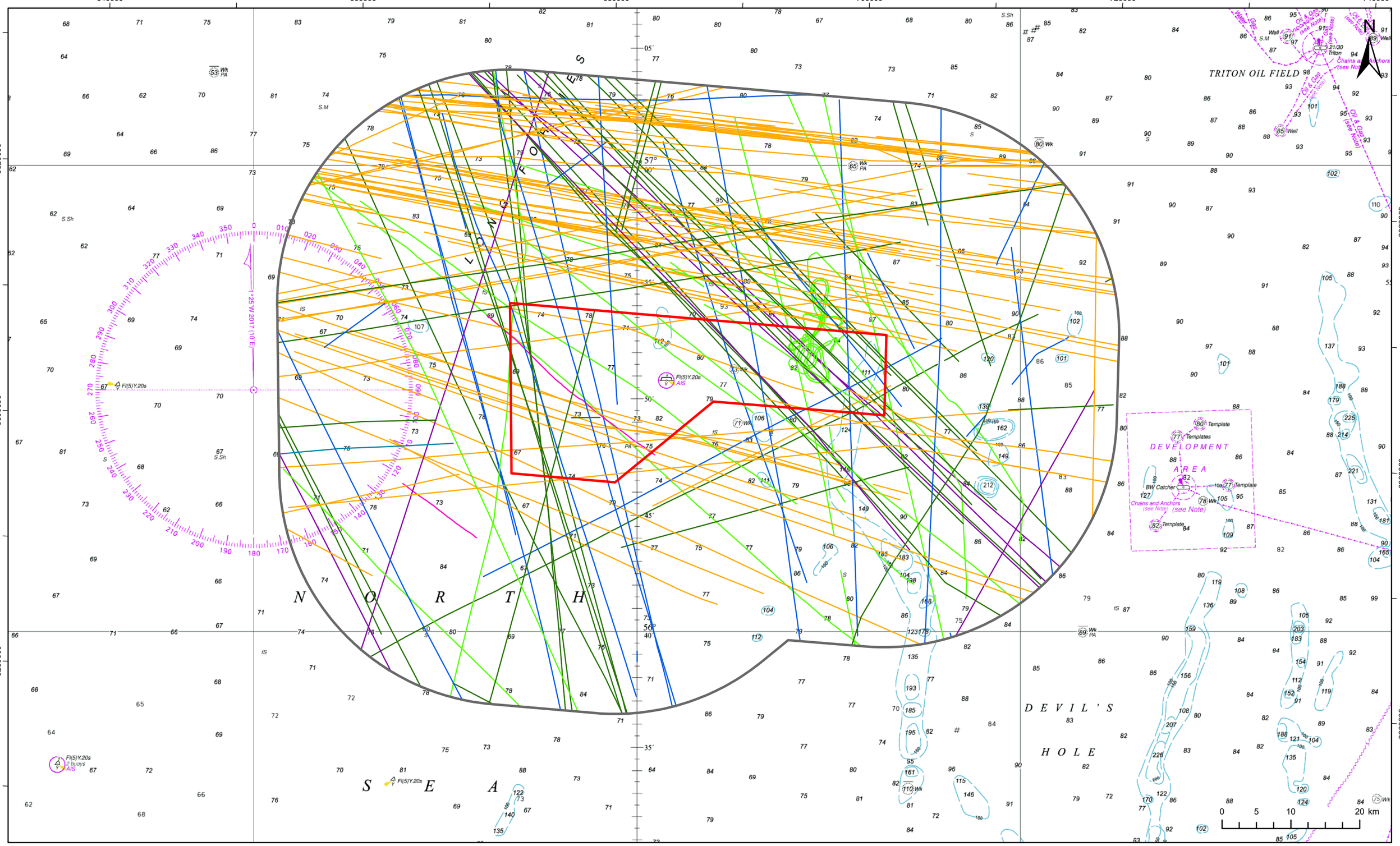
Figure Title: **Navigational Features in Proximity to the Bellrock WFDA**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0092

Figure 11.2



Legend:

- Bellrock WFDA Scoping Boundary
- Shipping and Navigation Study Area (10 nm buffer)

Vessel Type

- Fishing
- Passenger
- Cargo
- Tanker
- Recreational
- Oil and Gas
- Wind Farm

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/02/2024	Final	DS	RR	SW

Coordinate System: WGS 1984 World Mercator

Source: Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGSReproduced by permission of The Keeper of Public Records and the UK Hydrographic Office (www.GOV.uk/UKHO).'

Scale @ A3
1:500,000

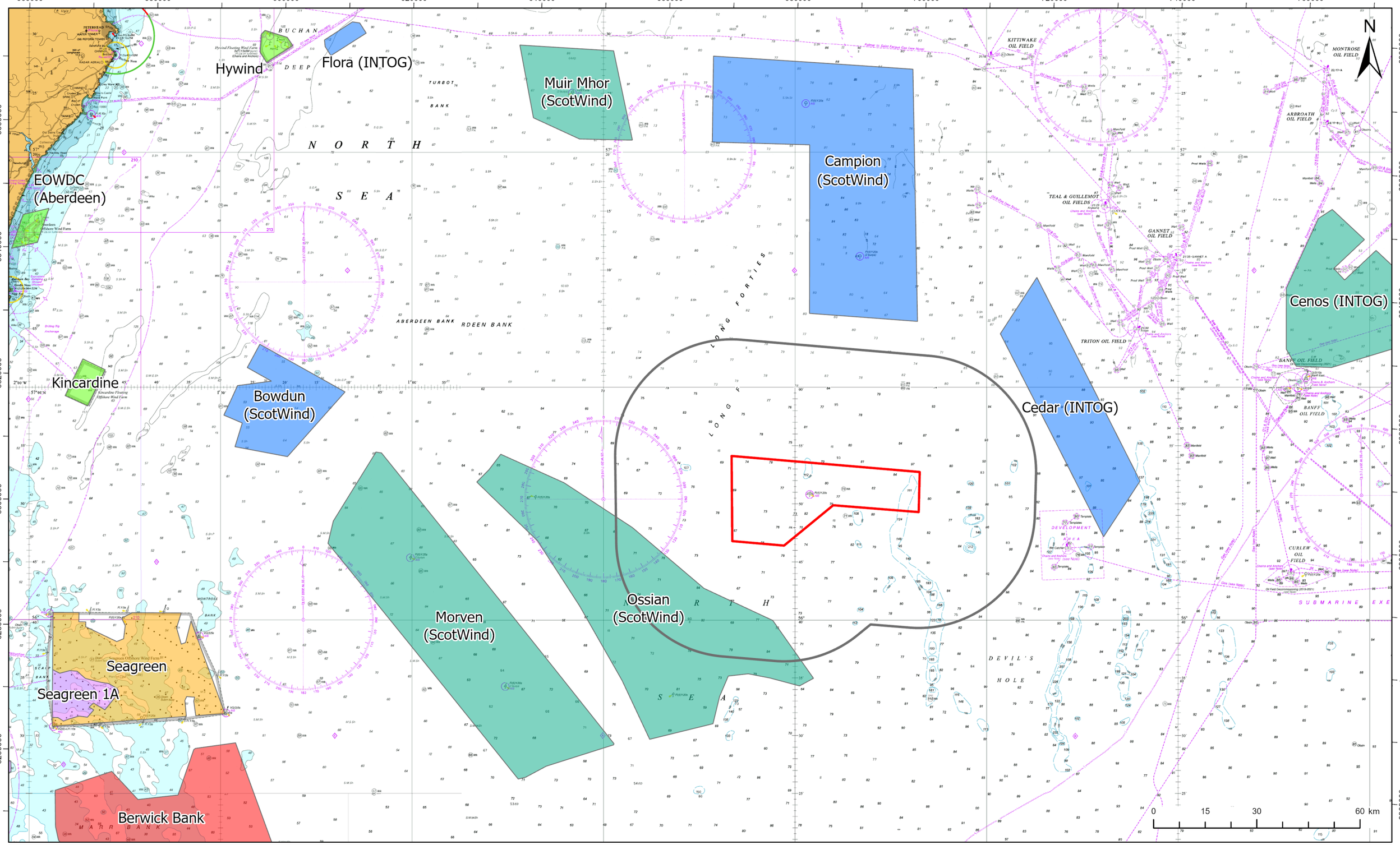
Figure Title: **28-Days of AIS Data by Vessel Type (Winter and Summer 2023) within the Shipping and Navigation Study Area**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0093

Figure 11.3



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Bellrock

Legend:

- Bellrock WFDA Scoping Boundary
- Shipping and Navigation Study Area (10 nm buffer)

Cumulative Development Phase

- Consent Application Submitted
- Consented
- Operational
- Pre Planning
- Scoped
- Under Construction

REV	DATE	STATUS	DRW	CHK	APR
01	12/02/2024	Final	DS	RR	SW

Coordinate System: WGS 1984 World Mercator

Source: Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS Reproduced by permission of The Keeper of Public Records and the UK Hydrographic Office (www.GOV.uk/UKHO).'

Scale @ A3
1:1,000,000

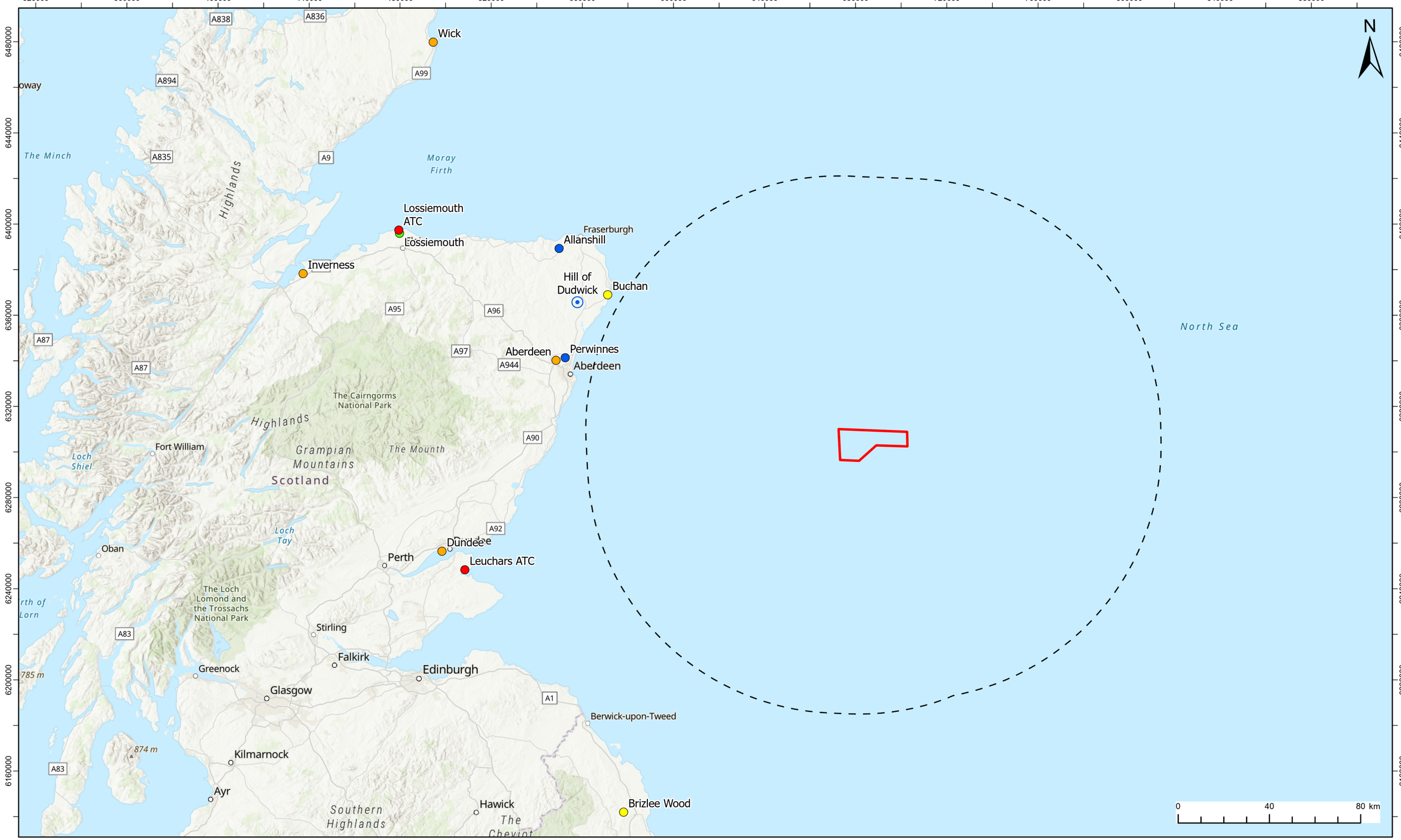
Figure Title:
Cumulative Offshore Wind Farm Developments

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0094

Figure 11.4



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Legend:

- Bellrock WFDA Scoping Boundary
- Bellrock 60 nm Buffer Zone
- Military Airfields
- Air Defence Radars
- Military Air Traffic Control (ATC) Radars
- Civil Airports
- Weather Radars
- NERL Radars

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, USGS

Scale @ A3
1:1,500,000

Figure Title:
Aviation and Radar Study Area - Airports and Radars

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0061

Figure 12.1

520000 540000 560000 580000 600000 620000 640000 660000 680000 700000 720000 740000 760000 780000 800000

6400000 6380000 6360000 6340000 6320000 6300000 6280000 6260000 6240000

N

MORAY CTA 6
MORAY CTA 3
MORAY CTA 15
MORAY CTA 2
TRA 008B
Peterhead
MORAY CTA 1
ABERDEEN CTA 1
MORAY CTA 17
Aberdeen
TAY CTA 9
ABERDEEN CTA 3
ABERDEEN CTA 2
TRA 007B
TAY CTA 8
TAY CTA 11
TAY CTA 10
TAY CTA 7
TAY CTA 12
FORTH CTA 3
Seagreen TMZ
TAY CTA 13
Neart Na Gaoithe TMZ
BORDERS CTA 12

Buckie
Brechin
Montrose
Arbroath
Carnoustie
Dundee
A98
A96
A941
A920
A93
A917

0 20 40 km

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Bellrock

Scotland
Edinburgh

Legend:
- Bellrock WFDA Scoping Boundary
- Control Area
- TMZ
- Temporary Reserved Area (TRA)

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:750,000

Figure Title: **Civil Airspace**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0062

Figure 12.2

520000 540000 560000 580000 600000 620000 640000 660000 680000 700000 720000 740000 760000 780000 800000

6400000 6380000 6360000 6340000 6320000 6300000 6280000 6260000 6240000

N

Fraserburgh
Allanshill
A98
A98
Peterhead
Hill of Dudwick
A96
A920
A96
Aberdeen
Perwinnes
Aberdeen
A93
Stonehaven
Brechin
Montrose
Arbroath
Carnoustie
A917

0 20 40 km

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Bellrock

Scotland
North Sea
Edinburgh

Legend:
- Bellrock WFDA Scoping Boundary
- Allanshill RLoS 400 m
- Perwinnes RLoS 400 m
- Civil Airports
- Civil ATC Radars
- Weather Radars
- NERL Radars

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:750,000

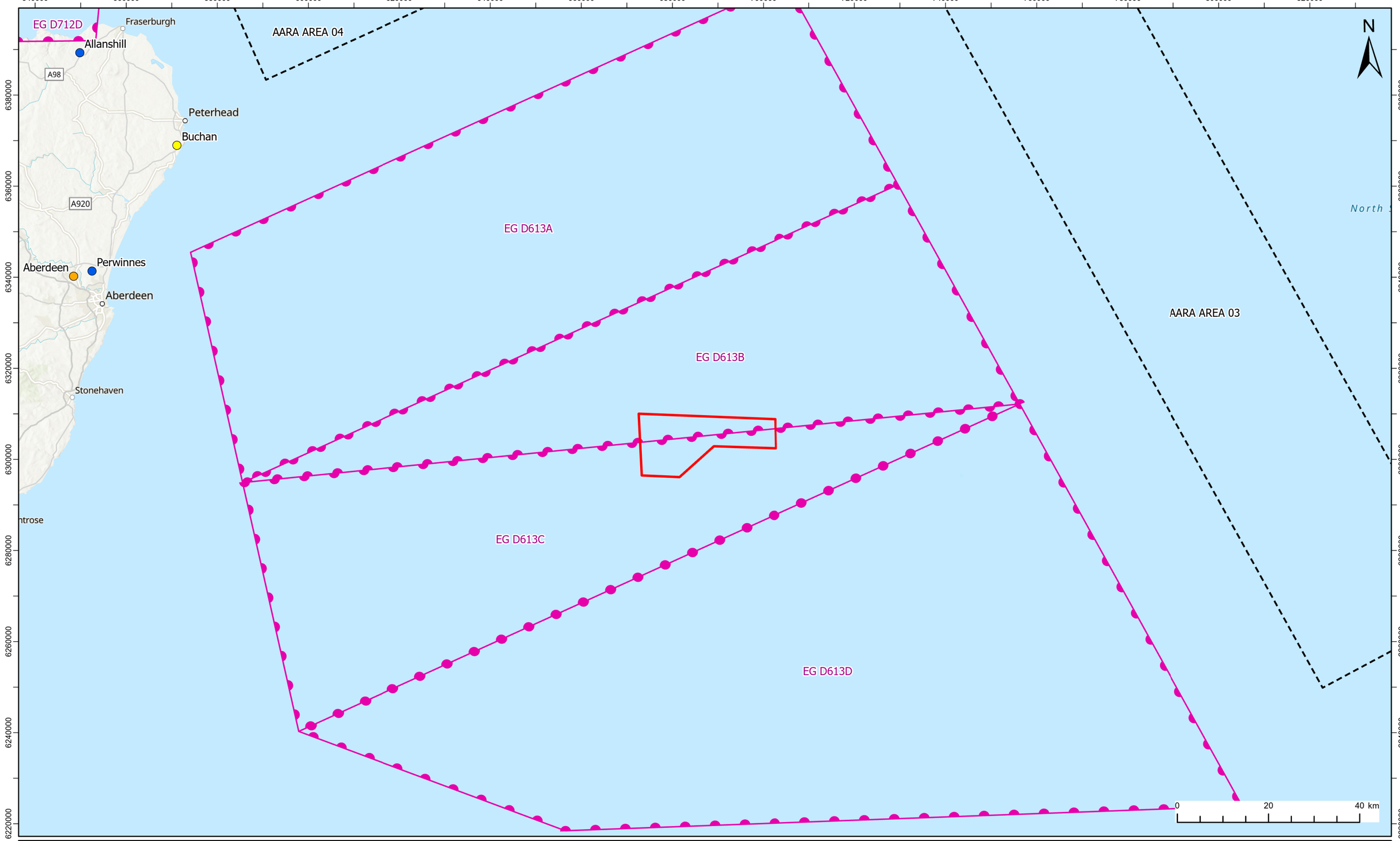
Figure Title:
Civil Air Traffic Control (ATC) and National Air Traffic (NATS) En Route Limited (NERL) Radar Line of Sight (RLoS)

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0064

Figure 12.3



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Legend:

- Bellrock WFDA Scoping Boundary
- Danger Areas
- Air to Air Refuelling Areas (AARAs)
- Air Defence Radars
- Civil Airports
- NERL Radars

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:750,000

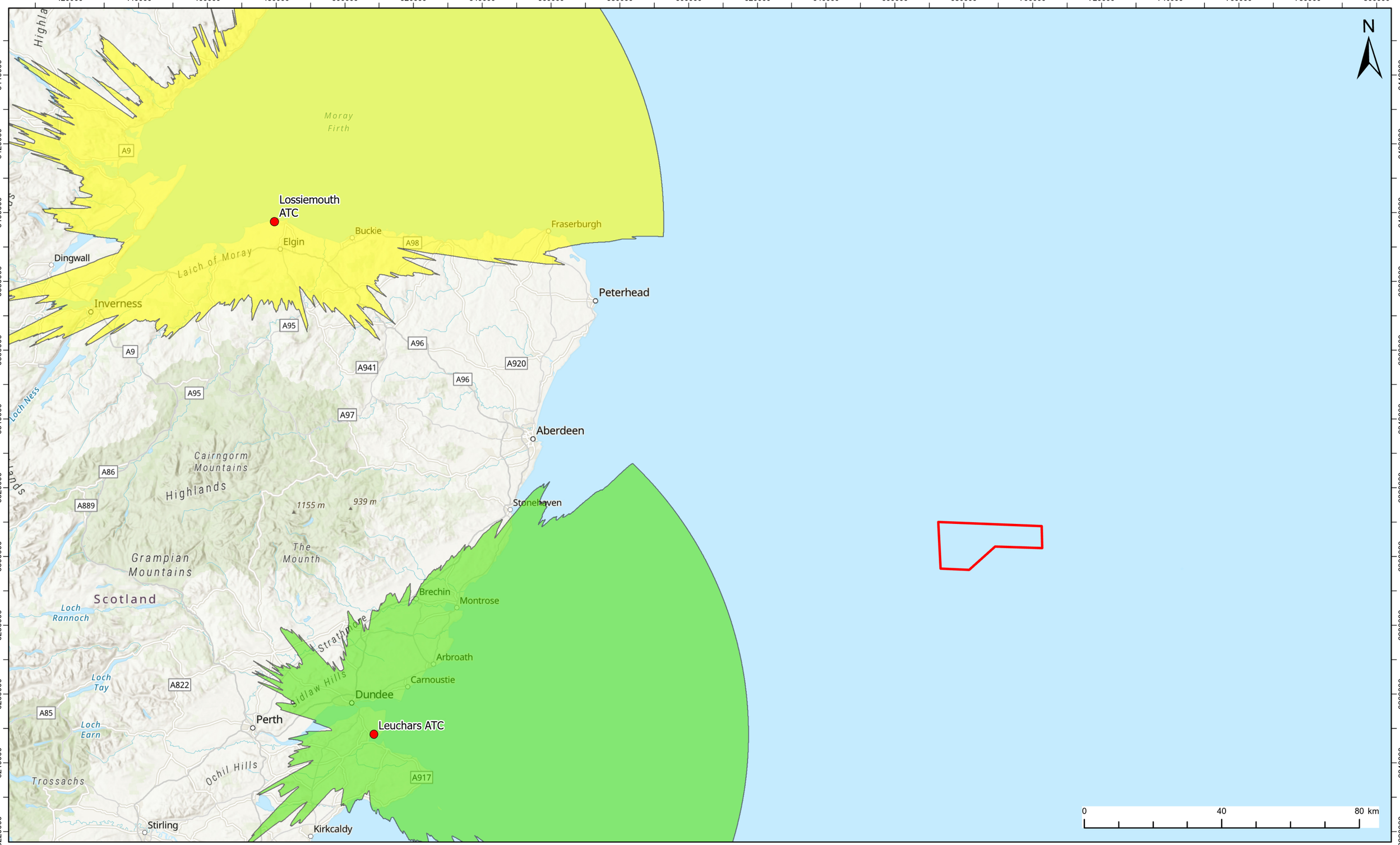
Figure Title:
Danger Areas and Restricted Zones

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0065

Figure 12.4


N
Moray Firth
Lossiemouth ATC
Leuchars ATC
Fraserburgh
Buckie
Elgin
Dingwall
Laich of Moray
Inverness
Peterhead
Aberdeen
Stonehaven
Brechin
Montrose
Arbroath
Carnoustie
Dundee
Perth
Stirling
Kirkcaldy
Cairngorm Mountains
Highlands
Grampian Mountains
Scotland
The Mounth
Strathmore
Sidlaw Hills
Ochil Hills
Trossachs
Loch Ness
Loch Rannoch
Loch Tay
Loch Earn
1155 m
939 m
A9
A95
A96
A941
A920
A97
A86
A889
A822
A85
A98
A917
0
40
80 km
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Bellrock
North Sea
Scotland
Edinburgh
Legend:
Bellrock WFDA Scoping Boundary
Leuchars RLoS 400 m
Lossiemouth RLoS 400 m
Military ATC Radars
Rev 1 | 12/03/2024 | Final | GC | HF | JM
REV | DATE | STATUS | DRW | CHK | APR
Coordinate System: WGS 1984 UTM Zone 30N
Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS
Scale @ A3
1:1,000,000
Figure Title:
Military Air Traffic Control (ATC) and Air Defence Radar Line of Sight (RLoS)
Project:
Bellrock WFDA
Report:
Scoping Report
Drawing No.: RHDHV_BEL_CST_FGR_0066
Figure 12.5

460000 480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000 700000 720000 740000 760000 780000 800000 820000 840000

6360000 6340000 6320000 6300000 6280000 6260000 6240000 6220000 6200000 6180000 6160000 6140000

N

North Sea

Peterhead
Buchan
Aberdeen
Stonehaven
Brechin
Montrose
Arbroath
Carnoustie
Dundee
Perth
Kirkcaldy
North Berwick
Falkirk
Edinburgh
Livingston
Berwick-upon-Tweed
Lanark
Galashiels
Hawick
Brizlee Wood

A95 A96 A941 A920 A97 A822 A917 A1 A701 A697 A7 A708

Cairngorm Mountains
1155 m
939 m
The Mounth
River Isla
Strathmore
Sidlaw Hills
Ochil Hills
Southern Highlands

0 40 80 km

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Legend:
- Bellrock WFDA Scoping Boundary
- Buchan RLoS 400 m
- Brizlee Wood RLoS 400 m
- Air Defence Radars

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, USGS

Scale @ A3
1:1,000,000

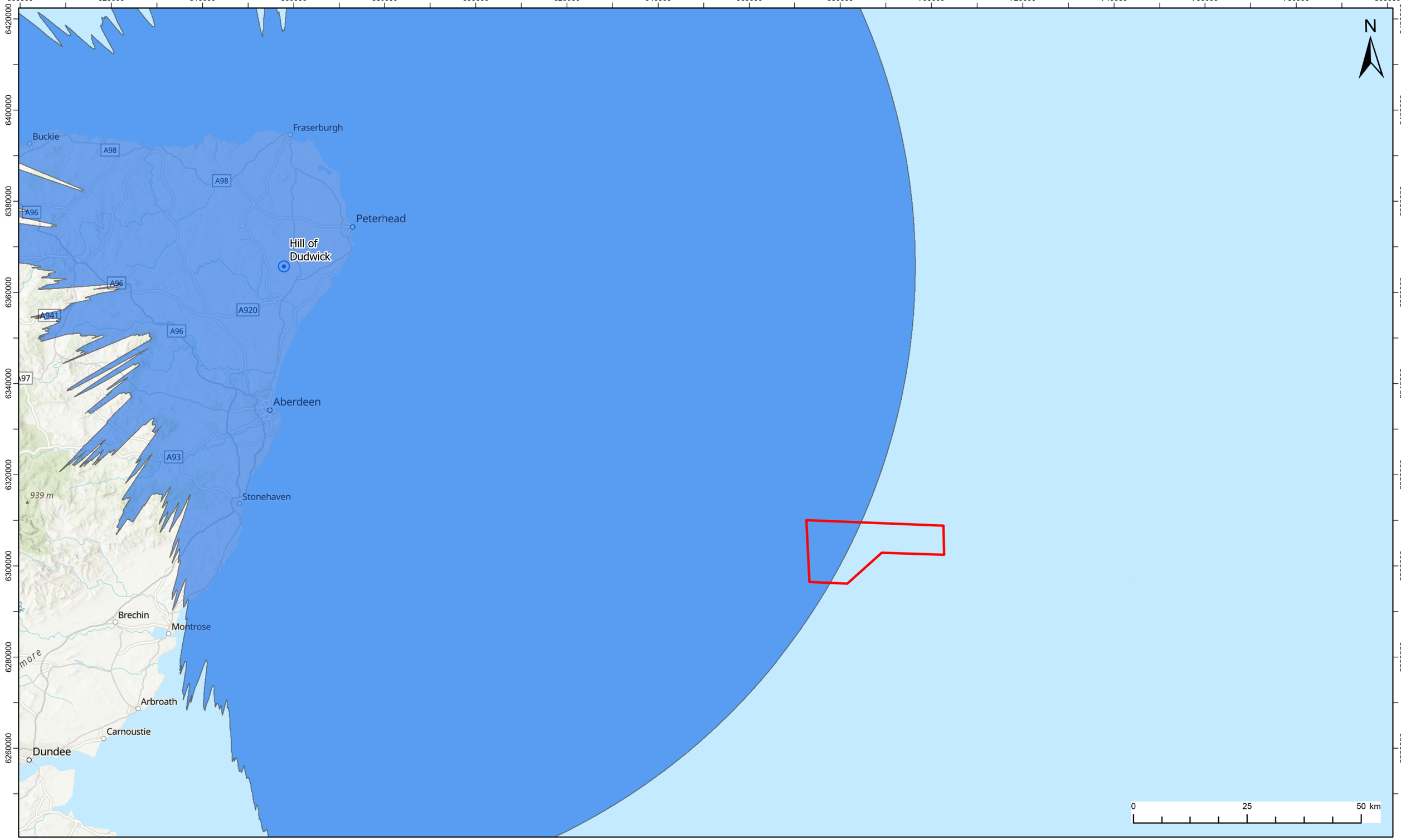
Figure Title:
Military Air Defence and Radar Line of Sight (RLoS) at 400 Above Mean Sea Level (AMSL)

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0073

Figure 12.6



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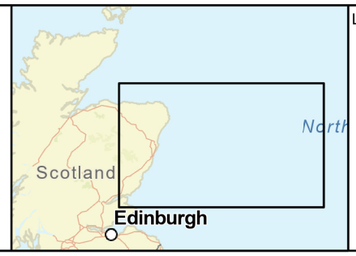
Bellrock



Legend:

- Bellrock WFDA Scoping Boundary
- Hill of Dudwick RLoS 400 m
- Weather Radars

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:750,000

Figure Title:
Hill of Dudwick Radar Line of Sight (RLoS)

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0067

Figure 12.7

600000 620000 640000 660000 680000 700000 720000 740000 760000 780000

6360000 6340000 6320000 6300000 6280000 6260000

HMRI 083
HMRI 086
HMRI 089
HMRI 092
HMRI 095
HMRI 098
HMRI 101
HMRI 104
HMRI 107
HMRI 110
HMRI 113
HMRI 116

N

0 10 20 km

Legend:
- Bellrock WFDA Scoping Boundary
- HMRI 110 with 2 nm buffer
- HMRI Centrelines

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:500,000

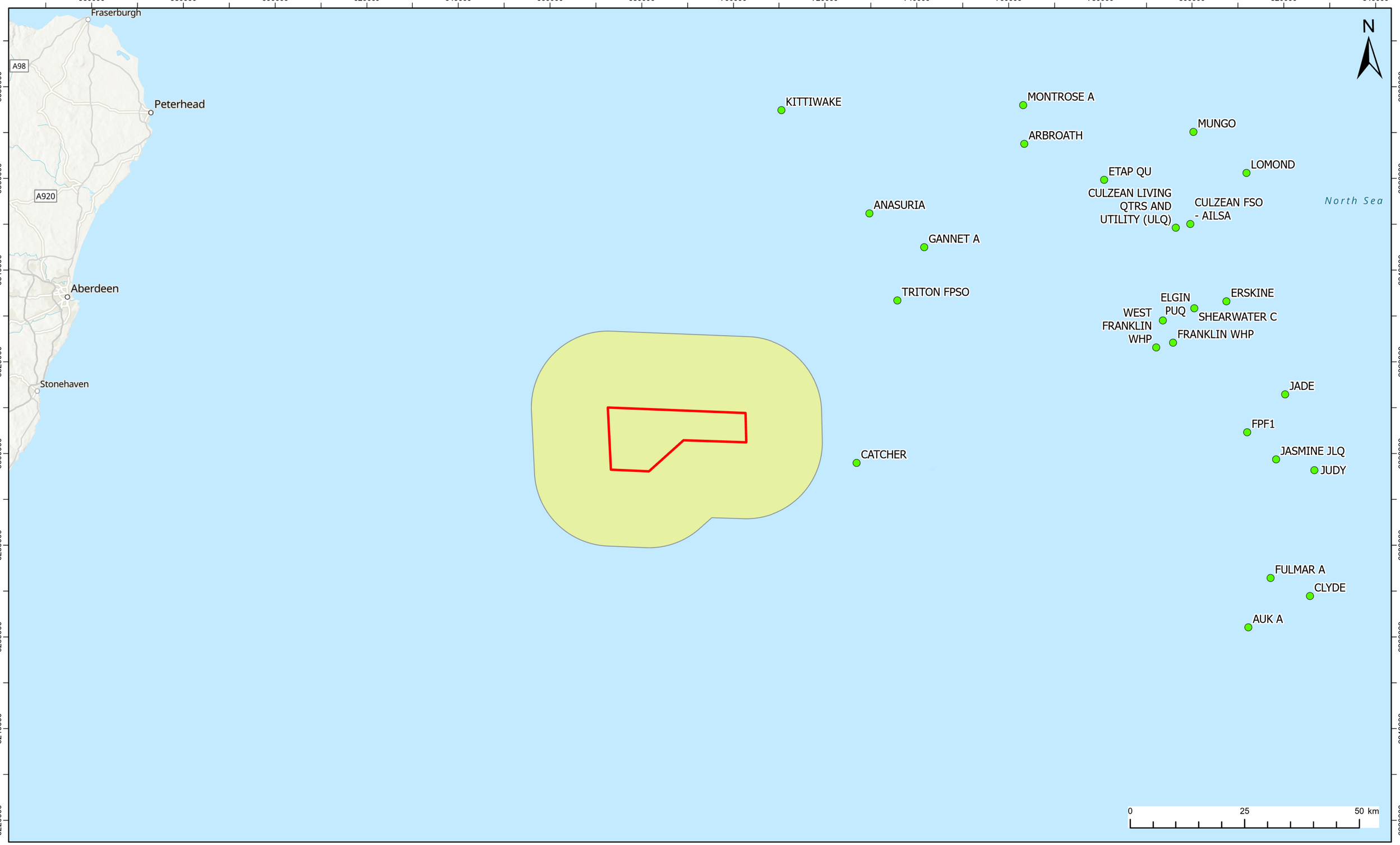
Figure Title:
Helicopter Main Routing Indicators (HMRI) Routes

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0068

Figure 12.8



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Legend:

- Bellrock WFDA Scoping Boundary
- Bellrock 9 nm Buffer Zone
- Active Oil and Gas Platforms and Helidecks

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:750,000

Figure Title:
Active Oil and Gas Helidecks

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0069

Figure 12.9

600000 620000 640000 660000 680000 700000 720000 740000 760000 780000

6360000 6340000 6320000 6300000 6280000 6260000

0 10 20 km

Legend:

- Bellrock WFDA Scoping Boundary
- Marine Infrastructure and Other Users Study Area (10 nm)

Rev 1	12/03/2024	Final	GC	HF	JM
REV	DATE	STATUS	DRW	CHK	APR

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:500,000

Figure Title:
Marine Infrastructure and Other Users Study Area

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0013

Figure 13.1

640000 660000 680000 700000 720000

6320000 6300000 6280000

21/30c
GANNET E
EVELYN
21/30f
21/27a
28/3a
28/2a
28/1
27/5
27/3
27/4
28/4a
LAVERDA
VARADERO
28/9f
28/9a
BURGMAN
CATCHER
27/9
27/10
28/6

N

0 10 20 km

Legend:

- Bellrock WFDA Scoping Boundary
- Marine Infrastructure and Other Users Study Area (10 nm)
- Licensed Blocks
- Oil/Gas Fields
- Unlicensed Blocks
- Pipelines

Wells
- Abandoned Phase 1
- Abandoned Phase 2
- Abandoned Phase 3
- Completed (Operating)
- Completed (Shut In)
- Plugged

Surface Infrastructure
- Floating Production Storage and Offloading (FPSO)

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: NSTA, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri UK, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS

Scale @ A3
1:250,000

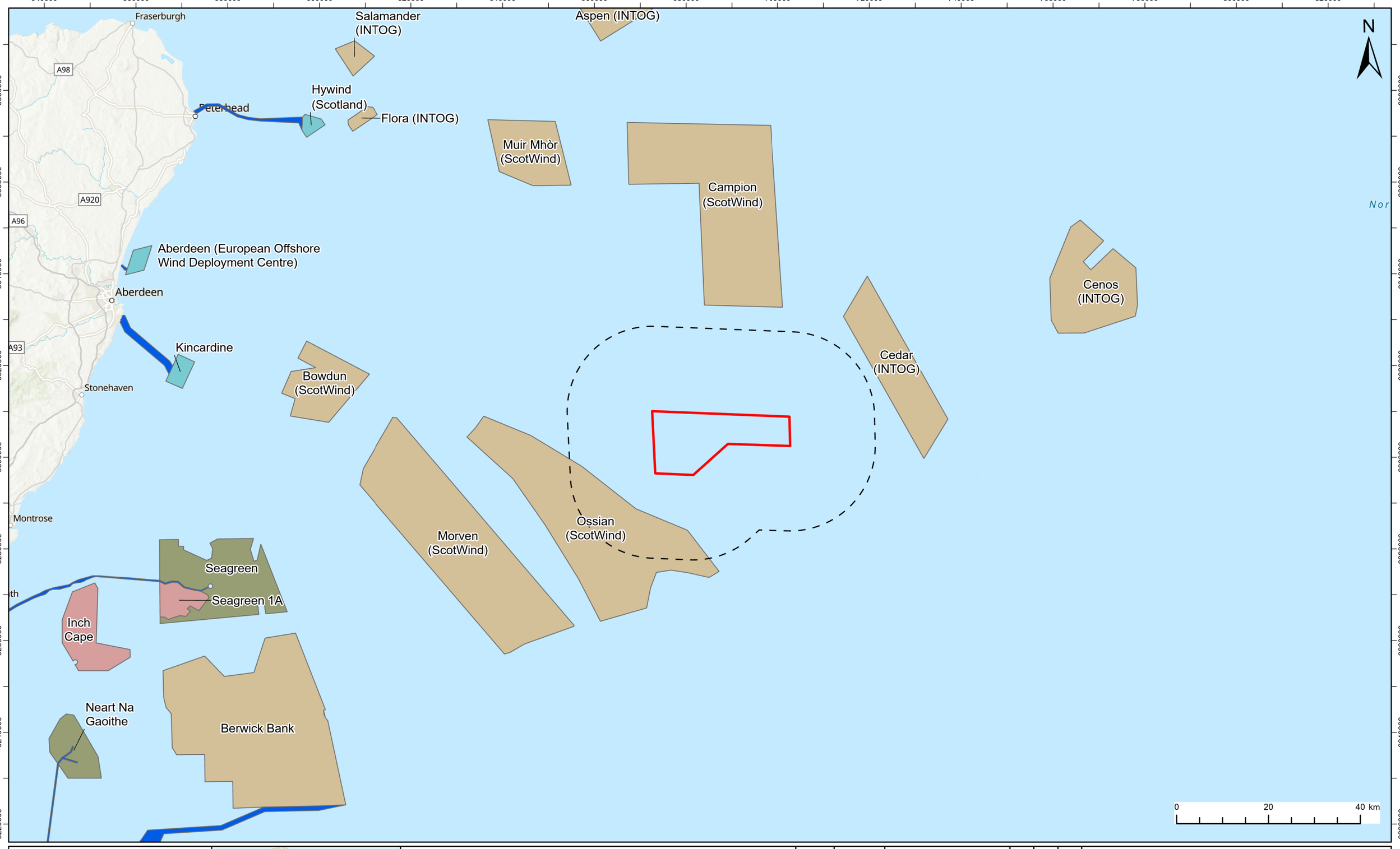
Figure Title:
Oil and Gas Infrastructure

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0014

Figure 13.2



Legend:

- Bellrock WFDA Scoping Boundary
- Marine Infrastructure and Other Users Study Area (10 nm)
- Offshore Wind Farm Cable Corridors

Offshore Wind Farm Developments

- Consented
- Operational
- Pre Planning (pre application)
- Under construction

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Crown Estate Scotland, Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:750,000

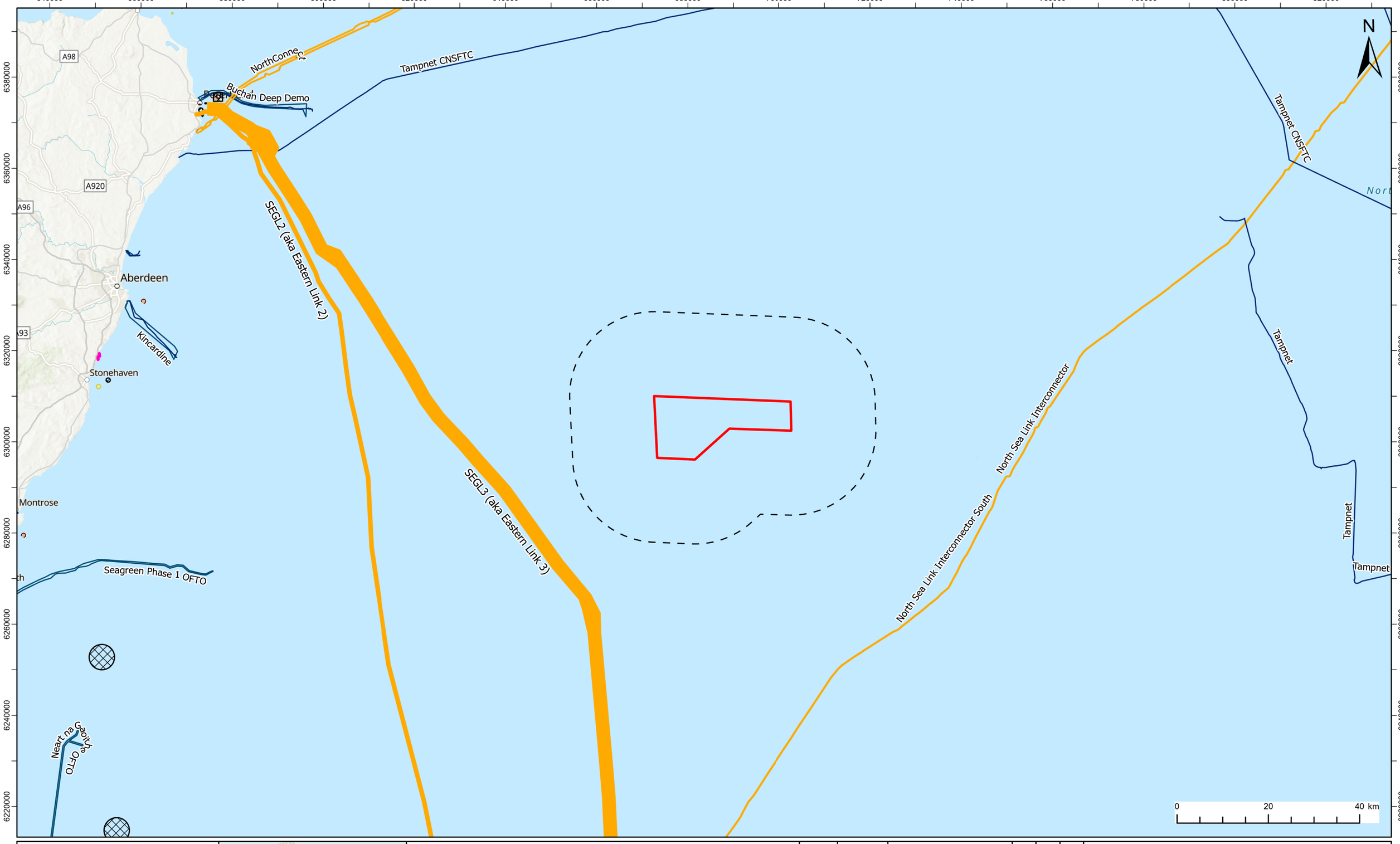
Figure Title:
Offshore Wind Farm Developments

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0015

Figure 13.3



Royal HaskoningDHV
Enhancing Society Together

Bellrock

Legend:

- Bellrock WFDA Scoping Boundary
- Marine Infrastructure and Other Users Study Area (10 nm)
- Aquaculture Leases

Subsea Cables

- Active
- Proposed

Dredging and Disposal Sites

- Closed
- Disused
- Open

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Crown Estate Scotland, UKHO, CEFAS, Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, USGS

Scale @ A3
1:750,000

Figure Title:
Other Infrastructure

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0020

Figure 13.4

600000 620000 640000 660000 680000 700000 720000 740000 760000 780000

6340000 6320000 6300000 6280000 6260000 6240000

N

0 10 20 km

Legend:

Bellrock WFDA Scoping Boundary and Marine Archaeology and Heritage Study Area

Rev 1	12/03/2024	Final	GC	HF	JM
REV	DATE	STATUS	DRW	CHK	APR

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, N Robinson, NCEAS, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3

1:500,000

Figure Title:

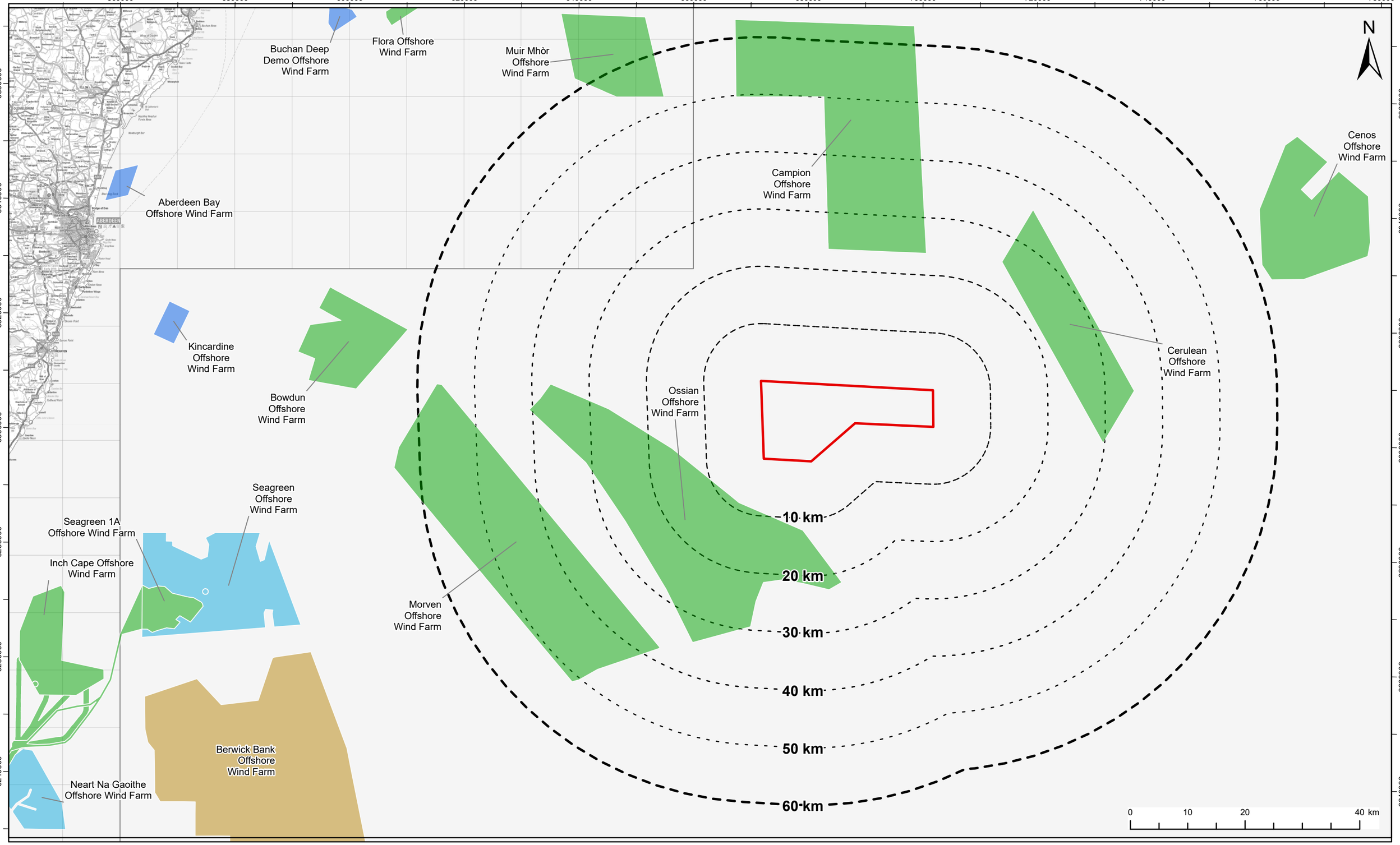
Marine Archaeology and Heritage Study Area

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0011

Figure 14.1



Legend:

- Bellrock WFDA Scoping Boundary
- 10 km Radii
- 60 km SLVIA Study Area
- Operational Offshore Wind Farms
- Offshore Wind Farms at Pre-Application Phase
- Offshore Wind Farms Under Construction
- Consent Application Submitted

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	13/03/2024	Final	HC	TH	PM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS

Scale @ A3
1:600,000

Figure Title: **SLVIA Study Area and Locations of Other Offshore Wind Farms**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0081

Figure 15.1

Bellrock OFFSHORE WIND

Appendix 2: Nature Conservation Marine Protected Area (NCMPA) Screening Report

BlueFloat ENERGY
Renantis
PARTNERSHIP

bellrockwind.co.uk

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Contents

Figures

Tables

Plates

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1 Introduction

1. As set out in **Chapter 2: Policy and Legislative Context** of the **Bellrock Wind Farm Development Area (WFDA) Scoping Report**, Nature Conservation Marine Protected Areas (NCMPAs) in Scotland are designated under the Marine (Scotland) Act 2010 within 12 nautical miles (nm), and under the Marine and Coastal Access Act 2009 in offshore waters between 12 nm and 200 nm. NCMPAs are designated to protect biodiversity and heritage, with specific focus on protected features (species, habitats, large scale features or geomorphological features).

2. Under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009, provisions are made for the relevant public authority (in this instance, Marine Directorate - Licensing Operations Team; MD-LOT) to consider whether a licensable activity is capable of affecting (other than insignificantly) a protected feature in a NCMPA or any ecological or geomorphological process on which the conservation of any protected feature in a NCMPA is dependant. Subject to the exception noted in paragraph three below, MD-LOT must not grant authorisation for the licensable activity where is a significant risk of hindering the achievement of the conservation objectives of the NCMPA.

3. Where the organisation seeking authorisation to undertake a licensable activity cannot satisfy MD-LOT that there is no significant risk of the activity hindering the conservation objectives, MD-LOT may still grant a licence to undertake the activity where MD-LOT is satisfied that:

   - There are no other means of proceeding that would create a substantially lower risk;
   - The benefit to the public clearly outweighs the risk of damage to the environment; and
   - Measures will be undertaken of equivalent environmental benefit to the damage which will or is likely to occur.

4. In order to assess whether there is any significant risk of the licensable activity (in this case, the development of the Bellrock WFDA, as described in **Chapter 3: Project Description** of the **Bellrock WFDA Scoping Report**) hindering the achievement of the conservation objectives of a given NCMPA, an MPA Assessment should be completed. Methodology for the MPA Assessment is also detailed in **Chapter 4: Approach to Scoping and Environmental Impact Assessment** of the **Bellrock WFDA Scoping Report**.

5. The MPA Assessment consists of two stages:

   - Stage 1 - Initial Screening (further details provided in **Section 1.1**); and.
   - Stage 2 - Main Assessment (further details provided in **Section 1.2**).

6. This NCMPA Screening Report, covering Stage 1, has been prepared and submitted for consideration alongside the **Bellrock WFDA Scoping Report**, in line with the guidance provided in the Marine Scotland *Nature Conservation Marine Protected Areas: Draft Management*

Handbook (2013). Following the Scoping Workshop held 30th October 2023, MD-LOT provided feedback that the 'Nature Conservation Marine Protected Areas: Draft Management Handbook' should be used as guidance and would suggest contacting NatureScot to understand the approach to be adopted. MD-LOT confirmed that there are no plans to update the MPA handbook and advised to refer to Conservation Advice on the Joint Nature Conservation Committee website.

7. This NCMPA Screening Report has linkages with the following chapters of the **Bellrock WFDA Scoping Report**:

- **Chapter 6: Benthic Ecology;**
- **Chapter 7: Fish and Shellfish Ecology;**
- **Chapter 8: Marine Mammals;** and
- **Chapter 9: Offshore Ornithology.**

8. This appendix has been prepared by Royal HaskoningDHV.

1.1 Stage 1: Screening

9. The initial screening will focus on what can reasonably be predicted as a consequence of the Bellrock WFDA and whether it is 'capable of affecting (other than insignificantly)', a protected feature of a NCMPA.

10. As per the Draft Management Handbook, the screening will use information that is currently available and consider aspects such as the scale, timing and duration of proposed activities/developments. These considerations will include proposals for developments or activities outside the boundary of a NCMPA.

11. The consideration of 'capable of affecting' results in removing from further consideration all proposals/functions which are not in any way connected to the protected feature(s). A capability that is both remote (in terms of likelihood of occurrence) and hypothetical should not be the basis of a conclusion that further assessment is required. This can be determined by considering whether the activity will exert pressures which the protected feature(s) are sensitive to (Marine Scotland, 2013).

12. Where the conclusion of the screening is that there is 'capability of affecting', the focus will then be on considering whether the proposed development or activity will affect the protected features of a NCMPA, other than insignificantly. Consideration of the degree of pressure that could be exerted by the activity on a spatial basis should help to establish what level of effect might occur (Marine Scotland, 2013).

13. It is proposed that 'insignificance' will be determined for the Bellrock WFDA through the assessments made in the Bellrock WFDA Environmental Impact Assessment (EIA) Report chapters.

14. Where the conclusion is that the Bellrock WFDA and any associated activities is capable of affecting, other than insignificantly the protected features of a NCMPA, then Stage 2: Main Assessment must be carried out, in consideration of the conservation objectives of the NCMPA.

1.2 Stage 2: Main Assessment

15. The NCMPA Main Assessment stage focuses on determining whether the Bellrock WFDA or associated activities pose a significant risk of hindering the achievement of objectives of a NCMPA, which is carried out on a case-by-case basis. The NCMPA Main Assessment will focus on the potential impact on the achievement of the conservation objectives of the protected features, in contrast to the screening which focuses on the protected features.

16. The NCMPA Main Assessment will build on the initial screening, and will consider aspects such as scale, timing and duration of the proposed activities or developments. The NCMPA Main Assessment will also include consideration of cumulative effects with other activities in line with EIA requirements (please refer to **Chapter 4: Approach to Scoping and Environmental Impact Assessment** in the **Bellrock WFDA Scoping Report**).

17. Conservation objectives for NCMPA features describe the desired conditions of the NCMPA feature. Therefore, the objective for each given feature that is:

- Already in favourable condition, is to remain in this condition; and
- Not already in favourable condition, is to be brought into this condition, and subsequently remain in this condition.

18. If required, the NCMPA Main Assessment will be presented as a standalone report alongside the Bellrock WFDA EIA Report. The NCMPA Main Assessment will consider whether the Bellrock WFDA could potentially affect these objectives (other than insignificantly) for each NCMPA screened into the assessment, and whether the Bellrock WFDA and associated works could impact the condition of the features within the NCMPA.

1.3 Identification of Relevant Nature Conservation Marine Protected Areas

19. In order to determine the zones of influence (ZoI) associated with the works during the construction, operation and decommissioning phases of the Bellrock WFDA, the Applicant proposes to apply the screening criteria as detailed in **Sections 1.3.1** to **1.3.4** below.

20. **Figure A2.1** shows the Bellrock WFDA Screening Boundary and NCMPAs. **Table 1.1** provides a summary of all NCMPAs considered in this NCMPA Screening and their features.

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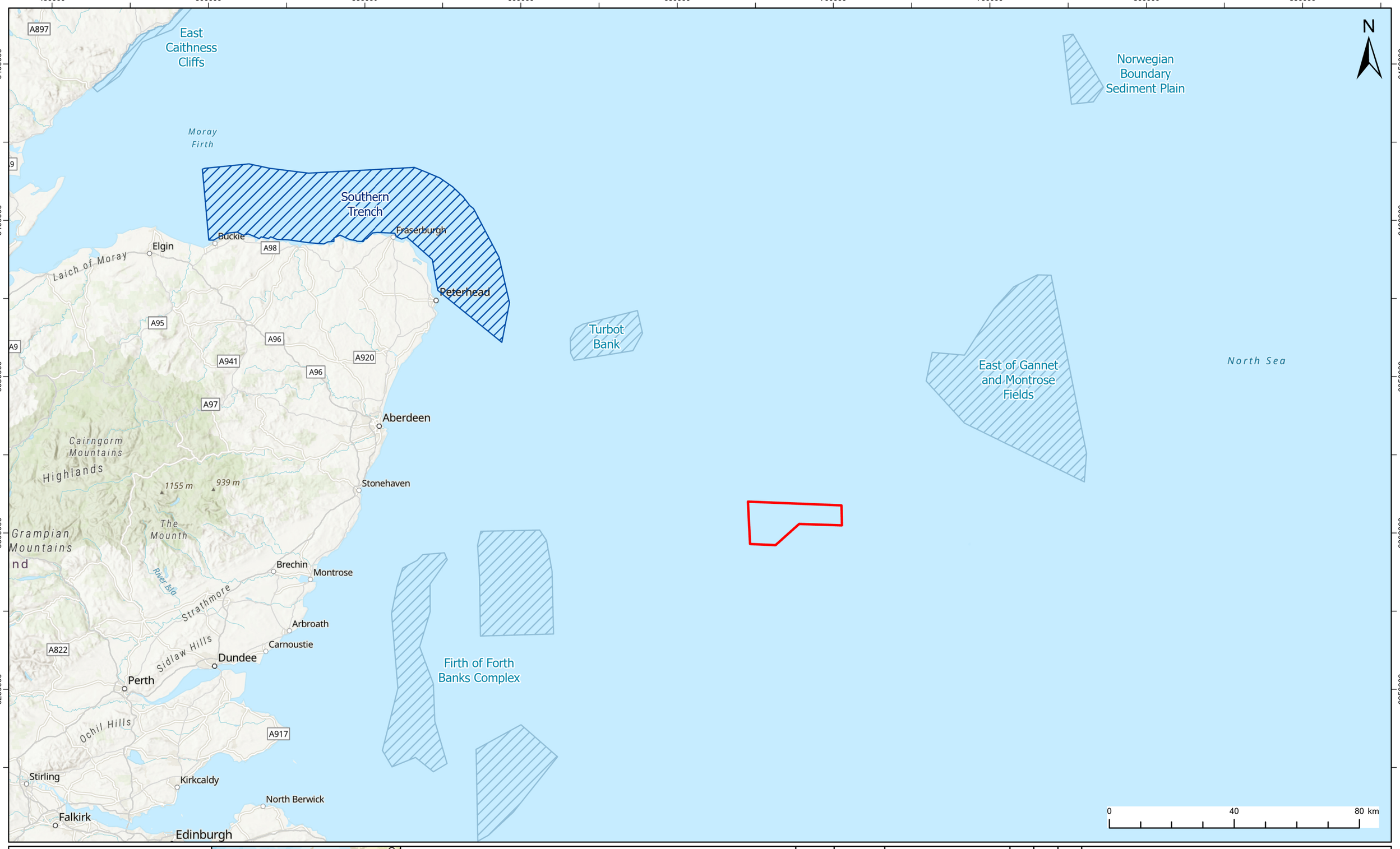

Legend:

- Nature Conservation Marine Protected Area (NCMPA) Screening Boundary
- Nature Conservation Marine Protected Area (NCMPA) Screened In
- Nature Conservation Marine Protected Area (NCMPA) Screened Out

REV	DATE	STATUS	DRW	CHK	APR
Rev 1	12/03/2024	Final	GC	HF	JM

Coordinate System: WGS 1984 UTM Zone 30N

Source: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri UK, Esri, TomTom, Garmin, FAO, NOAA, USGS, Esri, USGS

Scale @ A3
1:1,100,000

Figure Title: **Bellrock WFDA Nature Conservation Marine Protected Area (NCMPA) Screening Boundary and NCMPAs**

Project: Bellrock WFDA

Report: Scoping Report

Drawing No.: RHDHV_BEL_CST_FGR_0023

Figure A2.1

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Table 1.1: Summary of all NCMPAs Considered in this MPA Screening Report and their Features

NCMPA	Distance from Bellrock WFDA	Protected Feature(s)
East of Gannet and Montrose Fields	47 km	Offshore deep sea muds
		Ocean quahog *Arctica islandica* aggregations (including sands and gravels as their supporting habitat)
Turbot Bank	60 km	Sandeels *Ammodytes spp.*
Firth of Forth Banks Complex	65 km	Ocean quahog aggregations
		Offshore subtidal sands and gravels
		Shelf Banks and Mounds
		Moraines representative of The Wee Bankie Key Geodiversity Area
Southern Trench	95 km	Minke whale *Balaenoptera acutorostrata*
		Burrowed mud
		Fronts
		Shelf deeps
		Quaternary of Scotland (moraines and sub-glacial tunnel valleys)
		Submarine mass movement (side scars)
East Caithness Cliffs	240 km	Black guillemot *Cepphus grylle*
North-east Lewis	434 km	Risso's dolphin *Grampus griseus*
		Sandeels *Ammodytes spp.*
		Quaternary of Scotland
		Marine Geomorphology of the Scottish Shelf Seabed
Sea of the Hebrides	540 km	Minke whale
		Basking shark *Cetorhinus maximus*
		Marine Geomorphology of the Scottish Shelf Seabed
		Fronts

1.3.1 Benthic Habitats/Species and Geodiversity Features

21. The closest NCMPA to the Bellrock WFDA designated for benthic habitats/species and geodiversity features is the East of Gannet and Montrose Fields NCMPA (**Table 1.1**), where the following are protected features: offshore deep sea muds and Ocean quahog.

22. The ZoI for benthic habitats/species and geodiversity features is defined by the distance over which impacts from the offshore infrastructure associated with the Bellrock WFDA may occur, and the location of the receptors that may be affected by these impacts. Such impacts could include increased suspended sediment concentrations or changes to the hydrodynamic regime. The ZoI is defined by a tide-parallel 10 km wide buffer around the Bellrock WFDA, which is considered sufficiently precautionary to capture all sites likely to be in the ZoI from direct and indirect effects associated with construction activities.

23. No NCMPAs that are designated for benthic habitats/species and geodiversity features are located within a tide-parallel 10 km wide buffer around the Bellrock WFDA (**Table 1.1**), and therefore, as there is no potential pathway for impact, no NCMPAs that are designated for these features are screened in.

1.3.2 Fish and Shellfish

24. The greatest ZoI for fish and shellfish receptors arises from underwater noise associated with pile driving. Sensitivity to noise varies between fish species (Popper et al., 2014), and noise levels vary according to the dimensions of the piles and the environment within which the underwater sound propagates (e.g. sediment type, water depth) (Dahl et al., 2014; 2015). The underwater sound modelling for the Bellrock WFDA has not been completed at this stage and therefore the ZoI specific to the Bellrock WFDA is not yet known. Given these uncertainties, the screening distance for the fish and shellfish will be based on a conservative appraisal of the worst-case monopile pile driving impact ranges (temporary threshold shifts (TTS) in hearing or behavioural disturbance effects) for the most sensitive hearing groups of fish (fish that have a swim bladder that is involved in hearing), considered as stationary receptors, for recent offshore wind farm projects (**Table 1.2**). It should be noted that Bellrock WFDA plans to use smaller diameter pin piles and will therefore likely have lower impact ranges than the larger diameter monopiles referenced in **Table 1.2**.

Table 1.2: Worst-case Monopile Pile Driving Noise Impact Ranges for Recent Offshore Windfarm Projects

Project and Parameters	Worst-case Modelled Maximum Impact Range	Reference
Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects 16 m diameter monopile Maximum blow energy 5,500 kJ	39 km	Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects (2023) ES Appendix 10.2 – Underwater Noise Modelling Report (Revision C) (Clean)
Hornsea Project Four 15 m diameter monopile Maximum blow energy 5,000 kJ	38 km	Hornsea Project Four (2021) Environmental Statement: Volume A4, Annex 4.5: Subsea Noise Technical Report Part 1
Norfolk Vanguard 15 m diameter monopile Maximum blow energy 5,000 kJ	58 km	Norfolk Vanguard (2018) Environmental Statement Appendix 5.3 - Underwater Noise Modelling
East Anglia ONE North 15 m diameter monopile Maximum blow energy 4,000 kJ	39 km	East Anglia ONE North Limited (2019) Environmental Statement - Appendix 11.4 - Underwater Noise Assessment
Moray West 15 m diameter monopile Maximum blow energy 5,000 kJ	12 km	Moray West (2018) Environmental Impact Assessment Report - Technical Appendix 9.2: Underwater Noise Modelling
Berwick Bank 2 x 5.5m diameter pin piles piled concurrently Maximum blow energy 4,000 kJ	7 km	Berwick Bank Wind Farm (2022) Environmental Impact Assessment Report. Volume 2, Chapter 9: Fish and Shellfish Ecology

25. Given these reported impact ranges for other projects as detailed in **Table 1.2**, an appropriately conservative NCMPA screening range for the Bellrock WFDA has been set at 75 km.

26. Three NCMPAs that are designated for fish and shellfish species are located within 75 km of the Bellrock WFDA (**Table 1.1**), and therefore pathways for effect from underwater noise may exist. The relevant NCMPAs are:

- East of Gannet and Montrose Fields (designated for ocean quahog),
- Turbot Bank (designated for sandeels); and
- Firth of Forth Banks Complex (designated for ocean quahog).

27. In view of the designated features of the above sites, there are two features requiring consideration, sandeels and ocean quahog. The initial 75 km ZoI is based on the hearing sensitivity of the most sensitive fish species, however sandeels do not have a swim bladder and are therefore the lowest sensitivity group (Group 1 as defined by Popper *et al*. (2014) with regard to underwater sound) with no capacity to detect sound pressure waves (particle motion only). Ocean quahog, as bivalves, will also detect particle motion only, and will have less than or equal to sound sensitivity as sandeels. **Table 1.3** displays modelled recoverable injury ranges for Group 1 fish from other recent OWFs, demonstrating that in the case of sandeel (and similarly ocean quahog), significant effects are unlikely to occur at distances greater than 3.4 km. It should be noted that when using pin-piles, rather than monopiles, previous projects such as Berwick Bank have modelled that the SEL_{cum} threshold for recoverable injury for Group 1 fish will not be reached (**Table 1.3**).

28. For this reason, there is no likelihood that the Bellrock WFDA can affect the NCMPAs designated for fish and shellfish and they are screened out of further assessment on that basis.

Table 1.3: Worst-case Monopile Pile Driving Noise Recoverable Injury Ranges (Non-Sensitive Fish) for Recent Offshore Windfarm Projects

Project and Parameters	Worst-case Modelled Recoverable Injury Range for Group I Fish (SEL_{cum}, no swim bladder, particle motion detection)	Reference
Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects 16 m diameter monopile Maximum blow energy 5,500 kJ	1.1 km	Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects (2023) ES Appendix 10.2 – Underwater Noise Modelling Report (Revision C) (Clean)
Hornsea Project Four 15 m diameter monopile Maximum blow energy 5,000 kJ	1.3 km	Hornsea Project Four (2021) Environmental Statement: Volume A4, Annex 4.5: Subsea Noise Technical Report Part 1
Norfolk Vanguard 15 m diameter monopile Maximum blow energy 5,000 kJ	<10 m	Norfolk Vanguard (2018) Environmental Statement Appendix 5.3 - Underwater Noise Modelling
East Anglia ONE North 15 m diameter monopile Maximum blow energy 4,000 kJ	3.4 km	East Anglia ONE North Limited (2019) Environmental Statement - Appendix 11.4 - Underwater Noise Assessment
Berwick Bank 2 x 5.5m diameter pin piles piled concurrently Maximum blow energy 4,000 kJ	Impact threshold not reached	Berwick Bank Wind Farm (2022) Environmental Impact Assessment Report. Volume 2, Chapter 9: Fish and Shellfish Ecology

1.3.3 Marine Mammals

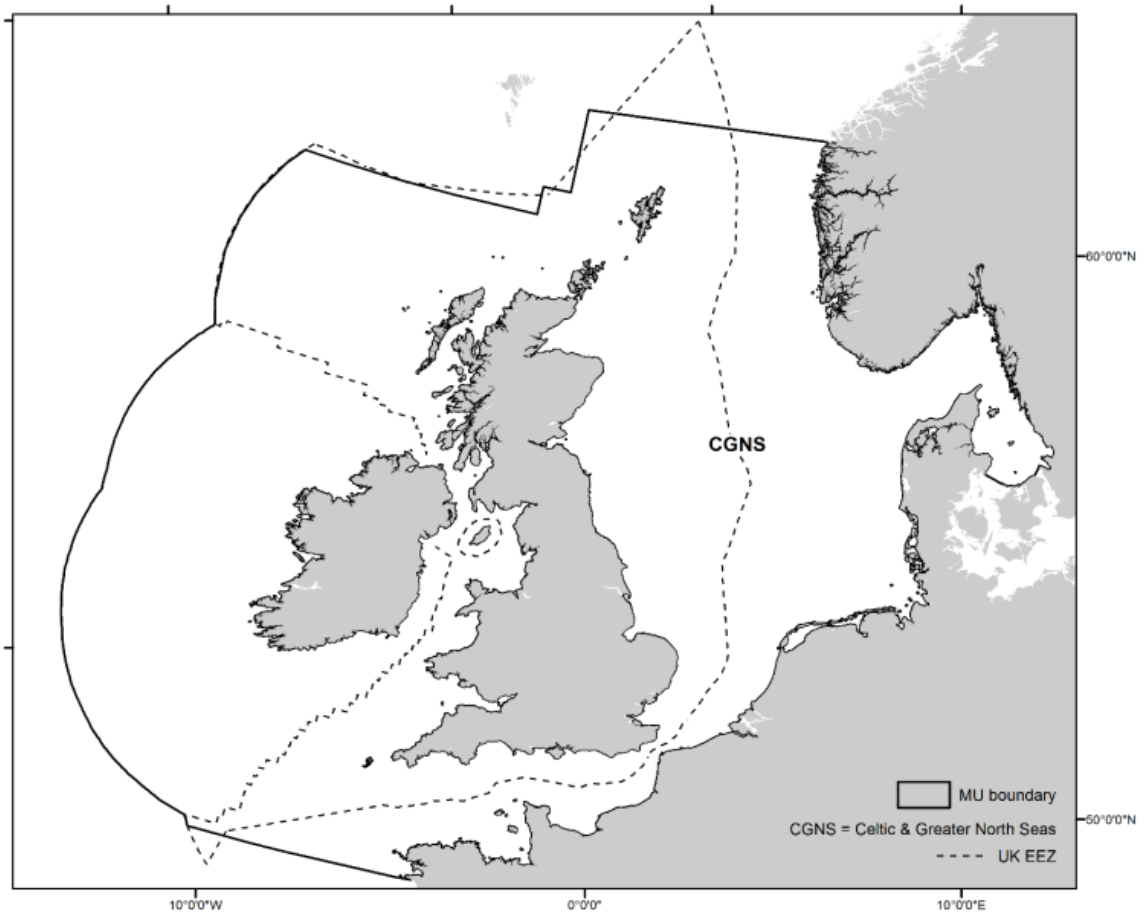
29. The closest NCMPA to the Bellrock WFDA designated for marine mammal features is the Southern Trench NCMPA (**Table 1.1**), where minke whale is a protected feature.

30. For marine mammals, MPA screening is initially undertaken based on the population range of the relevant species; i.e. their Management Units (MUs), as defined by the Inter-Agency Marine Mammal Working Group (IAMMWG) for cetaceans. For both Risso's dolphin and minke whale, this is the Celtic and Greater North Sea (CGNS) MU (as shown in **Plate 1.1**; IAMMWG, 2023). All three NCMPAs (as listed in **Table 1.1**) for marine mammals would fall into the CGNS MU.

31. Given the distance of 434 km and 540 km to the North-East Lewis (designated for Risso's dolphin) and Sea of the Hebrides NCMPAs (designated for minke whale) respectively, there is no potential for direct effect, or indirect effect to either protected site. Therefore, the North-East Lewis and Sea of the Hebrides NCMPAs are screened out of further assessment, with no potential for connectivity to the NCMPA site with either the Bellrock WFDA or its associated potential ZoIs.

32. Therefore, the Southern Trench NCMPA, which is designated for minke whale, is the only NCMPA to be screened in for assessment for marine mammals.

Plate 1.1: GCNS MU for Risso's Dolphin and Minke Whale



1.3.4 Ornithology

33. The closest NCMPA to the Bellrock WFDA designated for ornithology features is the East Caithness Cliffs NCMPA (**Table 1.1**), where black guillemot is a protected feature under the criterion 'Aggregations of breeding birds'.

34. The nearest distance between the Bellrock WFDA and the NCMPA is 240 km, whereas black guillemot have strongly inshore foraging ecology during the breeding season with a mean-maximum foraging range (+ 1 standard deviation (SD)) of less than 10 km (4.8±4.3 km, Woodward et al. 2019). As such, there is no potential connectivity between the black guillemot protected feature of the NCMPA and the Bellrock WFDA during the breeding season.

35. Similarly, there is no potential connectivity between the black guillemot protected feature of the NCMPA and the Bellrock WFDA during the non-breeding season. Furness (2015) defines the Biologically Defined Minimum Population Scale (BDMPS) of black guillemot during the non-breeding season as "birds found within 20 km of a specific [breeding] site," and considers 10-15 km to represent "exceptionally large" dispersal distances for the species.

36. These buffers are considered sufficiently precautionary to rule out indirect effects associated with the construction, operation and decommissioning of the Bellrock WFDA. Black guillemot is not expected to occur within or in proximity to the Bellrock WFDA and therefore this feature and the East Caithness Cliffs NCMPA is screened out of further assessment.

37. No other NCMPAs are relevant to screen in, as NCMPAs in Scotland designated for ornithology features are at the time of writing only designated for black guillemot (no other ornithological species) and of further distance than the East Caithness Cliffs NCMPA, and therefore outside the ZoI for this species.

1.3.5 Summary of Nature Conservation Marine Protected Areas Screened In and Out

38. In line with the descriptions in **Sections 1.3.1** to **1.3.4** above, **Table 1.4** provides a summary of the NCMPAs and features screened in/out for further assessment.

39. Note that for NCMPAs which have been screened out, given the lack of connectivity from the Bellrock WFDA to their features, it is considered that there is no potential for the Bellrock WFDA to contribute to any cumulative effects upon these NCMPAs.

Table 1.4: Summary of NCMPAs Screened In or Out

NCMPA	Protected Feature(s)	Screened In (✓) or Out (x)
East of Gannet and Montrose Fields	Offshore deep sea muds	X
	Ocean quahog aggregations (including sands and gravels as their supporting habitat)	X
Turbot Bank	Sandeels	X

NCMPA	Protected Feature(s)	Screened In (✓) or Out (x)
Firth of Forth Banks Complex	Ocean quahog aggregations	X
	Offshore subtidal sands and gravels	X
	Shelf Banks and Mounds	X
	Moraines representative of The Wee Bankie Key Geodiversity Area	X
Southern Trench	Minke whale	✓
	Burrowed mud	X
	Fronts	X
	Shelf deeps	X
	Quaternary of Scotland (moraines and sub-glacial tunnel valleys)	X
	Submarine mass movement (side scars)	X
East Caithness Cliffs	Black guillemot	X
North-east Lewis	Risso's dolphin *Grampus griseus*	X
	Sandeels *Ammodytes spp.*	X
	Quaternary of Scotland	X
	Marine Geomorphology of the Scottish Shelf Seabed	X
Sea of the Hebrides	Minke whale	X
	Basking shark *Cetorhinus maximus*	X
	Marine Geomorphology of the Scottish Shelf Seabed	X
	Fronts	X

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2 Nature Conservation Marine Protected Area Screening

2.1 Southern Trench Nature Conservation Marine Protected Area

40. In line with the screening methodology outlined in **Section 1.3**, the Southern Trench NCMPA is screened in for assessment, on the basis of the Bellrock WFDA being capable of affecting (other than insignificantly) a protected feature of the site.

41. The Southern Trench NCMPA was first designated in 2020 and lies in the Outer Moray Firth off the coast of Aberdeenshire. The Southern Trench NCMPA, which covers an area of 2,536 km^2, is designated to protect four biodiversity features (burrowed mud, fronts, minke whale and shelf deeps) and two geodiversity features (Quaternary of Scotland and Submarine Mass Movement) (NatureScot, 2020).

42. The NCMPA is host to a wide range of marine life and features a front (where dynamic mixing zone of warm and cold waters takes place) which attracts shoals of herring, mackerel and cod to the area. The NCMPA is named after the Southern Trench, which is 58 km long, 9 km wide and 250 m deep trench that runs parallel to the coast. The soft sands covering much of the seabed in the trench also provide abundant habitat for sandeels, which in turn draws predators such as minke whale to the area (NatureScot, 2020).

43. In line with the methodology outlined in **Section 1.3**, all features have been screened out, except minke whale (see **Table 1.4**). It is considered that the Bellrock WFDA and associated works is capable of affecting, other than insignificantly, the protected features of the NCMPA, with the proposed impacts to be considered for minke whale in the NCMPA Main Assessment, for construction, operation and maintenance and decommissioning respectively set out in **Table 2.1.** Only impacts that have the potential to affect minke whale within the boundary of the Southern Trench NCMPA will be considered in line with feedback received from NatureScot (refer to **Table 4.1** in the **Bellrock WFDA Scoping Report**). The final decision on impacts to be screened in will be informed by the underwater noise modelling undertaken for the Bellrock WFDA (see **Appendix 5** of the **Bellrock WFDA Scoping Report**).

Table 2.1: Potential Impacts to be Considered for Minke Whale in the NCMPA Main Assessment

Potential impact	Construction	Operation and Maintenance	Decommissioning
Underwater noise during unexploded (UXO) clearance (based on the worst case of high order clearance)	✓	x	x
Underwater noise during geophysical surveys	x	x	x

Potential impact	Construction	Operation and Maintenance	Decommissioning
Underwater noise during substructure installation	✓	x	x
Underwater noise from other activities (for example rock placement and cable laying)	x	x	x
Underwater noise and presence of vessels	✓	✓	✓
Underwater noise from operational wind turbines and floating turbine substructure moorings on the seabed	x	x	x
Collision risk with vessels	✓	✓	✓
Primary entanglement	x	x	x
Secondary entanglement	x	x	x
Changes in water quality	x	x	x
Changes to prey availability	x	x	x
Electromagnetic fields (EMF) - direct effects	x	x	x

44. The overarching conservation objectives of the Southern Trench NCMPA, with respect to minke whale, are detailed in **Table 3.1**.

3 Summary

45. In consideration of the ZoI outlined for benthic habitats/species and geodiversity features, fish, marine mammals and ornithology features in **Section 1.3**, this NCMPA Screening has screened in the Southern Trench NCMPA for minke whale.

46. This NCMPA will be taken forward for NCMPA Main Assessment alongside the Bellrock WFDA EIA Report. The summary of the screening is provided in **Table 3.1**.

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Table 3.1: NCMPA Screening Summary and Conservation Objectives

NCMPA	Protected Feature(s)	Type	Conservation Objective	Condition	Justification for Screening Feature In
Southern Trench	Minke whale	Mobile species	• Maintain in favourable condition. • Minke whale in the Southern Trench MPA are not at significant risk from injury or killing. • Conserve the access to resources (e.g. for feeding) provided by the NCMPA for various stages of the minke whale life cycle. • Conserve the distribution of minke whale within the site by avoiding significant disturbance. • Conserve the extent and distribution of any supporting feature upon which minke whale is dependent. • Conserve the structure and function of supporting features, including processes to ensure minke whale are healthy and not deteriorating.	Favourable (NatureScot, 2020)	Within ZoI identified for minke whale for the Bellrock WFDA

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Bellrock OFFSHORE WIND

Appendix 3: Mitigation Register

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Contents

Tables

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1 Introduction

1. This appendix provides a summary of proposed embedded mitigation and consent plans for the Bellrock Wind Farm Development Area (WFDA), as detailed in each technical chapter of the **Bellrock WFDA Scoping Report** (**Chapters 5 to 19**). The potential impacts and mitigation proposed are based on the Bellrock WFDA boundary and should the boundary change, this will be reflected in the Environmental Impact Assessment (EIA). If any changes are considered to change the Scoping Opinion, this will be highlighted in the EIA Report and discussed with Marine Directorate – Licensing Operations Team (MD-LOT) as appropriate.

2. As set out in **Chapter 4: Approach to Scoping and Environmental Impact Assessment** of the **Bellrock FDA Scoping Report**, three types of mitigation will be identified and used within the Bellrock WFDA EIA Report.

   - **Primary mitigation**: modifications to the location or design made during the pre-application phase that are treated as an inherent part of the Bellrock WFDA. This includes the adoption of methods and equipment for seabed preparation which have been designed to minimise the potential for sediment suspension and dispersal.
   - **Secondary mitigation**: actions that will require further activity in order to achieve the anticipated outcome. The effectiveness of such measures will be assessed within the EIA Report and appropriate mitigation will be secured by a consent condition. This may include seasonal restrictions on certain construction activities being undertaken to minimise impacts on a migratory species.
   - **Tertiary mitigation**: actions that would occur with or without input from the EIA. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are standard practices used to manage commonly occurring environmental effects. These measures are treated as an inherent part of the Bellrock WFDA. This includes development and adherence to management plans, such as a Marine Pollution Contingency Plan and Environmental Management Plan.

3. Primary and tertiary mitigation are considered to be ‘embedded’ mitigation as they are incorporated as part of the Bellrock WFDA’s design. The assessment of the likely significant environmental effects for the pre-mitigation scenario presented within the Bellrock WFDA EIA Report will take embedded mitigation (i.e. primary and tertiary mitigation) into account in determining the magnitude of change. Therefore, potential effects which might arise prior to the implementation of embedded mitigation do not need to be identified as potential effects as there is no potential for these potential effects to arise (IEMA, 2016).

4. **Table 1.1** below collates and summarises the embedded mitigation commitments set out within **Chapters 5 to 19** of the **Bellrock WFDA Scoping Report**. It is expected that the Scoping Opinion and ongoing stakeholder engagement will further refine and develop the proposed primary, secondary and tertiary mitigation measures as the EIA process progresses. This Mitigation Register is therefore considered to be a live document which will be updated accordingly throughout the EIA process.

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Table 1.1: Mitigation Register and Mitigation Type: Primary (P), Secondary (S) or Tertiary (T)

Mitigation Measure	Marine Geology, Oceanography & Physical Processes (Ch. 5)	Benthic Ecology (Ch. 6)	Fish & Shellfish Ecology (Ch. 7)	Marine Mammals (Ch. 8)	Offshore Ornithology (Ch. 9)	Commercial Fisheries (Ch. 10)	Shipping & Navigation (Ch. 11)	Aviation & Radar (Ch. 12)	Marine Infrastructure & Other Users (Ch. 13)	Marine Archaeology & Cultural Heritage (Ch. 14)	Seascape, Landscape & Visual (Ch. 15)	Socioeconomics, Tourism & Recreation (Ch. 16)	Climate Change (Ch. 17)	Offshore Air Quality (Ch. 18)	Major Accidents & Disasters (Ch. 19)	Mitigation Type (Primary (P), Secondary (S) or Tertiary (T))
Where seabed preparation is required (e.g. seabed levelling), methods and equipment that have been designed to minimise potential for sediment suspension and dispersal will be adopted.	✓	✓	✓													P
A detailed Cable Burial Risk Assessment (CBRA) will be prepared where inter-array cables are buried to confirm the extent to which cable burial can be achieved	✓					✓	✓								✓	P
Compliance with the International Convention for the Prevention of Pollution from Ships (MARPOL) 73/78	✓	✓	✓	✓										✓	✓	T
Development of, and adherence to, an Environmental Management Plan (EMP)	✓	✓	✓	✓										✓	✓	T
Development of and adherence to an Invasive Non-Native Species Management Plan (INNSMP)		✓	✓													T
Consideration of guidance from the International Maritime Organisation (IMO, 2023) on the control and management of ships' biofouling to minimise the transfer of invasive aquatic species.		✓	✓													T

Mitigation Measure	Marine Geology, Oceanography & Physical Processes (Ch. 5)	Benthic Ecology (Ch. 6)	Fish & Shellfish Ecology (Ch. 7)	Marine Mammals (Ch. 8)	Offshore Ornithology (Ch. 9)	Commercial Fisheries (Ch. 10)	Shipping & Navigation (Ch. 11)	Aviation & Radar (Ch. 12)	Marine Infrastructure & Other Users (Ch. 13)	Marine Archaeology & Cultural Heritage (Ch. 14)	Seascape, Landscape & Visual (Ch. 15)	Socioeconomics, Tourism & Recreation (Ch. 16)	Climate Change (Ch. 17)	Offshore Air Quality (Ch. 18)	Major Accidents & Disasters (Ch. 19)	Mitigation Type (Primary (P), Secondary (S) or Tertiary (T))
Implementation of and ramp-up measures for piling, to be set out in a Piling Strategy (PS)			✓	✓												P/T
Development of, and adherence to Fisheries Management and Mitigation Strategy (FMMS)			✓			✓										T
Development of, and adherence to, a Marine Pollution Contingency Plan (MPCP)	✓	✓	✓	✓	✓	✓	✓								✓	T
Development of, and adherence to, a Cable Plan (CaP)	✓	✓	✓			✓			✓	✓					✓	T
Adherence to the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)		✓	✓	✓	✓											T
Adherence to the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention, 2004)		✓	✓													T
Development of Unexploded Ordnance (UXO) Threat and Risk Assessment			✓	✓					✓	✓					✓	T
Use of low noise UXO clearance techniques where possible and use of UXO mitigation hierarchy			✓	✓											✓	P

Mitigation Measure	Marine Geology, Oceanography & Physical Processes (Ch. 5)	Benthic Ecology (Ch. 6)	Fish & Shellfish Ecology (Ch. 7)	Marine Mammals (Ch. 8)	Offshore Ornithology (Ch. 9)	Commercial Fisheries (Ch. 10)	Shipping & Navigation (Ch. 11)	Aviation & Radar (Ch. 12)	Marine Infrastructure & Other Users (Ch. 13)	Marine Archaeology & Cultural Heritage (Ch. 14)	Seascape, Landscape & Visual (Ch. 15)	Socioeconomics, Tourism & Recreation (Ch. 16)	Climate Change (Ch. 17)	Offshore Air Quality (Ch. 18)	Major Accidents & Disasters (Ch. 19)	Mitigation Type (Primary (P), Secondary (S) or Tertiary (T))
Development of, and adherence to, a Marine Mammal Mitigation Protocol (MMMP)				✓												T
Adherence to The Scottish Marine Wildlife Watching Code (Scottish Natural Heritage (SNH), 2017)			✓	✓												T
In the event of a collision with a marine mammal, this will be reported, and full information of the incident, including the marine mammal species, will be recorded				✓												T
Appointment of a Fisheries Liaison Officer (FLO) during the construction phase						✓										T
Development of, and adherence to, a Navigational Safety Plan (NSP)						✓	✓		✓						✓	T
Advance warning and accurate location details of construction, maintenance and decommissioning operations, associated Safety Zones and advisory passing distances will be given via Notices to Mariners and Kingfisher Bulletins						✓	✓		✓						✓	T
Development of, and adherence to, a Lighting and Marking Plan (LMP)						✓	✓	✓	✓						✓	T

Mitigation Measure	Marine Geology, Oceanography & Physical Processes (Ch. 5)	Benthic Ecology (Ch. 6)	Fish & Shellfish Ecology (Ch. 7)	Marine Mammals (Ch. 8)	Offshore Ornithology (Ch. 9)	Commercial Fisheries (Ch. 10)	Shipping & Navigation (Ch. 11)	Aviation & Radar (Ch. 12)	Marine Infrastructure & Other Users (Ch. 13)	Marine Archaeology & Cultural Heritage (Ch. 14)	Seascape, Landscape & Visual (Ch. 15)	Socioeconomics, Tourism & Recreation (Ch. 16)	Climate Change (Ch. 17)	Offshore Air Quality (Ch. 18)	Major Accidents & Disasters (Ch. 19)	Mitigation Type (Primary (P), Secondary (S) or Tertiary (T))
Adherence to best practice guidance with regards to fisheries liaison and procedures in the event of interactions between the Bellrock WFDA and fishing activities (e.g., FLOWW, 2014; 2015)						✓										T
Participation in any fisheries working group to assist with liaison between the Applicants and the fishing community						✓										S
Application for and use of Safety Zones						✓	✓		✓						✓	P
Dropped objects on the seabed during works associated with the Bellrock WFDA which may pose a hazard will be reported in line with Marine Directorate-Licensing Operations Team procedures						✓	✓		✓						✓	T
All offshore infrastructure associated with the Bellrock WFDA will be appropriately marked on UK Hydrographic Office Admiralty charts						✓	✓		✓						✓	T
The Applicants will ensure compliance with Marine Guidance Note 654 and its annexes, where applicable, including completion post consent of Search and Rescue (SAR) Checklist in consultation with the Maritime and Coastguard Agency (MCA)							✓	✓							✓	T

Mitigation Measure	Marine Geology, Oceanography & Physical Processes (Ch. 5)	Benthic Ecology (Ch. 6)	Fish & Shellfish Ecology (Ch. 7)	Marine Mammals (Ch. 8)	Offshore Ornithology (Ch. 9)	Commercial Fisheries (Ch. 10)	Shipping & Navigation (Ch. 11)	Aviation & Radar (Ch. 12)	Marine Infrastructure & Other Users (Ch. 13)	Marine Archaeology & Cultural Heritage (Ch. 14)	Seascape, Landscape & Visual (Ch. 15)	Socioeconomics, Tourism & Recreation (Ch. 16)	Climate Change (Ch. 17)	Offshore Air Quality (Ch. 18)	Major Accidents & Disasters (Ch. 19)	Mitigation Type (Primary (P), Secondary (S) or Tertiary (T))
Development of a Navigational Risk Assessment (NRA)						✓	✓								✓	T
Development of, and adherence to, an Emergency Response Cooperation Plan (ERCoP)						✓	✓	✓	✓						✓	T
The Applicant will ensure compliance with the Regulatory Expectations on Moorings for Floating Wind and Marine Devices (MCA and Health and Safety Executive, 2017)						✓	✓		✓						✓	T
Development of, and adherence to, a Development Specification and Layout Plan (DSLP)						✓	✓		✓						✓	T
Where appropriate, guard vessels will be used to ensure adherence with Safety Zones or advisory passing distances						✓	✓		✓						✓	P
Lights, marks, sounds, signals, and other aids to navigation will be exhibited as required by NLB, MCA, and Civil Aviation Authority (CAA) including the buoyed construction/decommissioning areas							✓	✓								P
Marine coordination will be implemented to manage project vessels throughout construction, maintenance, and decommissioning periods						✓	✓		✓						✓	T

Mitigation Measure	Marine Geology, Oceanography & Physical Processes (Ch. 5)	Benthic Ecology (Ch. 6)	Fish & Shellfish Ecology (Ch. 7)	Marine Mammals (Ch. 8)	Offshore Ornithology (Ch. 9)	Commercial Fisheries (Ch. 10)	Shipping & Navigation (Ch. 11)	Aviation & Radar (Ch. 12)	Marine Infrastructure & Other Users (Ch. 13)	Marine Archaeology & Cultural Heritage (Ch. 14)	Seascape, Landscape & Visual (Ch. 15)	Socioeconomics, Tourism & Recreation (Ch. 16)	Climate Change (Ch. 17)	Offshore Air Quality (Ch. 18)	Major Accidents & Disasters (Ch. 19)	Mitigation Type (Primary (P), Secondary (S) or Tertiary (T))
There will be a minimum blade tip clearance of at least 22 m Above Mean Sea Level					✓		✓								✓	P/T
Visual surveys and identification of debris entangled to the Bellrock WFDA infrastructure, through periodic inspections as part of the asset integrity campaign.					✓											T
Bellrock WFDA vessels will ensure compliance with international marine regulations as adopted by the Flag State, including the COLREGs (International Maritime Organisation; IMO, 1972/77) and SOLAS (IMO, 1974)						✓	✓		✓						✓	T
Development of, and adherence to, a Vessel Management Plan (VMP)				✓		✓	✓		✓						✓	T
Appropriate marking of the Bellrock WFDA on aeronautical charts. This will include provision of the positions and heights of structures to CAA, Ministry of Defence, and Defence Geographics Centre								✓							✓	T

Mitigation Measure	Marine Geology, Oceanography & Physical Processes (Ch. 5)	Benthic Ecology (Ch. 6)	Fish & Shellfish Ecology (Ch. 7)	Marine Mammals (Ch. 8)	Offshore Ornithology (Ch. 9)	Commercial Fisheries (Ch. 10)	Shipping & Navigation (Ch. 11)	Aviation & Radar (Ch. 12)	Marine Infrastructure & Other Users (Ch. 13)	Marine Archaeology & Cultural Heritage (Ch. 14)	Seascape, Landscape & Visual (Ch. 15)	Socioeconomics, Tourism & Recreation (Ch. 16)	Climate Change (Ch. 17)	Offshore Air Quality (Ch. 18)	Major Accidents & Disasters (Ch. 19)	Mitigation Type (Primary (P), Secondary (S) or Tertiary (T))
Aviation lighting and marking, as described in the LMP, will be installed in accordance with Article 223 of the UK ANO 2016 which sets out the mandatory requirements to be followed for lighting of offshore Wind Turbine Generators (WTGs)								✓							✓	P/T
Notification of the towing of FOUs will made to the CAA in accordance with article 225a of the UK ANO 2016								✓								T
No more than two none-rotating turbines will be towed together at once and will not exceed a velocity of 10 knots								✓								P
The layout of the WTGs in the Bellrock WFDA, will be finalised in discussion with the MCA and NLB in order to ensure the specific WTG layout is compatible with potential SAR activity							✓	✓	✓						✓	P/T
Failures of the lighting and marking in the Bellrock WFDA will be appropriately reported and rectified as soon as practicable. Interim hazard warnings (i.e. Notice to Mariners) will be put in place as required.						✓	✓	✓	✓						✓	T

Mitigation Measure	Marine Geology, Oceanography & Physical Processes (Ch. 5)	Benthic Ecology (Ch. 6)	Fish & Shellfish Ecology (Ch. 7)	Marine Mammals (Ch. 8)	Offshore Ornithology (Ch. 9)	Commercial Fisheries (Ch. 10)	Shipping & Navigation (Ch. 11)	Aviation & Radar (Ch. 12)	Marine Infrastructure & Other Users (Ch. 13)	Marine Archaeology & Cultural Heritage (Ch. 14)	Seascape, Landscape & Visual (Ch. 15)	Socioeconomics, Tourism & Recreation (Ch. 16)	Climate Change (Ch. 17)	Offshore Air Quality (Ch. 18)	Major Accidents & Disasters (Ch. 19)	Mitigation Type (Primary (P), Secondary (S) or Tertiary (T))
The implementation of Archaeological Exclusion Zones (AEZs) around sites identified as having a known important archaeological potential to mitigate the potential impacts from offshore infrastructure.										✓						T
Archaeological input into specifications for and analysis of future pre-construction geophysical surveys within the Bellrock WFDA.										✓						T
Archaeologists to be consulted in the preparation of any pre-construction Remotely Operated Vehicle or diver surveys and in monitoring/checking of data, if appropriate based upon the findings of the archaeological assessment of geophysical survey data.										✓						T
All anomalies of possible archaeological potential will be reviewed against the final layout and design. If they are likely to be impacted, these anomalies would undergo further archaeological investigation. Should these anomalies prove to be of archaeological importance then future AEZs may be implemented following consultation with Historic Environment Scotland.										✓						T

Mitigation Measure	Marine Geology, Oceanography & Physical Processes (Ch. 5)	Benthic Ecology (Ch. 6)	Fish & Shellfish Ecology (Ch. 7)	Marine Mammals (Ch. 8)	Offshore Ornithology (Ch. 9)	Commercial Fisheries (Ch. 10)	Shipping & Navigation (Ch. 11)	Aviation & Radar (Ch. 12)	Marine Infrastructure & Other Users (Ch. 13)	Marine Archaeology & Cultural Heritage (Ch. 14)	Seascape, Landscape & Visual (Ch. 15)	Socioeconomics, Tourism & Recreation (Ch. 16)	Climate Change (Ch. 17)	Offshore Air Quality (Ch. 18)	Major Accidents & Disasters (Ch. 19)	Mitigation Type (Primary (P), Secondary (S) or Tertiary (T))
Archaeological input into specifications for and analysis of future pre-construction geotechnical surveys and a provision for sampling, analysis and reporting of recovered cores, if appropriate. The results of all geoarchaeological investigations to be compiled in a final report which includes a sediment deposit model.										✓						T
Commitment to preparation and agreement on an Offshore Written Scheme of Investigation (WSI) and Protocol of Archaeological Discoveries (PAD).										✓						T
Micro-siting of station keeping system to avoid known heritage assets (AEZs) where possible.										✓						T
Adherence to Supply Chain Development Statement.												✓				P
Commitment to following the IEMA greenhouse gas (GHG) Management Hierarchy and PAS2080 guidance document													✓			T
Development and adherence to a Decommissioning Programme (see **Section 3.9.5** of Bellrock WFDA Scoping Report).	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	T

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5. **Table 1.2** below summarises the management plans which the Applicant commits to developing pre-construction in support of the Bellrock WFDA. The Applicant will discuss with MD-LOT and agree which plans, in outline form, will be included in the applications.

Table 1.2: Management Plans

Management Plan	Description
Cable Plan	Contains details on environmental sensitivities and design considerations to mitigate, as far as possible, the effects of export or inter-array cable laying and associated protection during installation and operation of the Bellrock WFDA.
Construction Method Statement	Describes how tasks and activities will be constructed safely.
Decommissioning Programme	Gives details of all aspects of the Bellrock WFDA, from the associated effects the infrastructure will have on the surrounding environment to the current known methods to undertake the decommissioning.
Development Specification and Layout Plan	Sets the final design and layout parameters associated with the Bellrock WFDA.
Emergency Response Cooperation Plan	Ensures the co-operation with the Maritime and Coastguard Agency by detailing the design parameters of the Bellrock WFDA, emergency contact details, and processes to be followed.
Environmental Management Plan	Outlines how the construction activities for the Bellrock WFDA will avoid, minimise or mitigate effects on the environment and surrounding area.
Fisheries Management and Mitigation Strategy	Details approach to undertaking pre-construction, construction, and operational works in co-operation with existing commercial fisheries activities, developed in consultation with fishing representatives.
Invasive Non-Native Species Management Plan	Details mitigation measures to minimise the introduction and transfer of invasive non-native species.
Lighting and Marking Plan	Sets out the marine and aviation navigational lighting and marking measures to be applied during the construction and operation of the Bellrock WFDA.
Marine Mammal Mitigation Protocol	Sets out the protocol of how potential impacts to marine mammals during construction activities would be mitigated to meet any relevant licence conditions associated with the marine mammals.
Marine Pollution Contingency Plan	Details appropriate measures and procedures to be undertaken in the event of a pollution incident.
Navigational Safety Plan	Describes measures put in place by the Bellrock WFDA related to navigational safety, including information on Safety Zones, charting, construction buoyage, temporary lighting and marking, and means of notification of Bellrock WFDA activity to other sea users (e.g., via Notice to Mariners).
Piling Strategy	Details piling methods and programme and includes the mitigation measure to be taken to reduce effects on noise sensitive species.
Protocol of Archaeological Discoveries	Provides procedures for reporting and investigation unexpected archaeological discoveries found during site investigations and construction.

Management Plan	Description
Vessel Management Plan	Provides the management and coordination of vessels to mitigate the impact of vessels.
Written Scheme of Investigation	A method statement that clearly details the process and approach to undertaking heritage works associated with the Bellrock WFDA's construction.

2 References

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Bellrock OFFSHORE WIND

Appendix 4: Marine Mammals Existing Enviroment

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Contents

Tables

Plates

1 Existing Environment

1. This appendix details the existing environment for marine mammals in relation to the Bellrock Wind Farm Development Area (WFDA) and should be read in conjunction with **Chapter 8: Marine Mammals** of the **Bellrock WFDA Scoping Report**. It details the existing environment for marine mammals and presents the scoping of marine mammal species. This appendix has been prepared by Royal HaskoningDHV.

1.1 Study Area

2. As highly mobile marine predators, the status and activity of marine mammals known to occur within or adjacent to the Bellrock WFDA will be considered in the context of their Management Unit (MU) population for each species shown below in **Section 1.4.**

1.2 Site-Specific Surveys

3. Site-specific offshore aerial surveys are being conducted for both marine mammals and seabirds. Offshore aerial surveys commenced in March 2022 and were completed in February 2024, with a single survey carried out in each calendar month (i.e. a total of 24 months). The survey, undertaken by HiDef Aerial Surveying Limited (HiDef) (refer to **Chapter 9: Offshore Ornithology** of the Bellrock WFDA Scoping Report for further details on the offshore aerial survey), collects high resolution aerial digital still imagery for marine megafauna (combined with ornithology surveys). The offshore aerial survey area adopted within this Scoping Report comprises the Bellrock WFDA area plus a 4 km buffer, totalling 658 km^2. For marine mammals, it is important to consider the individuals that it would not be possible to detect using observer-based survey or aerial survey techniques, due to the time marine mammals spend below the water surface, and therefore are undetectable. In order to account for this, the density and abundance estimates are corrected to account for the time that each species spends below the water surface (and therefore not detected in the offshore aerial surveys).

4. Correction factors for availability bias are based on the known dive behaviours of each species. For harbour porpoise, correction factors are based on the data presented in Voet et al*.* (2017) or Teilmann et al*.* (2007; 2013), and use different factors for each season, and for submerged and surfacing individuals. For harbour porpoise, these corrections will be undertaken by HiDef as part of the analysis and reporting process.

5. For other species, correction factors for availability bias are less well understood. If required to correct the density estimates for other species, a review of available correction factors will be undertaken through the Environmental Impact Assessment (EIA) process. The review will include data from the Sea Mammal Research Unit (SMRU) (2011) for both seal species, Rasmussen et al. (2013) for white-beaked dolphin, and Mate et al*.* (1995) for bottlenose dolphin *Tursiops truncatus*, and Small Cetaceans in European Atlantic Waters and the North Sea (SCANS)-II and SCANS-III (Hammond et al. 2013).

6. The results of the offshore aerial surveys would also be adjusted to account for those individuals that could not be identified to species level (i.e., unidentified seal species). This is referred to as species apportioning in the survey reporting. The standard method of apportioning would be to assume a proportion of the individuals in each species group would be a certain number of species within that unidentified group, based on the proportion of each of those species that had already been identified[1].

7. While a density and abundance estimate would be derived for each species recorded during the surveys, these would only be used within the impact assessments where that species has been sighted regularly and the quality of density estimates is considered sufficient. This is due to potential limitations on the estimates, including the low confidence in any density and abundance estimate from very few sightings[2]. The proposed use of the site-specific density estimates (if sufficient data is collected) is described in **Section 1.4.1** for cetacean species, and **Section 1.4.2** for seal species.

1.2.1 Summary of Site-specific Survey Results

8. The species (and number) of marine mammals recorded during the first year of the offshore aerial surveys (for March 2022 to February 2023) are set out in **Table 1.1**. The Bellrock WFDA EIA Report will be informed by the full two years of survey data.

Table 1.1: Species Recorded During the HiDef Offshore Aerial Surveys Between March 2022 – February 2023

Species	Number of individuals
Harbour porpoise *Phocoena phocoena*	100
White-beaked dolphin *Lagenorhynchus albirostris*	3
Minke whale *Balaenoptera acutorostrata*	2
Unidentified seal species	6
Unidentified cetacean species	1
Unidentified dolphin species	1

[1] For example, species apportioning for those individuals categorised as ‘unidentified dolphin species’ in **Table 1.1** would be 100% apportioned to being white-beaked dolphin, as no other dolphin species have been identified (to date) within the surveys. When analysing the results, consideration will be given to the proportion of unidentified individuals and how representative/reliable the proposed distribution of the data is.

[2] For example, based on the currently available data (**Table 1.1**), there would be sufficient numbers of harbour porpoise to provide density and abundance estimates with relatively good confidence. However, there would not be for white-beaked dolphin or minke whale, as only three or two respectively (plus the one unidentified cetacean and one unidentified dolphin species) have been sighted.

9. Harbour porpoise were identified in higher numbers during the summer months (of May to August 2022) than at any other time, with a peak of 42 individuals in June. When corrected for availability bias, the average annual harbour porpoise density is 0.728 individuals per km^2. Note that this is for the first year of surveys only, and will be updated with the full results for the EIA.

1.3 Data and Information Sources

10. **Table 1.2** lists the data sources that will be used to inform the baseline assessment within the Bellrock WFDA EIA Report. This list is not exhaustive, and a full review of all potential data sources and information for marine mammals in the vicinity of the Bellrock WFDA will be incorporated into the baseline review provided within the Bellrock WFDA EIA Report. This will include the latest research from the Cetacean Research & Rescue Unit, the Scottish Association for Marine Science (SAMS) and the SMRU.

Table 1.2: Summary of Key Data and Information Sources for Marine Mammals

Dataset	Year(s)	Description
Site-specific offshore aerial surveys.	March 2022 – February 2024	Digital offshore aerial surveys of the Bellrock WFDA. Further described in **Section 1.2**.
Small Cetaceans in the European Atlantic and North Sea (SCANS-III): Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys (Hammond et al. 2021).	Survey undertaken in Summer 2016	Density and abundance estimates for cetacean species in the European Atlantic and North Sea.
SCANS-IV: Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys (Gilles et al. 2023).	Survey undertaken in summer 2022	Density and abundance estimates for cetacean species in the European Atlantic and North Sea.
East Coast Marine Mammal Acoustic Study (ECOMMAS).	2013 - 2016	Cetacean-Porpoise Detectors (CPODs) data at 30 locations on the east coast. Deployed for four months (summer) in 2013 and 2014, and eight months (April to November) in 2015 and 2016.
Revised Phase III data analysis of Joint Cetacean Protocol (JCP) data resources (Paxton et al. 2016).	Data from a range of sources, analysed and reported on in 2015 and 2016	Density mapping for the most common cetacean species in UK waters.
Distribution maps of cetacean and seabird populations in the North-East Atlantic (Waggitt et al. 2019).	Data from a range of sources, analysed and reported on in 2019	Density mapping for the most common cetacean species in European and North-East Atlantic waters for each month.
POSEIDON project (Planning Offshore Wind Strategic Environmental Impact Decisions) [if available].	Various	Density mapping tools for marine mammals and seabirds.

Dataset	Year(s)	Description
The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area (Heinänen and Skov, 2015).	Utilised data sources covering the years between 1994 and 2011	Data was used to determine harbour porpoise Special Area of Conservation (SAC) sites. Provides information on harbour porpoise in the North Sea area.
ORCA surveys on ferry routes from Aberdeen (ORCA, 2023).	Data currently available up until April 2023	Provides information on species in the Northern North Sea ferry routes (trained volunteers).
Sea Watch Foundation volunteer sightings off North-East Scotland and South Grampian and South-East Scotland (Sea Watch Foundation, 2023).	Public sightings database	Provides information on species in North-East Scotland and South Grampian and South-East Scotland (SES) regions (volunteer sightings).
Management Units for cetaceans in UK waters (Inter-Agency Marine Mammal Working Group (IAMMWG), 2023).	Data from a range of sources, analysed and reported on in 2023	MU areas and abundance estimates for the most comment cetacean species in the UK.
Special Committee on Seals (SCOS) annual reporting of scientific advice on matters related to the management of seal populations (SCOS, 2022).	2022	Updated data and information on grey and harbour seals in the UK. Includes the most recent haul-out counts and population estimates for each seal MU in the UK.
Aerial surveys of seals in Scotland during the harbour seal moult, 2016-2019 (Morris et al. 2021).	2016 to 2019	Fifth full August count of harbour seals in Scotland.
Seal telemetry data (Sharples et al. 2008; Russel and McConnell, 2014).	Tracking data between 1988 - 2010	Provides the results of seal tagging studies in the UK and Europe, to provide an indication of seal movements.
UK seal at sea density estimates and usage maps (Carter et al. 2022).	Aerial surveys between 1987 - 2010 and tracking data between 2005 - 2019	Provides grey and harbour seal density estimates for UK waters, and for each seal designated SAC.
Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters (Hague et al. 2020).	Various	Provides a baseline review for all ScotWind sites.
Offshore Wind Farms marine mammal site data (e.g. Thompson et al. 2014; Brookes et al. 2013).	Various	Relevant information from other offshore wind farms (e.g. Moray East, Moray West, and Beatrice Offshore Wind Farms EIA characterisation surveys and Moray Firth (MF) Marine Mammals Monitoring Programme MF Regional Advice Group (MFRAG) reporting).

1.4 Densities of Marine Mammal Species

11. The following section provides an initial review of the baseline data sources available for marine mammals at the Bellrock WFDA. It should be noted that a further review of any additional or more appropriate sources will be undertaken as part of the EIA process.

12. A review of the SCANS-IV survey and the data review by Waggitt et al. (2019) indicates the following cetacean species could be present in or around the Bellrock WFDA:

- Cetaceans:
  - Harbour porpoise, *Phocoena phocoena*;
  - Bottlenose dolphin, *Tursiops truncatus*;
  - White-beaked dolphin, *Lagenorhynchus albirostris*;
  - Common dolphin, *Delphinus delphis*;
  - Minke whale, *Balaenoptera acutorostrata*; and
  - Fin whale, *Balaenoptera physalus*.
- Pinnipeds:
  - Grey seal, *Halichoerus grypus*; and
  - Harbour seal, *Phoca vitulina.*

13. Atlantic white-sided dolphin *Lagenorhynchus acutus*, Risso's dolphin *Grampus griseus*, killer whale *Orcinus orca*, humpback whale *Megaptera novaeangliae* and long-finned pilot whale *Globicephala melas* have the potential to be present within the area as occasional visitor but have been scoped out for further assessment as they are likely to be in lower numbers and less frequent than the key species listed above. The results of the full desk-based assessment complemented by site-specific surveys would be used to determine the species to be taken forward for further assessment. If the results of the site-specific surveys confirm sightings within the Bellrock WFDA, then the assessment will include these additional species. It should be noted that should any of these species be scoped in following scoping submission, it may not be possible to undertake a quantitative assessment due to a lack of data.

14. In the case of fin whale, there is a paucity of data available, and therefore assessments would be qualitative rather than quantitative, based on a desk-based review of the species and relevant impacts, as well as the modelled underwater noise impact ranges for the low-frequency hearing group. If other species, that are currently considered to be rare in the area, are subsequently scoped in for assessment, it is likely the same approach would be taken.

1.4.1 Cetacean Species

15. Distribution maps of cetacean species within the North-East Atlantic were produced by Waggitt et al. (2019). These maps indicate that harbour porpoise and white-beaked dolphin are relatively

common off the east coast of Scotland, while minke whale are relatively common in the summer months in particular. Killer whale, bottlenose dolphin[3], common dolphin, Atlantic white-sided dolphin, Risso's dolphin and long-finned pilot whale are present but in much lower densities (Waggitt et al. 2019). Fin whale, sperm whale and striped dolphin are shown to be rare in the area. The density estimates from these maps are presented in **Table 1.3**.

16. The SCANS-IV survey was undertaken in summer 2022, across the North-East Atlantic. In relation to the Bellrock WFDA (which is located within Survey Block NS-D), harbour porpoise was the most commonly sighted species. White-beaked dolphin and minke whale were also sighted in relatively high numbers, while fin whale was only rarely sighted. Bottlenose dolphin, Risso's dolphin, Atlantic white-sided dolphin, common dolphin and long-finned pilot whale were not sighted in Survey Block NS-D (**Plate 1.1**).

17. **Table 1.3** below shows the densities of cetacean species recorded in the SCANS-IV Survey Block NS-D (**Plate 1.1**). As noted above, no bottlenose dolphin or common dolphin were detected in Survey Block NS-D (Gilles et al. 2023). However, the SCANS-III Survey recorded bottlenose dolphins within the same survey block (R), noting a density of 0.03. There were no common dolphins recorded in SCANS-III for the same survey block (Hammond et al. 2016).

Table 1.3: Cetacean Annual Density Estimates for the Bellrock WFDA Scoping Boundary

Species	Waggitt et al. (2019) Annual Density Estimates for the Bellrock WFDA Scoping Boundary	SCANS-IV Density Estimates (Gilles et al. 2023)
	Bellrock WFDA (/km^2)	Density in Survey Block NS-D (/km^2)
Harbour porpoise	0.33 (Summer density = 0.372; Winter density = 0.288)	**0.5985** (CL = 0.367)
Bottlenose dolphin	**0.0024** (Summer density = 0.0025; Winter density = 0.0023)	-
White-beaked dolphin	0.079 (Summer density = 0.095; Winter density = 0.063)	**0.0799** (CL = 0.481)
Common dolphin	**0.02** (Summer density = 0.028; Winter density = 0.012)	-
Minke whale	0.0079 (Summer density = 0.0097; Winter density = 0.0061)	**0.0419** (CL = 0.594)

[3] These density maps show the presence of offshore bottlenose dolphin only, and do not therefore include consideration of the resident populations around the UK and northern Europe coastlines.

Plate 1.1: Area covered by SCANS-IV and Adjacent Surveys[4] (Gilles et al. 2023)

[4] Pink blocks were surveyed by air; blue blocks were surveyed by ship. Blocks coloured green were surveyed by the Irish ObSERVE2 project.

18. As detailed in **Section 1.2**, the site-specific offshore aerial surveys would also derive density estimates for cetacean species (if sufficient data is collected). For potential effects within the Bellrock WFDA itself, the worst-case density would be used as a precautionary approach, whether that's from the site-specific surveys or from desk-based data sources (such as those presented in **Table 1.3** above). However, for far-field impacts, and for those that extend past the boundary of Bellrock WFDA (e.g. for the potential for disturbance from piling), wider density estimates to cover the full area of effect would be used (e.g. Waggitt et al. 2020 or Gilles et al. 2023).

1.4.2 Seal Species

19. Carter et al. (2022) provides habitat-based predictions of at-sea distribution for grey and harbour seals in the British Isles. The habitat preference approach predicted distribution maps provide estimates per species, on a 5 km^2 grid, of relative at-sea density for seals hauling-out in the British Isles. It is important to note that Carter et al. (2022) provides *relative density* (i.e. percentage of at-sea population within each 5 km^2 grid square), whereas previous usage maps (e.g. Russell et al. 2017) have presented *absolute density* (i.e. number of animals).

20. The grey seal relative density map (as shown in **Figure 8.1** in **Appendix 1** of the **Bellrock WFDA Scoping Report**; Carter et al. 2022) shows that the mean predicted relative density for the Bellrock WFDA are relatively average for the UK and Republic of Ireland (RoI), with increased relative density closer to shore. For harbour seal (as shown in **Figure 8.2** in **Appendix 1** of the **Bellrock WFDA Scoping Report**; Carter et al. 2022), the mean predicted relative density within the Bellrock WFDA is very low, with increased densities close to shore, particularly around the Dundee area.

21. The grey and harbour seal density estimates for the Bellrock WDFA have been calculated from the seal at sea usage maps (Carter et al. 2022) based on the 5 km^2 grids that overlap with the Bellrock WFDA and corrected against the total UK and RoI population estimates. The total grey seal population in the British Isles is 178,262, and the total harbour seal population is 48,419 (**Table 1.5**; SCOS, 2022). These total population estimates are corrected to determine the total number of each species that may be at-sea at any time, using a correction factor of 0.8616 for grey seal, and 0.8236 for harbour seal (Russell et al. 2015). There are therefore approximately 153,591 grey seals, and 39,878 harbour seals at-sea at any one time, based on the corrected values and most recent haul-out counts for the UK. These are the at-sea population estimates used with the Carter et al. (2022) data to calculate density estimates, which are presented in **Table 1.4** below.

Table 1.4: Grey and Harbour Seal Mean Density Estimates for Bellrock WFDA Scoping Boundary (Carter et al. 2022)

Species	Bellrock WFDA Scoping Boundary Mean Density (/km^2)
Grey seal	0.080
Harbour seal	0.00000002

22. As noted in **Section 1.2**, the site-specific offshore aerial surveys would also derive density estimates (if sufficient data for seal species is collected). For potential effects within the Bellrock WFDA itself, the worst-case density would be used as a precautionary approach, however, for far-field impacts, and for those that extend past the boundary of Bellrock WFDA, the wider density estimates for the full area of effect would be used (e.g. for the potential for disturbance from piling) using wider density mapping (e.g. Carter et al. 2022).

1.5 Management Units and Population Estimates of Marine Mammal Species

23. As highly mobile marine predators, the status and activity of marine mammals known to occur within or adjacent to the Bellrock WFDA would be considered in the context of their MU population. For cetacean species, this would be based on IAMMWG (2023), and for seal species this would be based on the latest estimates from the SCOS reporting (at the time of writing, this is SCOS, 2022).

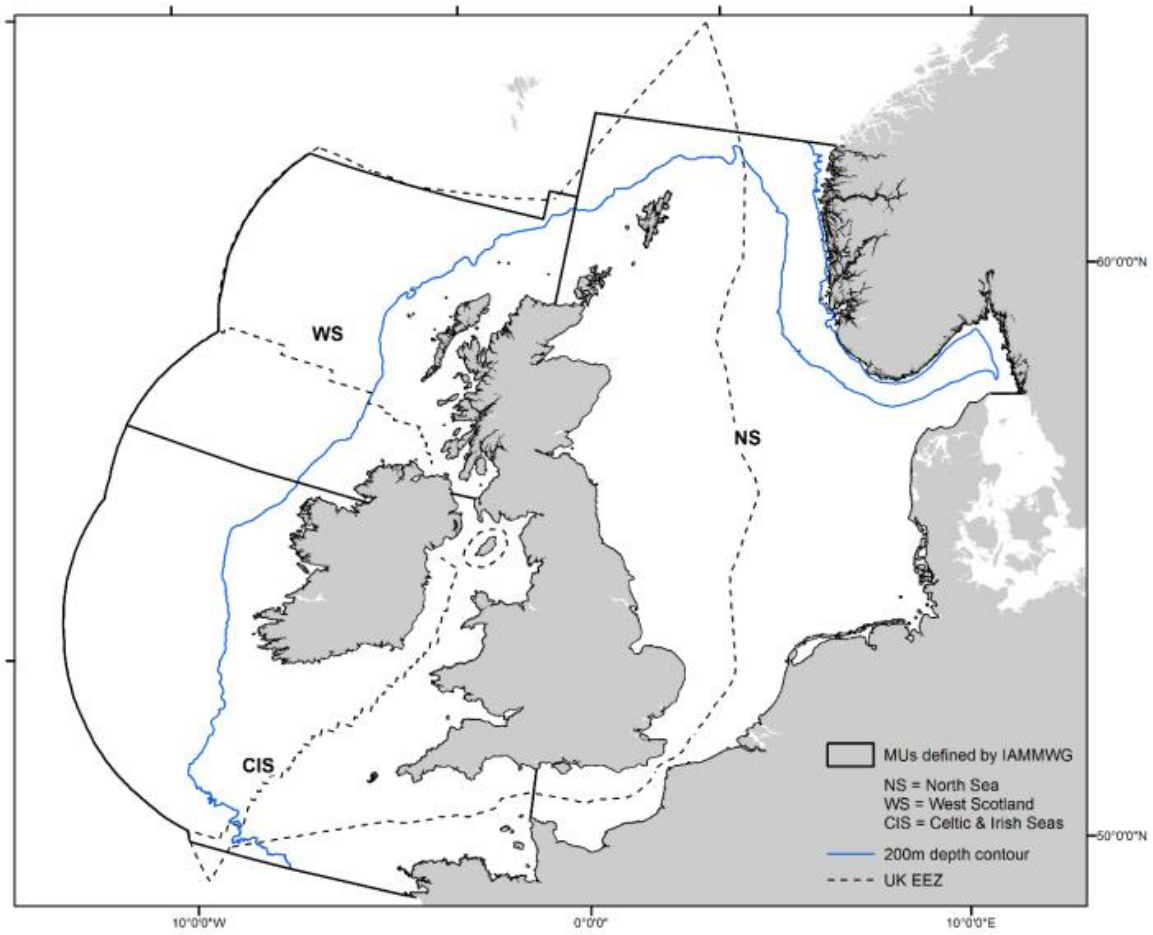
1.5.1 Cetacean Species

24. The harbour porpoise is listed on Annex II of the Habitats Directive which lists species whose conservation requires the designation of SAC.

25. MUs provide an indication of the spatial scales at which any impact should be assessed for cetacean species (IAMMWG, 2023). MUs, and the latest population estimate for each marine mammal species, have been determined based on the most relevant information, and scale at which potential impacts could occur.

26. For harbour porpoise, the relevant MU is the North Sea (NS) MU (**Plate 1.2**). Within the NS MU, there is an estimated abundance of 346,601 harbour porpoise (Coefficient of Variation (CV) = 0.09; 95% CI = 289,498 - 419,967). However, the SCANS-IV survey provides an update to this MU population estimate, with 338,918 harbour porpoise (95% CL = 243,063 – 476,203) (Gilles et al. 2023). This is the population estimate for which all impact assessments will be based on (**Table 1.6**).

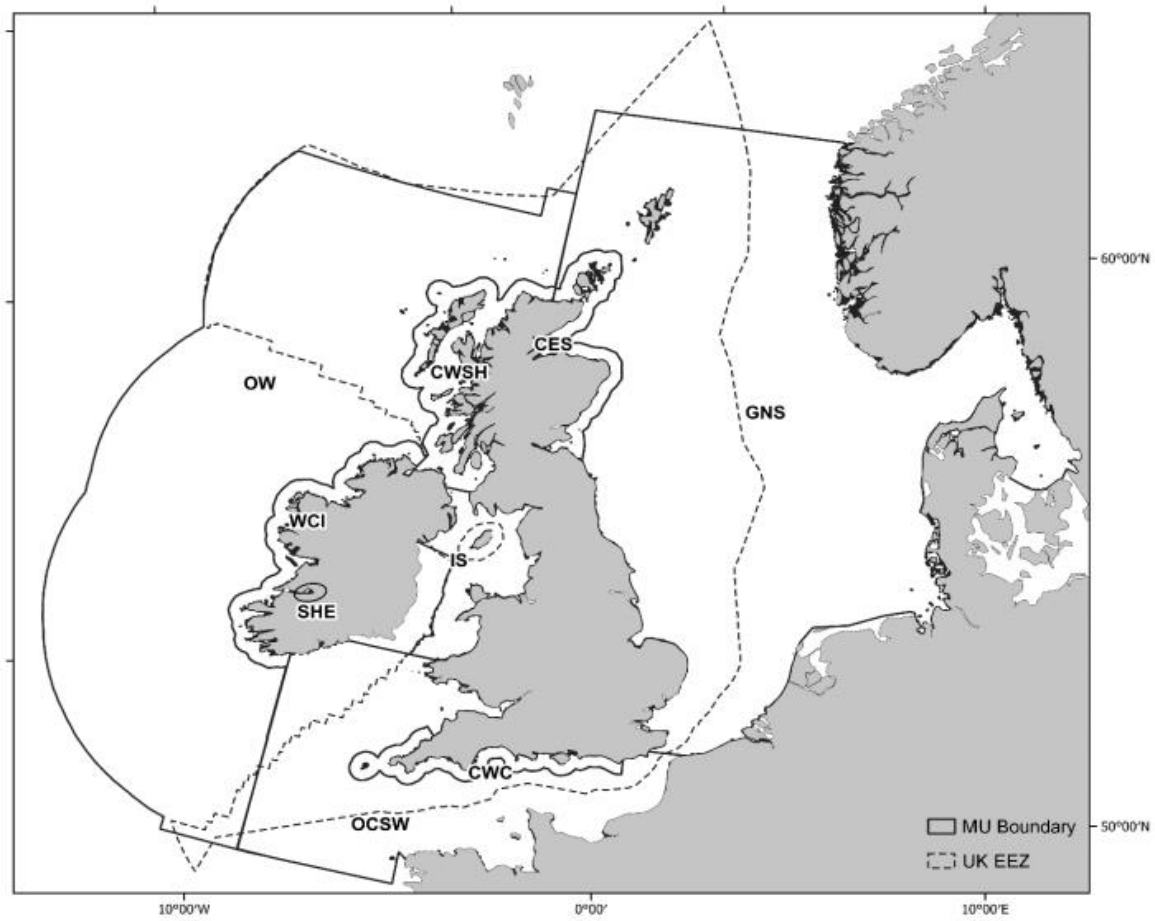
Plate 1.2: The MUs for Harbour Porpoise (IAMWWG, 2023)



27. For bottlenose dolphin, there are seven MUs within the North-East Atlantic (**Plate 1.3**). The relevant MUs are the Coastal East Scotland and Greater North Sea (GNS). The reference population estimates for these MUs are provided in **Table 1.6**.

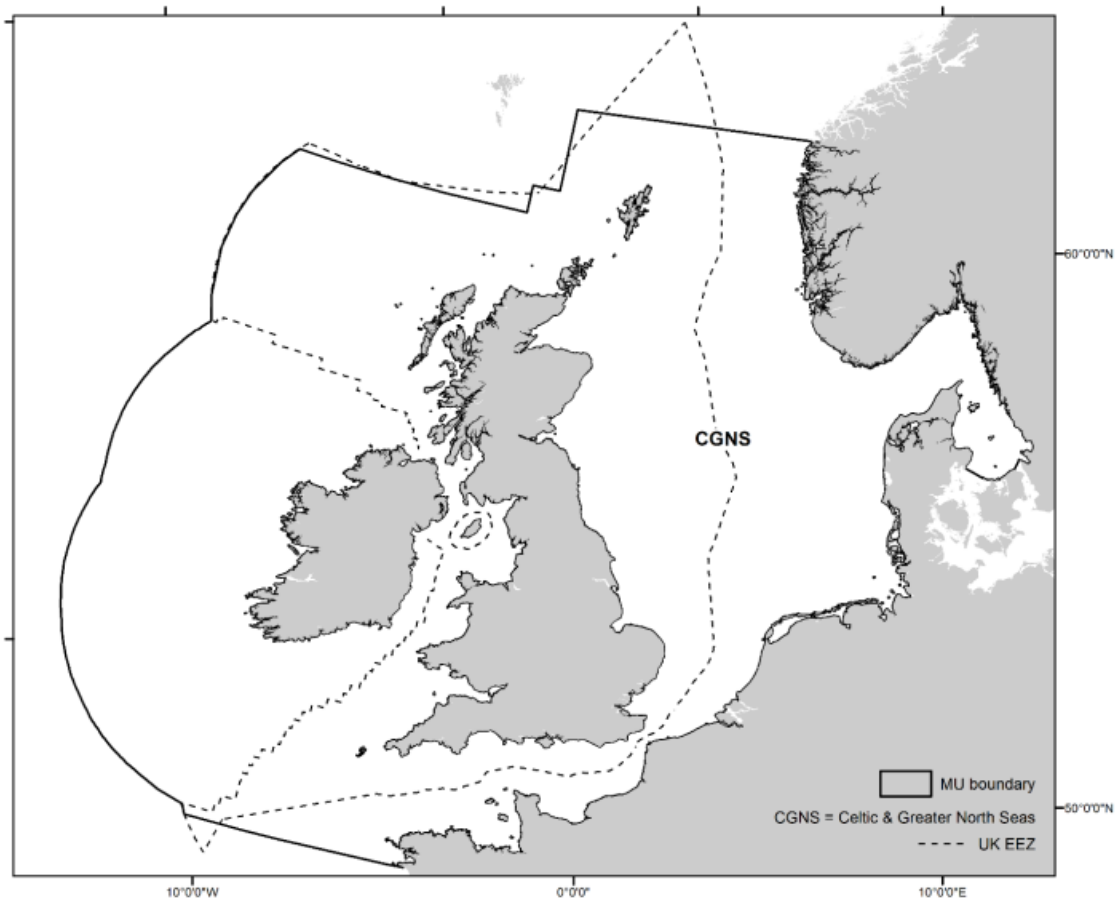
28. Studies into the movement patterns of bottlenose dolphins associated with the Coastal East Scotland MU population show that they are a coastal population, and remain within 3 km of the coastline (Quick *et al*., 2014; Arso Civil *et al*., 2019). As the Bellrock WFDA is within the GNS MU, and approximately 120 km from Stonehaven, any bottlenose dolphin present are most likely to be from the GNS MU, however, there is the potential for individuals to be from the Coastal East Scotland MU population. Therefore, the reference population for the GNS MU will be used, as well as the Coastal East Scotland MU.

Plate 1.3: The MUs for Bottlenose Dolphin (IAMMWG, 2023)



29. For white-beaked dolphin, common dolphin and minke whale, there is just one MU that covers the North-East Atlantic; the Celtic and Greater North Seas (CGNS) MU (**Plate 1.4**). The population for these species within the CGNS MU are shown in **Table 1.6**.

Plate 1.4: The MUs for White-Beaked Dolphin, Atlantic White-Sided Dolphin, Common Dolphin, Risso's Dolphin and Minke Whale (IAMWWG, 2023)

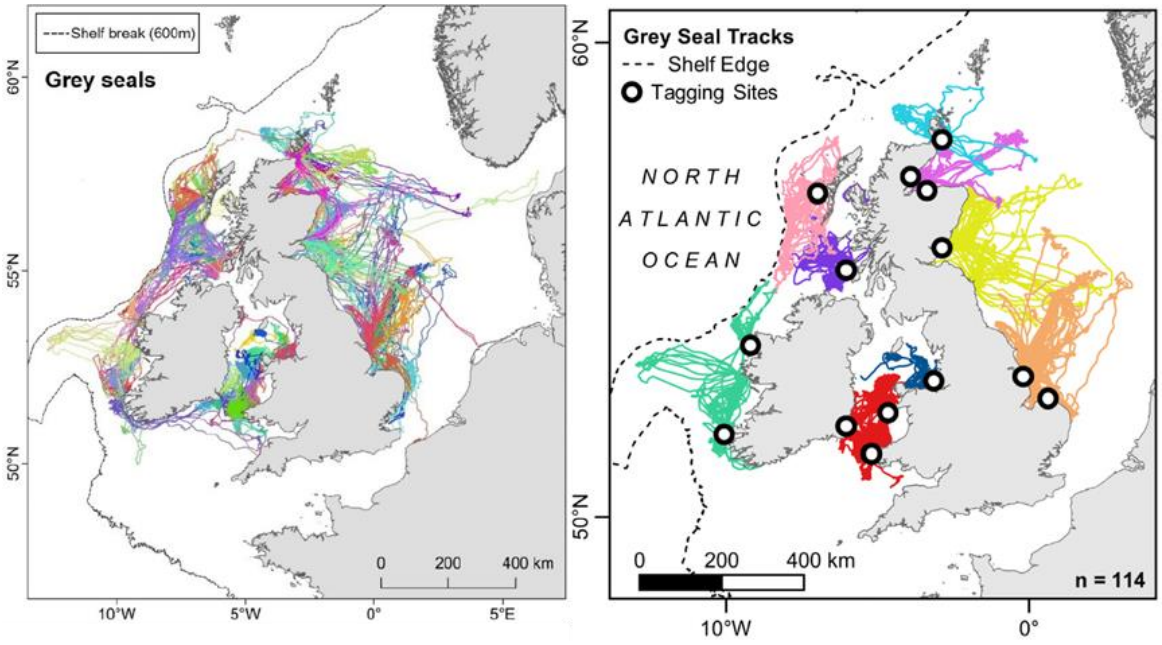


1.5.2 Seal Species

30. Grey seals are likely to be present in and around the Bellrock WFDA (SCOS, 2022; Carter et al. 2022). Harbour seals are likely present in low numbers around the Bellrock WFDA, as harbour seal densities in the area are generally lower than that for grey seal (SCOS, 2022; Carter et al. 2022).

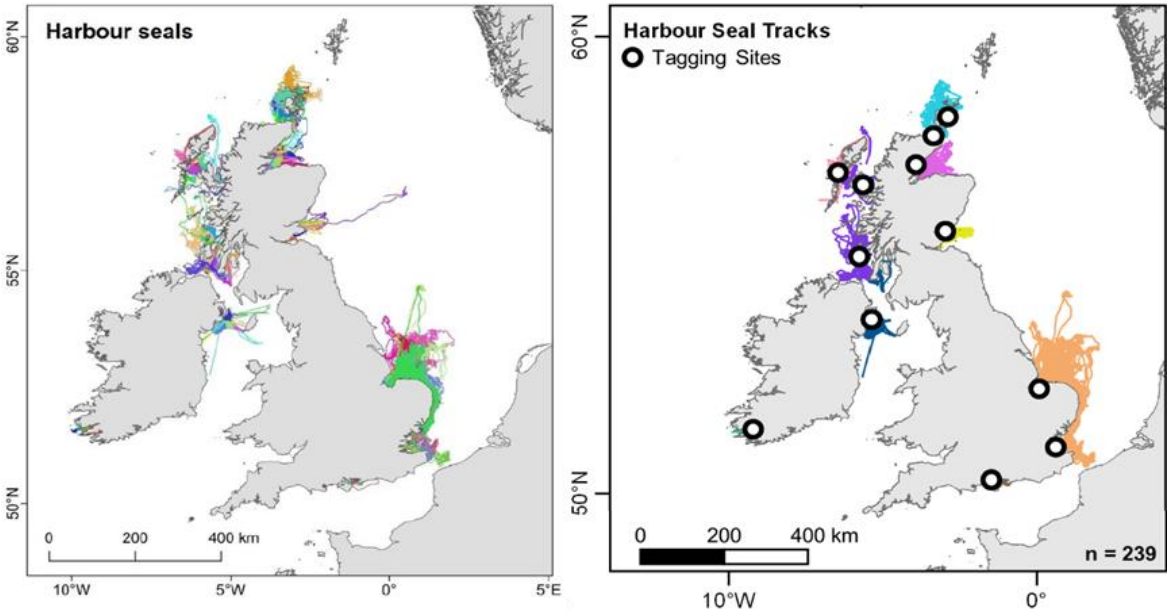
31. For seals, it is necessary to take into account their movements in the area. Grey seal have foraging ranges of up to 448 km (Carter et al. 2022). Global Positioning System (GPS) tracking data from tagged grey seal indicate there is the potential for presence in the Bellrock WFDA with individuals from the MF, East Scotland, and North East England, and limited connectivity with South East England, with no connection to West Scotland, or Shetland (Plate 1.5). Therefore, the South East England, North East England, MF, and East Scotland MUs would encompass the spatial area where grey seal may have connectivity with the Bellrock WFDA.

Plate 1.5: Left = GPS Tracking Data for Grey Seal (n=114) (Carter et al. 2020); Right = GPS Tracking Data for Grey Seal, Cleaned to Remove Erroneous Location Estimates, and Trips Between Regions During The Breeding Season (n=114) (Carter et al. 2022)



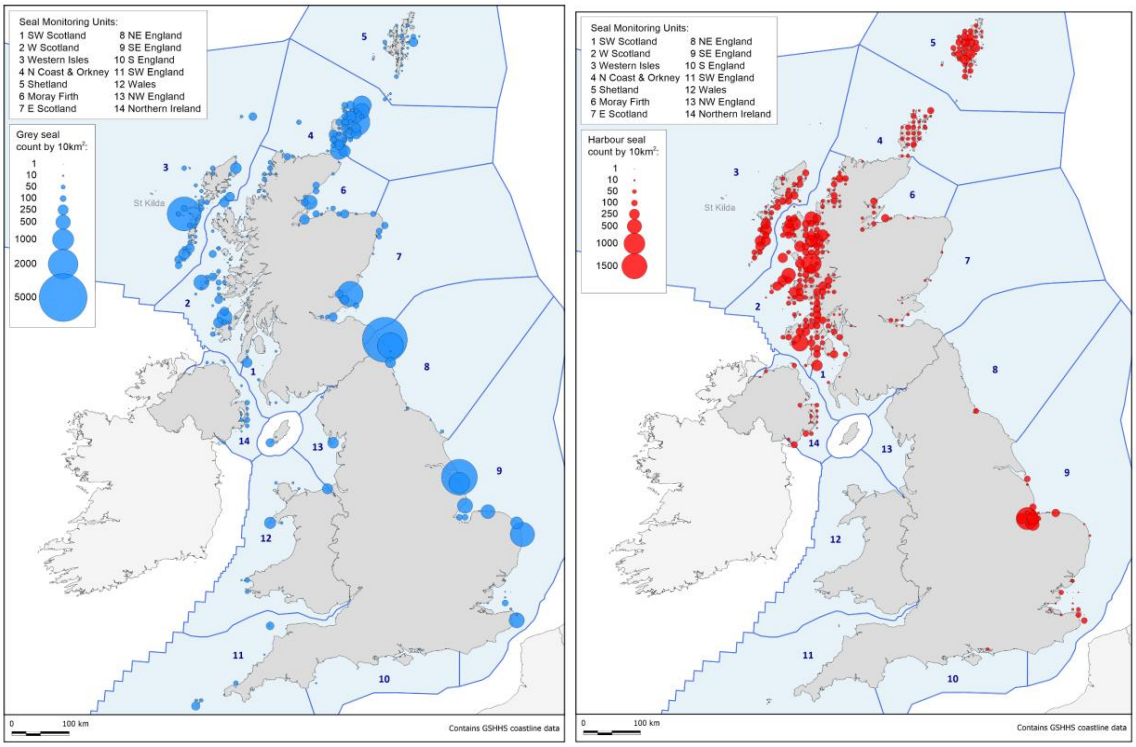
32. Harbour seal have foraging ranges of up to 273 km (Carter et al. 2022), and the GPS tracking data from tagged harbour seal indicate there is limited potential for presence in the Bellrock WFDA (**Plate 1.6**). Therefore, there is no connection from the Bellrock WFDA to North East England, West Scotland, MF or Shetland. Therefore, the East Scotland MU would encompass the spatial area where harbour seal may have connectivity with the Bellrock WFDA.

Plate 1.6: Left = GPS Tracking Data for Harbour Seal (n=239) (Carter et al. 2020); Right = (Carter et al. 2022)



33. The UK seal MUs are provided in SCOS (2022). The Bellrock WFDA lies approximately within the centre of MU 7 (East Scotland). However, the MUs 6 (MF) and 8 (North East England), are relevant for grey seals given the connectivity from the foraging distances (see **Plate 1.7**).

Plate 1.7: Seal MUs and August Distributions of Grey Seal (Blue) and Harbour Seal (Red) Around the UK (SCOS, 2022)



34. Both species of seals are counted in August. **Table 1.5** below provides the latest counts for both species. In order to generate an abundance estimates for seals, it is necessary to take account of those individuals that were not available to count during the August counts. Therefore, a correction factor is applied to the counts to generate a population estimate. The correction factor for grey seal is 0.2515 (Russell and Carter, 2021), and for harbour seal is 0.72 (Lonergan et al. 2013).

Table 1.5: August Counts of Grey and Harbour Seal, and the Corrected Abundance Estimates (SCOS, 2022)

Species	MU	Count (latest count as presented in SCOS, 2022)	Year of Latest Count	Correction Factor	Total Abundance Estimate
Grey seal	North East England	6,517	2021	0.2515	25,913
	South East England	7,694	2021	0.2515	30,592
	Moray Firth	1,856	2021	0.2515	7,380
	East Scotland	2,712	2021	0.2515	10,783
	Total for the three MUs	**18,779**	**-**	**0.2515**	**74,668**
	Total UK and RoI	*44,833*	*-*	*0.2515*	*178,262*

Species	MU	Count (latest count as presented in SCOS, 2022)	Year of Latest Count	Correction Factor	Total Abundance Estimate
Harbour seal	**East Scotland MU**	**262**	**2021**	**0.72**	**364**
	Total UK and RoI	*34,862*	-	*0.72*	*48,419*

35. For both grey seal and harbour seal, assessments will be undertaken based on the MU of relevance for the Bellrock WFDA; the East Scotland MU. For grey seal, all impacts will also be assessed against the wider population of all three MUs.

1.5.3 Summary of Reference Populations

36. **Table 1.6** summaries the relevant MU and abundance estimates (reference populations) for marine mammal species that could be present in and around the Bellrock WFDA.

Table 1.6: MU and Abundance Estimates (Reference Populations) for Marine Mammal Species

Species	MU	Abundance (Reference Population)	Source
Harbour porpoise	NS MU	338,918 (95% CI = 243,063 – 476,203)	Gilles et al. (2023)
Bottlenose dolphin	GNS MU	2,022 (CV = 0.75; 95% CI = 548 – 7,453)	IAMMWG (2023)
	Coastal East Scotland MU	224 (CV = 0.02; 95% CI = 214 – 234)	IAMMWG (2023); Arso Civil et al. (2021)
White-beaked dolphin	CGNS MU	43,951 (CV = 0.22; 95% CI = 28,439 – 67,924)	IAMMWG (2023)
Common dolphin	CGNS MU	102,656 (CV = 0.29; 95% CI = 58,932 – 178,822)	IAMMWG (2023)
Minke whale	CGNS MU	20,118 (CV = 0.18; 95% CI = 14,061 – 28,786)	IAMMWG (2023)
Grey seal	MF	7,380	SCOS (2022)
	East Scotland	10,783	
	North East England	25,913	
Harbour seal	East Scotland	364	

1.6 Seal Haul-out Sites

37. There are haul-out sites for grey and harbour seal along the north-east coast of Scotland (**Plate 1.7**). Therefore, there is the potential for foraging seal to be in the Bellrock WFDA. The nearest major grey seal site is at Dundee, approximately 150 km from the Bellrock WFDA. There are also smaller grey seal sites along the coast near Aberdeen approximately 120 km from the Bellrock WFDA.

38. The closest harbour seal sites are:

- Aberdeen - approximately 120 km from the Bellrock WFDA;
- Montrose - approximately 140 km from the Bellrock WFDA; and
- Dundee - approximately 150 km from the Bellrock WFDA.

1.7 Protected Sites

39. Designated sites for marine mammals in the North-East Scotland region and east coast of Scotland include the following:

- MF SAC, designated for bottlenose dolphin;
- Isle of May SAC, designated for grey seal;
- Firth of Tay and Eden Estuary SAC, designated for harbour seal;
- Berwickshire and North Northumberland Coast SAC, designated for grey seal;
- Southern North Sea SAC, designated for harbour porpoise;
- Humber Estuary SAC, designated for grey seal;
- Southern Trench Nature Conservation Marine Protection Area (NCMPA), designated for minke whale.

40. Information on species' movements, including seal tagging studies, will be reviewed to determine the potential for connectivity of marine mammals from designated sites and the Bellrock WFDA as part of the Habitats Regulation Appraisal (HRA) screening (**Bellrock WFDA HRA Screening Report;** BlueFloat Energy | Renantis Partnership, 2024).

41. In addition, the Southern Trench NCMPA has been designated for minke whale, and further information on this site is provided in **Section 1.7.1**. Within the Bellrock WFDA consent application, the Southern Trench NCMPA will be considered and assessed as part of the EIA process. The Southern Trench NCMPA is also screened in **Appendix 2: NCMPA Screening Report** of the **Bellrock WFDA Scoping Report.**

1.7.1 Southern Trench Nature Conservation Marine Protected Area

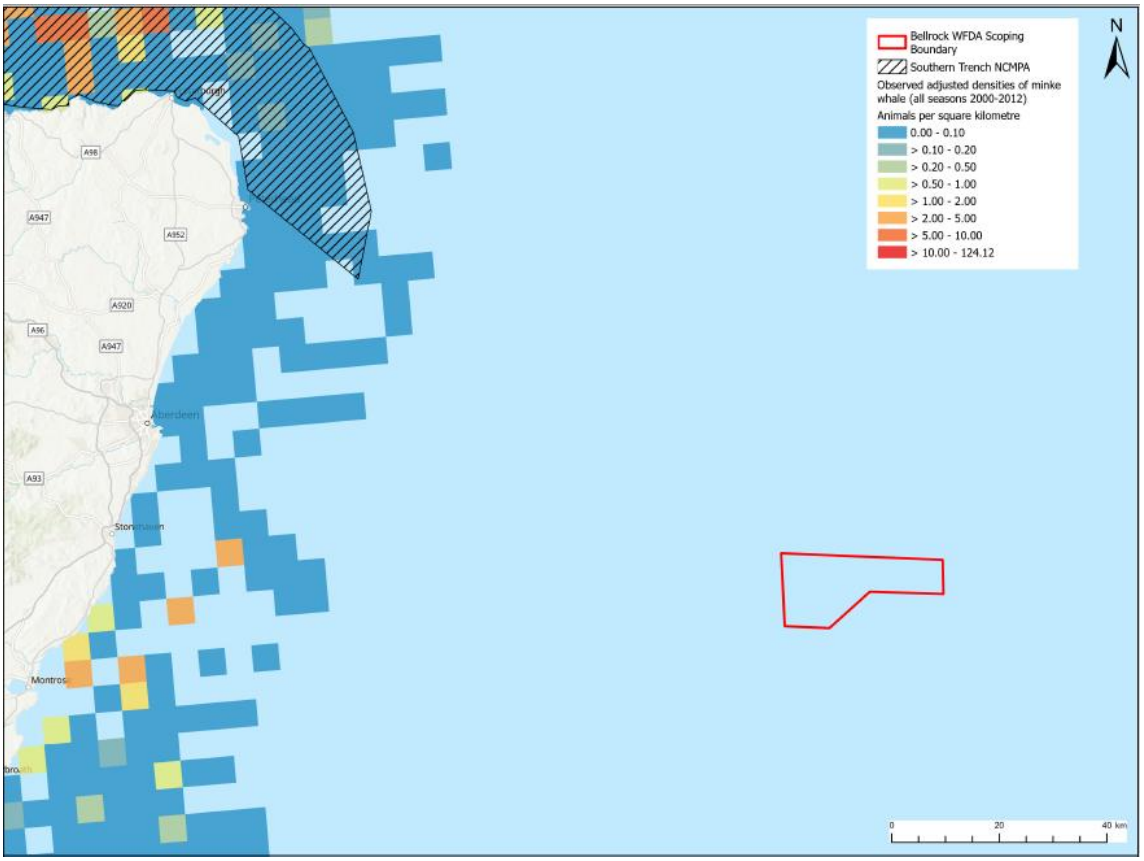
42. The Southern Trench NCMPA is located on the east coast of Scotland in the outer Moray Firth and is designated to protect minke whale, burrowed mud, fronts, shelf deeps, Quaternary of Scotland and Submarine Mass Movement. Fronts in the Southern Trench are created by mixing of warm and cold waters, which creates an area of high productivity, attracting a number of predators to the area. Minke whale are attracted by the fish species brought to the area by the fronts, as well as the abundance of sandeels in the soft sands. NatureScot advise that, in order to conserve minke whale, the risk of injury and death should be minimised, access to resources within the site should be maintained, and supporting features should also be conserved.

43. The Conservation Objectives of this site are to conserve the features, specifically to ensure "*Minke whale in the Southern Trench MPA are not at significant risk from injury or killing, conserve the access to resources (e.g. for feeding) provided by the MPA for various stages of the minke whale life cycle, and conserve the distribution of minke whale within the site by avoiding significant disturbance*". The supporting features of the minke whale is also protected under these Conservation Objectives.

44. Minke whale are wide-ranging baleen whales which are present in the Moray Firth primarily in the summer months (June – September) (Reid et al. 2003; Hammond et al. 2021). They often prefer water depths of up to 200 m and are often solitary or found in pairs, though they occasionally form larger groups (up to 15 individuals) while feeding.

45. The data for which this NCMPA was designated on shows that minke whale are present in higher number in the northern area of the NCMPA, with densities of up to more than 10 minke whales per km^2 (**Plate 1.8**; Paxton et al. 2014). At closest point to Bellrock (of approximately 80 km), this density data shows minke whale presence of less than 0.1/km^2.

Plate 1.8: Adjusted Densities of Minke Whale within the Southern Trench NCMPA (taken from Paxton et al. 2014)



46. Minke whale density estimates will be derived from more recently available data sources (such as SCANS-IV or Waggitt et al. (2019)), and the worst-case of these, with the Paxton et al. 2014 reporting, will be used for any assessments specific to the Southern Trench NCMPA. In addition, the Applicant will engage with other ScotWind developers to seek alignment on the approach to minke whale density estimates.

47. In order to determine an abundance estimate of minke whale within the Southern Trench NCMPA, the density estimates as described above can be used to determine the number of minke whale present for each season.

1.8 Summary of Marine Mammal Species Scoping

48. As noted above, a full assessment of the baseline conditions will be undertaken through the EIA process, and will inform, alongside the results of the site-specific offshore aerial surveys, the species to be taken forward for further assessment in the Bellrock WFDA EIA Report. However, it is expected that the key species taken forward for assessment would be:

- Harbour porpoise;
- Bottlenose dolphin;
- White-beaked dolphin;
- Common dolphin;
- Minke whale;
- Fin whale;
- Grey seal; and
- Harbour seal.

49. Other marine mammal species have been recorded in the area, although in lower numbers than those listed above, including Risso's dolphin, Atlantic white-sided dolphin, killer whale, humpback whale, and long-finned pilot whale. It is intended that these species will be scoped out, however, if the results of the site-specific surveys confirm sightings within the Bellrock WFDA, then the assessment will include these additional species. It should be noted that should any of these species be scoped in following scoping submission, it may not be possible to undertake a quantitative assessment due to a lack of data.

50. Assessments will not be undertaken for other cetacean species that are considered to be rare or infrequent in the Bellrock WFDA area, as the potential for these cetacean species to be impacted is considered unlikely.

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Bellrock OFFSHORE WIND

Appendix 5: Approach to Marine Mammals and Underwater Noise Modelling

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Contents

Tables

Plates

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1 Overview

1. This appendix is complementary to the **Bellrock Wind Farm Development Area (WFDA) Scoping Report** and sets out the approach to underwater noise modelling for marine mammals. This appendix covers the:

   - Approach to underwater noise modelling; and
   - Approach to assessment for disturbance from underwater noise for marine mammals.

2. This appendix should be read in conjunction with **Chapter 8: Marine Mammals** of the **Bellrock WFDA Scoping Report** and has been prepared by Royal HaskoningDHV.

2 Approach to Underwater Noise Modelling

3. Underwater noise modelling is required in order to provide a robust assessment of underwater noise associated with the construction, operation and maintenance, and decommissioning of the Bellrock WFDA. The modelling will be used to inform the assessment of potential impacts from underwater noise on both marine mammal and fish species (see **Chapter 7: Fish and Shellfish Ecology** in the **Bellrock WFDA Scoping Report**).

4. The underwater noise modelling will include the following activities, with the focus of the modelling report being impact piling:

- Impact piling;
- Non-impact piling substructure installation options;
- Other underwater noise generating activities;
- Unexploded ordnance (UXO) clearance;
- Geophysical survey equipment;
- Vessel noise;
- Cable laying and burial/protection activities;
- Seabed preparation activities (such as boulder clearance); and
- Operational turbines (both floating and/or fixed bottom substructures currently being considered).

5. The underwater noise modelling will incorporate current international best practice guidance, thresholds and criteria, including Southall et al. (2019) for marine mammal species, and Popper et al. (2014) for fish species. Any other literature that may be identified should be included as appropriate.

6. Existing data from previous measurements of (other) offshore wind farm construction noise will be used along with detailed acoustic propagation models to predict the possible sound levels as a function of distance around the sound source. Knowledge of the local seabed properties and bathymetry will be incorporated to provide realistic propagation scenarios for the area. Where necessary, information obtained from noise data measured for existing United Kingdom (UK) and other European offshore wind farm projects will be included.

7. A suitable range of frequencies will be modelled to allow the transmission loss to be predicted for potential sources. This will include the primary frequency ranges of interest for each source which overlap with the hearing sensitivity frequency range for key marine species.

8. Subacoustech Environmental Limited (Subacoustech) will undertake the underwater noise modelling, using the latest version of their INSPIRE model. An initial underwater noise modelling exercise has been undertaken with Subacoustech using the INSPIRE Light model, which will be utilised to inform the design process.

9. The following recent underwater noise modelling guidance documents will be considered within the underwater noise modelling report, although it should be noted that the INSPIRE model used by Subacoustech does not use an energy conversion factor, as per the focus of Wood et al. (2023)[1]:

- Energy Conversion Factors in Underwater Radiated Sound from Marine Piling: Review of the method and recommendations (Wood *et al.*, 2023); and
- Reducing Uncertainty in Underwater Noise Assessments for Offshore Wind (ORJIP Offshore Wind, 2023).

10. The Applicant is also aware of the ORJIP project on the range dependent nature of impulsive noise – analysis of existing data and development of method for incorporation into noise impact assessments (RaDIN), this project is underway and will be referenced if published in time to inform the Bellrock WFDA Environmental Impact Assessment (EIA) Report.

11. It is anticipated the underwater noise modelling will incorporate the following:

- A number of impact piling scenarios to be considered:
  - Monopile, jacket pile, and anchor piles:
    - Maximum pile diameter;
    - Maximum hammer energy;
    - Starting hammer energy (e.g. 10% maximum hammer energy); and
    - A single pile per day, multiple piles per day (sequential piling), and multiple pile locations at the same time (simultaneous piling).
- Source levels for the required hammer energies[2];
- Transmission loss/propagation which includes the effects of bathymetry, frequency-dependent absorption, and frequency dependent interaction with the surface and seabed based on specific site characteristics (e.g. substrate type);
- Received levels relative to estimated ambient noise levels;
- A number of piling locations within the Bellrock WFDA;
- Cumulative weighted Sound Exposure Criteria (SEL_{cum}) scenarios will be completed assuming a fleeing receptor. Swim speeds will be based on best practice, and are expected to include:

[1] NatureScot's consultation response for the Scoping Opinion for the Buchan Offshore Wind Farm noted that the Wood et al., 2023 report is likely to be less relevant to the INSPIRE model (MD-LOT, 2023).

[2] Subacoustech's approach to source level modelling correlates blow energy, along with water depth and pile diameter, with a large dataset of field measurements to estimate apparent source levels.

  - 1.4 m/s for harbour porpoise (Scottish Natural Heritage (SNH) [now NatureScot], 2016);
  - 1.52 m/s for dolphin species (Bailey and Thompson, 2006);
  - 2.1 m/s for minke whale (SNH, 2016);
  - 2.5 – 4.1 m/s for fin whale (Wursig and Perrin, 2009); and
  - 1.8 m/s for seal species (SNH, 2016).
- The piling soft-start and ramp-up for the SEL_{cum} scenarios will be defined and agreed prior to the commencement of the underwater noise modelling.

12. The underwater noise modelling will result in noise maps around the source, over an area sufficient to demonstrate decay of the sound level such that it is not deemed to have adverse effect on marine fauna based on the relevant hearing thresholds. This will be presented in terms of the chosen acoustic metrics and will show noise contours indicating zones of impact where thresholds for injury or behavioural response may be exceeded. In addition to the results for each threshold, five decibel (dB) contours will be used to inform the dose response curve assessment, as described in **Section 3.1**.

2.1 Underwater Noise Thresholds

13. Southall et al. (2019) presents unweighted peak Sound Pressure Level (SPL) criteria (SPL_{peak}) for single strike, weighted Sound Exposure Level (SEL) criteria for single strike (SEL_{ss}) and cumulative (i.e. more than a single sound impulse) weighted Sound Exposure criteria (SEL_{cum}) for permanent auditory injury (permanent threshold shift - PTS), where unrecoverable reduction in hearing sensitivity may occur (**Table 2.1**). The weighted thresholds take account of the differences in hearing range of each species group.

14. Southall et al. (2019) also include criteria based on SPL_{peak}, which are unweighted and do not take species sensitivity into account. It is important to note that they are different criteria and as such they should not be compared directly. All decibel SPL values are referenced to 1 µPa and all SEL values are referenced to 1 μPa^2s. Assessments will be based on the criteria with the greatest predicted impact ranges.

15. Those calculated for SEL_{cum} tend to give the greatest ranges as they account for exposure to the noise for the full period of the activity. For the cumulative noise criteria (SEL_{cum}), the calculations assume that a marine mammal flees from the noise source at a constant speed and the resultant contours give the position that a receptor must be from the pile at the start of the piling process, in order to just avoid receiving the relevant exposure criterion.

16. Noise sources (and the thresholds) are categorised as either impulsive or non-impulsive (Southall et al., 2019):

- Impulsive (single or multiple pulsed) - high peak sound pressure, short duration, fast rise-time and broad frequency content at source. Explosives, impact piling and seismic airguns are considered impulsive noise sources.

- Non-impulsive - continuous non-pulsed sound. Vessel engines, sonars, vibro-piling, drilling and other low-level continuous noises are considered non-impulsive. However, a non-impulsive noise does not necessarily have to have a long duration.

17. When reviewing the results of the underwater noise modelling for impulsive noise sources (e.g. impact piling), it is important to note that as sound travels through the water column, the interactions with the seafloor and absorption means that the sound waves will lose their 'impulsivity' over distance. Within a few kilometres, the sound waves would lose their impulsive shape (and act as a non-impulsive source of noise) (e.g. Hastie *et al.*, 2019). Therefore, for any of the results under the impulsive criteria that are in the tens of kilometres, the results are highly likely to be an overestimation.

Table 2.1: Southall et al. (2019) Thresholds and Criteria for PTS used in the Underwater Noise Modelling and Assessments

Species	Species group	Impact	SPL_{peak} Unweighted (dB re 1 µPa) Impulsive	SEL_{ss} and SEL_{cum} Weighted (dB re 1 µPa^{2}s)	
				Impulsive	Non-impulsive
Harbour porpoise	Very high frequency (VHF) cetacean	PTS	202	155	173
Bottlenose dolphin White-beaked dolphin Common dolphin	High frequency (HF) cetacean	PTS	230	185	198
Minke whale Fin whale	Low frequency (LF) cetacean	PTS	219	183	199
Grey seal Harbour seal	Phocid Carnivores in Water (PCW)	PTS	218	185	201

18. There are currently no agreed thresholds or criteria for modelling the disturbance of dolphin, whale and seal species from underwater noise.

3 Approach to Assessments for Disturbance from Underwater Noise

19. The Marine Scotland (2020) guidance specifies disturbance as occurring if the activity is likely "*to significantly affect the local distribution or abundance of the species to which it belongs*". The relevant European Commission guidance (2007), suggests that a disturbance must significantly impact the local distribution or abundance of a species, including temporary impacts. The Joint Nature Conservation Committee (JNCC) et al. (2010), guidance proposes that "*any action that is likely to increase the risk of long-term decline of the population(s) of (a) species could be regarded as disturbance under the Regulations*."

20. To assess the potential for disturbance it is necessary to consider the likelihood that exposure of the animal(s) elicits a response which is likely to generate a significant population-level effect. Assessment of population-level impacts from a temporary disturbance is made complicated by the highly variable nature of the introduced disturbance (e.g. the complex nature of sound and its propagation in the marine environment), the variability of behavioural response in different species and individuals.

3.1 Dose Response Curves

21. Where sufficient scientific evidence exists, current best practice is to apply a species-specific dose-response assessment rather than the fixed behavioural threshold approach.

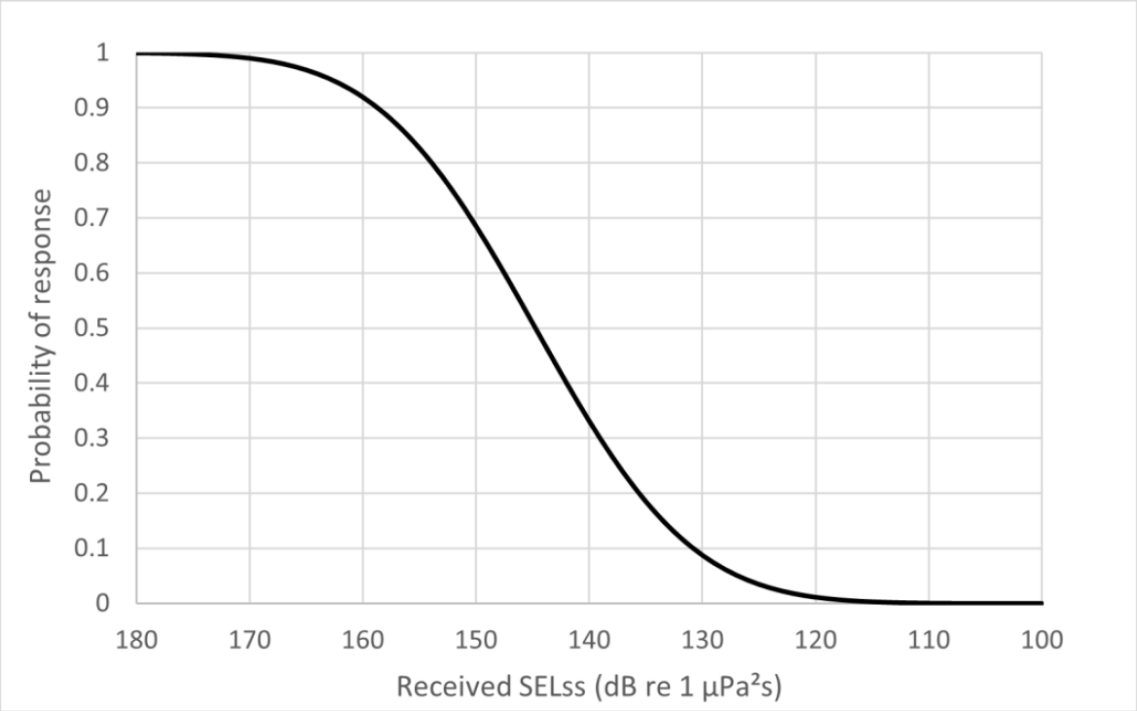
22. The application of a dose-response curve allows for an evidence-based estimate which accounts for the fact that the likelihood of an animal exhibiting a response to a stressor or stimulus will vary according to the dose of stressor or stimulus received (Dunlop et al. 2017). Therefore, unlike the traditional threshold assessments commonly used, a dose-response analysis assumes that not all animals in an impacted area will respond (with behavioural disturbance response in this case). For the purposes of this assessment, the dose is the SEL_{ss}. The use of SEL_{ss} in a dose-response analysis, where possible, is considered to be best practice in the latest guidance provided by Southall et al. (2021).

23. To estimate the number of animals disturbed by piling, SEL_{ss} contours at five dB increments (generated by the noise modelling) will be overlain on the relevant species density surfaces (such as Carter et al. 2022 for both grey and harbour seal, Waggitt et al. 2019 or Gilles et al. 2023 for harbour porpoise) to quantify the number of animals receiving each five dB SEL_{ss} contour, and subsequently the number of animals likely to be disturbed based on the corresponding dose-response curve.

24. The dose-response relationship used for harbour porpoise was developed by Graham et al. (2017), using data collected on harbour porpoises during Phase 1 of piling at the Beatrice Offshore Wind

Farm. This dose response relationship is displayed in **Plate 3.1**. Following the development of this dose-response relationship, further study revealed that the responses of harbour porpoises to piling noise diminishes over the construction period (Graham et al. 2019). Therefore, the use of the dose-response relationship related to an initial piling event for all piling events in this assessment can be considered conservative.

Plate 3.1: Dose-response Relationship Developed by Graham et al. (2017) to be used for Harbour Porpoise in the Bellrock WFDA EIA Report

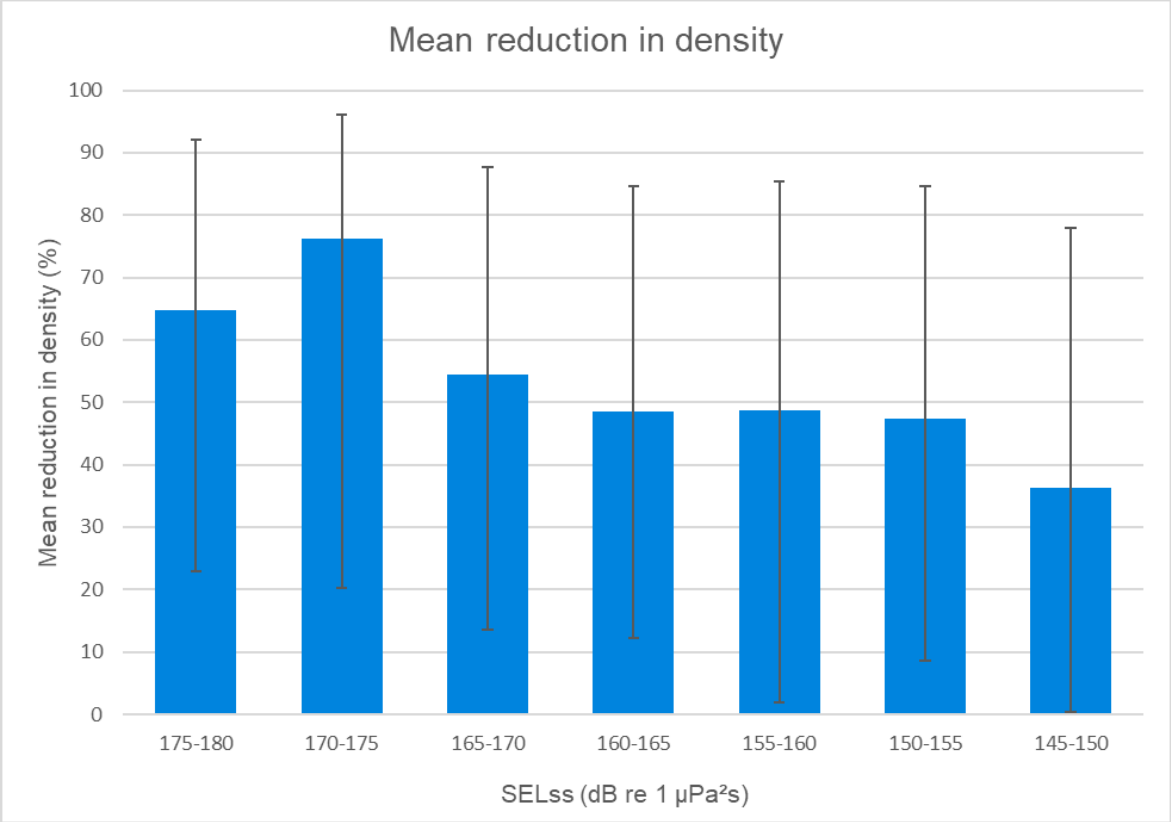


25. While it would be possible to use the harbour porpoise dose response curve for other cetacean species (such as minke whale and dolphin species), due to the differences in hearing abilities of these species' groups, and due to harbour porpoise being a more sensitive species to underwater noise disturbance, the use of this dose response curve for other species groups may overestimate the potential for effect. However, as there is an absence of species-specific dose-response data for dolphins or whale species, while over-precautionary, the Graham *et al*., (2019) dose response curve will be applied to all cetacean species. The Bellrock WFDA EIA Report will highlight the over-precautionary nature of this dose response curve.

26. For both harbour seal and grey seal, a dose-response relationship that is derived from harbour seal telemetry data collected during several months of piling at the Lincs Offshore Wind Farm will be used (Whyte et al. 2020). As seen in **Plate 3.2**, the greatest SEL_{ss} considered in the Whyte et al. (2020) study was 180 dB re 1 µPa^{2}s. The assessment will therefore conservatively assume that at SEL_{ss} > 180 dB re 1 µPa^{2}s, all seals will be disturbed. The dose-response curve for harbour seal will be used for grey seal, as both species have similar hearing audiograms. The Applicant understands that a more robust estimate of harbour seal dose-responses has been developed from the data in Whyte (2022). However, this is currently embargoed by the University of St Andrews.

Should the new estimates become publicly available prior to the production of the Bellrock WFDA EIA Report, they will be used in place of the data in **Plate 3.2**.

Plate 3.2: Dose-response Behavioural Disturbance Data for Harbour Seal Derived from the Data Collected and Analysed by Whyte et al. (2020)



3.2 Population Modelling

27. Population modelling will be undertaken to determine the population level consequences of disturbance due to piling at the Bellrock WFDA. This will also be used to determine whether the number of animals disturbed (as assessed in the methods described in **Section 3.1** and **Section 8.7** of **Chapter 8: Marine Mammals** in the **Bellrock WFDA Scoping Report**) would cause a population level effect.

28. Population modelling for the Bellrock WFDA will be carried out according to best practice, using the best available scientific information, and the latest expert elicitation results (e.g. Booth and Heinis, 2018).

29. The Interim Population Consequences of Disturbance (iPCoD) model will be used to undertake population modelling. iPCoD modelling will be undertaken for harbour porpoise, bottlenose dolphin, minke whale, grey seal and harbour seal, where a potential for a significant disturbance impact is identified. It is currently not possible to undertake iPCoD modelling for other species.

30. The demographic parameters for each species will be based on the latest available information and will follow best practice for iPCoD modelling (e.g. Sinclair et al., 2020). The populations of marine mammal species will be based on the reference populations for each species, as set out in **Chapter 8: Marine Mammals** of the **Bellrock WFDA Scoping Report**.

3.2.1 Determination of Significance

31. There are currently no specific potential biological removal limits in place for population modelling. Therefore, there are no specific thresholds to determine whether a population level effect would be significant in EIA terms.

32. Evans and Arvela (2012) advise that an annual population decline of more than 1% on average over a 12-year period represents unfavourable conservation status. Booth et al., 2016 undertook a study into the use of the iPCoD model for assessing population level effects of offshore wind farm piling in the North Sea. The study assumed that the harbour porpoise population could already be experiencing an annual decline of 1% (in reference to the Evans and Arvela (2012) threshold noted above), and therefore a threshold of an additional 1% annual decline could be used to determine whether the construction works of offshore wind would result in a disturbed population.

33. Recent Natural Resource Wales (NRW) guidance on this topic concluded that a significant population level of effect would be present in the case of a continued 1% annual decline within a population (NRW, 2023) for a six-year period (in line with Favourable Conservation Status reporting periods). It is proposed that the NRW guidance would be used to determine the potential for a significant population level effect at the Bellrock WFDA, and will take into account any further information or guidance that becomes available through the EIA process.

34. Full details on the approach to impact assessment and determining significance is provided in **Chapter 8: Marine Mammals** of the **Bellrock WFDA Scoping Report**.

3.3 Summary of Marine Mammal Disturbance Assessments

35. The approach to the assessment to disturbance effects would be as follows:

- For impact piling:
  - The dose response curve from Graham et al. (2017) would be used to determine the potential for disturbance for harbour porpoise, dolphin species, minke whale, and fin whale; and
  - The dose response curve from Whyte et al. (2020) would be used to determine the potential for disturbance for grey and harbour seal.
- For other noise impacts:
  - For noisy activities other than piling, the disturbance assessments would be based on a literature review of responses of marine mammal species to certain activities (e.g. Benhemma-Le Gall et al., 2021; Frankish et al., 2023).

36. The current approach for the disturbance assessments is to use the Graham et al. (2017) dose response curve for all cetacean species, and to use the Whyte et al. (2020) curve for seal species. However, the EIA will also consider emerging data from other sources, either to further contextualise the conservative nature of this approach or, where possible, replace this proxy with species-specific data if they become available. The Bellrock WFDA EIA Report will identify where this has been the case and justify the use of such data.

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Bellrock OFFSHORE WIND

Appendix 6: Apportioning Breeding Season Impacts to SPA Seabird Populations

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Contents

Tables

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1 Introduction

1. This appendix accompanies **Chapter 9: Offshore Ornithology** of the **Bellrock Wind Farm Development Area (WFDA) Scoping Report**. It presents an overview and details of the findings of the element of this scoping exercise which is specific to informing the apportionment of breeding season impacts associated with the Bellrock WFDA to the qualifying features of breeding seabird colony Special Protection Areas (SPAs).

2. This appendix has been prepared by Royal HaskoningDHV.

3. The potential impacts of offshore wind farms (OWFs) on the qualifying features of breeding seabird colony SPAs may be concentrated on qualifying features from a relatively small number of these SPAs during the breeding season. This is because the foraging ranges of breeding seabirds are constrained by the colony location during the breeding season, when the birds from these colonies must attend nests and provision chicks. By contrast, the distribution of seabirds from these SPAs is not constrained in this way during the non-breeding periods, and during these periods these populations may be widely distributed across large expanses of sea and oceanic waters (Furness, 2015).

4. Consequently, for OWFs located in regions of high importance for breeding seabirds (such as north-east Scotland), the largest project alone effects on individual seabird SPA populations are likely to be associated with the breeding season. Given this, breeding season apportionment can be used to identify those SPA seabird populations on which the predicted effects from the Bellrock WFDA are likely to be greatest, and so provide an early indication of the populations which may be of particular concern in this respect. For the purposes of the Bellrock WFDA scoping exercise, the breeding season apportionment was focussed on the following four species:

   - Gannet;
   - Kittiwake;
   - Razorbill; and
   - Puffin.

5. This was on the basis that there are important SPA populations of each of these species with connectivity to the Bellrock WFDA (as detailed in the **Bellrock WFDA Habitats Regulations Appraisal (HRA) Screening Report** (BlueFloat Energy | Renantis Partnership, 2024)), they include the species for which likely significant effect (LSE) is concluded and which are recorded in highest abundance on the offshore aerial survey area during the first year of surveys (see **Bellrock WFDA Scoping Report** and **Bellrock WFDA HRA Screening Report**), and include species for which there are SPA populations with connectivity for which predicted levels of impact from the in-combination effects of existing projects have been considered sufficient to mean that an Adverse Effect on Integrity (AEoI) cannot be excluded (ABPmer 2019, RPS and Royal HaskoningDHV 2022).

6. Although guillemot were the most abundant species recorded on the offshore aerial survey area during the first year of surveys (see **Table 9.4** of the **Bellrock WFDA Scoping Report**), breeding season apportioning was not undertaken on this species. This is because the Bellrock WFDA is beyond the advised breeding season foraging range from all SPA colonies of this species, noting that for colonies south of the Pentland Firth, NatureScot (2023) advise that the mean maximum +1 standard deviation (SD) foraging range for guillemot should be calculated excluding the data from Fair Isle. Thus, at a 'by-sea' distance of 113.4 km from the Bellrock WFDA, the closest SPA colony (Buchan Ness to Collieston Coast) is beyond the advised foraging range of 95.2 km (see **Table 7.1** and **Table 7.2** of the **Bellrock WFDA HRA Screening Report**).

7. The apportionment calculations undertaken to support this scoping exercise follow the approach of the NatureScot (2018) interim guidance, which derives a weighting on the basis of colony population size, distance to the development and the extent of sea around the colony (see below). The Marine Directorate's Apportioning Tool (Butler et al. 2020) provides an alternative method for apportioning the breeding season impacts from OWFs for kittiwake and razorbill, based upon the use of tracking data. However, consultation with NatureScot (by e-mail, 27th June 2023) advised that this method could not be made available at the current time, with this apportioning tool unlikely to become readily accessible until the Cumulative Effects Framework (CEF) tool is published.

2 Methodology

8. Apportioning to seabird populations that are qualifying features of SPA breeding colonies was undertaken for the four species identified above using the approach detailed in the NatureScot Interim Guidance (NatureScot 2018). Thus, populations from SPA colonies that are identified as having connectivity with the Bellrock WFDA (see **Table 7.1** and **Table 7.2** in the **Bellrock WFDA HRA Screening Report**) and from non-SPA colonies that are within mean-maximum foraging range +1 SD (Woodward et al. 2019) of the Bellrock WFDAs were included in the apportioning calculations.

9. The NatureScot (2018) approach uses three weighting factors to estimate the contribution of the different SPA and non-SPA colonies to the population of adult birds occurring within the Bellrock WFDA during the breeding season (and hence the proportional allocation of predicted impacts to each of these colonies). These factors are:

- The colony population size (of breeding adult birds);
- the distance of the centre of the colony by sea (i.e. circumventing land masses) from the centre of the Bellrock WFDA; and
- the proportion of sea within the area encompassed by a circle of radius equal to the defined foraging range (see above) around the colony site.

10. Colony population sizes were derived from the most recent counts in the Seabird Monitoring Programme database (JNCC, 2023). It should be noted that the colony counts from the Seabird Monitoring Programme database are of individuals counted on land, with the exception of puffins which included counts of birds on the water adjacent to the colony. For razorbill, an availability correction of 1.34 has been applied to the Seabird Monitoring Programme colony count data, to give a more accurate estimate of the number of breeding adults[1]. By-sea distance to each colony and proportion of foraging range around each colony which comprises sea were both calculated using GIS. By-sea distances were squared (Distance^2), and the reciprocal was calculated for the proportion of foraging range as sea (1/Proportion of foraging range as sea). For each species, the values of each of the three weighting factors were summed, with the weighting for each colony calculated using the following equation:

Weighting = (Colony population size/Sum of colony population size) x (Sum of Distance^2/Colony Distance^2) x ((1/Proportion of foraging range as sea)/Sum of (1/Proportion of foraging range as sea)).

[1] Email of 8th December 2017 from Marine Scotland Licensing Operations Team to Inch Cape Offshore Limited (IC02-INT-EC-OFA-001-RRP-RPT-003 – Available at: https://www.inchcapewind.com/wp-content/uploads/2021/06/IC02-INT-EC-OFA-001-RRP-RPT-003_Ornithology-Habitats-Regulations-Appraisal_For-Information_A_2.pdf

11. Colony weightings were then expressed as a percentage of the sum of weighting values, to provide the percentage apportioning estimate for each breeding colony population. Outputs of apportioning for each of the four species are presented in **Section 3**.

3 Apportioning Results

12. The species-specific apportioning results are presented in **Table 3.1** through **Table 3.4** below. In these tables species are treated as representing a 'SPA population' if they are either a qualifying feature of the SPA in their own right or a named component of a breeding seabird assemblage qualifying feature of the SPA.

3.1 Gannet

13. The apportioning calculations for gannet (**Table 3.1**) suggest that during the breeding season 94.0% of the adult gannets present on the Bellrock WFDA derive from SPA populations. The Forth Islands SPA makes the greatest contribution of any colony population, accounting for approximately 75.5% of the adult gannets present. Other SPA populations make much smaller contributions (all less than 10%). The contribution of non-SPA populations to the adult gannets on the Bellrock WFDA is estimated to be 6.0%.

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Table 3.1: Apportioning of Gannet Present Within the Bellrock WFDA to Breeding Colonies with Connectivity (Non-SPA Colonies are not Listed Individually)

Colony Site	Colony Population (Individual Adults)	Distance by Sea to Bellrock WFDA Centroid (km) (Rounded to Nearest Whole Number)	Distance Squared (Rounded to Nearest Whole Number)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Forth Islands SPA	150,518	191	36,665	1.420	1.5940	75.5%
Flamborough and Filey Coast SPA	26,784	299	89,138	1.658	0.1362	6.5%
Hermaness, Saxa Vord and Valla Field SPA	51,160	449	20,1583	1.162	0.0806	3.8%
Noss SPA	27,530	372	138,429	1.178	0.0641	3.0%
Sule Skerry and Sule Stack SPA	18,130	365	133,174	1.139	0.0424	2.0%
North Rona and Sula Sgeir SPA	22,460	448	200,937	1.133	0.0346	1.6%
Fair Isle SPA	9,942	315	98,954	1.175	0.0323	1.5%
(Non-Qualifying SPA Colonies)	(17,330)	(171 - 386)	-	-	-	(6.0%)
Totals	**314,450**	**-**	**1,321,835**	**14.927**	**2.1102**	**-**

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3.2 Kittiwake

14. Ten SPA colonies for kittiwake are identified as having potential connectivity with the Bellrock WFDA during the breeding season and the apportioning calculations suggest that approximately 75% of the adult kittiwakes present in the Bellrock WFDA during this period derive from SPA populations (**Table 3.2**). Of these SPA populations, the Fowlsheugh SPA, Buchan Ness to Collieston Coast SPA and Troup, Pennan and Lion's Head SPA account for the vast majority of the birds and contribute 20.6%, 16.8% and 11.2% of the adult kittiwakes found in the Bellrock WFDA, respectively. The individual contributions of the other SPA colonies are considerably smaller, all contributing less than 10% each of the adult kittiwakes present in the Bellrock WFDA during the breeding season.

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Table 3.2: Apportioning of Kittiwake Present Within the Bellrock WFDA to Breeding Colonies with Connectivity (Non-SPA Colonies are not Listed Individually)

Colony Site	Colony Population (Individual Adults)	Distance by Sea to Bellrock WFDA Centroid (km) (Rounded to Nearest Whole Number)	Distance Squared (Rounded to Nearest Whole Number)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Fowlsheugh SPA	28,078	135	18,301	1.496	0.3471	20.6%
Buchan Ness to Collieston Coast SPA	22,590	129	16,626	1.377	0.2830	16.8%
Troup, Pennan and Lion's Heads SPA	27,038	172	29,746	1.369	0.1882	11.2%
East Caithness Cliffs SPA	48,958	255	65,183	1.300	0.1477	8.8%
Forth Islands SPA	13,676	191	36,665	1.683	0.0949	5.6%
St Abb's Head to Fast Castle SPA	10,300	171	29,282	1.665	0.0886	5.3%
Farne Islands SPA	8,804	170	28,910	1.632	0.0752	4.5%
North Caithness Cliffs SPA	7,602	290	84,338	1.249	0.0170	1.0%
Coquet Island SPA	1,038	195	37,830	1.682	0.0070	0.4%
Copinsay SPA	1,910	2280	78,193	1.204	0.0044	0.3%
(Non-SPA Colonies)	(59,422)	(131 - 296)	-	-	-	(25.5%)
Totals	**229,416**	**-**	**3,291,327**	**94.861**	**1.6821**	**-**

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3.3 Puffin

15. The apportioning calculations suggest that during the breeding season over 98% of the adult puffins present on the Bellrock WFDA derive from SPA populations, with these being attributable to three SPA colonies (**Table 3.3**). Thus, the Farne Islands SPA, the Forth Islands SPA and Coquet Island SPA are estimated to contribute 42.3%, 37.4% and 18.8% of the adult puffins, respectively. The remaining contributions are from non-SPA colonies that together contribute less than 2% of the adult puffins found at the Bellrock WFDA, with each individual non-SPA colony contributing less than 1%.

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Table 3.3: Apportioning of Puffin Present Within the Bellrock WFDA to Breeding Colonies with Connectivity (Non-SPA Colonies are not Listed Individually)

Site	Colony Population (Individual Adults)	Distance by Sea to Bellrock WFDA Centroid (km) (Rounded to Nearest Whole Number)	Distance Squared (Rounded to Nearest Whole Number)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Farne Islands SPA	87,504	170	28,910	1.707	0.4145	42.3%
Forth Islands SPA	92,281	191	36,665	1.816	0.3667	37.4%
Coquet Island SPA	50,058	195	37,830	1.732	0.1839	18.8%
(Non-SPA Colonies)	(4,482)	(129 - 259)	-	-	-	(1.5%)
Totals	**234,325**	**-**	**598,859**	**31.857**	**0.9800**	**-**

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3.4 Razorbill

16. The apportioning calculations suggest that during the breeding season 72.4% of the adult razorbills present in the Bellrock WFDA derive from the Fowlsheugh SPA population (**Table 3.4**). The remaining adult razorbills found at the Bellrock WFDA are considered to be non-SPA birds, with the colony at the Buchan Ness to Collieston Coast SPA (for which razorbill is neither a qualifying feature nor a named component of a seabird assemblage feature) contributing the vast majority of these and accounting for 26.9% of the adult razorbills on the Bellrock WFDA.

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Table 3.4: Apportioning of Razorbill Present Within the Bellrock WFDA to Breeding Colonies with Connectivity (Non-SPA Colonies are not Listed Individually)

Site	Colony Population (Individual Adults using 1.34 Correction Value)	Distance by Sea to Bellrock WFDA Centroid (km) (Rounded to Nearest Whole Number)	Distance Squared (Rounded to Nearest Whole Number)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Fowlsheugh SPA	18,844	135	18,301	1.671	0.7514	72.4%
(Non-Qualifying SPA Colonies)	(8,033)	(129 - 133)	-	-	-	(27.6%)
Totals	**26,878**	**-**	**52,698**	**4.49**	**1.0383**	**-**

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4 Implications of the Apportionment Findings

17. As would be expected from the location of the Bellrock WFDA, the apportionment exercise highlights the likely importance of breeding seabird colony SPAs on the east coast of the Scottish mainland in terms of the potential project alone effects. Thus, for two of the four species considered (gannet and puffin), the Forth Islands SPA figures prominently, whilst for both kittiwake and razorbill the Fowlsheugh SPA is of greatest importance. For kittiwake, the Buchan Ness to Collieston Coast SPA is also of high importance, as is the case for the Farne Islands SPA (in northeast England) in relation to puffin.

18. Overall, the apportioning calculations suggest that a relatively small number of SPAs make substantive contributions to the populations of the key seabird species occurring on the Bellrock WFDA (although kittiwake is, to some extent at least, an exception in this regard). This reflects the considerable distance of the Bellrock WFDA from the coast, which reduces the potential for connectivity with SPA populations and, for some species (notably guillemot but also herring gull) means that there is no connectivity with any SPA populations in the breeding season (see **Table 7.2** in the **Bellrock WFDA HRA Screening Report**). At the same time, for gannet, puffin and razorbill, a very high proportion of the adult birds occurring on the Bellrock WFDA are estimated to derive from just one or two SPA populations. Thus, for these species, it is likely that the project-alone effects will be concentrated on these populations.

19. For several of the SPA populations associated with high apportionment estimates, the predicted in-combination effects from existing projects have been identified as being of sufficient scale to prevent a conclusion of no AEoI. Thus, the ScotWind plan-level HRA considered that this is potentially the case for kittiwake at the East Caithness Cliffs SPA and Fowlsheugh SPA, for gannet at the Forth Islands SPA and for razorbill at the Fowlsheugh SPA (ABPmer 2019). More recently, the assessment for the Berwick Bank Wind Farm (RPS and Royal HaskoningDHV, 2022) concluded that there was a potential AEoI for in-combination effects (under at least some of the impact scenarios considered) for:

- Kittiwake at the East Caithness Cliffs SPA, Troup, Pennan and Lion's Head SPA, Buchan Ness to Collieston Coast SPA and Fowlsheugh SPA;
- Razorbill at the Fowlsheugh SPA; and
- Puffin at the Forth Islands SPA and Farne Islands SPA.

20. The apportionment estimates that have been calculated in the current report for the purposes of informing the **Bellrock WFDA Scoping Report** may be subject to change prior to preparing the subsequent offshore ornithology assessment for the Bellrock WFDA. This could arise as a result of updated colony count data becoming available (noting that effects of the recent outbreak of HPAI on colony population sizes could vary between sites, so affecting the apportionment), whilst there may also be a requirement to undertake breeding season apportionment for kittiwake, guillemot

and razorbill using the MS Apportioning Tool (Butler et al., 2020). The consequences of the former on the apportionment results reported here are uncertain but (based on previous experience of the MS Apportioning Tool) it is likely that the latter would result in a higher proportion of the impacts being assigned to a smaller number of colony populations, with the apportionment values likely to increase amongst those colony populations which are closer to the Bellrock WFDA.

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Annex A: SPA and Non-SPA Breeding Season Apportioning Results

Table A1: Apportioning of Gannet Present within the Bellrock WFDA to Breeding Colonies with Connectivity

Colony Site	SPA for Gannet	Year of Colony Count	Colony Population (Individual Adults)	Distance by Sea to Bellrock WFDA Centroid (km)	Distance Squared (km)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Forth Islands SPA	Yes	2014	150,518	191.48	36,664.6	1.42	1.5940	75.54%
Flamborough and Filey Coast SPA	Yes	2017	26,784	298.56	89,138.1	1.658	0.1362	6.46%
Hermaness, saxa vord and valla field SPA	Yes	2014	51,160	448.98	201,583.0	1.162	0.0806	3.82%
Noss SPA	Yes	2019	27,530	372.06	138,428.6	1.178	0.0641	3.04%
Sule Skerry and Sule Stack SPA	Yes	2013/18	18,130	364.93	133,173.9	1.139	0.0424	2.01%
North Rona and Sula Sgeir SPA	Yes	2013	22,460	448.26	200,937.0	1.133	0.0346	1.64%
Fair Isle SPA	Yes	2021	99,42	314.57	98,954.3	1.175	0.0323	1.53%

Colony Site	SPA for Gannet	Year of Colony Count	Colony Population (Individual Adults)	Distance by Sea to Bellrock WFDA Centroid (km)	Distance Squared (km)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Troup, Pennan and Lion's Heads SPA	No	2019[2]	9,650	172.47	29,745.9	1.214	0.1077	5.10%
Foula SPA	No	2021	4,886	386.31	149,235.4	1.14	0.0102	0.48%
Noup Cliffs (West Westray SPA)	No	2021	2,768	328.83	108,129.2	1.133	0.0079	0.38%
St Abb's Head to Fast Castle SPA	No	2019	8	171.12	29,282.1	1.445	0.0001	0.01%
Marwick Head SPA	No	2021	18	326.44	106,563.1	1.13	0.0001	0.00%
Totals	**-**	**-**	**314,450**	**-**	**1,321,835.2**	**14.927**	**2.0652**	**-**

[2] Seabird Monitoring Programme whole-colony count value of 246 individuals in 2021 not used in apportioning as assumed to be erroneous.

Table A2: Apportioning of Kittiwake Present within the Bellrock WFDA to Breeding Colonies with Connectivity

Colony Site	SPA for Kittiwake	Year of Colony Count	Colony Population (Individual Adults)	Distance by Sea to Bellrock WFDA Centroid (km)	Distance Squared (km)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Fowlsheugh SPA	Yes	2018	28,078	135.28	18,300.7	1.496	0.3471	20.64%
Buchan Ness to Collieston Coast SPA	Yes	2019	22,590	128.94	16,625.5	1.377	0.2830	16.82%
Troup, Pennan and Lion's Heads SPA	Yes	2017/21	27,038	172.47	29,745.9	1.369	0.1882	11.19%
East Caithness Cliffs SPA	Yes	2015/18	48,958	255.31	65,183.2	1.3	0.1477	8.78%
Forth Islands SPA	Yes	2019/21/22	13,676	191.48	36,664.6	1.683	0.0949	5.64%
St Abb's Head to Fast Castle SPA	Yes	2016/18/21	10,300	171.12	29,282.1	1.665	0.0886	5.27%
Farne Islands SPA	Yes	2019	8,804	170.03	28,910.2	1.632	0.0752	4.47%
North Caithness Cliffs SPA	Yes	2015/16	7,602	290.41	84,338.0	1.249	0.0170	1.01%
Coquet Island SPA	Yes	2022	1,038	194.50	37,830.3	1.682	0.0070	0.41%
Copinsay SPA	Yes	2015	1,910	279.63	78,192.9	1.204	0.0044	0.26%
Firth of Forth SPA	no	2007	2,310	184.46	34,025.5	1.693	0.0174	1.03%
Ythan Estuary, Sands of Forvie and Meikle Loch SPA	no	2023	1,150	133.31	17,771.6	1.416	0.0139	0.82%

Colony Site	SPA for Kittiwake	Year of Colony Count	Colony Population (Individual Adults)	Distance by Sea to Bellrock WFDA Centroid (km)	Distance Squared (km)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Pentland Firth Islands SPA	no	2021	353	275.18	75,724.0	1.231	0.0009	0.05%
Auskerry SPA	no	2016	0	288.08	82,990.1	1.186	0.0000	0.00%
Girdle Ness to Hare Ness	N/A	2017	4,186	130.76	17,096.9	1.455	0.0539	3.20%
Catterline to Inverbervie	N/A	2017	4,093	138.20	19,099.7	1.503	0.0487	2.90%
Lunan Bay to Arbroath	N/A	2018	3,302	158.16	25,014.9	1.559	0.0311	1.85%
Findon Ness - Hare Ness	N/A	2017	2,354	131.66	17,333.2	1.464	0.0301	1.79%
Burn of Daff	N/A	2017	2,186	132.77	17,626.9	1.47	0.0276	1.64%
Berwick to Scottish Border	N/A	2000	3,054	172.50	29,755.9	1.662	0.0258	1.53%
Marsden Bay	N/A	2016	4,776	224.84	50,550.8	1.739	0.0248	1.48%
Scarborough to Osgodby Point	N/A	2011/22/23	5,592	286.54	82,105.9	1.724	0.0178	1.06%
Howick - Cullornose Point - Dunstanburgh Castle Point	N/A	2019	2,136	183.55	33,691.0	1.662	0.0159	0.95%
Carr Craig, Eyebroughy and Haystack	N/A	2021/22	2,352	222.47	49,494.3	1.738	0.0125	0.74%
River Tyne to Seaton Sluice	N/A	2015	2,514	233.88	54,700.4	1.769	0.0123	0.73%

Colony Site	SPA for Kittiwake	Year of Colony Count	Colony Population (Individual Adults)	Distance by Sea to Bellrock WFDA Centroid (km)	Distance Squared (km)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Eyemouth to Burnmouth	N/A	2018	1,418	170.46	29,056.7	1.662	0.0123	0.73%
Boulby Cliffs	N/A	2020	2,880	259.47	67,323.6	1.739	0.0113	0.67%
Saltburn Coast	N/A	2020	2,220	259.28	67,223.8	1.747	0.0087	0.52%
Stonehaven to Wine Cove	N/A	2018/21	621	136.25	18,564.9	1.49	0.0075	0.45%
Newtonhill - Hall Bay	N/A	2017	596	133.97	17,948.5	1.475	0.0074	0.44%
Montrose to Lunan Bay	N/A	2017	740	156.27	24,419.4	1.544	0.0071	0.42%
Staithes to Sandsend	N/A	2019	1,562	261.61	68,439.5	1.722	0.0059	0.35%
Portsoy to Cullen	N/A	2017	1,032	199.90	39,961.2	1.383	0.0054	0.32%
Cayton Bay to Filey	N/A	2015/17	1,580	291.09	84,734.0	1.72	0.0049	0.29%
Hopeman Bay	N/A	2019	1,120	240.07	57,635.0	1.384	0.0041	0.24%
Whitby to Robin Hood's Bay	N/A	2002/21/22	924	266.03	70,770.5	1.713	0.0034	0.20%
Seahouses	N/A	2019	412	174.94	30,605.6	1.646	0.0034	0.20%
River Tees Mouth	N/A	2018	754	258.62	66,884.9	1.771	0.0030	0.18%
North Sutor to Shandwick	N/A	2022	846	274.53	75,368.9	1.381	0.0023	0.14%

Colony Site	SPA for Kittiwake	Year of Colony Count	Colony Population (Individual Adults)	Distance by Sea to Bellrock WFDA Centroid (km)	Distance Squared (km)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Hall Bay to Craigeven Bay	N/A	2017	158	135.27	18,297.7	1.482	0.0019	0.12%
Fraserburgh	N/A	2021	162	154.94	24,005.5	1.354	0.0014	0.08%
Hartlepool Fish Quay	N/A	2018	322	250.99	62,994.5	1.758	0.0014	0.08%
Melvich to Duncansby Stacks SSSI	N/A	2022	500	291.24	84,820.6	1.244	0.0011	0.07%
Peterhead	N/A	2021	66	131.57	17,310.9	1.373	0.0008	0.05%
Stronsay	N/A	2018/19	315	294.06	86,472.5	1.179	0.0006	0.04%
Rosehearty to Bay of Cullen	N/A	2017	56	178.68	31,927.1	1.374	0.0004	0.02%
Horse of Copinsay	N/A	2015	144	279.88	78,330.6	1.202	0.0003	0.02%
Portknockie	N/A	2018	62	206.68	42,715.0	1.382	0.0003	0.02%
Scalby to Rocky Point	N/A	2015/18/21	90	281.00	78,959.3	1.719	0.0003	0.02%
Caithness - Wick Bay to Freshwick Bay	N/A	2018	90	258.73	66,939.4	1.265	0.0003	0.02%
South Ronaldsay	N/A	2016/21	102	280.65	78,763.2	1.225	0.0002	0.01%
Hartlepool	N/A	2020	48	249.91	62,456.0	1.76	0.0002	0.01%
Hoy and Southwalls	N/A	2019	66	288.45	83,205.1	1.229	0.0001	0.01%

Colony Site	SPA for Kittiwake	Year of Colony Count	Colony Population (Individual Adults)	Distance by Sea to Bellrock WFDA Centroid (km)	Distance Squared (km)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
South Sutor	N/A	2022	50	274.76	75,492.4	1.384	0.0001	0.01%
Scapa Bay to St. Marys	N/A	2021	46	293.38	86,074.5	1.206	0.0001	0.01%
Shapinsay (Coastal)	N/A	2016/21	34	295.63	87,394.9	1.193	0.0001	0.00%
Holm	N/A	2018	28	283.55	80,400.0	1.207	0.0001	0.00%
Newton Hill	N/A	2017	4	134.83	18,180.2	1.48	0.0000	0.00%
Deerness	N/A	2002/18/19	10	286.54	82,105.7	1.197	0.0000	0.00%
Rerwick Head to Mirkady Point	N/A	2019	6	292.42	85,508.2	1.197	0.0000	0.00%
Fishtown of Usan to River North Esk	N/A	2018	0	152.96	23,396.5	1.538	0.0000	0.00%
Ravenscar to Robin Hood's Bay	N/A	2019	0	271.32	73,616.7	1.719	0.0000	0.00%
St Abbs to Eyemouth	N/A	2018	0	170.12	28,940.6	1.664	0.0000	0.00%
Switha	N/A	2019	0	286.41	82,029.5	1.225	0.0000	0.00%
Totals	**-**	**-**	**229,416**	**-**	**3,291,327.5**	**94.861**	**1.6821**	**-**

Table A4: Apportioning of Puffin Present within the Bellrock WFDA to Breeding Colonies with Connectivity

Site	SPA for Puffin	Year of Colony Count	Colony Population (Individual Adults)	Distance by Sea to Bellrock WFDA Centroid (km)	Distance Squared (km)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Farne Islands SPA	Yes	2019	87,504	170.030	28,910.2	1.707	0.4145	42.29%
Forth Islands SPA	Yes	2017-2021	92,281	191.480	36,664.6	1.816	0.3667	37.41%
Coquet Island SPA	Yes	2019	50,058	194.500	37,830.3	1.732	0.1839	18.76%
Fowlsheugh SPA	No	2018	178	135.280	18,300.7	1.606	0.0013	0.13%
Buchan Ness to Collieston Coast SPA	No	2019	182	128.940	16,625.5	1.411	0.0012	0.13%
East Caithness Cliffs SPA	No	2015	189	255.310	65,183.2	1.34	0.0003	0.03%
Troup, Pennan and Lion's Heads SPA	No	2017	30	172.470	29,745.9	1.413	0.0001	0.01%
St Abb's Head to Fast Castle SPA	No	2016/19	0	171.120	29,282.1	1.746	0.0000	0.00%
Carr Craig, Eyebroughy and Haystack	N/A	2021/22	3,800	222.473	49,494.3	1.876	0.0116	1.18%
Lunan Bay to Arbroath	N/A	2018	26	158.161	25,014.9	1.707	0.0001	0.01%
Findon Ness - Hare Ness	N/A	2015/17	19	131.656	17,333.2	1.551	0.0001	0.01%

Site	SPA for Puffin	Year of Colony Count	Colony Population (Individual Adults)	Distance by Sea to Bellrock WFDA Centroid (km)	Distance Squared (km)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Portsoy to Cullen	N/A	2017	32	199.903	39,961.2	1.446	0.0001	0.01%
Catterline to Inverbervie	N/A	2017	10	138.202	19,099.7	1.623	0.0001	0.01%
Burn of Daff	N/A	2017	7	132.766	17,626.9	1.562	0.0000	0.01%
Newtonhill - Hall Bay	N/A	2017	3	133.972	17,948.5	1.569	0.0000	0.00%
Newton Hill	N/A	2017	2	134.834	18,180.2	1.577	0.0000	0.00%
Stonehaven to Wine Cove	N/A	2018/21	1	136.253	18,564.9	1.597	0.0000	0.00%
Caithness - Wick Bay to Freshwick Bay	N/A	2018	3	258.727	66,939.4	1.299	0.0000	0.00%
Eyemouth to Burnmouth	N/A	2018	0	170.460	29,056.7	1.74	0.0000	0.00%
Girdle Ness to Hare Ness	N/A	2017	0	130.755	17,096.9	1.539	0.0000	0.00%
Totals	**-**	**-**	**234,325**	**-**	**598,859.1**	**31.857**	**0.9800**	**-**

Table A4: Apportioning of Razorbill Present within the Bellrock WFDA to Breeding Colonies with Connectivity

Site	SPA for Razorbill	Year of Colony Count	Raw Colony Population	Corrected Population (Individual Adults using 1.34 Correction Value)	Distance by Sea to Bellrock WFDA Centroid (km)	Distance Squared (km)	1/Proportion of Foraging Range as Sea	Weight for SPA	Proportional Weight of SPA
Fowlsheugh SPA	Yes	2018	14,063	18,844	135.28	18,300.7	1.671	0.7514	72.36%
Buchan Ness to Collieston Coast SPA	No	2019	5,833	7,816	128.94	16,625.5	1.36	0.2792	26.89%
Ythan Estuary, Sands of Forvie and Meikle Loch SPA	No	2023	162	217	133.31	17,771.6	1.459	0.0078	0.75%
Totals	**-**	**-**	**20,058**	**26,877.72**	**-**	**52,697.7581**	**4.49**	**1.0383**	**-**