Orkney Logistics Base (Hatston)
Marine Mammal and Fish Baseline

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CONTROL SHEET

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EnviroCentre Limited Office Locations:

Glasgow **Edinburgh** **Inverness** **Banchory**

Registered Office: Craighall Business Park 8 Eagle Street Glasgow G4 9XA
Tel 0141 341 5040 info@envirocentre.co.uk www.envirocentre.co.uk

EnviroCentre Limited is registered in Scotland under no. SC161777.

VAT no. GB 348 6770 57.

EXECUTIVE SUMMARY

EnviroCentre Limited was commissioned by Orkney Islands Council Harbour Authority to undertake a marine mammal and fish desk study to inform an Environmental Impact Assessment (EIA) in relation to the Orkney Logistics Base (Hatston) of a pier extension and quayside laydown area.

The desk study is required to inform an ecological impact assessment and mitigation requirements.

The site does not lie within any statutory designated sites relating to marine species (Marine Protected Areas (MPA), Special Areas of Conservations (SAC), Sites of Special Scientific Interest (SSSI) or Designated Haul Out Site for seals.

From the proposed works associated with the development, some of the following potential impacts may occur:

- Noise and vibration generated during construction and future operations may temporarily or permanently impact marine mammals, seals and fish and any prey resources.
- Potential impacts on water quality from pollution events (fuel spills, sediment runoff etc.).
- Removal of benthic habitat for construction of pier.

It has been assessed that the most frequently and recently observed species, and therefore the species considered to be of most concern within the zone of influence of the proposed Hatston development and associated potential impacts, are:

- Harbour porpoise
- Risso's dolphin
- Minke whale
- Killer whale
- White-beaked dolphin
- Long-finned pilot whale
- Short-beaked common dolphin
- Grey seal
- Harbour seal
- Basking sharks
- Commercial fisheries
- Some fish PMFs
- Flapper skate

Species scoped out due to limited or no records surrounding Orkney or unsuitable habitat and therefore considered to be at least concern from the proposed development and associated potential impacts include:

- Humpback whale
- Fin whale
- Striped dolphin
- Atlantic white-sided dolphin
- Bottlenose dolphin
- Sperm whale
- Cuvier's beaked whale
- Sei whale
- Short-finned pilot whale
- Sowerby's beaked whale
- Northern bottlenose whale
- False killer whale
- Blue whale
- Narwhal
- Beluga whale
- Diadromous fish
- European Eel

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1 INTRODUCTION

1.1 Terms of Reference

EnviroCentre Limited was commissioned by Orkney Islands Council Harbour Authority to undertake a marine mammal and fish desk study to inform an Environmental Impact Assessment (EIA) in relation to the Orkney Logistics Base (Hatston) of a pier extension and quayside laydown area. Please see Appendix A: Proposed Site Location and Layout.

The desk study is required to identify records of marine mammals as well as basking shark and fish associated with Orkney, to provide an ecological marine baseline.

1.2 Scope of Study

The aim of this study is to establish which species are likely to present and could be impacted by the proposed development to aid scoping of features to be taken forward for further assessment within the EIA. The objectives were as follows:

- Collate existing data in relation to designated sites, species records, distribution, population counts, habitat use and any other relevant information, to establish which species are likely to be present within the development site and the wider zone of influence of the development.
- Identify potential impacts to marine mammals and fish which could occur as a result of the proposed development.
- Provide a summary of species which are likely to be present and which may be subject to significant impacts.

1.3 Project Overview

It is proposed to extend the existing outer quay by 300m (with minimum water depth of -10m Chart Datum (CD)) which would also form a 125m inner berth. This would create substantially more quayside which would be available for both current and future operations. In addition to the above, circa 7.5 hectares (Ha) of additional land extending from the current shoreline outwards would be made available for harbour-related operations through reclamation. The design includes a ship lift, additional link span and fuel facility.

The development is designed to be built in three phases as noted below. These phases should not be considered consecutively but allow for a degree of flexibility which can be adapted to suit the requirements, budget and programme of OICHA.

In summary, the proposed development contains the following components during each Phase:

- **Phase 1**
  - Reclaim the area by depositing appropriate material to form a platform on the south-eastern side of the current pier causeway and thereby create 3Ha of hard-core surfaced marshalling / storage area along with an HGV trailer park for the ferry service which will be covered by a reinforced concrete slab;

  - A sheet pile wall is to be installed to allow a retained interface with the current suspended deck; and
  - Place rock armour along the northern and eastern edges of the infill area.
- **Phase 2**
  - Extend the current quay to the west by circa 300m with a 25m return and an inner berth to facilitate the proposed linkspan berth and fixed ramp. The extension will comprise a steel sheet pile wall and will initially interface with the alignment of the existing suspended deck on the north-west inner face before forming the new quay extension;
  - Reinforced concrete slabs will form the new main deck areas;
  - Reclaim the shoreline by depositing appropriate material to form a platform on the southwestern side of the current pier causeway to create an additional 3.71Ha to be used as a multi-use laydown/work area surfaced with hard-core, as well as establish a separate access road to the new quay extension;
  - Place rock armour along the western edge of the infill area; and
  - Dredge the approaches to the quay, after quay works complete.
- **Phase 3**
  - Reclaim the shoreline to the south-west of Phase 2 to form a platform on the southwestern side of the current pier causeway to be used as a multi-use laydown/work area as well as create a ship lift;
  - The ship lift will extend from the linkspan fixed ramp installed in Phase 2 and will comprise piles and reinforced concrete pads designed for the boatlift wheel-loads;
  - The rest of the area will be infilled to provide extra yard / storage;
  - Place rock armour along the western edge of the infill area; and
  - Dredge the area around the boat lift.

1.4 Report Usage

The information and recommendations contained within this report have been prepared in the specific context stated above and should not be utilised in any other context without prior written permission from EnviroCentre Limited.

If this report is to be submitted for regulatory approval more than 12 months following the report date, it is recommended that it is referred to EnviroCentre Limited for review to ensure that any relevant changes in data, best practice, guidance or legislation in the intervening period are integrated into an updated version of the report.

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2 MARINE MAMMAL AND FISH BASELINE

2.1 Desk Study

In order to anticipate the potential marine mammal and fish ecological sensitivities at the site, a desk study was conducted. The following sources were checked:

- Marine Directorate National Marine Plan interactive (NMPi) for:
  - Location of marine designated sites;
  - Seal haul out sites;
  - Distribution of Priority Marine Features
- Marine Scotland (MS) Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters [1] and appendices[2];
- JNCC Report No 680: Updated abundance estimates for cetacean management units in UK waters[3];
- Sea Watch Foundation (SWF) website for recent sightings of marine mammals from the Orkney region[4];
- The Hebridean Whale and Dolphin Trust (HWDT) Whale Track for recent sightings (2014-2024) within a 65km radius[5];
- Orcadian Wildlife (OW)[6];
- Scottish Marine Animal Stranding Scheme (SMASS) for records of strandings between 2001 and 2020[7];
- Orkney Marine Mammal Research Initiative (OMMRI)[8] for available species records;
- ORCA website for recent records[9]
- OMMRI Longhope Harbour Porpoise Project 2022[10];
- OMMRI Trustees' Annual Report April 2022-2023[11];
  Marine Mammal sightings recorded by Andrew Upton between 2022-2024;

[1] Marine Scotland Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters, Scottish Marine and Freshwater Science, Vol 11 No 12, available at: https://data.marine.gov.scot/sites/default/files/Scottish%20Marine%20and%20Freshwater%20Science%20%28SMFS%29%20Vol%2011%20No%2012%20Regional%20baselines%20for%20marine%20mammal%20knowledge%20across%20the%20North%20Sea%20and%20Atlantic%20areas%20of%20Scottish%20waters.pdf (Accessed 07/06/2024)

[2] Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters: Appendix 3 - SCANS surveys Scottish Marine and Freshwater Science Vol 11 No 12, available at: https://data.marine.gov.scot/sites/default/files//Scottish%20Marine%20and%20Freshwater%20Science%20%28SMFS%29%20Vol%2011%20No%2012_%20Regional%20baselines%20for%20marine%20mammal%20knowledge%20across%20the%20North%20Sea%20and%20Atlantic%20areas%20of%20Scottish%20waters%20-%20Appendix%203%20SCANS%20surveys%20%281%29.pdf (Accessed 07/06/2024)

[3] IAMMWG. 2022. Updated abundance estimates for cetacean Management Units in UK waters. JNCC Report No. 680 (Revised March 2022), JNCC Peterborough, ISSN 0963-8091. Available at: https://data.jncc.gov.uk/data/3a401204-aa46-43c8-85b8-5ae42cdd7ff3/jncc-report-680-revised-202203.pdf (Accessed 09/05/2024)

[4] Sea Watch Foundation Recent Sightings Orkney available at: https://www.seawatchfoundation.org.uk/recentsightings/ (Accessed 12/12/2023)

[5] HWDT sightings data available at: https://whaletrack.hwdt.org/sightings-map/ (Accessed 06/06/2024)

[6] Orcadian Wildlife information available at: http://orcadianwildlife.co.uk/wPress/cetaceans-in-orkney/ last accessed 06/06/2024

[7] Species reported within a 10km (sea route) from 2001-2020 to Scottish Marine Animal Stranding Scheme (SMASS) available at: https://strandings.org/map/ (Accessed 07/06/2024)

[8] Orkney Marine Mammal Research Initiative data request, available at: https://ommri.org/ (Accessed 18/05/2023)

[9] ORCA Whale and Dolphin Sightings interactive map, available at: https://orca.org.uk/whale-dolphin-sightings (Accessed 27/05/2024)

[10] OMMRI Longhope Harbour Porpoise Project 2022, available at: https://ommri.org/get-involved-2/longhope-bay-harbour-porpoise-project/ (Accessed 28/05/2024)

[11] OMMRI Trustees' Annual Report 6th April 2022 to 5th April 2023, available at: https://ommri.org/wp-content/uploads/2024/03/22-23-TAR_FINAL.pdf (Accessed 28/05/2024)

- MS Updated Seal Usage Maps: The Estimated at-sea Distribution of Grey and Harbour Seals[12], which includes data obtained from the Sea Mammal Research Unit at St Andrews University[13];
- NatureScot Aerial surveys of seals in Scotland during the harbour moult season 2016-2019[14];
- Natural Environment Research Council Scientific Advice on Matters Related to the Management of Seal Populations: 2021[15];
- Marine Scotland Regional Differences in the Abundance Trends Amongst Harbour Seal Populations[16];
- IUCN Red List[17];
- The Shark Trust basking shark sightings[18];
- NatureScot Basking shark satellite tagging project, Commissioned Report[19];
- Orkney Trout Fishing Association (OTFA)[20];
- Orkney Shore Angling Association (OSAA)[21];
- Orkney Skate Trust[22];
- MS Aquaculture – Active Fin-fish Sites to identify locations of fin-fish sites[23]; and
- Scotland's Aquaculture to provide detailed information on aquaculture sites[24].

2.1.1 Disclaimer

It should be noted that the baseline is limited by the reliability of third party information and the geographical availability of biological and/or ecological records and data. The absence of species from biological records cannot be taken to represent actual absence. Species distribution patterns should be interpreted with caution as they may reflect survey/reporting effort rather than actual distribution.

2.2 Cetaceans

All cetaceans present in Scottish waters are European Protected Species (EPS) and are classed as Priority Marine Features (PMFs).

[12] Updated Seal Usage Maps: The Estimated at-sea Distribution of Grey and Harbour Seals, Scottish Marine and Freshwater Science, Vol 8 No 25, available at: https://data.marine.gov.scot/sites/default/files//SMFS%200825.pdf (Accessed 07/06/2024)
[13] St Andrews Sea Mammal Research Unit, available at: http://www.smru.st-andrews.ac.uk/ (Accessed 07/06/2024)
[14] NatureScot Aerial Surveys of Seals in Scotland during the Harbour Seal Moult, 2016-2019, available at: https://www.nature.scot/doc/naturescot-research-report-1256-aerial-surveys-seals-scotland-during-harbour-seal-moult-2016-2019 (Accessed 07/06/2024)
[15] Scientific Advice on Matters Related to the Management of Seal Populations: 2021, Natural Environment Research Council Special Committee on Seals. Available at: http://www.smru.st-andrews.ac.uk/files/2022/08/SCOS-2021.pdf (Accessed 07/06/2024)
[16] Marine Scotland topic Sheet Number 33 (V2), Regional Differences in the Abundance Trends Amongst Harbour Seal Populations, available at: https://www.gov.scot/binaries/content/documents/govscot/publications/factsheet/2019/11/marine-scotland-topic-sheets-marine-mammals/documents/regional-differences-in-the-abundance-trends-amongst-harbour-seal-populations-updated-march-2017/regional-differences-in-the-abundance-trends-amongst-harbour-seal-populations-updated-march-2017/govscot%3Adocument/harbour-seal-populations.pdf (Accessed 27/05/2024)
[17] IUCN Red List available at: http://www.iucnredlist.org/ (Accessed 07/06/2024)
[18] The Shark Trust basking shark sightings available at: https://www.sharktrust.org/basking-shark-project (Accessed 07/06/2024)
[19] Witt, M.J., Doherty, P.D., Godley, B.J. Graham, R.T. Hawkes, L.A. & Henderson, S.M. 2016. Basking shark satellite tagging project: insights into basking shark (Cetorhinus maximus) movement, distribution and behaviour using satellite telemetry. Final Report. Scottish Natural Heritage Commissioned Report No. 908. (Accessed 07/06/2024)
[20] Contact with the Orkney Trout Fishing Association to discuss species information (Accessed 09/01/2023)
[21] Contact with the Orkney Shore Angling Association to discuss species information (23/01/2023)
[22] Orkney Skate Trust website available at: https://www.orkneyskatetrust.co.uk/ (Accessed 27/06/2023)
[23] MarineScotland Aquaculture – active Fin-fish Sites, available at: https://marine.gov.scot/maps/1586, (Accessed 06/06/2024)
[24] Scotland's Aquaculture Site Data, available at: http://aquaculture.scotland.gov.uk/data/site_details_record.aspx?site_id=FS1305, (Accessed 06/06/2024)

Harbour Porpoise

The harbour porpoise (*Phocoena phocoena*) is widely distributed and common throughout the Orkney region. Harbour porpoise are predominantly confined to shelf waters, although sightings have occurred in deep water. Although present throughout the year, most sightings associated with Orkney occur during summer-Autumn (June to October), with peak number of records occurring July-August.

Harbour porpoises eat a variety of fish, cephalopods and crustaceans, determined by local availability. Prey species including herring (*Clupea harengus)*, sprat (*Sprattus sprattus*), pouting (*Trisopterus luscus*), sandeel (*Ammodytes tobianus*), gobies (*Gobiidae*), cod (*Gadus morhua*), saithe (*Pollachius virens*) and whiting (*Merlangius merlangus*)[25].

No sightings of harbour porpoise have been recorded within the proposed development site, however records of harbour porpoise have been recorded within Orkney waters. Table 2-1 lists records of harbour porpoise applicable to the wider area:

Table 2-1: Records of Harbour Porpoise

Resource	Date records available	Records/ Information
SWF	2022	10 records of harbour porpoise have been submitted to SWF in 2022 from Orkney, consisting of 28 individuals, the closest being approximately 19km south of the development site, offshore of Hoxa in July.
HWDT	2014-2024	45 sightings comprising 252 individuals between 2014-2024 were returned from HWDT within a 65km radius, with the closest record being 43km west of the site.
OW	N/A	OW also state that each Autumn large numbers gather in Switha Sound to the south of Scapa Flow (approximately 22km south).
OMMRI	1977-2020	734 records of harbour porpoise sightings (dead and alive) within 10km radius of Hatston have been submitted to OMMRI between 1977-2020.
ORCA	2011-2022	26 sightings of harbour porpoise comprising 29 individuals have been submitted to ORCA between 2011-2022, predominantly to the east and south east. The furthest record was 60km from the Hatston development.
Longhope Harbour Porpoise Project 2022	2022	Anecdotal evidence over the last few years suggests 150-250 harbour porpoises gather at Longhope Bay each year (approximately 57km from the proposed Hatston development site) from the end of August to November. It is considered to the largest aggregation in the UK.
Andrew Upton	2022 - 2024	The following sightings were all >40km south of the Hatston development site, within Scapa Flow: 10th April 2022 11:40-11:45 four harbour porpoises resting at surface then continued north. 25th April 2022 12:59 one-two harbour porpoises very briefly noted. 27th August 2022 several harbour porpoises moving west. 29th September 2022 two harbour porpoises sighted. 26th December 2023 13:30 one-two harbour porpoises briefly observed. 4th November 2023 p.m. several harbour porpoises recorded briefly. 10th January 2024 10:50 several harbour porpoises recorded.

[25] SWF, harbour Porpoise fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/Harbour-Porpoise.pdf (Accessed 07/06/2024)

		25th March 2024 12:30 two harbour porpoises identified.
OMMRI 2022 Sightings Report	2022	Harbour porpoise was by far the most numerous cetaceans reported in 2022. Aggregations of harbour porpoise in the Longhope Bay were recorded in late August to the end of October. Four harbour porpoises were observed in Longhope Bay, Hoy on 11th December.
SMASS	2022-2024	One record of harbour porpoise strandings between 2022-2024 within a 20km radius of the development site.

In the 2022 JNCC report, the most recent harbour porpoise abundance estimates for the Management Unit (MU) which covers Orkney (North Sea (NS)) based on SCANS-III and ObSERVE data are 346,601, with the UK proportion of the MU being 159,632 individuals. Figure 2-1 shows predicted density surface for harbour porpoise in 2016 using SCANS III survey data. Predicted density within the vicinity of the Proposed Development is 0.3 – 0.5 animals per km^2.

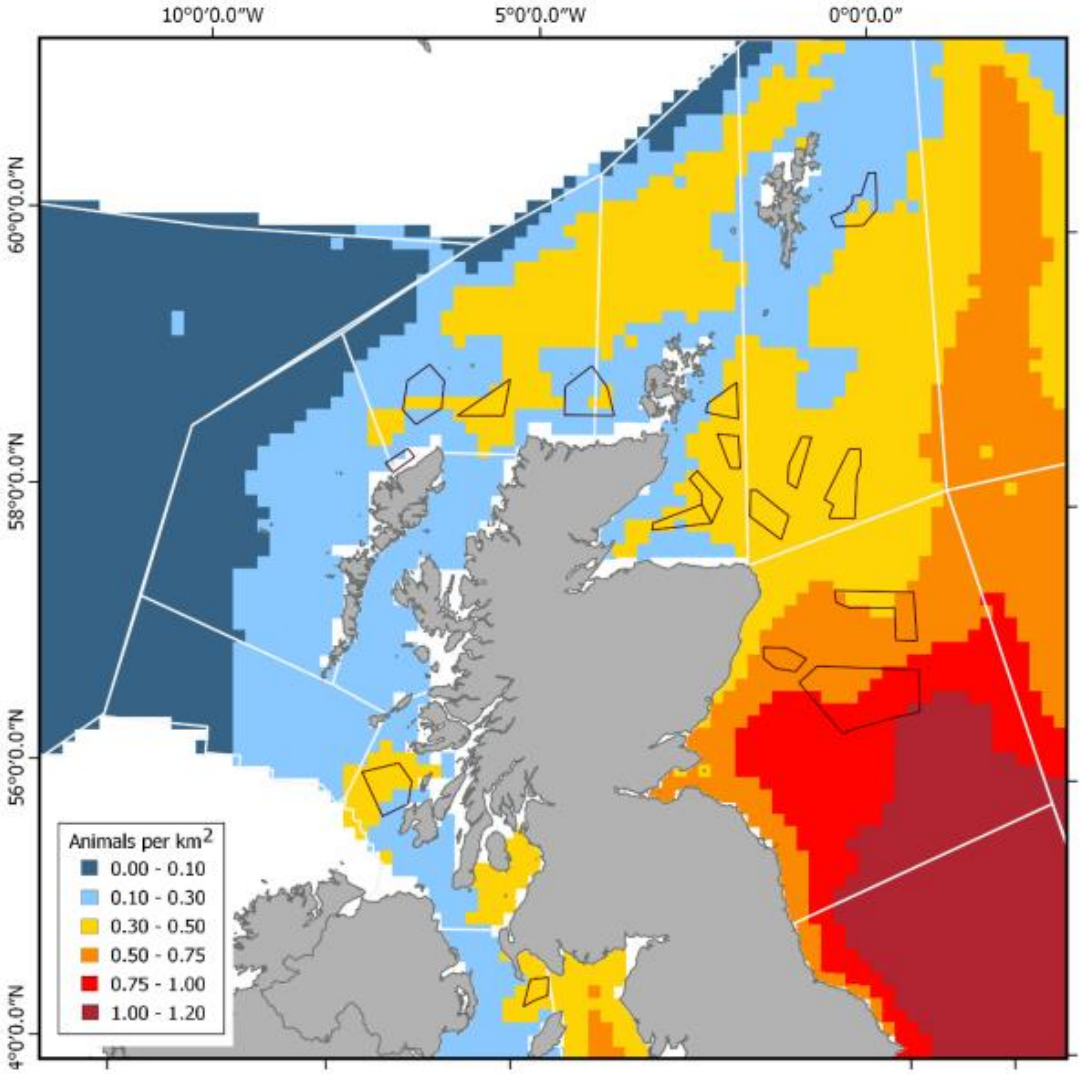

Figure 2-1: Predicted density surface for harbour porpoise in 2016 using SCANS III survey data. Figure reproduced from Marine Directorates Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters.

From the information gathered (number of records and locations of records) harbour porpoise are regularly present within proximity to the proposed Hatston site and therefore may be impacted by the proposed development.

Risso's Dolphin

Sightings of Risso's dolphin (*Grampus griseus*) around Orkney are amongst the furthest north in the eastern Atlantic, with most frequent sightings concentrated along the west coasts of Orkney, particularly west mainland and west Hoy, but also off North Ronaldsay and in the Pentland Firth. They are widely distributed mainly in groups of 5-25 (occasionally up to 50) individuals. Risso's dolphins have been recorded mainly over slopes of 50-100 m depth in the UK.

Sightings generally occurring between April and November, with peak number of records occurring in August. Strandings have occurred between November and March and individuals have also been observed off north-east Scotland and Shetland in winter, suggesting that the species may be present in the area year-round.

Risso's dolphin predominantly eat cephalopods, specifically octopus (*Octopoda*), cuttlefish (*Sepiida*) and various small squid (*Decapodiformes)*, but will occasionally eat small fish, including cod[26].

No sightings of Risso's dolphin have been recorded within the proposed development area, however records of Risso's dolphin have been recorded within Orkney waters. Table 2-2 lists records of harbour porpoise applicable to the wider area:

Table 2-2: Records of Risso's Dolphin

Resource	Date records available	Records/ Information
SWF	2022	Eight records of Risso's dolphin (38 individuals) off the coast of Orkney, have been submitted to SWF in 2022, with the closest sighting being approximately 17km north west, offshore of Eynhallow.
HWDT	2014-2024	16 sightings of 71 individual Risso's dolphin have been recorded via the HWDT, with the closest record approximately 32km north west.
OW	N/A	No information available
OMMRI	1964-2020	146 records of Risso's dolphin sightings within 10km radius of Hatston have been submitted to OMMRI between 1964-2020.
ORCA	2021-2022	Eight sightings of Risso's dolphin comprising 31 individuals within a 60km radius of Hatston have been submitted to ORCA between 2021-2022, predominantly to the south and east.
Andrew Upton	2022	The following sighting was >40km south of the Hatston development site, within Scapa Flow: 19th February 2022 08:15, six Risso's dolphin.
OMMRI 2022 Sightings Report	2022	Four Risso's dolphin on 6th March were recorded off Stanger Head, Flotta. A pod of 12 were observed well spread-out between Hoxa, Flotta and Switha on 5th November.
SMASS	2023	One records of Risso's dolphin strandings in 2023 within a 20km radius of the development site.

[26] SWF, Risso's dolphin fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/10/Rissos-Dolphin.pdf

There were no abundance estimates for Risso's dolphin in SCANS-II, therefore first estimates for Rissos dolphin have been provided by JNCC (2022) an update abundance estimate report for the MU which covers the Celtic and Greater North Seas (CGNS) inclusive of Orkney, providing abundance estimates of Risso's dolphin in the MU to be 12,262, with the UK proportion of the MU being 8,687 individuals

From the information gathered (number and locations of records) Risso's dolphin are present occasionally within Scapa Flow and may be impacted by the Hatston development.

Minke Whale

Minke whale (*Balaenoptera acutorostrata*) are widely distributed in relatively small numbers, usually observed singly or in pairs. They tend to reside mainly on the continental shelf in water depths of 200 m or less, often being observed close to land, however have been recorded at depths of 500m. Minke whales are frequently seen in coastal and inshore waters and are widely distributed throughout the North Sea. Minke whale are mostly observed along the west and south coasts of Orkney and in the Pentland Firth. The species is deemed widely distributed in small numbers, with most sightings occurring between June and October.

Minke whale are both meso- and bentho-pelagic feeders, with those in the northern hemisphere, mainly taking fish including sandeel, herring, mackerel (*Scombrus scombrus*), sprat, capelin (*Mallotus villosus*), cod, whiting, haddock (*Melanogrammus aeglefinus*), but will also take euphausiids and copepods, especially at higher latitudes[27].

Minke whale have been recorded within the proposed development area as well as within the waters associated with Orkney. Table 2-3 lists records of minke whale applicable to the development site and wider area:

Table 2-3: Records of Minke Whale

Resource	Date records available	Records/ Information
SWF	2022	One sighting submitted to SWF of minke whale was recorded approximately 22km south east of the proposed development in 2022.
HWDT	2014-2024	13 sightings of 15 individual minke whale have been reported to HWDT, with the nearest sighting being 26km north west.
OW	N/A	No information available
OMMRI	1951-2020	142 records of minke whale sightings (dead and alive) within 10km radius of SDWQ have been submitted to OMMRI between 1951-2020.
ORCA	2021-2022	Two records of minke whale comprising two individuals within a 60km radius of Hatston proposed development have been submitted to ORCA in 2022, east, south and north west of the site.
Andrew Upton	2022 - 2024	The following sightings were >40km south of the Hatston development site, within Scapa Flow: 10th April 2022 10:30 one minke whale observed briefly heading into Scapa Bay. 10th April 10:05 2022 one minke whale identified. 10th April 10:40-10:53 2022 one minke whale was observed travelling south along the coast. 16th March 2024 09:50 one minke whale identified.

[27] SWF, minke whale fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/Minke-Whale.pdf

OMMRI Sightings report 2022	2022	A lone minke whale was observed heading west through Scapa Flow on the 10th November.
SMASS	2023	One record of minke whale strandings in 2023, located 22km from the development site.

The most recent minke whale abundance estimates for the Management Unit (MU) which covers Orkney (CGNS) based on SCANS-III and ObSERVE data are 20,118, with the UK proportion of the MU being 10,288 individuals. Figure 2-2 shows predicted density surface for minke whales in 2016 using SCANS III data. Predicted densities in the vicinity of the Proposed Development are between 0.00 – 0.03 animals per km^2.

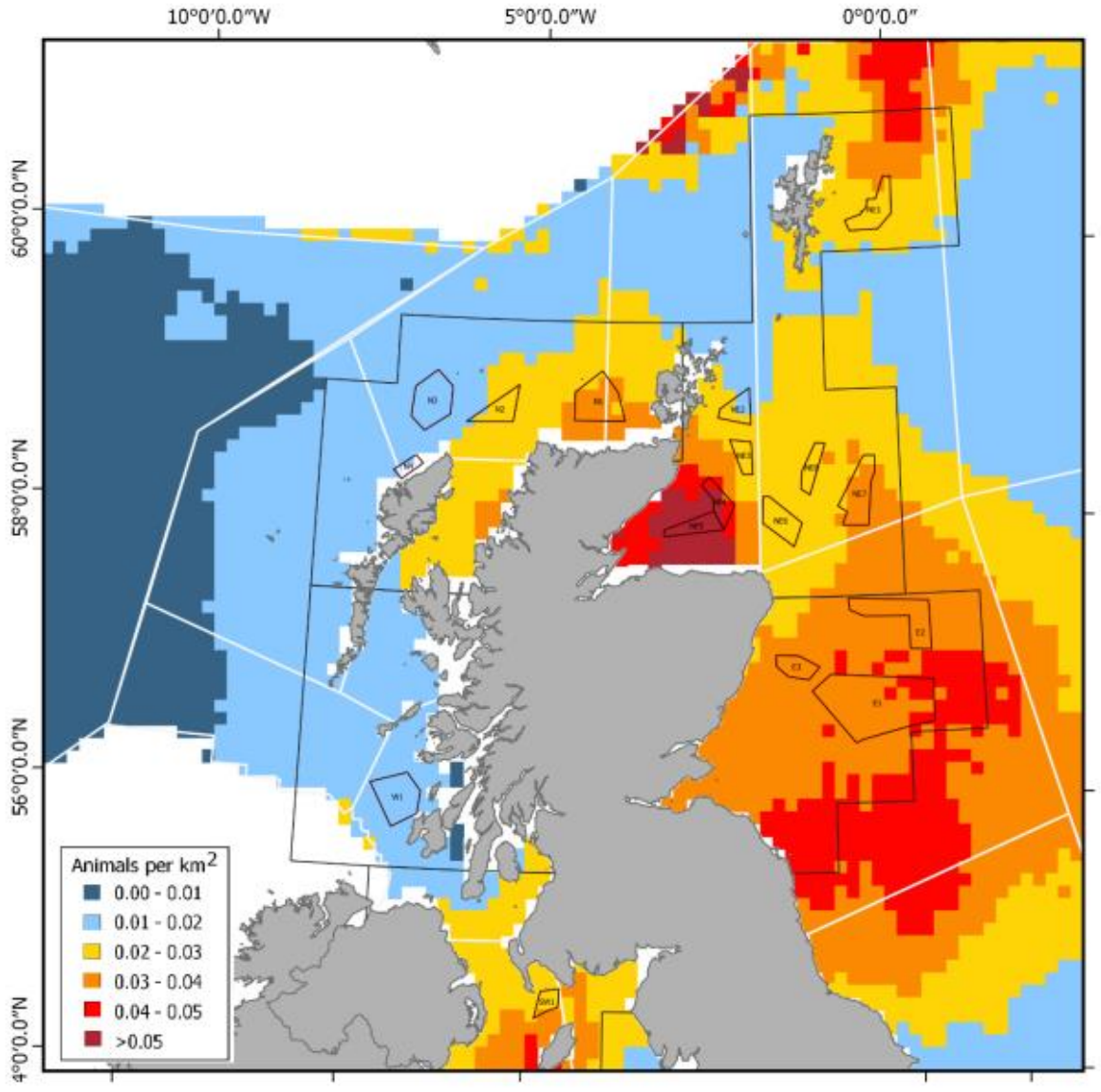

Figure 2-2: Predicted density surface for minke whale in 2016 using SCANS III survey data. Figure reproduced from Marine Directorates Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters.

From the information gathered (number of records and locations of records) minke whale may be impacted by the Hatston development.

Long-finned Pilot Whale

Long-finned pilot whale (*Globicephala melas*) mainly occur in deep waters (200-3,000 m), although have occasionally been observed in shallower coastal waters around northern Scotland, the northern North Sea and the Channel. Long-finned pilot whales occur in greater numbers to the north of Scotland, with little seasonality in the pattern of sightings. Long-finned pilot whale are infrequently observed in nearshore waters, but sightings have been recorded year round, with no particular area favoured, although greater sightings are recorded between November and March, when several mass strandings have also occurred.

Long-finned pilot whale are benthic and pelagic feeders, with a diet consisting predominantly of squid, with some fish, including mackerel, hake (*Merluccius hubbsi*), cod, whiting, pollack (*Pollachius pollachius*), scad (*Selar crumenophthalmus*), sea bass (*Dicentrarchus labrax*) and sandeels [28].

Sightings of long-finned pilot whale have been recorded within the development area, and records of long-finned pilot whale have been recorded within Orkney waters. Table 2-4 lists records of long-finned pilot whale applicable to the proposed development site:

Table 2-4: Records of Long-finned Pilot Whale

Resource	Date records available	Records/ Information
SWF	2022	One record of long-finned pilot whale, approximately 20km south west of the development site, offshore of Hoy was submitted to SWF in 2022.
Orkney Islands Council	2019	Orkney Islands Council comments to the MS-LOT scoping response[29] refer to a pod of pilot whales found within Kirkwall Bay, near to the current Hatston Pier in May 2019.
HWDT	N/A	No information available
OW	N/A	No information available
OMMRI	1980-2020	14 records of long-finned pilot whale sightings within 10km radius of Hatston (at Billia Croo and Black Craig, Stromness and Warbeth) have been submitted to OMMRI between 1980-2020.
ORCA	N/A	No information availble
OMMRI 2022 Sightings Report	2022	The only long-finned pilot whale was a single animal washed in dead at Bay of Tafts, Westray on 20th February.
SMASS	N/A	No information available

No abundance estimates for long-finned pilot have been provided by JNCC in the update abundance estimate report (2022). Previous density estimates of 0.00-0.003 pilot whales/km^2 were predicted by SCANS III survey data for the Orkney region[30].

[28] SWF, long-finned pilot whale fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/Long-finned-Pilot-Whale.pdf

[29] Marine Scotland – Licensing Operations Team Scoping Opinion Scoping Opinion adopted by the Scottish Ministers under Part 4 of The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017. Orkney Island Council Harbour Authority Expansion of Hatston Pier and Harbour. October 2021

[30] Scottish Government: Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters, Scottish Marine and Freshwater Science Vol 11 No 12 (2020), available at: https://data.marine.gov.scot/sites/default/files/Scottish%20Marine%20and%20Freshwater%20Science%20%28SMFS%29%20Vol%2011%20No%2012%20Regional%20baselines%20for%20marine%20mammal%20knowledge%20across%20the%20North%20Sea%20and%20Atlantic%20areas%20of%20Scottish%20waters.pdf

The habitat within the proposed development site is suboptimal for long-finned pilot whale and records suggest they are infrequent visitors, however there are enough records to suggest they may be present and have potential to be impacted by the Hatston development.

Killer Whale

Killer whale (*Orcinus orca*) are widely distributed in the northern Scottish water and specifically throughout Orkney waters. Killer whales usually first appear in coastal waters around the Northern Isles and Outer Hebrides in May and June, singly or in groups numbering up to 14 individuals, with peak number of records occurring between June and October. Sightings have been reported particularly around Pentland Firth, the Scapa Flow and the North Isles. Pods of up to 150 killer whales have also been observed in the North Sea east of Orkney, closely associated with purse seine fishing activities.

Killer whale use a wide variety of foraging methods and thus have a very variable diet, including fish, such as herring, mackerel, salmon (*Salmo salar*), cod, halibut (*Hippoglossus stenolepis*), squid, rays (*Batoidea*), marine mammals, and occasionally turtles (*Testudines*) and birds[31].

OW also state killer whale have been sighted in the waters surrounding Orkney.
Killer whale have been recorded within the development area and within the waters surrounding Orkney. Table 2-5 lists records of killer whale applicable to the development site:

Table 2-5: Records of Killer Whale

Resource	Date records available	Records/ Information
SWF	2022	10 records of killer whale (43 individuals) off the coast of Orkney, have been submitted to SWF in 2022, with the closest sighting being approximately 40km south within Scapa Flow.
HWDT	2014-2024	14 sightings of 53 individual killer whales reported to HWDT with the nearest recorded 2km south east of the proposed development site.
OW	N/A	OW also state killer whale have been sighted in the waters surrounding Orkney.
OMMRI	1978-2020	51 records of killer whale sightings within 10km radius of Hatston have been submitted to OMMRI between 1978-2020.
ORCA	2021-2022	Two records of killer whale comprising four individuals within a 60km radius of Hatston have been submitted to ORCA between 2021-2022, east of the site.
Andrew Upton	2022 - 2023	The following sightings were >40km south of the Hatston development site, within Scapa Flow: 20th May 2022 11:49 seven-eight killer whale sighted slowly surfacing then diving back down, briefly returned at 12:12 to a similar area. 20th May 2022 17:45-17:55 several killer whale were sighted moving steadily south in Scapa Bay. 3rd June 2022 06:14 six killer whale (with big male) sighted travelling south. 3rd June 2022 07:15 several killer whale recorded. 3rd June 2022 12:00-12:18 several killer whale observed travelling south through Scapa Flow.

[31] SWF, killer whale fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2021/03/Killer-Whale.pdf

Resource	Date records available	Records/ Information
		3rd June 2022 10:55-11:12 four killer whale, were observed travelling south in Scapa Flow. Further south the number of individuals increased from six to several. 3rd June 2022 12:23 five-six killer whale observed travelling north. 1st December 2023 14:02 two male killer whale identified travelling south. 1st December 2023 14:10 five female/immature killer whales recorded travelling south.
OMMRI Sightings report 2022	2022	Sightings of killer whales around the waters of Orkney have been returned for 2022.
SMASS	N/A	One records of killer whale stranding in 2024 located 16km north west of the proposed development site.

No abundance estimates for killer whale are available for the Orkney region.

From the information gathered (number of records and locations of records) killer whale may be present within the vicinity of the proposed development occasionally and could therefore be impacted.

White-beaked Dolphin

White-beaked dolphin (*Lagenorhynchus albirostris*) are recorded frequently in the North Sea and are fairly common and widely distributed around Orkney. Although present year-round in near-shore waters, with most sightings occurring offshore in the northern North Sea east and south of Orkney or at either end of the Pentland Firth throughout the year, peak number of records of the species generally occur between June and October.

White-beaked dolphin eat a variety of prey items, including fish (cod, whiting, hake, haddock, sprat, mackerel, herring, scad, and gobies), cephalopods (octopus) and sometimes crustaceans[32].

No sightings of white-beaked dolphin have been recorded within the development area, however records of white-beaked dolphin have been reported within the waters surrounding Orkney. Table 2-6 lists records of white-beaked dolphin applicable to the development site:

Table 2-6: Records of White-beaked Dolphin

Resource	Date records available	Records/ Information
SWF	2022	One sighting submitted to SWF of white-beaked dolphin was recorded approximately 22km west of the proposed development in 2022.
HWDT	2014-2024	No information available
OW	N/A	No information available
OMMRI	1976-2020	36 records of white-beaked dolphin sightings within 10km radius of Hatston (Billia Croo, Stromness) have been submitted to OMMRI between 1976-2020.
ORCA	N/A	No information available

[32] SWF, white-beaked dolphin fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/White-beaked-Dolphin.pdf (Accessed 07/06/2024)

Andrew Upton	N/A	No information available
OMMRI 2022 Sightings Report	2022	A small calf live-stranded at Scapa was recorded on 22nd January (refloated by members of the public, but it died in the process).
SMASS	2023	One record of white-beaked dolphin strandings in 2023 located 21km north west of the development site.

The most recent white-beaked dolphin abundance estimates for the MU which covers Orkney (CGNS) based on SCANS-III and ObSERVE data are 43,951, with the UK proportion of the MU being 34,025 individuals. Figure 2-3 shows predicted density surface for white-beaked dolphins in 2016 using SCANS III data. Although no density is shown immediately around the development area, predicted density around Orkney is generally 0.05 – 0.10 animals per km^2.

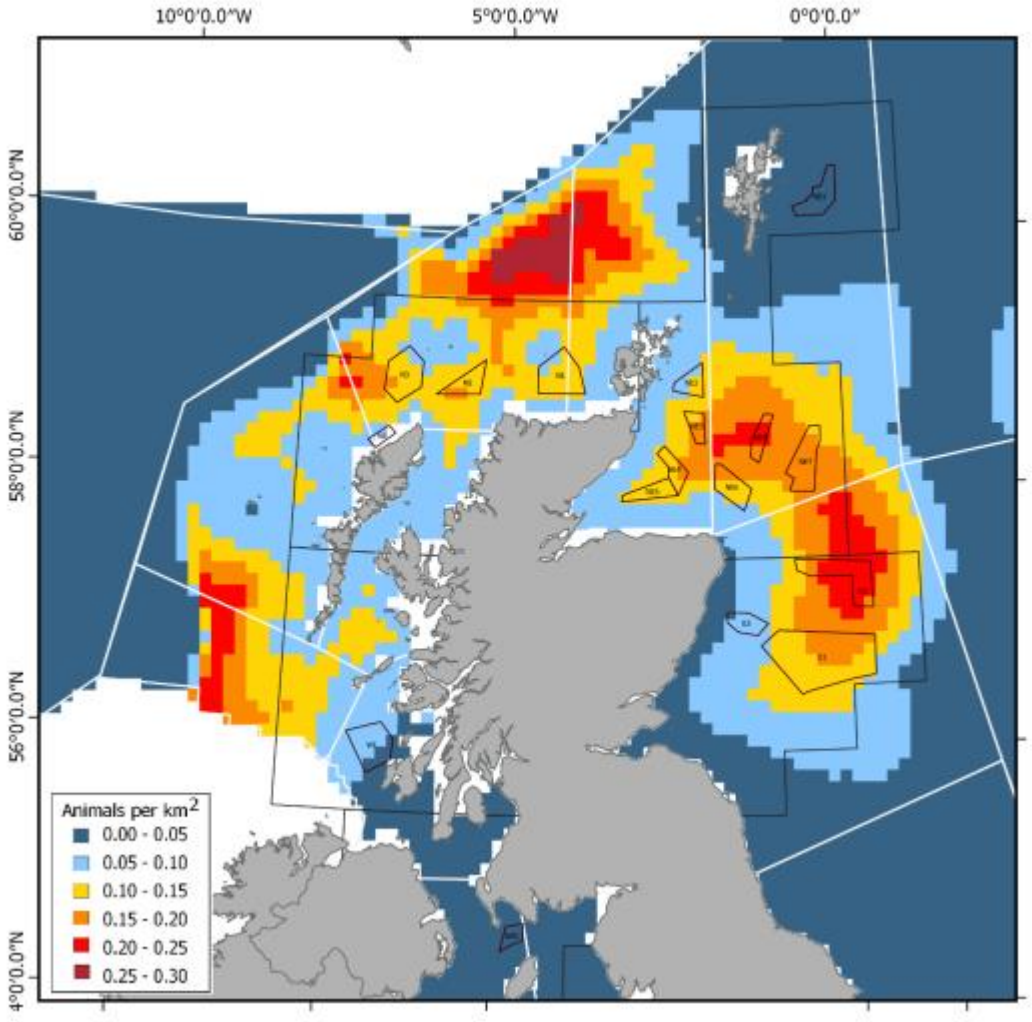

Figure 2-3: Predicted density surface for white-beaked dolphins in 2016 using SCANS III data. Figure reproduced from Marine Directorates Regional baselines for marine mammal knowledge across the North Sea and Atlantic areas of Scottish waters.

From the information gathered (number of records and locations of records) white-beaked dolphin may be present within the vicinity of the proposed development site occasionally and therefore may be impacted.

Atlantic White-sided Dolphin

Atlantic white-sided dolphin (*Lagenorhynchus acutus*) are predominantly distributed north west of Britain and found in deep waters around the north of Scotland throughout the year and tend to be an infrequent visitor to the nearshore waters of Orkney. They tend to enter the North Sea mainly in summer, but little is known about seasonal movements. Atlantic white-sided dolphin are most frequently sighted around the waters to the west of Orkney out to Sule Skerry between May and October, with peak number of records occurring in August.
Atlantic white-sided dolphin are pelagic feeders, predominantly eating herring, silver pout (*Gadiculus argenteus*), blue whiting (*Micromesistius poutassou*), scad, lantern fish (*Myctophidae*), Argentine (*Argentina*) and mackerel as well as some squid and shrimps (*Caridea*)[33].

No records of Atlantic white-sided dolphin were returned from SWF or HWDC, however OW state they are occasionally observed, but usually well offshore.

No sightings of Atlantic white-sided dolphin have been recorded within the development area, however records of Atlantic white-sided dolphin have been reported within the waters surrounding Orkney. Table 2-7 lists records of Atlantic white-sided dolphin applicable to the development site:

Table 2-7: Records of Atlantic White-sided Dolphin

Resource	Date records available	Records/ Information
SWF	N/A	No information available
HWDT	2014-2024	No information available
OW	N/A	No information available
OMMRI	1927-2015	45 records of Atlantic white-sided dolphin sightings within 10km radius of Hatston (Billia Croo and Black Craig, Stromness) have been submitted to OMMRI between 1976-2015.
ORCA	N/A	No information available
Andrew Upton	N/A	No information available
OMMRI 2022 Sightings Report	2022	No information available
SMASS	N/A	No information available

The most recent Atlantic white-sided dolphin abundance estimates for the MU which covers Orkney (CGNS) based on SCANS-III and ObSERVE data are 18,128, with the UK proportion of the MU being 12,293 individuals.

From the habitat preferences, reduced number of records and locations in what records have been submitted, Atlantic white-sided dolphin are considered unlikely to be impacted by the Hatston development.

Sperm Whale

Male sperm whales (*Physeter macrocephalus*) occur mainly in waters deeper than 200m beyond the shelf break north of Scotland, but they have also been observed in near-shore waters mainly off the Northern Isles of Scotland. Sperm whale are frequently sighted between July and December.

[33] SWF, Atlantic white-sided dolphin fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/Atlantic-White-sided-Dolphin.pdf (Accessed 07/06/2024)

Sperm whale eat a variety of deep sea squid. However, they will also take saithe, monkfish (*Lophius*), halibut, benthic octopus, and crustaceans[34].
No sightings of sperm whale have been recorded within the development area, however records of sperm whale have been reported within the waters surrounding Orkney. Table 2-8 lists records of sperm whale applicable to the development site:

Table 2-8: Records of Sperm Whale

Resource	Date records available	Records/ Information
SWF	1993 and 1994	SWF state that sperm whale are occasionally recorded near Orkney, with most notable records of six sperm whales that remained in Scapa Flow (approximately 9km south) between 22nd February and 25th March in 1993, and eleven sperm whales which were stranded at Backaskaill Bay, Sanday (approximately 32km north) on 7th December 1994, where they died the subsequent morning.
HWDT	N/A	No information available
OW	N/A	OW state that sperm whale have been sighted, in Scapa Flow (within proximity to the development site), however previous reports of sperm whales associated with Scapa Flow suggest accidental occurrences.
OMMRI	1990-1998	7 records of sperm whale sightings within 10km radius of Hatston have been submitted to OMMRI between 1990-1998.
ORCA	N/A	No information available
Andrew Upton	N/A	No information available
OMMRI 2022 Sightings Report	N/A	No information available
SMASS	N/A	No information available

No abundance estimates for sperm whale have been provided by JNCC in the update abundance estimate report (2022). Previous density estimates of 0.00 sperm whales/km^2 were predicted by SCANS III survey data for the Orkney region[30].

Habitat preferences and the reduced number of records and locations where records have been submitted, suggest sperm whale are not present regularly within the vicinity of the proposed development and are unlikely to be impacted.

Humpback Whale
Humpback whale (*Megaptera novaeangliae*) sightings off Orkney are unusual, with isolated records almost exclusively in waters deeper than 200m. Most sightings are recorded in summer between May and September, which is when small numbers are seen off the continental shelf west and north of Scotland.

[34] SWF, Sperm whale fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/Sperm-Whale.pdf (Accessed 07/06/2024)

Humpback whale eat krill (*Euphausiids*) and various species of small schooling fish, such as herring, sprat, capelin, sandeel and mackerel[35].

OW state they are observed annually, mostly in Scapa Flow (approximately 7km from the development site).
Humpback whale have been recorded within the development area, as well as the waters surrounding Orkney. Table 2-9 lists records of humpback whale applicable to the development site:

Table 2-9: Records of Humpback Whale

Resource	Date records available	Records/ Information
SWF	2022	One sighting submitted to SWF of humpback whale was recorded approximately >40km south of the proposed development in 2022 off the shore of Hobbister (Scapa Flow).
HWDT	2014-2024	Five sightings of seven individuals reported to HWDT, with the nearest 32km south of the proposed development site.
OW	N/A	OW state they are observed annually, mostly in Scapa Flow (>40km from the development site).
OMMRI	2006-2015	Three records of humpback whale sightings within 10km radius of Hatston (Billia Croo and Black Craig, Stromness) have been submitted to OMMRI between 2006-2015.
ORCA	N/A	No information available
Andrew Upton	2023	The following sightings were >40km south of the Hatston development site, within Scapa Flow: 1st December 2023 13:52 one-two humpback whale recorded travelling south.
OMMRI 2022 Sightings Report	2022	One-two humpback whale were reported breaching repeatedly at Scapa Flow off Hobbister on 29th July. Two humpback whale were identified in Scapa Flow on 15th September and considered likely to be in Scapa Flow near the Sound of Hoxa on 17th September.
SMASS	N/A	No information available

No abundance estimates for humpback whale are available for the Orkney region.
From the lack of records in proximity to the site and sub-optimal habitat humpback whale are considered unlikely to be impacted by the proposed Hatston development.

Fin Whale
Fin whale (*Balaenoptera physalus*) are distributed predominantly at depths beyond 500m. Fin whale sightings occurring mainly between June and December and peak number of records in northern Britain occur between June and August.

Fin whale diet consists predominantly of planktonic crustaceans (particularly *euphausiids*) but will also prey upon small schooling fish including herring, capelin, sandeel, blue whiting, mackerel, and squid[36].

[35] SWF, humpback whale fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/Humpback-Whale.pdf (Accessed 07/06/2024)
[36] SWF, Fin whale fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/Fin-Whale.pdf (Accessed 07/06/2024)

No sightings of fin whale have been recorded within the development area, however records of fin whale have been reported within the waters surrounding Orkney. Table 2-10 lists records of fin whale applicable to the development site:

Table 2-10: Records of Fin Whale

Resource	Date records available	Records/ Information
SWF	N/A	No information available
HWDT	2014-2024	Two sightings of two individuals reported to HWDT with the nearest recorded 23km south of the proposed development site.
OW	2019-2020	OW state fin whale have been rarely observed passing Hoxa Head (approximately 60km south of the development site) and records of two strandings in Scapa Flow were recorded in two consecutive years, 2019 and 2020.
OMMRI	2020	Two records of fin whale sightings within 10km radius of Hatston (Billia Croo and Black Craig, Stromness) have been submitted to OMMRI in 2020.
ORCA	N/A	No information available
Andrew Upton	N/A	No information available
OMMRI Sightings report 2022	2022	September 15th 2022 a single fin whale was recorded in Scapa Flow (>40km from the site). Two fin whale were observed seen near the ship to ship transfer site in Scapa Flow on 18th September and a single fin whale (assumed to be one of the two observed on the 18th September) was identified in various locations in Scapa Flow between 19th to 21st September.
SMASS	N/A	No information available

No abundance estimates for fin whale have been provided by JNCC in the update abundance estimate report (2022). Previous density estimates of 0.00 fin whales/km^2 were predicted by SCANS III survey data for the Orkney region[30].

From the lack of records in proximity to the site (all records >23km from the site, with most recorded in Scapa Flow, south of the mainland) and sub-optimal habitat fin whale are considered unlikely to be impacted by the proposed Hatston development.

Sei Whale

Sei whales (*Balaenoptera physalus*) have mostly been recorded in waters deeper than 200m between the Northern Isles and the Faroes (specifically in proximity to the Faroe-Shetland Channel). Infrequent sightings of sei whale have been reported in coastal waters off Shetland. In general, sightings of sei whale were mainly previously observed in July and August off the Shetland coast.

Sei whale skim the surface waters for patches of copepod, their preferred prey. However, they also feed on *euphausiids*, shoals of fish (e.g. sardine (*Sardina pilchardus*), anchovy (*Engraulidae*)) and where encountered, squid[37].

No sightings of sei whale have been recorded within the development area or within the waters surrounding Orkney.

[37] SWF, Sei whale fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/Sei-Whale.pdf (Accessed 07/06/2024)

No abundance estimates for sei whale are available for the Orkney region.

From the lack of records and sub-optimal habitat sei whale are considered unlikely to be impacted by the Hatston development.

Striped Dolphin

Striped dolphin are considered rare in UK waters, with the species normal distribution reaching its northern limits at 50º N (due to warmer temperatures) and most infrequent records reported in the South-west Channel. Striped dolphin dive between depths of 200-700m for prey.

Striped dolphin have variable diets and are classed as opportunistic feeders, depending on the region and season. Being meso- and bentho-pelagic feeders, their diet consists of fish (sprat, blue whiting, herring, mackerel, hake, sandeel, lanternfish, and cod), with crustaceans and cephalopods also making up part of their diet[38].

No sightings of striped dolphin have been recorded within the development area, with limited records within the waters surrounding Orkney. Table 2-11 lists records of striped dolphin applicable to the development site:

Table 2-11: Records of Striped Dolphin

Resource	Date records available	Records/ Information
SWF	N/A	No information available
HWDT	N/A	No information available
OW	N/A	No information available
OMMRI	1997-2012	Two records of striped dolphin sightings within 10km radius of Hatston have been submitted to OMMRI between 1997-2012.
ORCA	N/A	No information available
Andrew Upton	N/A	No information available
OMMRI 2022 Sightings Report	N/A	No information available
SMASS	N/A	No information available

No abundance estimates for striped dolphin are available for the Orkney region.

From the lack of records and sub-optimal habitat striped dolphin are considered unlikely to be impacted by the Hatston development.

Cuvier's Beaked Whale

Cuvier's beaked whales (*Ziphius cavirostris*) have a preference for deep waters (1000m) and there have been only six confirmed sightings of this species in British and Irish waters. Previous sightings have occurred east of the Orkney Islands in the northern North Sea in August 1980. From the limited sightings, it has been suggested that there is likely a summer movement of Cuvier's beaked whale into UK waters between June and September.

[38] SWF, Striped dolphin fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/Striped-Dolphin.pdf (Accessed 07/06/2024)

Cuvier's beaked whale eat a variety of deep-sea squid species but will also prey upon crustaceans and fish[39].

No sightings of Cuvier's beaked whale have been recorded within the development area and limited sightings have been reported in the waters surrounding Orkney. Table 2-12 lists records of Cuvier's beaked whale applicable to the development site:

Table 2-12: Records of Cuvier's Beaked Wale

Resource	Date records available	Records/ Information
SWF	N/A	No information available
HWDT	N/A	No information available
OW	N/A	No information available
OMMRI	1963-2007	Three records of striped dolphin sightings within 10km radius of Hatston have been submitted to OMMRI between 1963-2007.
ORCA	N/A	No information available
Andrew Upton	N/A	No information available
OMMRI 2022 Sightings Report	N/A	No information available
SMASS	N/A	No information available

No abundance estimates for Cuvier's beaked whale have been provided by JNCC in the update abundance estimate report (2022). Previous density estimates of 0.00- 0.001 Cuvier's beaked whales/km^2 were predicted by SCANS III survey data for the Orkney region[30].

From the lack of records and sub-optimal habitat Cuvier's beaked whale are considered unlikely to be impacted by the Hatston development.

Short-beaked Common Dolphin

Short-beaked common dolphin (*Delphinus delphis*) have previously been considered to not be strongly associated with the Orkney islands and in general are considered an offshore species. In North Atlantic waters, short-beaked common dolphins are predominantly found in continental shelf waters, notably in the Celtic Sea and Western Approaches to the Channel.

Short-beaked common dolphin are opportunistic feeders, with their diet being very varied, but predominantly small schooling fish are preferred, with species depend upon region, including hake, horse mackerel (*Trachurus trachurus*), mackerel, sprat, sardine, anchovy, Norway pout (*Trisopterus esmarkii*), cod, scad, sandeel, herring, whiting and blue whiting. Squid is also taken depending on local availability[40].

No sightings of short-beaked common dolphin have been recorded within the development area, however records of short-beaked common dolphin have been reported within the waters surrounding Orkney. Table 2-13 lists records of short-beaked common dolphin applicable to the development site:

[39] SWF, Cuvier's beaked whale fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/Cuviers-Beaked-Whale.pdf (Accessed 07/06/2024)

[40] SWF, Short-beaked common dolphin fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/Common-Dolphin.pdf (Accessed 07/06/2024)

Table 2-13: Records of Short-beaked Common Dolphin

Resource	Date records available	Records/ Information
SWF	N/A	No information available
HWDT	2014-2024	Seven sightings of 51 individuals reported to HWDT with the nearest recorded 23km north west of the proposed development site.
OW	N/A	Short-beaked common dolphin have been rarely observed by OW.
OMMRI	1935-2020	24 records of short-beaked common dolphin sightings (dead and alive) within 10km radius of SDWQ have been submitted to OMMRI between 1935-2020.
ORCA	N/A	No information available
Andrew Upton	2022-2023	The following sightings were >40km south of the Hatston development site, within Scapa Flow: 23rd June 2022 16:00 two short-beaked common dolphin observed. 11th July 2022 12:54 two short-beaked common dolphin sighted. 4th November 2023 late a.m. five-six common dolphin recorded travelling south. 26th December 2023 11:55 seven-ten common dolphin recorded travelling north.
OMMRI 2022 Sightings Report	2022	Small groups were reported in Scapa Flow in July and late August.
SMASS	2023	Three records of short-beaked common dolphin strandings in 2023 within a 20km radius of the development site.

The most recent short-beaked common dolphin abundance estimates for the MU which covers Orkney (CGNS) based on SCANS-III and ObSERVE data are 102,656, with the UK proportion of the MU being 57,417 individuals.

From the number of records and locations in what records have been submitted, short-beaked common dolphin are considered likely to be impacted by the Hatston development.

Bottlenose Dolphin

Bottlenose dolphin (*Tursiops truncates*) are not strongly associated with Orkney islands and have been rarely recorded in the area since 1980. Bottlenose dolphin are observed in the greatest numbers between July and October (with a secondary peak number of records occurring in some localities in March-April).

Bottlenose dolphin are considered selectively opportunistic and eat a variety of fish and squid species, including cod, saithe, whiting, haddock, salmon, sprat, sandeels, pout, flatfish (*Pleuronectiformes*), and cephalopods[41].

No sightings of bottlenose dolphin have been recorded within the development area, however records of bottlenose dolphin have been reported within the waters surrounding Orkney. Table 2-14 lists records of bottlenose dolphin applicable to the development site:

[41] SWF, Bottlenose dolphin fact sheet (2020), available at: https://www.seawatchfoundation.org.uk/wp-content/uploads/2020/07/Bottlenose-Dolphin.pdf (Accessed 07/06/2024)

Table 2-14: Records of Bottlenose Dolphin

Resource	Date records available	Records/ Information
SWF	N/A	No information available
HWDT	2023	On records of 23 individuals reported to HWDT located 48km west of the proposed development site.
OW	N/A	OW state that bottlenose dolphin have been observed offshore of Orkney.
OMMRI	2013-2020	Four records of bottlenose dolphin sightings within 10km radius of Hatston have been submitted to OMMRI between 2013-2020.
ORCA	N/A	No information available
OMMRI 2022 Sightings Report	2022	A lone bottlenose dolphin was recorded at Finstown between 12-14th February and considered very unusual as the species is rarely observed in waters surrounding Orkney.
Andrew Upton	N/A	No information available
JNCC	N/A	The nearest statutory designated site featuring marine mammals is the Moray Firth SAC, approximately 123km from Hatston, which is designated for supporting the only known resident bottlenose dolphin population in the North Sea (estimated to be around 130 individuals). Dolphins are present all year round[42].
SMASS	2022	One record of bottlenose dolphin strandings in 2022 located 7km west of the development site.

The most recent harbour porpoise abundance estimates for the MU which covers Orkney (Greater North Sea (GNS)) based on SCANS-III and ObSERVE data are 2,022, with the UK proportion of the MU being 1,885 individuals.

From the reduced number of records and locations in what records have been submitted, bottlenose dolphin are considered unlikely to be impacted by the Hatston development.

Short-finned Pilot Whale

Short-finned and long-finned pilot whale species can be difficult to separate at sea. In general, short-finned pilot whale tend to be associated and reside in tropical and warm-temperate areas, whilst long-finned pilot whales occur in more cooler waters. Although the possibility exists that some of the pilot whales observed off Orkney (one record submitted to SWF in 2022) are short-finned, the conditions in these areas do not tend to suit the requirements of this species[43].

They feed mainly on squid, with octopus and fish (mackerel, hake, herring and cod) comprising some of their diet[44].

No records of short-finned pilot whales have been recorded within the development area and limited records of short-finned pilot whale have been reported within the waters surrounding Orkney. Table 2-15 lists records of short-finned pilot whale applicable to the development site:

[42] JNCC SAC Site Details available at: https://sac.jncc.gov.uk/site/UK0019808 (Accessed 07/06/2024)
[43] No JNCC UK distribution map was available as all sightings were assumed to be of long-finned pilot whales, supported by all strandings in the study area having been of long-finned pilot whales
[44] WDC Short-finned pilot whale species guide, available at: https://uk.whales.org/whales-dolphins/species-guide/short-finned-pilot-whale/ (Accessed 07/06/2024)

Table 2-15: Records of Short-finned Pilot Whale

Resource	Date records available	Records/ Information
SWF	2022	One record submitted to SWF in 2022
HWDT	N/A	No information available
OW	N/A	No information available
OMMRI	N/A	No information available
ORCA	N/A	No information available
Andrew Upton	N/A	No information available
OMMRI 2022 Sightings Report	N/A	No information available
SMASS	N/A	No information available

No abundance estimates for short-finned pilot whale are available for the Orkney region.

From the reduced number of records and locations in what records have been submitted, short-finned pilot whale are considered unlikely to be impacted by the Hatston development.

Other Cetaceans

Other rare cetacean species recorded around the shores of Orkney since 1980 include Sowerby's beaked whale (*Mesoplodon bidens*; PMF), Northern bottlenose whale (*Hyperoodon ampullatus*; PMF), false killer whale (*Pseudorca crassidens*), blue whale (*Balaenoptera musculus*), narwhal (*Monodon monoceros*) and Beluga whale (*Delphinapterus leucas*). In general, the conditions off Orkney do not tend to suit the requirements of the majority of these species and no recent records of these species were returned from SWF, HWDC, OW, OMMRI or ORCA.

2.3 Seals

Both harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*) are PMFs and can be seen all around Scotland, predominantly on many of the offshore islands and along much of the west mainland coast.

A number of seal haul out sites are associated with Orkney as detailed in Table 2-16 below.

Table 2-16: Seal Haul Out Sites

Seal Haul Out Name	Distance* and Orientation	Breeding Colony	Species
Damsay and Holm of Grimbister	4km west	No	Harbour and Grey seals
Helliar Holm North and Elwick	5km north	No	Harbour seal
Taing Skerry and Grass Holm	7km north	No	Harbour and grey seals
Gairsay	8km north	Yes	Grey seals
Holm of Rendall	8km north	No	Harbour and Grey seals

Seal Haul Out Name	Distance* and Orientation	Breeding Colony	Species
Sweyn Holm	10km north	No	Harbour and Grey seals
Deer Sound	14km south east	No	Harbour and Grey seals
South East Egilsay	14km north	No	Harbour and Grey seals
Little Green Holm	15km north east	Yes	Grey seals
Muckle Green Holm	16km north east	Yes	Grey seals
Holm of Scockness	18km north	No	Harbour Seal
Costa and Burgar	19km north west	No	Harbour and Grey seals
Eynhallow and Westside	19km north west	No	Harbour and Grey seals
Egilsay North	20km north	No	Harbour and Grey seals
Greenli Ness	21km north east	No	Grey seals
Seal Skerry (Eday)	21km north east	No	Harbour and Grey seals
Rusk Holm	23km north east	Yes	Grey seals
Auskerry	23km north east	Yes	Grey seals
Bay of Holland East and Tor Ness	23km north east	No	Harbour and grey seals
Copinsay	25km south east	No	Grey seals
Linga Holm	25km north east	Yes	Grey seals
Bay of Houseby	27km north east	No	Harbour and Grey seals
Little Linga	28km north east	Yes	Grey seals
Sty Taing	28km north east	Yes	Grey seals
South Westray	28km north east	Yes	Grey seals
Skerry of Wastbist	29km north	No	Harbour and Grey seals
Holms of Spurness	29km north east	Yes	Grey seals
Holm of Huip	30km north east	Yes	Grey seals
Odness	33km north east	No	Harbour and Grey seals
Calf of Eday	35km north east	Yes	Grey seals
North end Mill Bay	36km north east	No	Harbour and Grey seals
Spo Ness to Ness of Brough	37km north	No	Harbour and Grey seals
Holm of Papa Westray and North Wick	40km north	No	Harbour and Grey seals
South Ronaldsay East	43km south	Yes	Grey seals
North West Water Sound	44km south	No	Harbour seal
Narr Ness	47km north	No	Harbour and Grey seals
Calf of Flotta	49km south	Yes	Grey seals
North Flotta	50km south	Yes	Grey seals

Seal Haul Out Name	Distance* and Orientation	Breeding Colony	Species
Pentland Skerries	51km south	No	Grey seals
Barrel of Butter	52km south	No	Harbour seal
Flotta Oil Terminal	52km south	No	Harbour seals
Ve Ness	52km south west	No	Harbour and Grey seals
South Ronaldsay West	53km south	Yes	Grey seals
Switha	54km south west	No	Harbour and Grey seals
Cava	54km south west	No	Harbour seal
North and East Fara	54km south west	No	Harbour and Grey seals
Swona	55km south	Yes	Grey seals
Holm of Houton	56km south west	No	Harbour and Grey seals
South North Ronaldsay	56km north east	No	Harbour and Grey seals
North east Hoy	58km south west	Yes	Grey seals
Stroma	59km south	No	Harbour and Grey seals
Duncansby Head	59km south	Yes	Grey seals
Seal Skerry (North Ronaldsay)	61km north east	No	Grey seals
Gills Bay	62km south	No	Harbour and Grey seals
Selwick	64km south west	No	Harbour and grey seals
Bay of Ireland	65km west	No	Harbour seals
Dunbeath-Wick	83km south	Yes	Grey seals

*Direct route via sea

Grey Seal

Orkney is a stronghold for breeding grey seals and is part of the North Coast and Orkney Seal Management Unit (SMU). It is estimated that the Orkney colonies produced nearly a third of UK pups in 2019. The overall trend is for an increased numbers in the UK population but there was a slight reduction in the Orkney population estimate between 2016 and 2019. The latest estimate of the UK grey seal population is 106,300 with the Orkney and North Coast SMU being home to c.8% of that.

Grey seals travel large distances, frequently over 100km, to forage and prefer offshore feeding areas as well as exposed coasts and islands to come ashore, with the outer fringes of Orkney being classed as suitable. The waters surrounding the site offer habitat for various gadoids and flat fish which are grey seal prey species. From research undertaken by St Andrews Sea Mammal Research Unit on seal diets[45], in Orkney sandeels were the greatest prey resources, with gadoids (haddock, cod, whiting) being the second biggest contributor .

There are many (50) seal haul outs (including breeding) for grey seals (see Table 2-16) with the nearest located 4km west (Damsay and Holm of Grimbister) and the nearest breeding colony located 8km north (Gairsay). Two SSSIs (Faray and Holm of Faray SSSI located 23km north and Muckle and

[45] http://www.smru.st-andrews.ac.uk/documents/scotgov/CSD3-3_Grey_Seal_Diet_Composition_and_Prey_Consumption.pdf (Accessed 07/06/2024)

Little Green Holm SSSI located 17km north) and a SAC (Faray and Holm of Faray SAC located 23km north) designated for grey seals are present within 100km of the site. This means grey seals may therefore use the coastal waters within and adjacent to the site for commuting between haul outs (including breeding colonies) and/or foraging.

Seal haul out data counts for grey seal also show the important association with Orkney, as detailed in Figure 2-4[12].

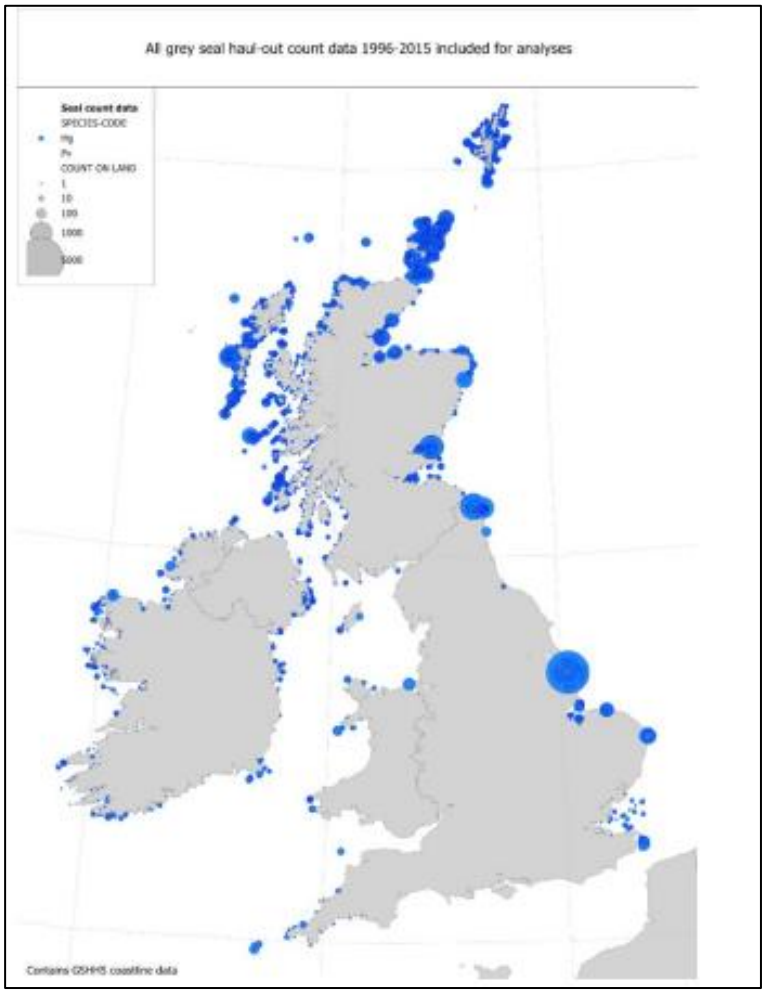

Figure 2-4: Grey seal haul out seal count data (1996-2015)

Records of 285 out of 355 tagged grey seals within UK waters (1988-2018) show a broad-scale distribution, with tagged grey seals utilising both coastal and offshore habitat, with Orkney being a key high-use area, as detailed in Figure 2-5 The estimated sea usage for grey seals within the site is less than other areas of the Orkney Isles though (10 - <50 vs >100 individuals per 5km^2 to the north, east and south) as detailed in Figure 2-6.

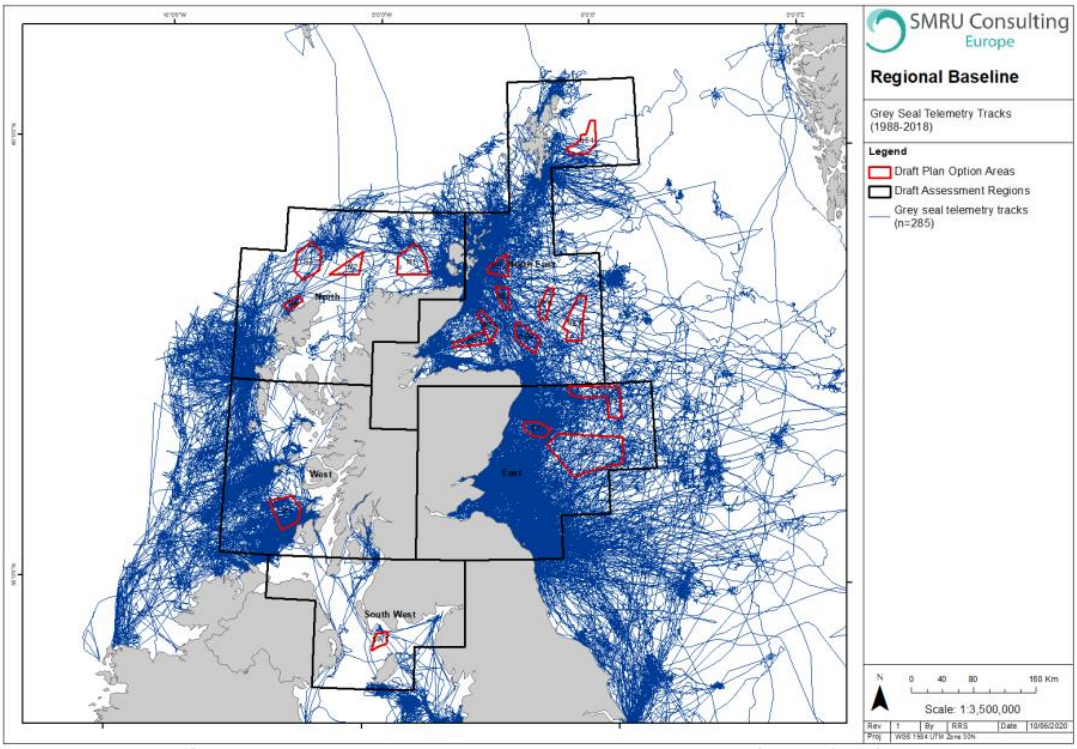

Figure 2-5: Telemetry tracked grey seals (1988-2018)

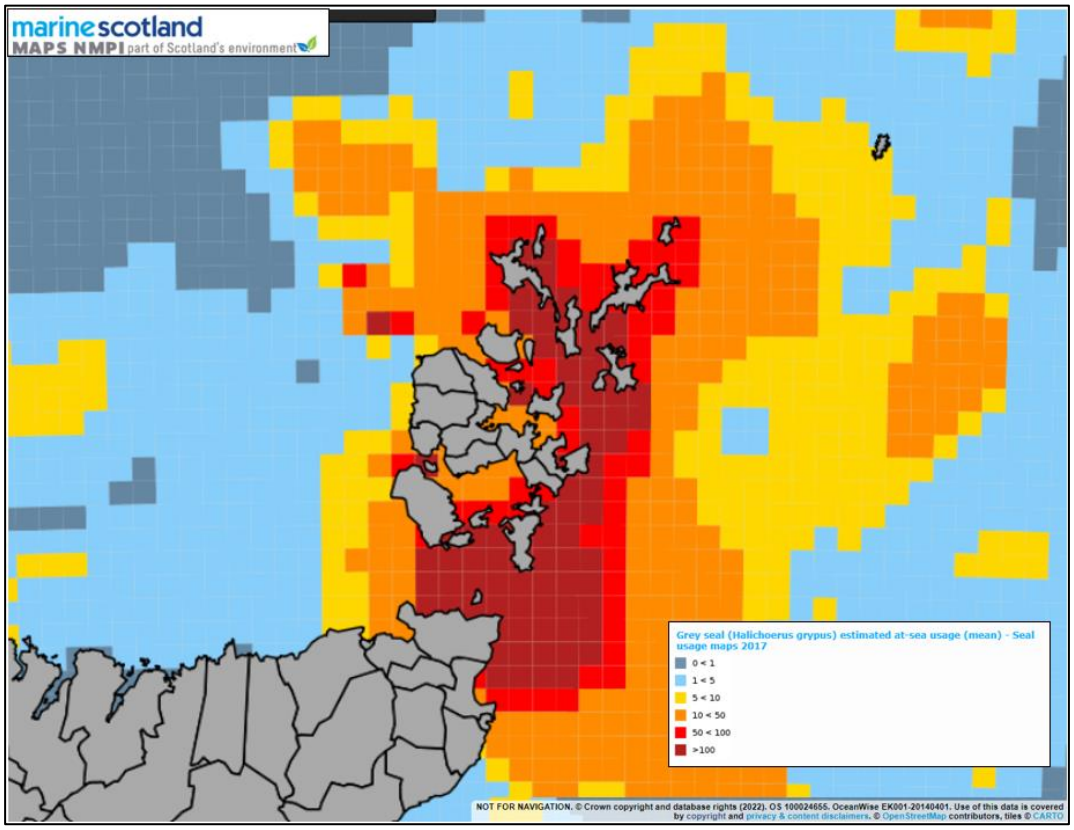

Figure 2-6: Map showing the estimated mean grey seal density at sea. Image taken from the National Marine Plan Interactive Map (NMPi). Data from surveys conducted between 1991 and 2016, originated from the Sea Mammal Research Unit.

OW state that grey seals can be observed annually and SMASS have recorded 18 grey seal strandings within 8km of the site between 1995-2021. No records of grey seal were returned from SWF, HWDT or OMMRI.

The site is not within a designated site for grey seal and due to activities associated with the existing pier and adjacent industrial area, it is not considered that the habitat is suitable for use as a breeding or moulting haul out site.

Harbour Seal

The latest estimate of the UK harbour seal population is 37,300 with the Orkney and North Coast SMU being home to c.4% of that. Whilst the overall trend for harbour seals within the UK is increasing, there has been a dramatic change in distribution. Counts within the Orkney and North Coast SMU have gone from c.9000 in the late 1990's to less than 2000 by 2020 (an 85% decline) (see Figure 2-7 below). Orkney and Shetland were once proportionally the most important regions in Scotland for harbour seals in 1990s, whereas these regions only contribute to one sixth of the Scottish total. Within Scotland there is a general pattern of population increases in the west and losses along the east and north coasts. The causes of decline for harbour seals in the east and north coasts have not been identified yet, however a range of factors such as prey quality and availability, increasing grey seal population size and the potential for competition between the two seal species and the occurrence and exposure of seals to toxins and harmful algae have been considered factors that are potentially critical drivers.

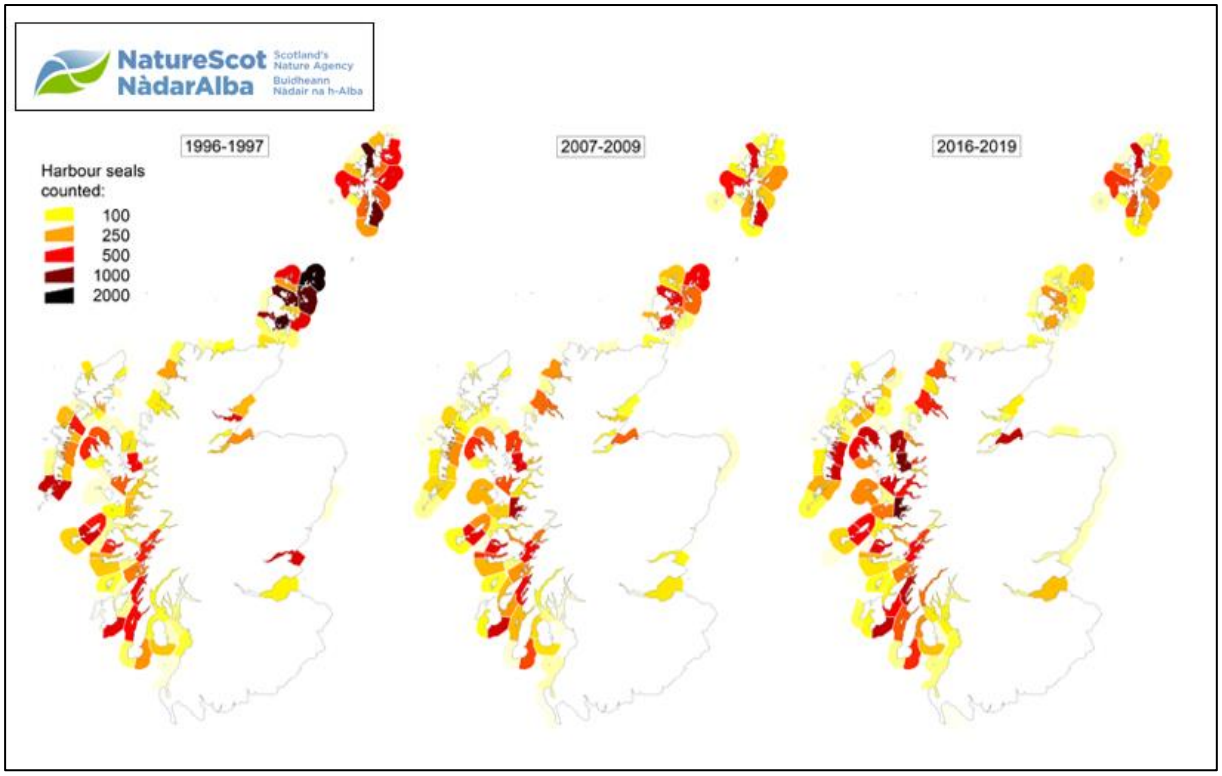

Figure 2-7: Maps showing the number of harbour seals counted during August over three time periods (1996-1997; 2007-2009 and 2016-2019) are detailed in NatureScot Research Report 1256

Harbour seals routinely travel 40-50km from their haul-out sites to forage and prefer more sheltered waters. The waters within and surrounding the site are known to host fish and other suitable prey items for harbour seals. There are several (34) designated haul outs (non-breeding) for harbour seals (see Table 2-16) within 50km of the site, with the nearest located 4km west (Damsay and Holm of Grimbister). Two SSSI (Eyenhallow SSSI; 17km north west and East Sanday Coast SSSI; 33km north east) and SAC (Sanday SAC; 33km north east) with harbour seal being a designated feature are

located 50km from the site. This means harbour seals may therefore use the coastal waters within and adjacent to the site for commuting between haul outs and/or foraging.

Records of 420 out of 461 tagged harbour seals within UK waters (2001-2018) show a primarily coastal distribution, with concentrations of tagged seals in Hebrides, the Moray Firth, Orkney and Shetland, as detailed in Figure 2-8 Estimated at sea usage for the area around the site is c.1 - <5 individuals per 5km^2 Figure 2-9.

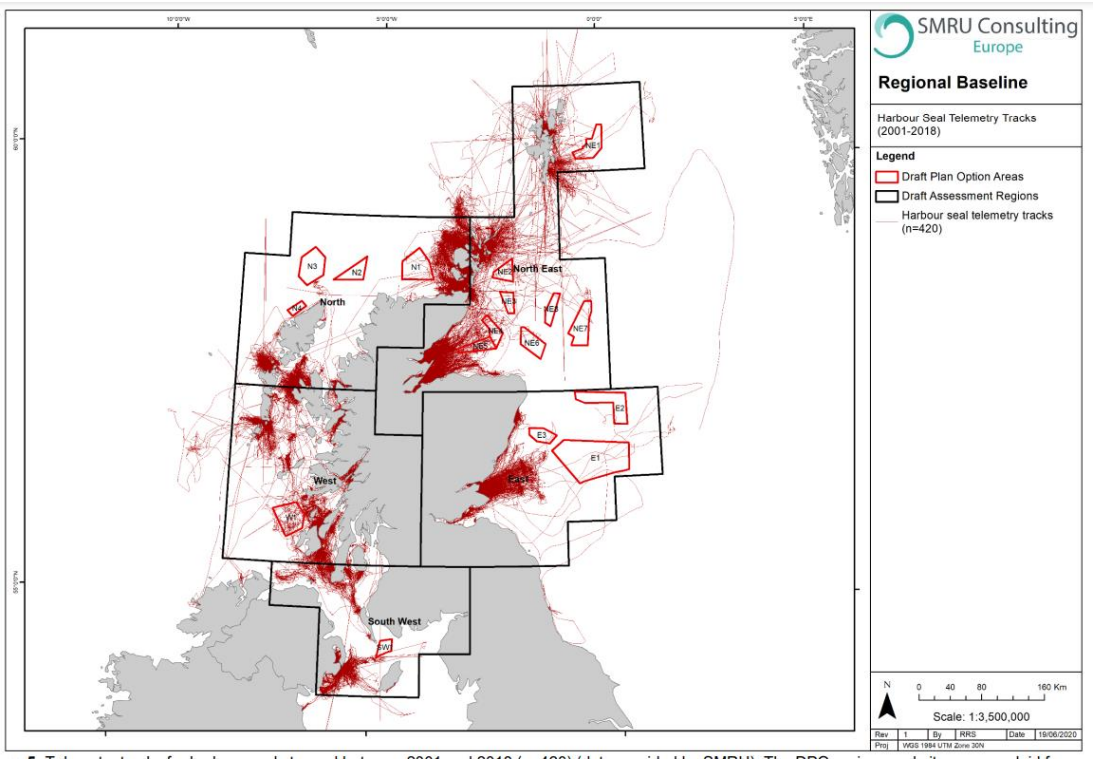

Figure 2-8: Telemetry tracked harbour seals (2001-2018)

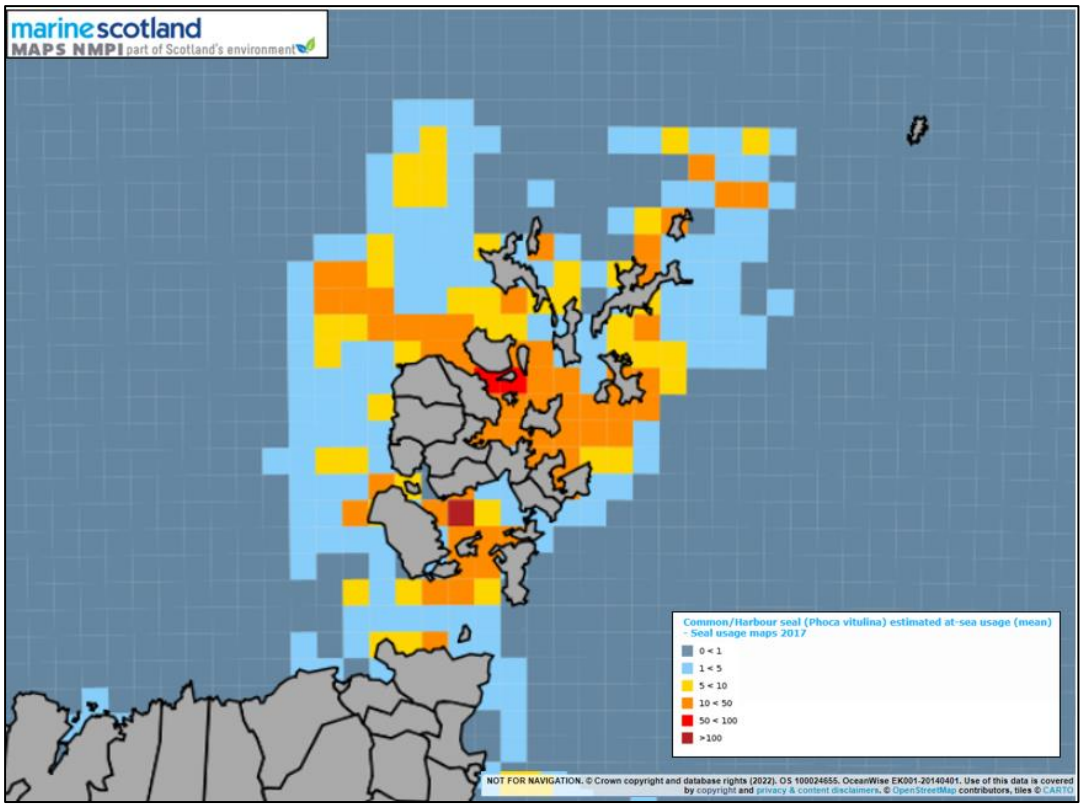

Figure 2-9: Map showing the estimated mean harbour seal density at sea. Image taken from the NMPi. Data from surveys conducted between 1991 and 2016, originated from the Sea Mammal Research Unit.

Seal haul out data counts for harbour seal also show the important association with Orkney, as detailed in Figure 2-10.

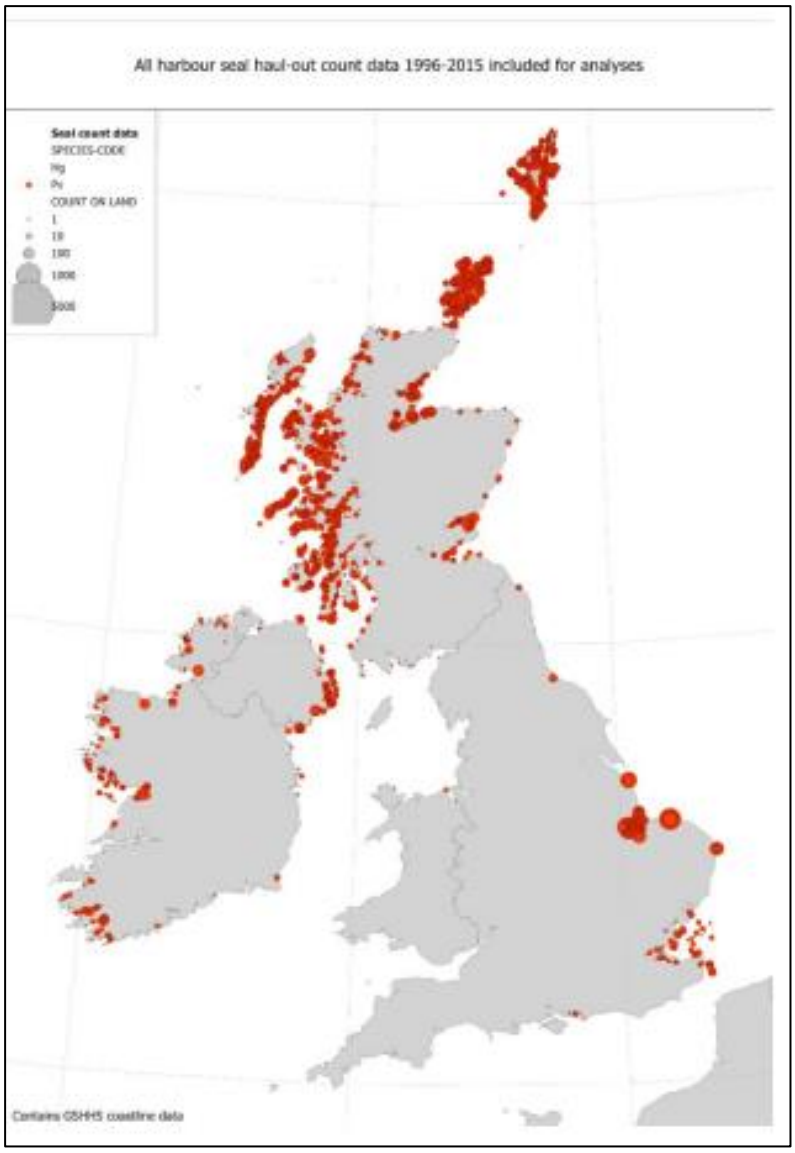

Figure 2-10: Harbour seal haul out seal count data (1996-2015)

SMASS have recorded 75 harbour seal strandings within 8km of the site between 1994-2022. No records of grey seal were returned from SWF, HWDT, OW or OMMRI.

The site and adjacent coastline is not considered suitable for use as a haul out by harbour seals due to the relatively high level of disturbance associated with the existing pier and adjacent industrial units.

From the information both harbour seal and grey seal are considered likely to be impacted by the Hatston development.

2.4 Fish

2.4.1 Basking Shark

Basking sharks *(Cetorhinus maximus)* are listed as endangered on the International Union for Conservation of Nature and Natural Resources (IUCN) Redlist[46]. They are a PMF and are afforded domestic protection under the Wildlife and Countryside Act. The nearest known basking shark hotspot[47] during the summer months, between May and October is along the coast of the Isle of Skye, approximately 247km south west of Orkney.

Basking shark sightings have been reported to HWDC since 2017, with three records nearest to the site being approximately 40km west in 2022, 58km south in 2022 and 94km south west in 2019.

No sightings of basking sharks have been recorded within the development area, however records of basking shark have been reported within the waters surrounding Orkney. Table 2-17 lists records of basking shark applicable to the development site:

Table 2-17: Records of Basking Shark

Resource	Date records available	Records/ Information
SWF	N/A	No information available
HWDT	2014-2024	Seven sightings of seven individuals reported to HWDT with the nearest located 41km west of the proposed development site.
OW	N/A	No information available
OMMRI	1936-2020	58 records of basking shark sightings within 10km of SDWQ have been submitted to OMMRI between 1936-2020.
ORCA	N/A	No information available
OMMRI 2022 Sightings Report	N/A	No information available
JNCC	N/A	No information available
SMASS	N/A	No information available

Basking shark are considered likely to be impacted by the Hatston development, due to number of sightings and record locations.

2.4.2 Diadromous Fish

A series of burns and watercourses are present throughout Orkney, which have potential to provide suitable habitat for a range of fish species for spawning, nursery grounds and residing. The Burn of Hatston is an open watercourse that flows through the west of the proposed site, which is culverted to the Bay of Kirkwall at approximately 250m south west of the existing Hatston Pier and has a catchment size of 1.36km^2 upstream of the point of discharge.

Malcolm Thomson of the Orkney Trout Fishing Association completed survey work (approx.15 years ago) looking at streams around Orkney to identify which held populations of brown trout (*Salmo trutta*) and of those, which were also producing sea trout (*Salmo trutta*). Out of the freshwater systems

[46] IUCN Redlist available at: http://www.iucnredlist.org/ (Accessed 07/06/2024)
[47] The Shark Trust basking shark sightings available at: https://www.sharktrust.org/basking-shark-project last accessed 12/12/2022

surveyed, 36 contained brown trout, and evidence of sea trout was found in 23 of those. However, no trout were found in any burns close to the development site, only eel (*Anguilla anguilla*) and threespine stickleback (*Gasterosteus aculeatus*) (pers comm). These watercourses are also not considered Atlantic salmon or sea trout rivers by Marine Scotland[48].

A recent site visit undertaken by EnviroCentre considered the burn of Hatston to be unsuitable for Atlantic salmon or sea trout, specifically due to the heavily culverted nature with lack of design for fish passage and constrained access between the watercourse mouth and sea (limited water levels and exposed nature) (Photograph 1 and 2).

A number of trout burns are also present in the wider area, with the Bay of Firth (approximately 6.5km west of the site) being a known feeding area for sea trout and supports a recreational fishery which occurs at sea and it is available to the public for free.

The Atlantic salmon, sea trout and European eel are PMFs (marine part of life cycle).

Although river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*) are PMFs (marine part of life cycle), they are not considered to be of relevance to the site as lampreys were absent from all survey sites on Orkney during the National Lamprey Survey of Scotland, undertaken by NatureScot between 2003-2005[49].

Photograph 1: Culverted entrance to Burn of Hatston, with limited fish suitability

Photograph 2: Low water levels and exposed mouth of Burn of Hatston

2.4.3 Flapper Skate

Flapper skate (*Dipturus intermedius*) are PMFs and considered to be Critically Endangered within the IUCNs red list. It is thought that their population has declined by over 80% within the past three generations with the main pressures relating to commercial fishing activities[50]. They take over 10 years to reach sexual maturity and have small numbers of young. Their egg cases also take a year to mature. Due to this life history, populations are slow to recover from individual losses. They are found over

[48] Marine Scotland Salmon and Sea Trout – Scottish Salmon Rivers, available ta: https://marine.gov.scot/information/atlantic-salmon-distribution-scotland, (Accessed 09/01/2023)
[49] NatureScot (2020). National Lamprey Survey of Scotland (2003-2005). Occurrence dataset https://doi.org/10.15468/gbeajh accessed via GBIF.org (Accessed 23/01/2023)
[50] Ellis, J.R., McCully-Philipps, S.R., Sims, D., Walls, R.H.L., Cheok, J., Derrick, D. & Dulvy, N.K. 2021. Dipturus intermedius. The IUCN Red List of Threatened Species 2021: e.T18903491A68783461. https://dx.doi.org/10.2305/IUCN.UK.2021-2.RLTS.T18903491A68783461.en. (Accessed 28/06/2023)

various types of seabed, with a preference for sandy and muddy areas and have been recorded occurring in around Orkney, with verified records near the proposed development site.

The Orkney Skate Trust (OST) have observed flapper skate laying egg cases on rough ground in close proximity to sediments, such as a boulder field skerry over sand, in Orkney[51]. In 2021 the OST counted > 21,000 spent flapper skate egg cases washed on Orkney shorelines, recorded over 200 sightings of flapper skate around Orkney and recorded the locations of inshore egg laying areas (establishing the habitats skate are using). A study undertaken by Phillips et al (2021)[52] presents OST data on egg case record, as shown in Figure 2-11, with the highest numbers being found to the north and west of the mainland. The study found that areas where egg cases were repeatedly found had similar habitat traits being >20 m depth, with boulders or exposed bedrock, in moderate current flow (0.3–2.8 knots) with low sedimentation. Combined survey data from 2019-2023 for flapper skate eggs in situ shows an absence near the proposed development site, as detailed in Figure 2-12.

The Shark Trust 'Great Egg Hunt' citizen science project[53] shows a similar distribution of records to those found by OST, as detailed in Figure 2-13.

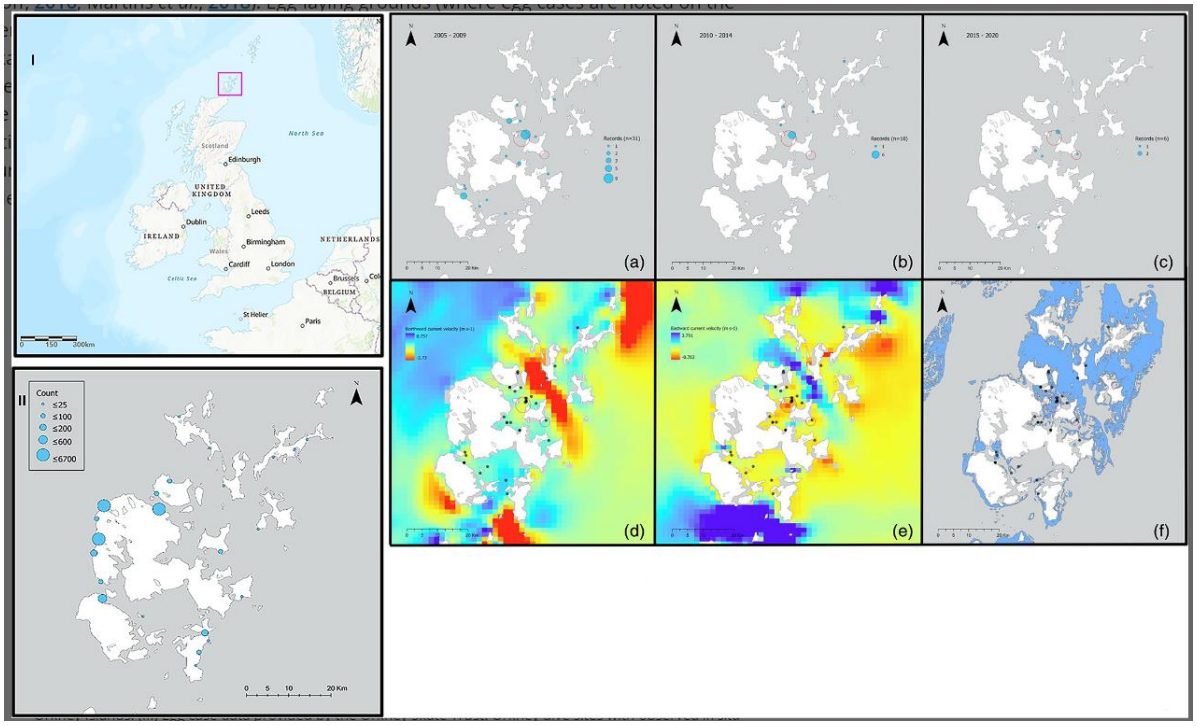

Figure 2-11: (I) Map of UK, with Orkney Islands highlighted in a pink box. (II) Map of flapper egg case records around the Orkney Islands. (III) Egg case data provided by the Orkney Skate Trust. Orkney dive sites with observed in situ flapper skate egg cases from 2005 to 2020; red open circles indicate sites of interest at the Foot of Shapinsay and Galt. (a–c) Maps showing in situ observations of egg cases, Orkney. Data points represent the number of records recorded at each location for the years (a) 2005–2009, (b) 2010–2014 and (c) 2015–2020. (d and e) In situ egg case observations overlaid on (d) northward and (e) current velocity data (m s–1) obtained from E.U. Copernicus Marine Service Information (CMEMS, 2020). (f) In situ egg case

[51] Orkney Skate Trust, available at: https://www.orkneyskatetrust.co.uk/flapper-skate/ (Accessed 07/06/2024)
[52] Phillips et al., (2021) Evidence of egg-laying grounds for critically endangered flapper skate (Dipturus intermedius) off Orkney, UK, Jounral of Fish Biology, Vol 99, Issue 4, pages 1492-1496, available at: https://doi.org/10.1111/jfb.14817 (Accessed 07/06/2024)
[53] The Shark Trust Great Egg Hunt Citizen Science Project, available at: https://www.sharktrust.org/Handlers/Download.ashx?IDMF=8b6b55ee-522b-4dbb-8d33-1fbd6082a635 (Accessed 07/06/2024)

observations in relation to hard-rock substrata indicated in blue (EMODnet, 2021). Figure obtained from Philips *et al*

Figure 2-12: Figure obtained from the Orkney Skate Trust showing combined data from 2019-2023 on *D. intermeius* eggs in-situ

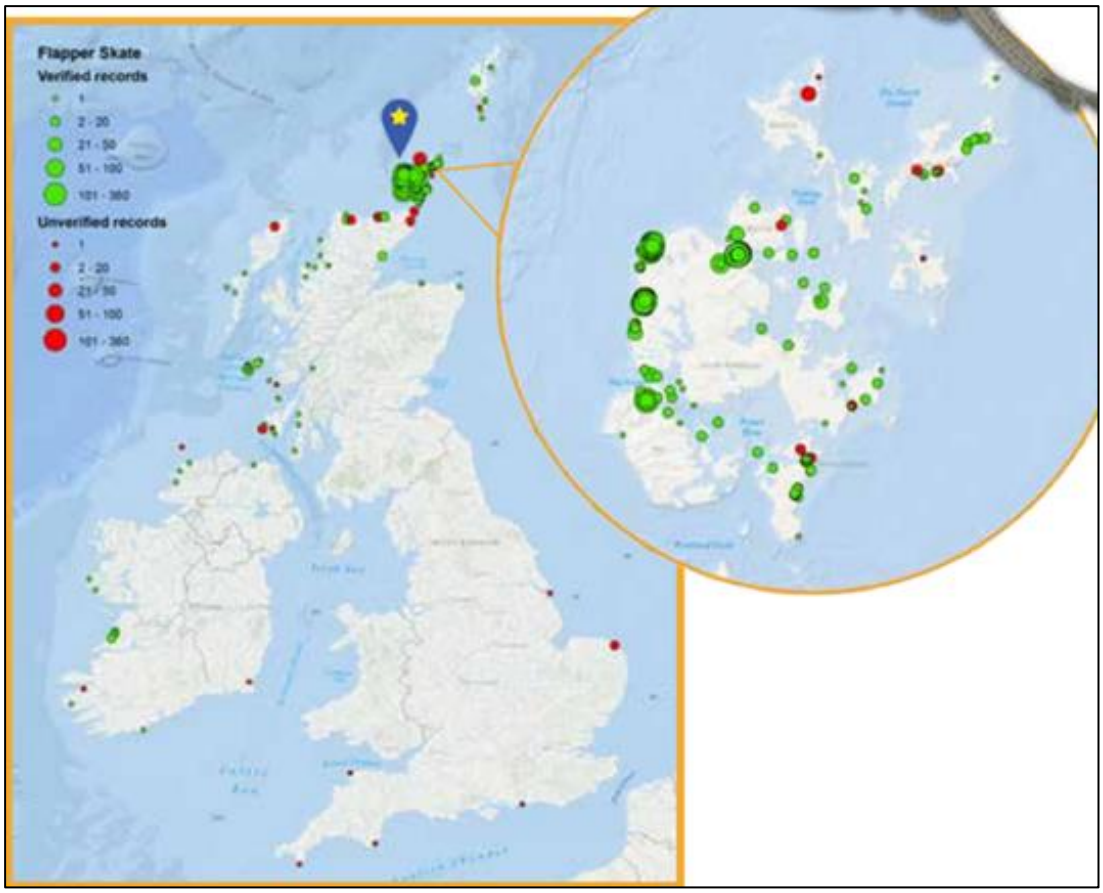

Figure 2-13: Flapper skate eggcases submitted to the Great Egg Hunt (The Shark Trust)

Benthic habitat surveys undertaken on the site revealed underwater habitat types comprising predominantly infralittoral muddy sand, with a mosaic of boulders, cobbles, red seaweeds, muddy sand, bedrock, sand/gravel, occasional kelp/seaweed and shells in the nearshore areas[54]. The habitat therefore may be optimal for egg laying, although no eggs or individuals were identified during the benthic surveys.

From the information gathered, it is considered that flapper skate may be impacted by the Hatston development.

2.4.4 Other Marine Fish

A range of fish species have been caught by the Orkney Shore Angling Association (OSAA) off Hatston pier, some of which are PMFs (as indicated by *), including:

- Mackerel*
- Ling (*Molva molva*)*
- Cod*
- Whiting*
- Flapper Skate (*Dipturus intermedius*)* [55]
- Herring*
- Sea Trout*

[54] Dewey, S., Forster, S., O'Dell, J., and MacMillan, A. (2023). Hatston Pier and Harbour Subtidal Survey – Interim Report. A report to Envirocentre by Seastar Survey Ltd. and Physalia Associates Ltd. 18 pages
[55] Reported as common skate by OSAA, however likely to be the flapper skate following the common skate being identified as two distinct species in 2010, with the flapper skate occurring in the northern North Sea and off Scotland's north-west coast.

- Atlantic Horse-Mackerel*
- Pollack
- Lesser spotted dogfish (*Scyliorhinus caniculus*)
- Coalfish (*Pollachius virens*)
- Pouting
- Poor cod (*Trisopterus minutus*)
- Sea Scorpion (*Taurulus bubalis*)
- Short-Horn Sculpin (*Myoxocephalus scorpius*)
- Flounder (*Platichthys flesus*)
- Plaice (*Pleuronectes platessa*)
- Dab (*Limanda limanda*)
- Conger Eel (*Conger conger*)
- Tub Gurnard (*Trigla lucerna*)
- Grey Gurnard (*Eutrigla gurnardus*)
- Lumpsucker (*Cyclopteridae*)
- Garfish (*Belone belone*)
- Thornback Ray (*Raja clavata*)
- Spotted Ray (*Raja montagui*)
- Thicklip Grey Mullet (*Chelon labrosus*)
- Shore Rockling (*Gaidropsarus mediterraneus*)
- Ballan Wrasse (*Labrus bergylta*)
- Cuckoo Wrasse (*Labrus bimaculatus*)

The following PMF fish species in Table 2-18, have either been recorded in proximity to the site (I) or are marine mammal prey sources (II). Information (where possible) on, nursery and spawning ground areas [56] [57] [58] as well as distribution has been used to assess whether the species could be present within the development site in Orkney. In addition, benthic habitat surveys undertaken on the site revealed underwater habitat types comprising predominantly infralittoral muddy sand with a mosaic of boulders, cobbles, red seaweeds, muddy sand, bedrock, sand/gravel, occasional kelp/seaweed and shells in the nearshore areas[59]. Therefore, PMFs for which there is not habitat have been excluded.

Table 2-18: Fish PMFs in Relation to the Development Site

PMF	Spawning Grounds Cover the Site	Nursery Grounds Cover the Site	Distribution Covers the Site
Anglerfish (*Lophius piscatorius*)	Unlikely (insufficient data)	Yes (high density)	Yes
Atlantic halibut (II)	No	No	Yes
Atlantic herring (I) (II)	Yes	Yes (low density)	Yes
Atlantic mackerel (I) (II)	No	No	Yes
Atlantic salmon (II)	No	No	Yes
Blue whiting (I) (II)	No	Yes (low density)	Yes
Cod (I) (II)	No	No	Yes

[56] MS NMPi data available at: https://marine.gov.scot/maps/nmpi?title=&items_per_page=25
[57] CEFAS Ellis, J.R., Milligan, S.P., Readdy, L., Taylor, N. and Brown, M.J. 2012. Spawning and nursery grounds of selected fish species in UK waters. Sci. Ser. Tech. Rep., Cefas Lowestoft, 147: 56pp.,
[58] NatureScot https://www.nature.scot/sites/default/files/Publication%202016%20-%20SNH%20Commissioned%20Report%20406%20-%20Descriptions%20of%20Scottish%20Priority%20Marine%20Features%20%28PMFs%29.pdf
[59] Dewey, S., Forster, S., O'Dell, J., and MacMillan, A. (2023). Hatston Pier and Harbour Subtidal Survey – Interim Report. A report to Envirocentre by Seastar Survey Ltd. and Physalia Associates Ltd. 18 pages

PMF	Spawning Grounds Cover the Site	Nursery Grounds Cover the Site	Distribution Covers the Site
Flapper skate and blue skate (formerly common skate) (*Dipturus intermedius* and *D. batis*) (I) (II)	Potentially	Potentially	Yes
Horse mackerel (I) (II)	No	No	No
Ling (I)	No	Yes (low density)	Yes
Norway pout (II)	No	No	No
Saithe (II)	No	Yes (unknown density)	Yes
Sandeels (*Ammodytes marinus* & *Ammodytes tobianus*) (II)	Yes	Yes (low density)	Yes
Sand goby (*Pomatoschistus minutus*) (II)	Potentially	Potentially	Yes
Sandy ray (*Leucoraja circularis*) (II)	No	No	No
Spiny dogfish (*Squalus acanthias*)	No	Yes (low density)	Yes
Whiting (I) (II)	No	Yes (low density)	Yes

From the information gathered, it is considered that PMF fish may be impacted by the Hatston development.

2.4.5 Aquaculture/Fisheries

A number of active aquaculture sites are present within 20km of the site, comprising of Atlantic Salmon, lumpsucker (*Cyclopteridae*) and wrasse (*Labridae*). The nearest commercial fishery is Quanterness, present approximately 800m north west of the development site and consist of Atlantic salmon and lumpsucker. There are plans for the Quarterness fishery to be relocated further from the Hatston development site.

From the information gathered, it is considered that commercial fisheries may be impacted by the proposed development, dependent on when the relocation of the fisheries occurs.

2.5 Marine Mammals and Fish Species Likely to be Impacted

From the proposed works associated with the development, some of the following potential impacts may occur:

- Noise and vibration generated during construction of pier and future operations, ship traffic and other port activities may temporarily or permanently impact marine mammals, seals and fish and any prey resources.
- Potential impacts on water quality as a result of pollution events (fuel spills, sediment runoff etc.) during and post construction.
- Removal of benthic habitat for construction of pier.
- Introduction or further spread of non-native species during and post construction.
- Increased ship movement may result in collisions with marine mammals, seals or basking sharks.

Based on the above information, it has been assessed that the most frequently observed species, and therefore the species considered to be of most concern within the zone of influence of the proposed development, are harbour porpoise, Risso's dolphin, killer whale, white-beaked dolphin, long-finned pilot whale, grey seal, harbour seal, basking sharks, diadromous fish, commercial fisheries, European

eel and some fish PMFs. The other species aforementioned are less frequently observed in Orkney waters and therefore are less likely to be of concern within the zone of influence.

Table 2-19: Marine Mammals and Fish Species with Potential to be Impacted by Proposed Development

Species	Regularly Present near Hatston	Potential to be Impacted
Harbour porpoise	Yes	Yes
Risso's dolphin	Yes	Yes
Killer whale	Yes	Yes
White beaked dolphin	Yes	Yes
Long-finned pilot whale	Yes	Yes
Minke whale	Yes	Yes
Short-beaked common dolphin	Yes	Yes
Striped dolphin	No	No
Atlantic white-sided dolphin	No	No
Bottlenose dolphin	No	No
Humpback whale	No	No
Sperm whale	No	No
Fin whale	No	No
Cuvier's beaked whale	No	No
Sei whale	No	No
Short-finned pilot whale	No	No
Sowerby's beaked whale	No	No
Northern bottlenose whale	No	No
False killer whale	No	No
Blue whale	No	No
Narwhal	No	No
Beluga	No	No
Harbour seal	Yes	Yes
Grey seal	Yes	Yes
Basking shark	Yes	Yes
Diadromous fish	Yes	Yes
Commercial fisheries	Yes	Yes
European Eel	Yes	Yes
PMF fish species with nursery and spawning grounds covering the site	Yes	Yes
Flapper Skate	Yes	Yes

APPENDICES

A PROPOSED SITE LOCATION AND LAYOUT

Chart Datum (Kirkwall)	Ordnance Datum (Newlyn)	Quay Heights and Tide Data Hatston Pier, Kirkwall
+6.40m	+5.00m	Quay Edge Level
+3.00m	+1.60m	Mean High Water Spring Tides
+1.40m	0.00m	Ordnance Datum (Newlyn)
+0.60m	-0.80m	Mean Low Water Spring Tides
0.00m	-1.40m	Chart Datum (Kirkwall)
-5.00m	-6.40m	
-7.50m	-8.90m	
-10.00m	-11.40m	

-11m CD

Phase 2 Works: Dredging

-10m CD -9m CD -8m CD -7m CD -6m CD -5m CD -4m CD -3m CD -2m CD

Travel Lift Dock:
Based on Planet Marina (Italy)
820Tonne Lift, with dock sizes based on recommendations for lift size.
Dock Width: 15.0m
Dock Length: min 56.5m

15.0m
18.0m
62.672m
20.0m

O.I.C. 'Thor'

Phase 2 Works:
Pier Extension &
North Side
Reclamation

New Surface Water Outfall from Reclamation Area

MH
French Drain
Fall

Hardcore Surfaced Storage / Development Area
14,000m2 1.4Ha / 3.46 Acres

Earth House site left un-disturbed. All services routed in road verge on landward side.

Phase 1 Works:
South Side
Reclamation

Ex. ESS

Hatston Pier Waste Storage Facility
Ex. Tanks

Shingle
Coastal Slope
Spreads
Shingle

GALT VIEW

Proposed Site for Fuel Tank Farm

Wind Turbine
WB
El Sub Sta
Track

Shingle
Coastal Slope

-10m CD -9m CD -8m CD -7m CD -6m CD -5m CD

ORKNEY ISLANDS COUNCIL
ORKNEY LOGISTICS BASE, HATSTON
PHASE 3 WORKS
SHIP LIFT & ADDITIONAL
NORTH SIDE RECLAMATION

Scale 1: 1000

10 0 10 20 30 40 50 60 70 80 90 100m
SCALE 1:1000 at A1

REV	DATE	REVISION	DRN	CHK
A	06.06.2023	Pier Approach Dredging Removed	JJM	
P1	21.02.2023	Preliminary Issue P1 for comment	JJM	

ORKNEY ISLANDS COUNCIL
Harbour Authority

Orkney Logistics Base, Hatston, Orkney

Consenting Process
Phase 3 Works: Ship Lift & Reclamation

Arch Henderson 1919
Civil Engineers
Structural Engineers
Architects
CDM Co-ordinators
Geotechnical services
Environmental services
Stewart Building, Lerwick, Shetland, ZE1 0LL.
Tel : 01595 695512
www.arch-henderson.co.uk - email : lerwick@arch-henderson.co.uk
Aberdeen, Dundee, Glasgow, Lerwick, Inverness, Thurso, Stromness, Southampton, Falkland Islands

DRAWN :	DATE :	CHECKED :	APPROVED :
JJM	February 2023	SSJ	APS

SCALE : (A1)	DRAWING STATUS :
As Shown	Consents

DRAWING No : 202043/C- 30 REV : A