



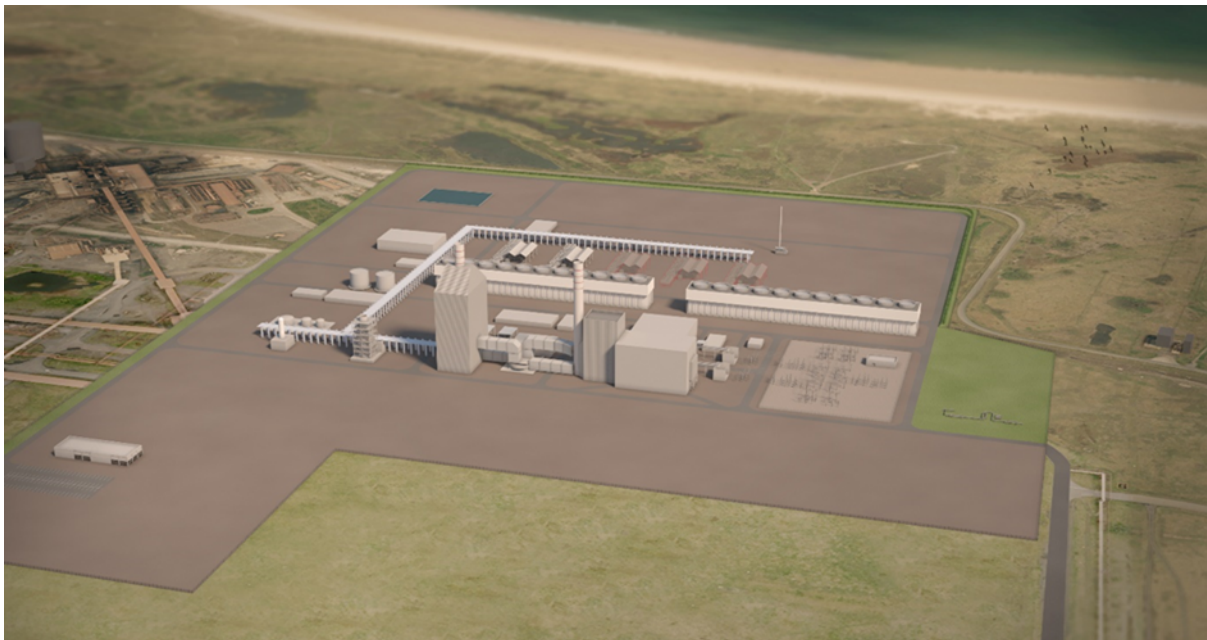
Net Zero Teesside – Environmental Statement

Planning Inspectorate Reference: EN010103

Volume III – Appendices

Appendix 14B: Fisheries and Fish Survey Report

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)



Prepared by: **AECOM**

Table of Contents

14B. Fisheries and Fish Ecology Baseline	14-1
14.1 Introduction.....	14-1
14.2 Methodology	14-5
14.3 Marine Designations.....	14-8
14.4 Fish and Shellfish Communities	14-12
14.5 Commercial Fisheries	14-30
14.6 Species-Specific Information	14-37
14.7 Baseline Evolution	14-60
14.8 Summary of Findings.....	14-62
14.9 References	14-64
Appendix A Temporal variations in the type of gear used during the Environmental TraC surveys	14-75
Appendix B Full species list and proportions as presented in TraC survey fish species proportion figures	14-79
Appendix C Freshwater Fish Count NFPD Environment Agency Survey Figures	14-82

Figures

Figure 14B-1: Study Area for the fisheries and fish ecology baseline	14-3
Figure 14B-2: Marine Designated Sites which fall within the Study Area for the fisheries and fish ecology baseline.....	14-10
Figure 14B-3a-f: Spawning and nursery areas of herring, anglerfish, plaice, cod, whiting and spurdog which fall within the Study Area.....	14
Figure 14B-4: Diadromous fish counts from Environment Agency (2019a) TraC surveys in the River Tees. Data has been reported for a range of survey methods (beam trawl, otter trawl, and seine netting) and effort.	14-21
Figure 14B-5: TraC fish count sampling locations (Environment Agency, 2019a). ..	14-22
Figure 14B-6: Total fish counts for each gear type used, in Environment Agency (2019a) TraC surveys in the lower reaches of the River Tees.	14-24
Figure 14B-7: Proportion of fish species from Environment Agency (2019a) TraC surveys in the lower reaches of the River Tees (1985 – 2018). Fish species in the legend have been presented in order of percentage contribution.	14-25
Figure 14B-8: Total fish counts for each gear type used, in Environment Agency (2019a) TraC surveys in the middle reaches of the River Tees.	14-26
Figure 14B-9: Proportion of fish species from Environment Agency (2019a) TraC surveys in the middle reaches of the River Tees (1981 – 2015). Fish species in the legend have been presented in order of percentage contribution.	14-27
Figure 14B-10: Total fish counts for each gear type used, in Environment Agency (2019a) TraC surveys in the upper reaches of the River Tees.	14-28

Figure 14B-11: Proportion of fish species from Environment Agency (2019) TraC surveys in the upper reaches of the River Tees (1982 – 1996). Fish species in the legend have been presented in order of percentage contribution. 14-29

Figure 14B-12: Average landed weight (tonnes) (2013 – 2017) recorded in the ICES rectangle 38E8 for each gear category used. Fishing activity data taken from iFISH data system, as reported by the MMO (2018a). 14-33

Figure 14B-13: Annual landed weight (tonnes) (2013 – 2017) recorded in the ICES rectangle 38E8. Fishing activity data taken from IFISH data system, as reported by the MMO (2018a). 14-34

Figure 14B-14: Average landed weight (tonnes) (2013 – 2017) recorded in the ICES rectangle 38E8 for each vessel length category. Fishing activity data taken from IFISH data system, as reported by the MMO (2018a). 14-36

Figure 14B-15: Main salmon rivers in England and Wales, denoting those with Salmon Action Plans (*) and those designated as Special Areas of Conservation (\$) in which salmon must be maintained or restored to favourable conservation status (CEFAS *et al.*, 2019). 14-40

Figure 14B-16: Monthly combined upstream counts for salmon and sea trout from 2011 to 2020 at the Tees Barrage on the lower Tees, reported by the Environment Agency (Environment Agency, 2021). Counter only monitors upstream migration through the fish pass. No data was reported for January to June 2011. 14-41

Figure 14B-17: Monthly mean upstream counts for salmon from 1995 to 2011 at the Tees Barrage on the lower Tees, reported by the Environment Agency (Environment Agency, 2013). Fish trap counts only refer to upstream migration through the fish pass. Error bars refer to standard deviation. No data was reported for January to April 1995 and July to December 2011. 14-41

Figure 14B-18: Monthly mean upstream counts for sea trout from 1995 to 2011 at the Tees Barrage on the lower Tees, reported by the Environment Agency (Environment Agency, 2013). Fish trap counts only refer to upstream migration through the fish pass. Error bars refer to standard deviation. No data was reported for January to April 1995 and July to December 2011. 14-42

Figure 14B-19: Summary of salmon and sea trout rod catches from the river Tees that were declared from 2007 to 2017, as reported by the Environment Agency (2017). 14-43

Figure 14B-20: Total fish counts for European eel (*Anguilla anguilla*), in Environment Agency (2019a) TraC surveys in the three reaches of the River Tees. 14-44

Figure 14B-21: UK Distribution of River Lamprey (left) and Sea Lamprey (right) (JNCC, 2013a and 2013b). 14-46

Figure 14B-22: Size classes (mm) (based on total length (mm)) measured for herring (*Clupea harengus*) in Environment Agency (2019a) TraC surveys in the River Tees. Data has been presented for the first 95% of fish counts. 14-48

Figure 14B-23: Size classes (mm) (based on total length (mm)) measured for sprat (*Sprattus sprattus*) in Environment Agency (2019a) TraC surveys in the River Tees. Data has been presented for the first 95% of fish counts. 14-49

Figure 14B-24: Size classes (mm) (based on total length (mm)) measured for cod (*Gadus morhua*) in Environment Agency (2019a) TraC surveys in the River Tees. Data has been presented for the first 95% of fish counts. 14-52

Figure 14B-25: Size classes (mm) (based on total length (mm)) measured for whiting (*Merlangus merlangus*) in Environment Agency (2019a) TraC surveys in the River Tees. Data has been presented for the first 95% of fish counts. 14-53

Figure 14B-26: Size classes (mm) (based on total length (mm)) measured for plaice (*Pleuronectes platessa*) in Environment Agency (2019a) TraC surveys in the River Tees. Data has been presented for the first 95% of fish counts. 14-56

Figure 14B-27: Size classes (mm) (based on total length (mm)) measured for *Ammodytidae* (sandeel species) in Environment Agency (2019a) TraC surveys in the River Tees. Data has been presented for the first 95% of fish counts. 14-58

Tables

Table 14B-1: Summary of key legislation relevant to the assessment of fisheries and fish ecology baseline 14-5

Table 14B-2: Summary of relevant fish and shellfish species protected by national and international legislation or policy..... 14-12

Table 14B-3: Marine fish counts from Environment Agency (2019a) TraC surveys in the River Tees for 2009 to 2018. Data has been reported for a range of survey methods (beam trawl, otter trawl, and seine netting) and effort. Fish species have been presented in order of prevalence (number of years present), followed by total abundance. 14-18

Table 14B-4: Nationalities of vessels fishing in the ICES rectangle 38E8 and the weight (tonnes) of their annual landings (tonnes) (2013 – 2017). 14-31

Table 14B-5: Length categories of vessels fishing in the ICES rectangle 38E8 and their average landed weight (tonnes) per year (2013 – 2017) for each gear type used. 14-35

14B. Fisheries and Fish Ecology

Baseline

14.1 Introduction

Project Background

- 14.1.1 Net Zero Teesside Power Limited (NZT Power) and Net Zero North Sea Storage Limited (NZNS Storage), together the Applicants are seeking Development Consent for the construction, operation, maintenance and decommissioning of the Net Zero Teesside (NZT) Carbon Capture, Usage and Storage (CCUS) Project (the Proposed Development). The Proposed Development comprises the construction, operation and decommissioning of a CCUS facility comprising a gas-fired generating station with an electrical output of up to 860 MWe, together with equipment required for the capture and compression of carbon dioxide (CO₂) emissions from the power generating station. In addition, there is a need for the provision of supporting infrastructure and connections to support the power generating station and to facilitate the development of a wider industrial carbon capture network on Teesside, the construction of which also forms part of the Proposed Development. The Proposed Development also includes high-pressure compression of CO₂ and the onshore section of a pipeline to export the captured CO₂ for off-shore storage.
- 14.1.2 The Proposed Development forms the onshore part of the wider NZT Project; further details relating to this are provided in Chapter 4: Proposed Development (ES Volume I, Document Ref 6.2).

Aims and Objectives

- 14.1.3 The study aims to provide a detailed baseline description of marine and estuarine fish and shellfish populations (including diadromous species) and fisheries within the Tees Estuary and the wider coastal marine environment in the absence of the Proposed Development. The objective is to enable identification of potentially important fisheries and fish ecology features within the Zone of Influence (Zoi) of the Proposed Development.
- 14.1.4 This report presents the results of a desk study carried out to date, the objectives of which were to:
- Collate and review available information on fisheries and fish ecology;
 - Summarise the findings the of the available information; and
 - Identify key fish and shellfish receptors as well as relevant marine designations in the area.

Study Area

- 14.1.5 Based on the location of the Proposed Development, the Study Area for the fisheries and fish ecology baseline has been defined as the area comprising the River Tees, the Tees estuary, and the wider coastal area up to and

including the Greater North Sea out to a distance of 10 km offshore from the indicative Site boundary (Figure 14B-1). This spatial extent was chosen on the basis that it provides geographical context and encompasses the relevant functional habitats and range of movement for the species found within the vicinity of the Proposed Development.

- 14.1.6 The Study Area falls within the MMO North East Inshore Marine Plan area and the International Council for the Exploration of the Sea (ICES) rectangle 38E8, representing a standard geographical unit, of approximately 30 by 30 nautical miles, for the reporting of fisheries data. In addition, the Study Area is also encompassed within the district of the North Eastern Inshore Fisheries and Conservation Authority (NEIFCA) which is responsible for managing and conserving marine resources between the River Tyne and North East Lincolnshire.
- 14.1.7 The Study Area has been presented to both the MMO (and their specialist advisers, Cefas) and the local NEIFCA during the evolution of the assessment.

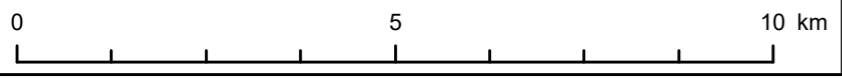
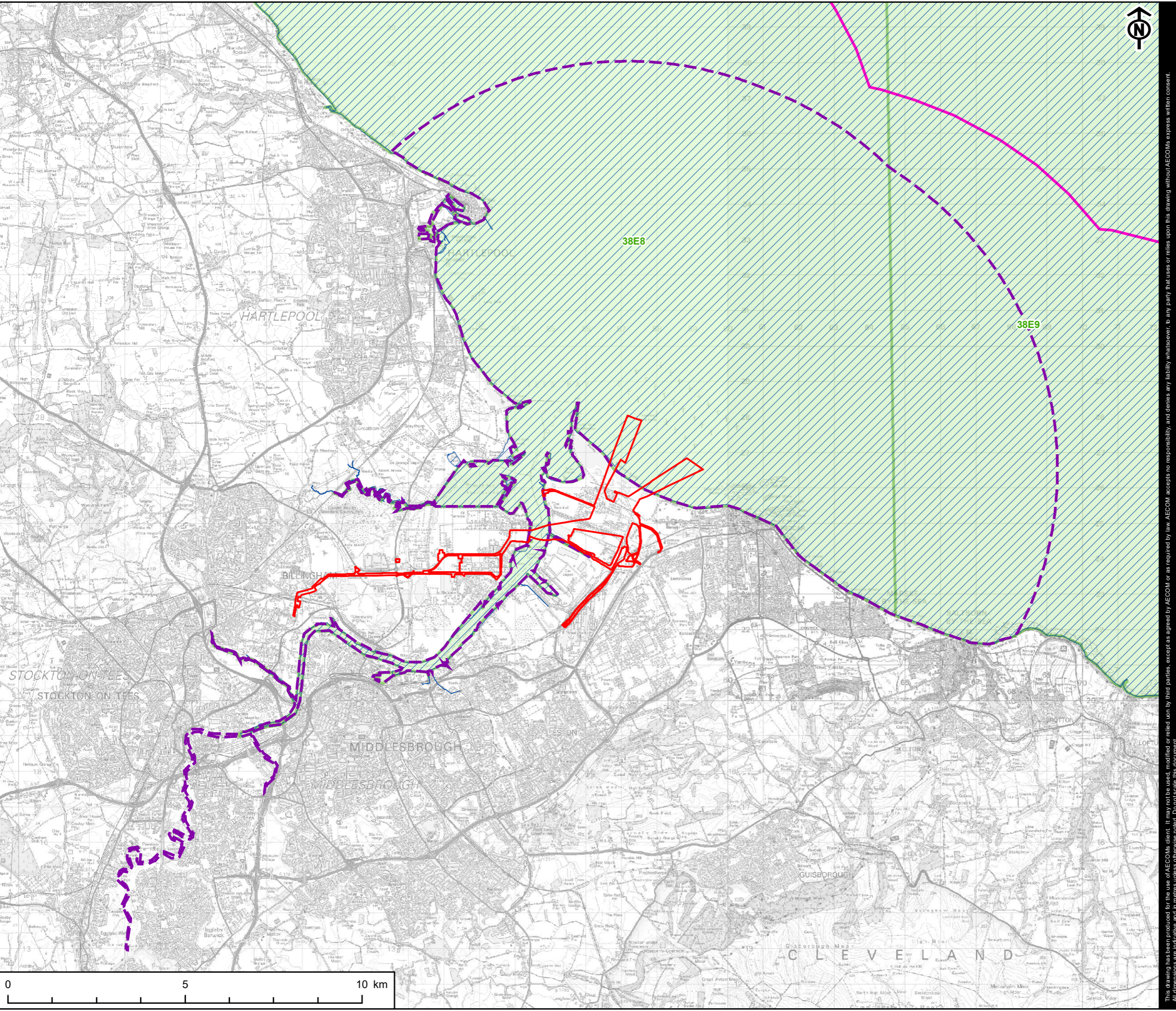
Structure of Report

- 14.1.8 This report is structured as follows:
- **Section 14.2 (Methodology)** – summarises the methodology for undertaking the fisheries and fish ecology baseline study and includes information related to relevant conservation legislation and key data sources;
 - **Section 14.3 (Marine Designations)** – provides an overview of marine designations including local, national and internationally protected sites and species which are relevant to the assessment of the fisheries and fish ecology baseline;
 - **Section 14.4: (Fish and Shellfish Communities)** – provides a general characterisation of fish and shellfish communities within the Study Area and presents the results of the National Fish Populations Database (NFPD) for the Tees as reported by the Environment Agency (2019a);
 - **Section 14.5: (Commercial Fisheries)** – describes the commercial fish and shellfish fisheries operating within the Study Area;
 - **Section 14.6: (Species Information)** – provides further information on the ecology of specific fish and shellfish species known to be of commercial and/or conservational importance in the Study Area;
 - **Section 14.7 (Baseline Evolution)** – summarises how the fisheries and fish ecology baseline may change during the consenting process and over the lifetime of the Proposed Development; and
 - **Section 14.8 (Summary of Findings)** – provides a summary of the findings of the desk study and identifies the key fish and shellfish receptors which require consideration within the relevant environmental assessments.

Figure 14B-1: Study Area for the fisheries and fish ecology baseline



- KEY
- Site Boundary
 - 10km Study Area
 - North East Inshore Marine Plan Area (MMO)
 - Statistical Rectangle (ICES)
 - North Eastern Inshore Fisheries and Conservation Authority District Boundary



TITLE
FIGURE 14B-1
STUDY AREA FOR THE FISHERIES AND FISH
ECOLOGICAL BASELINE

REFERENCE
 NZT_210511_FEB_14B-1_v5

SHEET NUMBER
 1 of 1

DATE
 11/05/21

This drawing has been produced for the use of AECOM's client. It may not be used, modified or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, for any party that uses or relies upon this drawing without AECOM's express written consent. All dimensions are indicative and in metres unless otherwise noted. Do not scale this document.

14.2 Methodology

Legislative Context

14.2.1 Key biodiversity and conservation legislation relevant to the development of the fisheries and fish ecology baseline is shown in Table 14B-1. This information has been used to inform the scope of baseline information required and to determine the key ecological features pertinent to the assessment of effects outlined within the Environmental Statement (ES).

Table 14B-1: Summary of key legislation relevant to the assessment of fisheries and fish ecology baseline

Name	Description	How it relates to the Proposed Development
The Marine Strategy Regulations 2010	Transposes the Marine Strategy Framework Directive (MSFD) (2008/56/EC) into UK legislation. The MSFD sets out a framework for achieving Good Environmental Status by 2020. As such, member states are required to carry out an assessment of the current state of UK marine waters and establish what constitutes good environmental status, including the development of relevant targets and indicators.	The latest UK assessment states that GES is not currently being achieved for fish (including some commercial fish and shellfish species). The four ecology indicators used to make this assessment include: population abundance, size structure and species composition. For commercial species, indicators include commercial fishing pressure and reproductive capacity. These indicators have been considered as part of this baseline characterisation.
The Water Environment (Water Framework Directive (WFD)) Regulations 2017	Transposes the European Water Framework Directive (2000/60/EC) in UK legislation. It establishes a legislative framework for the protection of surface waters (including rivers, lakes, transitional waters and coastal waters) and groundwater.	Fish represents a biological quality element considered in the determination of ecological status for the Tees and the Tees Coastal water bodies which fall within the Study Area.
The Conservation of Habitats and Species Regulations 2017 ("The Regulations")	The Regulations transpose the Habitats Directive (92/43/EEC) into UK legislation out to the 12 nautical mile (nm) limit and provide for the designation and protected of European Sites, the protection of 'European protected species', and the adaption of planning and other controls for the protection of European Sites.	There are several European Sites and European protected fish species listed under Annex II and IV known to be present within the Study Area and require consideration.
Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (England)	Provides a statutory list of species and habitats of principal importance for the purpose of conservation biodiversity.	Several species known to be present within the Study Area are listed under Section 41 as being of Principal Importance in England.
The Convention on the Conservation of Migratory Species of	Provides protection for endangered migratory species (listed in Appendix I and II) and their habitats. The legal	Species listed in Appendix II are known to present within the Study Area.

Name	Description	How it relates to the Proposed Development
Wild Animals (the 'Bonn Convention') 1985	requirement for the strict protection of Appendix I & II species is provided by the Wildlife & Countryside Act (1981 as amended).	
The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) 1982	Aims to conserve and protect wild plant and animal species and their natural habitats (listed in Appendices II and III of the Convention). The legal requirement for the strict protection of Appendix II & III species is provided by the Wildlife & Countryside Act (1981 as amended).	Species listed in Appendix III are known to be present within the Study Area.
The Oslo and Paris Convention for the Protection of the Marine Environment of the North-East Atlantic (the 'OSPAR Convention') 1998	Initiated the development of a list of threatened and/or declining species and habitats that required protection in accordance OSPAR Biological Diversity and Ecosystem Strategy.	Species listed by OSPAR are known to be present within the Study Area.
Convention on Biological Diversity 1992	Provides an international legal framework for the conservation of biodiversity and sustainable use of its components. UK Biodiversity Action Plan (UK BAP)* priority species and habitats lists and habitats and species of principal importance in the Section 41 of the NERC Act 2006 reflect the conservation priorities of the CBD.	Highlights the importance of conserving, protecting and enhancing general biological diversity (as well as specific species and habitats). Several fish species of principal importance listed under Section 41 of the NERC Act 2006 are known to be present within the Study Area.

* The 'UK Post-2010 Biodiversity Framework', was published in 2012 and succeeds the UK BAP (Joint Nature Conservation Committee (JNCC) and Defra, 2018).

14.2.2 In England, fisheries management between 0 – 6 nautical miles (nm) is under the jurisdiction of the Inshore Fisheries Conservation Authorities (IFCAs), which were established under the Marine and Coastal Access Act (MCAA) 2010. The IFCAs main legal duties are described in Section 153 of the MCAA and they have a duty to sustainably manage sea fisheries resources within their district and to protect marine ecosystems from the impact of fishing. As outlined in paragraph 14.1.6, the Study Area falls within the NEIFCA District.

14.2.3 The Environment Agency has a general duty to maintain, improve and develop freshwater fisheries of migratory species, including salmon, trout and freshwater eels. The Salmon and Freshwater Fisheries Act 1975 (as amended) provides the Agency with the powers to make Byelaws and restrict the number of licences issued for individual net fisheries by making Net Limitation Orders (NLO's).

Data Sources

14.2.4 The fisheries and fish ecology baseline have been described using several data sources. These data sources were used to determine the relative importance and functionality of the Study Area in the regional context of fish

populations in the Teesside estuarine/coastal area and the associated North Sea, as well as the populations of diadromous fish using the River Tees.

14.2.5 Between February 2020 and January 2021, engagement with the local MMO fisheries team was attempted to validate these sources and/or obtain any additional local insight; no responses were received. Concurrently, engagement with the NEIFCA has been undertaken. As well as validation of the data source and approach being followed, responses received from the fisheries officer have been used to inform this assessment.

14.2.6 The data sources reviewed include the following:

- General:
 - FishBase (www.fishbase.org) for general fish ecology, distribution and biological information;
 - The Humber and East Coast Regional Environmental Characterisation (Tappin *et al.*, 2011 and Limpenny *et al.*, 2011, respectively) for a summary of the distribution and ecology of fish in the North Sea;
 - Environment Agency (2009) River Tees Salmon Action Plan which sets out stock assessments and management actions for this species;
 - Centre for Environment, Fisheries and Aquaculture (CEFAS) Sensitivity Maps (Coull *et al.*, 1998; Ellis *et al.*, 2012) which provide spatial data highlighting spawning and nursery grounds in UK waters;
 - The International Convention for the Conservation of Nature (IUCN) Red List of Threatened Species (<https://www.iucnredlist.org/>); and
 - Published Environmental Statements and survey reports produced for large infrastructure projects in the vicinity of the Proposed Development, including Dogger Bank Teesside A & B Offshore Wind (Brown and May Marine, 2014; Precision Marine Survey Ltd, 2014) and Teesside Offshore Wind Farm (Lancaster *et al.*, 2011).
- Data:
 - Environment Agency (2019a) National Fish Populations Database Transitional and Coastal (TraC) fish counts for all species within the Tees Estuary;
 - Environment Agency (2019b) National Fish Populations Database freshwater fish counts for species within the River Tees;
 - Environment Agency (2013, 2021) fish count data recorded from the Tees Barrage;
 - Marine Mammal Organisation (MMO) 2013 – 2014 annual landings statistics (<https://www.gov.uk/government/collections/uk-sea-fisheries-annual-statistics>);
 - Environment Agency (2017). Salmonid and Freshwater Fisheries Statistics for England and Wales 2017;

- CEFAS (2019) assessment of salmon stock and fisheries in England and Wales; and
- International Council for the Exploration of the Seas (ICES) data (<https://www.ices.dk/Pages/default.aspx>).

14.3 Marine Designations

Relevant Marine Designated Sites

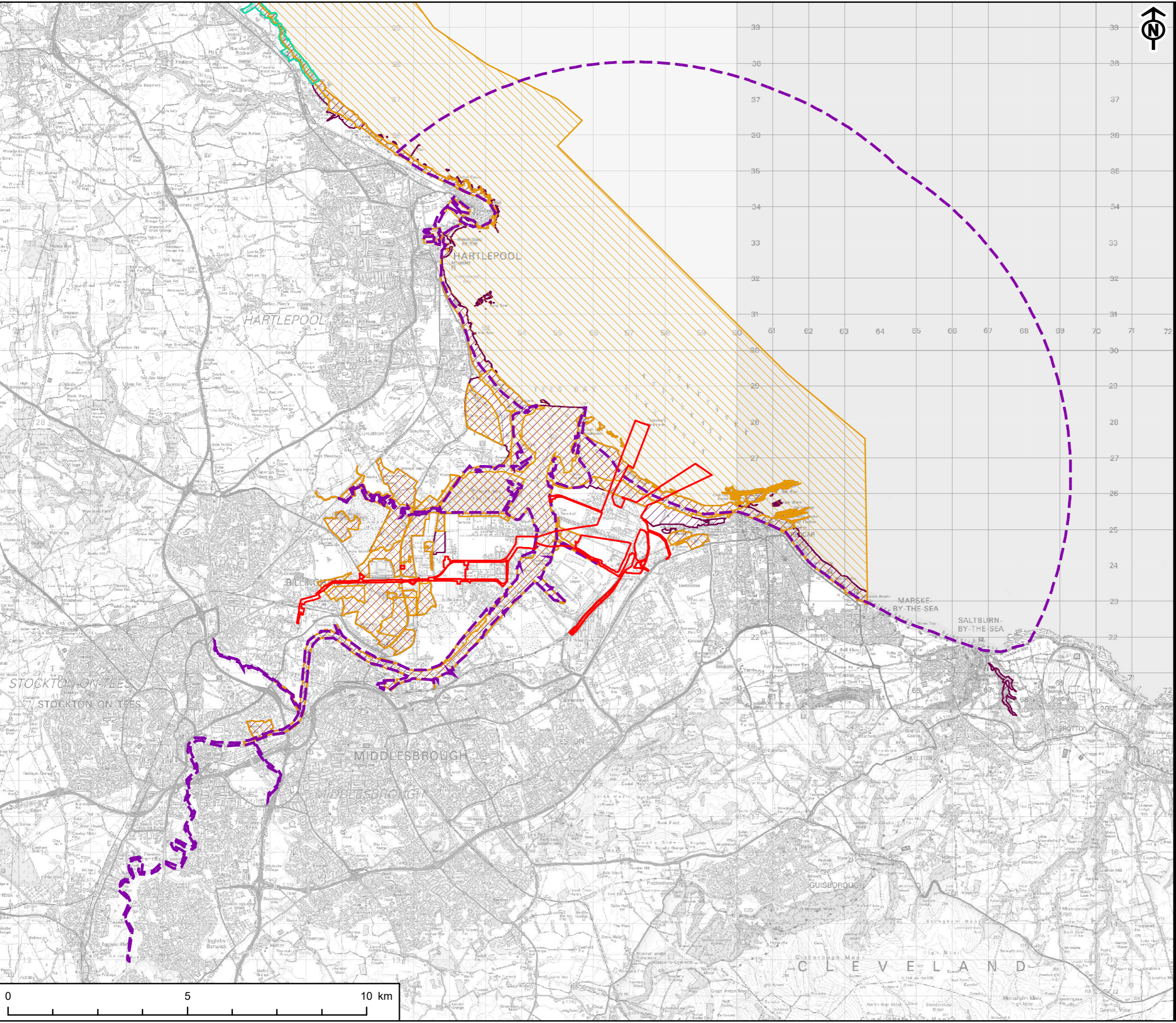
- 14.3.1 To the north east of the PCC Site, as part of the Proposed Development, lie the coastal areas of South Gare and Cotham Sands which form part of the Teesmouth and Cleveland Coast Special Protected Area (SPA) / Ramsar site. Underpinning the SPA designation is the Teesmouth and Cleveland Coast Site of Specific Interest (SSSI), which encompasses five SSSI sites within 5 km of the Site boundary (Figure 14B-2). Both the Teesmouth and Cleveland Coast SPA and SSSI are designated for the protected breeding / non-breeding bird species and other important waterfowl species associated with the site. As of January 2020, the proposed extension of the existing Teesmouth and Cleveland SPA and Ramsar site has been formally adopted and is intended to protect important marine foraging areas for breeding terns well as intertidal areas and estuarine waters used by wintering birds.
- 14.3.2 The Teesmouth and Cleveland Coast SPA / Ramsar site includes a range of coastal habitats (sand-flats and mud-flats, rocky shore, saltmarsh, freshwater marsh and sand dunes) within and around the Tees Estuary. These habitats are important in providing feeding and roosting opportunities for important numbers of water birds in winter and during passage periods. This includes in summer when Little Tern (*Sterna albifrons*) breed on the beaches within the site and when Sandwich Tern (*Sterna sandvicensis*) are abundant on passage. These birds, as well as others also protected under the site designation are known to prey upon small fish species including juvenile sandeel (*Ammodytes* spp.), clupeids such as herring (*Clupea harengus*) and sprat (*Sprattus sprattus*), and sand smelt (*Atherina presbyter*), as well as molluscs, crustaceans and worms (Green, 2017).
- 14.3.3 The Teesmouth and Cleveland Coast SSSI is of special interest for a range of nationally important features and supported by a wider mosaic of coastal and freshwater habitats. The SSSI includes the whole of the Tees Estuary, from between North Gare and South Gare, where the mouth of the estuary lies, up to the tidal limits of the Tees and Greatham Creek. As with the SPA, the key features of the SSSI include both non-breeding and breeding birds which utilise and assemble on the sand dune and saltmarsh special features and lowland open waters and are known to prey on small fish species.
- 14.3.4 Seal Sands SSSI, located approximately 2.9 km to the west of the Site boundary, supports a population of harbour seal (*Phoca vitulina*) which re-colonised the area in the 1980s and has since established a regular breeding colony. Harbour seals in the British Isles are known to prey on a variety of fish species including: sandeel, gadoids, flatfish, herring and sprat; the large majority consumed being <30 cm in estimated length (Wilson and Hammond, 2016). Grey seals are also known to be present in the Study Area and prey upon similar fish species to harbour porpoise (SCOS, 2018).

- 14.3.5 There are no other European Sites or Marine Conservation Zones within 10 km of the indicative Site boundary.






Designated Species

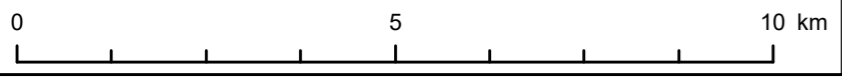
- 14.3.6 The Study Area of the Proposed Development is found within the Tees Valley BAP which covers the local authority areas of Hartlepool, Stockton-on-Tees, Middlesbrough, and Redcar and Cleveland. A variety of migratory fish species, which are species of Principal Importance in England, have been identified as utilising the Tees Estuary and forming the basis of the local BAP. These species include salmon (*Salmo salar*), sea trout (*Salmo trutta*), European eel (*Anguilla anguilla*), sea lamprey (*Petromyzon marinus*), and river lamprey (*Lampetra fluviatilis*). Furthermore, the River Tees is also recognised as a main salmon river in England and Wales, with a Salmon Action Plan (Environment Agency, 2009) enforced by the Environment Agency, used to provide a strategy for the management of the fishery.
- 14.3.7 Table 14B-2 lists all the fish known to be present in the Study Area which are protected under national and international conservation legislation. All species listed are also considered to be of commercial importance within the Study Area with the exception of sandeel and the diadromous fish species.
- 14.3.8 There are no shellfish species which are afforded conservation protection known to be present in the Study Area.

Figure 14B-2: Marine Designated Sites which fall within the Study Area for the fisheries and fish ecology baseline



KEY

	Site Boundary
	10km Study Area
	Special Area of Conservation
	Special Protection Area
	Site of Special Scientific Interest



This drawing has been produced for the use of AECOM's client. It may not be used, modified or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies upon this drawing without AECOM's express written consent. All dimensions are indicative and in metres unless otherwise noted. Do not scale this document.

Table 14B-2: Summary of relevant fish and shellfish species protected by national and international legislation or policy.

Common names	Latin names	Habitats Directive Annex II and IV species	OSPAR list of threatened and/or declining species	Bonn Convention Appendix I and II species	Bern Convention Appendix II and III species	NERC 2006 Species of Principal Importance	Features of Conservation Interest (FOCI)	IUCN Red List*
Herring	<i>Clupea harengus</i>					✓	✓	LC (↑)
Mackerel	<i>Scomber scombrus</i>					✓	✓	LC (↓)
Cod	<i>Gadus morhua</i>		✓			✓	✓	VU (-)
Whiting	<i>Merlangius merlangus</i>					✓	✓	LC (?)
Dover sole	<i>Solea solea</i>					✓	✓	DD (↔)
Plaice	<i>Pleuronectes platessa</i>					✓	✓	LC (↑)
Sandeel	<i>Ammodytidae</i>					✓ ¹	✓ ¹	LC (?) ¹
Atlantic salmon	<i>Salmo salar</i>	✓	✓			✓	✓	LC (-)
Sea trout	<i>Salmo trutta</i>					✓		LC (?)
European eel	<i>Anguilla anguilla</i>		✓	✓		✓	✓	CR (↓)
Sea lamprey	<i>Petromyzon marinus</i>	✓	✓		✓	✓	✓	LC (↔)
River lamprey	<i>Lampetra fluviatilis</i>	✓				✓	✓	LC (?)

14.4 Fish and Shellfish Communities

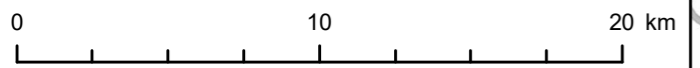
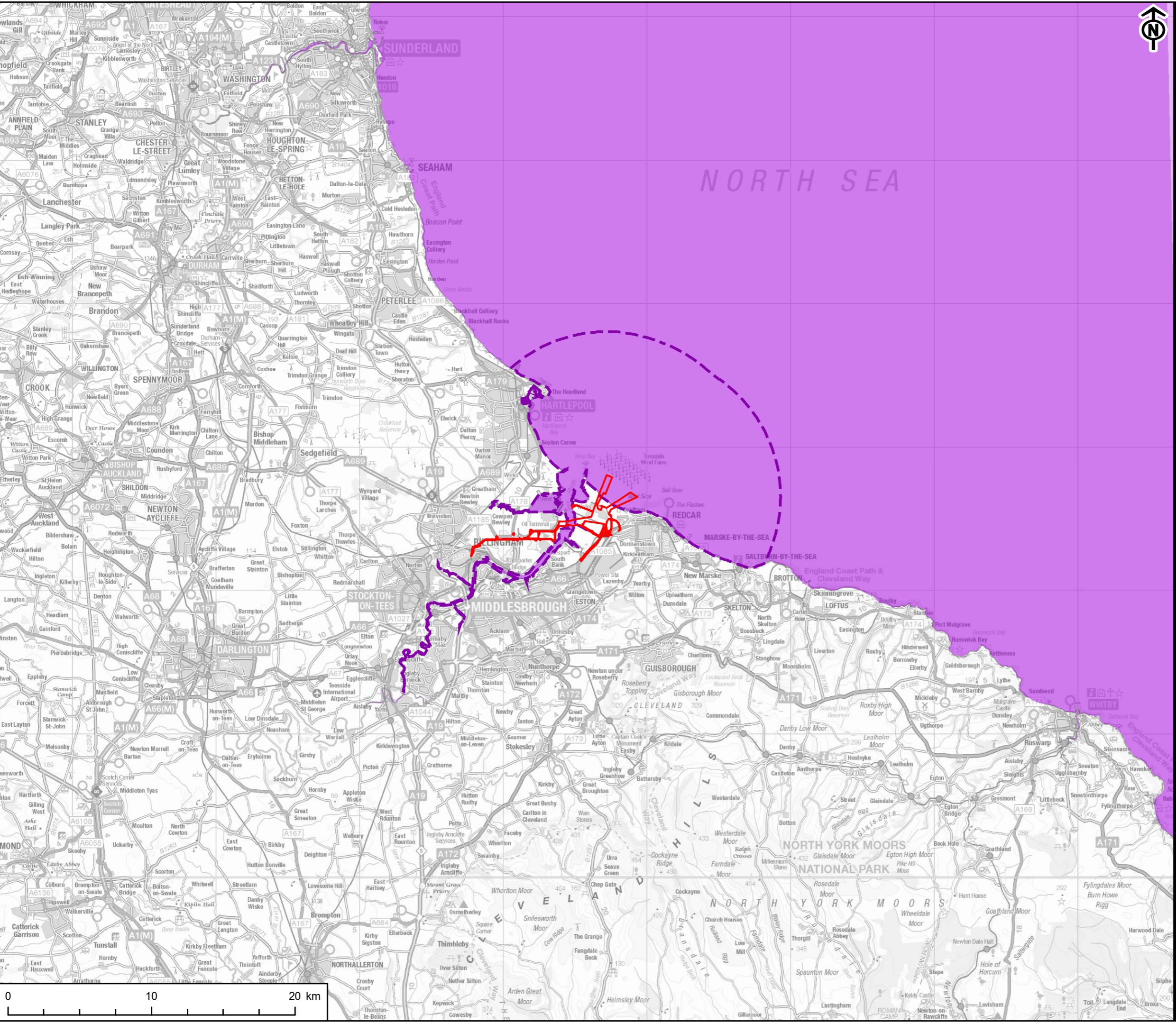
14.4.1 The central North Sea area is described as having a mixed demersal and pelagic fish assemblage with a high diversity of species, likely due to an overlap of the northern and southern North Sea fish communities (Reiss *et al.*, 2009). The fish assemblage in the deeper northern region of the North Sea (central and northern areas) is characterised by the following fish species: herring, mackerel (*Scomber scombrus*), horse mackerel (*Trachurus trachurus*), cod (*Gadus morhua*), whiting (*Merlangius merlangus*), haddock (*Melanogrammus aeglefinus*), plaice (*Pleuronectes platessa*), and dab (*Limanda limanda*) (Teal, 2011; Callaway *et al.*, 2002). Important prey fish species for the North Sea also include sandeels (Ammodytidae), Norway pout (*Trisopterus esmarki*), and sprat (ICES, 2008).

14.4.2 The occurrence, distribution and abundance of many fish and shellfish within the Study Area is determined by their propensity to aggregate within coastal areas to spawn (lay or release their eggs). ‘Spawning grounds’ are defined

either by the species behaviour and therefore may cover a wide area, or by specific habitat preferences (e.g. gravel), which may restrict spatial extent. Fish exhibit several modes of reproduction, the most common being broadcast spawning, where eggs and sperm are released into the water column (Ellis *et al.*, 2012). Other species deposit egg-cases (e.g. dogfish and whelk) or egg mats onto the seafloor (e.g. herring), making them particularly vulnerable to seabed disturbance. Eggs which are fertilised in the water column (i.e. pelagic) are transported along with pelagic early life stages (e.g. larvae and juvenile fish) within the plankton to nursery areas which provide plentiful food and shelter for young fish species. Once grown, most fish leave their nursery grounds to join adult populations further from shore.

- 14.4.3 Fisheries sensitivity maps (Coull *et al.*, 1998; Ellis *et al.*, 2012) provide information on spawning grounds (the location where eggs are laid) and nursery areas (the location where juveniles are common) for selected fish and shellfish species prevalent in the Study Area. This data indicates that the Proposed Development is located within the nursery grounds of the following species: herring, anglerfish, plaice, cod, whiting and spurdog (*Squalus acanthias*) (Figure 14B-3) as well as sprat, *nephrops* (Norway lobster) and lemon sole. The Proposed Development is also found within the spawning area of plaice, lemon sole and *nephrops*. Juvenile horse mackerel appear to be widespread exhibiting no spatially discrete nursery grounds within the Study Area.
- 14.4.4 Diadromous fish are known to transit through the River Tees and estuary during seasonal migrations between the sea and riverine environments. The species known to migrate through the Study Area were identified as part of the Tees Valley BAP and include salmon, sea trout, European eel, river lamprey and sea lamprey, all of which are listed under Section 41 of the NERC Act 2006 as species of principal importance (see Table 14B-2). The Tees river is particularly important for salmon and sea trout with these species regularly using the Tees catchment area (Moore and Potter, 2014). The River Tees includes a tidal barrage which was constructed across the Tees at Stockton in 1995 (Environment Agency, 2009). During a three-year tracking study of fish passage at the River Tees Barrage, conducted by Moore and Potter (2014), a total of 237 fish, of which 84% were salmon, were recorded. Salmon and trout in the Tees form the basis of small net and rod recreational fisheries for the catchment which places pressure on the population in combination with other factors such as water quality and quantity, obstructions to migration, loss of spawning habitat, predation and climate change (Environment Agency, 2009).

Figure 14B-3a-f: Spawning and nursery areas of herring, anglerfish, plaice, cod, whiting and spurdog which fall within the Study Area



This drawing has been produced for the use of AECOM's client. It may not be used, modified or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, for any party that uses or relies upon this drawing without AECOM's express written consent. All dimensions are indicative and in metres unless otherwise noted. Do not scale this document.