

Environmental Baseline Report

Prepared for

East Devon District
Council

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Ash House
Falcon Road
Sowton
Exeter
EX2 7LB

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Executive Summary

This report provides a review of the key environmental baseline features within the Seaton Beach Management Plan (BMP) area and identifies some of the preliminary issues and constraints that will require further consideration within the BMP options appraisal:

- **Access, noise and visual disturbance to recreational users, residents and local businesses.** Seaton is a coastal town and seaside resort with an active harbour area for recreational and commercial fishing vessels. The beach, estuary and harbour areas are important amenity areas, particularly during the peak holiday season, and there are a number of valued community and tourist attractions nearby. There is the B3172 road (Harbour Road) and other local roads to consider, along with access for the coastal path, and access for other watercraft users. Seaton Esplanade is popular with walkers and runners, and hosts a weekly parkrun that attracts around 140 runners per week. Works should be programmed to minimise impact on amenity users, residents and businesses where possible and ensure safe public access.
- **Impact of beach management activities on internationally, nationally and locally designated sites.** The town is positioned within a highly-valued area for geology, nature, landscape and cultural heritage which is reflected in the number of international, national and locally designated sites present. Nature and geological designations include a World Heritage Site, Special Area of Conservation and Sites of Special Scientific Interest that afford protection to the surrounding geology and habitat communities of the surrounding cliffs and coast. An internationally designated Site of Community Interest protects the important ecology of the marine environment, and a Marine Conservation Zone is currently being nationally recommended to protect important habitats and wildlife of the Axe Estuary. An Area of Outstanding Natural Beauty and Heritage Coast are landscape and cultural heritage designations that protect the land, coast and seascape that surrounds Seaton. The town itself is rich in heritage with a Conservation Area, Scheduled Monuments and Listed Buildings with further heritage designations within the surrounding area. Seaton's coastal waters are designated Bathing Waters, and there are also protected waterbodies covering the coast, river, tidal and ground water areas present.
 - Early consultation with Natural England during the development of the BMP will be required. There is a potential requirement for a Habitats Regulations Assessment to assess impacts of beach management activities on the integrity of international nature conservation sites. There is also a potential requirement for a Marine Conservation Zone assessment.
 - Early consultation with the Jurassic Coast Partnership and the East Devon Area of Outstanding Natural Beauty Partnership will be required.
- **Maintenance dredging within Axmouth Harbour and the disposal of sediment within the shingle spit at the eastern end of the beach at the estuary mouth.** Since the 1970's there has been regular dredging of Axmouth harbour and the shingle spit is now unnaturally fixed. Any requirement for re-profiling of the spit and beach management plans for future dredging and disposal works will need to consider sediment quality (i.e. chemical composition) under new licensing requirements (Environment Agency and Marine Management Organisation) as well as impacts to designated sites.

Introduction

1.1 Background and Study Area

This report has been prepared for East Devon District Council (EDDC) as part of the Seaton Beach Management Plan (BMP). Seaton is a small seaside town in East Devon. The Seaton BMP study area covers the coastline from Seaton Hole in the west, to the mouth of the Axe estuary in the east, as shown in Figure 1-1.



Figure 1-1 Seaton BMP Study Area

1.2 The Basis of this Report

This Environmental Baseline Report is a supporting document to the BMP to inform future beach management solutions. Studies covering coastal processes, defences and economics are being undertaken separately and a detailed options appraisal will be completed as part of the BMP process.

1.3 Report Content

This report has been divided into sections, with the main content of the Environmental Setting presented in Section 2. This information has been prepared in line with best practice and follows recommendations made by the Beach Management Manual 2nd Edition (Rogers *et al.*, 2010) to cover specific topics.

Details of the environmental topics considered in this report are presented in Table 1-1. Table 1.1 also references relevant environmental receptors in Environmental Impact Assessment (EIA) legislation, which might require consideration as part of any EIA during future consent applications.

Environmental Impact Assessment (EIA) procedures in EC countries are based on the European Community Directive ‘The Assessment of the Effects of Certain Public and Private Projects on the Environment’ (85/337/EEC) as amended by the Council Directive 97/11/EC.

The Directive was implemented in the UK through various regulations. Those regulations relevant to this BMP are considered to be:

The Town and Country Planning (Environmental Impact Assessment) Regulations 2017

These EIA Regulations apply only to the environmental impact assessment (“EIA”) of certain developments which are given consent for development under the town and country planning laws of England.

The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 revoke and replace the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2011, as amended, in England.

The Town and Country Planning (Environmental Impact Assessment) Regulations 2017

Paragraph 4

Within the Environmental Impact Assessment process:

(2) The EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors

- a) population and human health;*
- b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC(34) and Directive 2009/147/EC(35);*
- c) land, soil, water, air and climate;*
- d) material assets, cultural heritage and the landscape*

The Marine Works (Environmental Impact Assessment) (Amendment) Regulations 2015

These EIA regulations apply only to the environmental impact assessment (“EIA”) of certain developments which are given consent for development under the Marine and Coastal Access Act 2009.

It should be noted that the level of detail presented in this document allows for an initial appraisal of environmental features to provide for an environmentally sustainable future management regime. This does not negate the requirement for future detailed environmental assessment, which may be required to support consent applications or prejudge the scope of the assessment.

Table 1-1 Environmental Baseline Topics*Details of the topics covered by the Environmental Setting Section, in Context with Current EIA Legislation*

Seaton BMP Environmental Topics ¹	Seaton BMP Sub-topic	Section Reference	Relevant environmental aspects outlined in The Town and Country Planning (Environmental Impact Assessment) Regulations 2017	Relevant environmental aspects outlined in The Marine Works (Environmental Impact Assessment) (Amendment) Regulations 2017
Physical Setting	N/A	2.1	N/A	N/A
Overview of Environmental Designations	N/A	2.2	N/A	N/A
Designated Nature and Geological Conservation Sites Geomorphology and Coastal Processes Sediment Quality	<ul style="list-style-type: none"> Designated Nature and Geological Conservation Sites Geomorphology and Coastal Processes 	2.3	Land, soil, Biodiversity, with attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC	Soil, Fauna and flora
Ecology	<ul style="list-style-type: none"> Protected Habitats Other Protected and Notable Species Fish Ecology 	2.3 2.6	Biodiversity, with attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC	Fauna and flora
Fisheries	<ul style="list-style-type: none"> Commercial fisheries Recreational fisheries 	2.7	Material Assets including the architectural and archaeological heritage, Population and human health, Material Assets	Fauna and flora, Human beings, Material assets and Cultural heritage
Navigation	<ul style="list-style-type: none"> Road Transportation Marine Navigation 	2.8	Material Assets including the architectural and archaeological heritage	Human beings, Material assets, Landscape and Cultural heritage
Landscape setting	<ul style="list-style-type: none"> National Landscape Designations 	2.9	Cultural heritage and the landscape	Landscape, cultural heritage
Archaeology and Cultural Heritage	<ul style="list-style-type: none"> Designated Archaeology and Cultural Heritage Non-Designated Archaeology and Cultural Heritage 	2.10	Material assets, cultural heritage and the landscape	Material assets, landscape and cultural heritage

Water	<ul style="list-style-type: none"> • Water Framework Directive (WFD) • Designated Bathing Water 	2.11	Water, population and human health	Human beings, fauna and flora, and water
Land Use	<ul style="list-style-type: none"> • Amenity Value • Land Ownership • Contaminated Land • Services and Utilities 	2.12	Population and human health, material assets, soil	Human beings, fauna and flora, soil and material assets
Air Quality	<ul style="list-style-type: none"> • Air Quality 	2.13	Air and climate, population and human health	Human beings, air and climate
Noise	<ul style="list-style-type: none"> • Noise 	2.14	Population and human health	Human beings, fauna and flora

1 Topics sourced from the Beach Management Manual 2nd Edition, Rogers et al., 2010

Environmental Setting

The following section provides an overview of the environmental features within the BMP study area as set out in Table 1.1.

2.1 Physical Setting

Seaton is a small seaside town and residential area within Seaton Bay in East Devon. The area is of high environmental, landscape and geological value, reflected in its international and national conservation status (see environmental designations in Section 2.2). Seaton Bay faces the larger marine area and biodiversity 'hotspot' of Lyme Bay. Seaton itself is also within a geological area iconic in its value displaying evidential layers that show past climate change. To the west and east of Seaton, the area is prone to cliff slips and falls, and away from manmade influences, diversely unique habitats form. West Seaton and Seaton Town are protected by a concrete seawall.

Running east of the town, the Axe Estuary saltmarsh habitat is linked to supporting birds afforded international protection and is being recommended as a Marine Conservation Zone (MCZ) to protect the European eel, and important intertidal habitats. The estuary is also known to be an important nursery ground for fish, including sea bass. Further upstream, Seaton Wetlands Nature Reserve are important areas for a variety of species including birds.

The Axe Harbour is situated within the lower estuary, here the channel winds behind a shingle barrier ridge and the beach before navigating a narrow entrance out to the open sea. The estuary mouth is overlooked by steep vegetated cliffs afforded conservation protection and part of the UNESCO Dorset and East Devon World Heritage Site ('Jurassic Coast'). The historically listed Axe River bridge and old Toll House adjacent to Axmouth Harbour are thought to be some of the oldest concrete structures in the country.

The surrounding coastline consists of undulating cliffs with shingle beaches. Some sections of the cliffs are subject to landslides, and this stretch of coastline is considered to be the largest active coastal landslip and mudflow complex in Europe (Halcrow, 2010). To the west of Seaton, the white cliffs consist of sandstone, chalk and limestone; and to the east, the Old Beer Road and west section of the town sit on top of eroding mudstone/sandstone cliffs.

The rock platforms that extend from the cliffs in Seaton Bay mirror the above water geology's. The rock platforms, are protected underwater reefs and features of a Special Area of Conservation (SAC) that affords protection to the whole of Lyme Bay and Seaton Bay. The reefs and SAC are home to a diverse range of internationally protected marine habitats.

2.2 Overview of Environmental Designations

A summary of the designated, non-designated sites, and important ecological features relevant to the BMP study area is provided in the subsequent sections.

2.2.1 Environmental Designations Within the BMP Study Area

The environmental designations within the BMP study area, which are listed below, are central in the consideration of delivering BMP options along the frontage (see Section 5.1):

- **Nature and Geological Conservation sites**
 - Dorset and East Devon World Heritage Site (WHS)
 - Lyme Bay and Torbay Site of Community Importance (SCI)
 - Sidmouth to West Bay SAC
 - Sidmouth to Beer Coast Site of Special Scientific Interest (SSSI)

- Axmouth to Lyme Regis Under Cliffs SSSI/National Nature Reserve (NNR)
- Axe Estuary Recommended Marine Conservation Zone (rMCZ)
- Geological Conservation Review (GCR) site
- **Historical and Cultural Heritage**
 - Scheduled Monuments and Listed Buildings
- **Landscape Setting**
 - East Devon Area of Outstanding Natural Beauty (AONB)
 - East Devon Heritage Coast
- **Water**
 - Water Framework Directive (WFD) Protected sites
 - Seaton designated Bathing Water

2.2.2 Environmental Designations Near the BMP Study Area

Further environmental designations within approximately 2km (unless otherwise stated as there is a pathway for potential impact) to the BMP study area may also require consideration in the BMP, depending on the options selected:

- **Nature and geological conservation**
 - River Axe SAC
 - Exe Estuary Special Protection Area (SPA)
 - Beer Quarry and Caves SAC/SSSI
 - Seaton Marshes Local Nature Reserve (LNR)
- **Historical and Cultural Heritage**
 - Listed buildings and three Scheduled Monuments
- **Landscape Setting**
 - Conservation Area
- **Water**
 - Water Framework Directive (WFD) Protected sites and Sensitive Habitat Features
 - Beer designated Bathing Water

2.3 Designated Nature and Geological Conservation Sites

The geological importance of the Seaton and surrounding area is recognised by the following designations (see Figure 2-1). The BMP will need to consider designated geology within, and near the BMP study area.

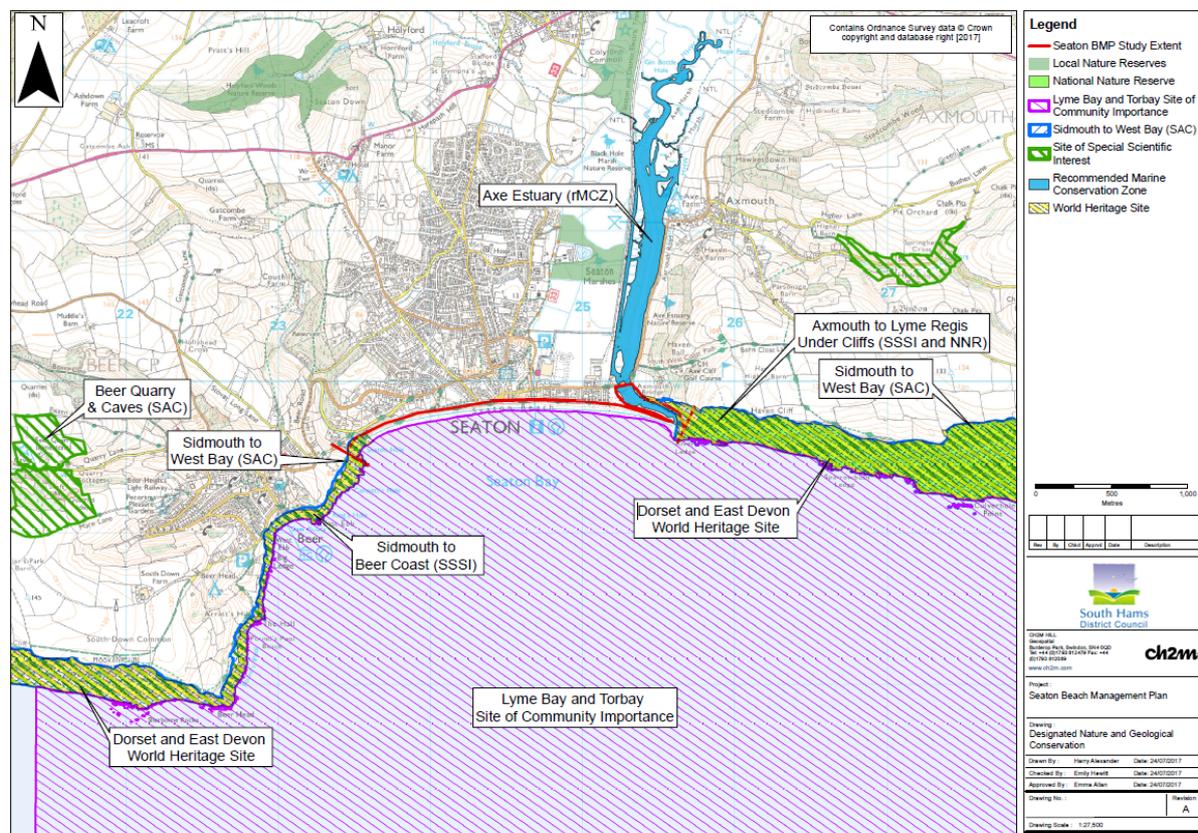


Figure 2-1 Seaton BMP Nature and Geological Conservation Designations

2.3.1 Internationally Designated Sites

Within the BMP Study Area:

- **Dorset and East Devon World Heritage Site (WHS).** The cliffs on both side of the town are located within the UNESCO Dorset and East Devon World Heritage Site ('Jurassic Coast') designated for their geological importance. These cliffs, which extend from Exmouth in East Devon to Studland Bay in Dorset, contain a nearly complete sequence through the entire Mesozoic period of geological time, displaying evidence of 185 million years of evolution from the Triassic, Jurassic and Cretaceous periods. The Jurassic Coast's Management Plan (Jurassic Coast Partnership, 2014) policies seek to avoid or mitigate any negative impacts of coastal defence works on the natural processes of erosion and exposed geology (section 5.6). As such the undeveloped nature of the site is important. The setting of the site is also protected by the East Devon Area of Outstanding National Beauty (see section 2.9.1.1).
- **Lyme Bay and Torbay Site of Community Importance (SCI).** The SCI designation is a marine site and present within the BMP study area below the Mean Low Water Mark (MLWM). The site is designated under Annex 1 of the EC Habitats Directive for supporting Annex I habitats that are a primary reason for selection of this site:
 - 1170 Reefs – likely present adjacent to the BMP study area. These features are entirely subtidal.

- 8330 Submerged or partially submerged sea caves – one sea cave present along the coast south-west of the BMP study area at Beer Head.

The range and diversity of the reef and sea cave habitats distinguish the area as one of conservation significance. The associated ecological communities of the Lyme Bay reefs are noted to have particularly high species richness supporting a diverse number of invertebrates, immobile filter feeders and anemones anchored to the substrate. An assortment of hydroids, bryozoans, sea squirts, erect sponges and corals populate the area. Lyme Bay has been marked a marine biodiversity ‘hotspot’.

Lyme Bay is also one of only five areas in the British Isles where the sunset cup coral *Leptopsammia pruvoti* is known to occur. Other important species include the nationally scarce sponge *Adreus fascicularis* and the pink sea fan *Eunicella verrucosa*.

Natural England has recently published advice on potential pressures from marine activities and operations to the SCI. This advice extends to coastal development and flood and erosion risk management schemes and should be consulted during development of the Seaton BMP. Designated reef features are situated directly adjacent to the BMP study area at the eastern and western extent (Appendix, Figure A.3). The nearest seacave is present at Beer Head, approximately 2km southwest of the BMP study area.

- **Sidmouth to West Bay SAC.** The SAC runs along the coast in both directions of Seaton. The SAC designation sits within the far western section of the BMP study area, briefly stopping at Seaton Hole and Seaton Town and Beach where the frontage has been modified before resuming protection of the coast to the east of the mouth of the Axe estuary and beyond.

The SAC is designated for Annex I habitats that are a primary reason for selection of this site:

- 1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts
- 9180 Tilio-Acerion forests of slopes, screes and ravines * Priority feature

And Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- 1210 Annual vegetation of drift lines

The Sidmouth to West Bay Site Improvement Plan identifies inappropriate coastal management as a priority issue.

Near to the BMP Study Area:

- **Beer Quarry & Caves SAC** is situated approximately 1.8km from the BMP study area at its nearest point. The SAC is designated under Annex 1 of the EC Habitats Directive for supporting Annex II species that are a primary reason for selection of this site:

- 1323 Bechstein's bat *Myotis bechsteinii*

And Annex II species present as a qualifying feature, but not a primary reason for site selection

- 1303 Lesser horseshoe bat *Rhinolophus hipposideros*
- 1304 Greater horseshoe bat *Rhinolophus ferrumequinum*

The BMP study area lies at a sufficient distance from the SAC so as not to impact on the cave bat roost habitat of the SAC, but the Axe Estuary may provide foraging opportunities for the qualifying bat species. Bats should be considered by future BMP options.

- **The River Axe SAC** is situated approximately 2.7km from the BMP study area at its nearest point, and upstream of the tidal range of the Axe Estuary (within the BMP study area). The SAC is designated under Annex 1 of the EC Habitats Directive for supporting Annex II species that are a primary reason for selection of this site:

- 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

And Annex II species present as a qualifying feature, but not a primary reason for site selection

- 1095 Sea lamprey *Petromyzon marinus*
- 1096 Brook lamprey *Lampetra planeri*
- 1163 Bullhead *Cottus gobio*

Due to the waterflow direction, and relative distance from BMP study area to the River Axe SAC site area, any future BMP options are thought unlikely to affect the designated habitat feature. However, designated fish species that may use the lower reaches of the estuary such as Sea lamprey, Brook lamprey and Bullhead will require consideration as part of future BMP options.

- **Exe Estuary SPA** is situated approximately 17.7km from the BMP study area at its nearest point. This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

Over winter;

- Avocet *Recurvirostra avosetta*, 359 individuals representing at least 28.3% of the wintering population in Great Britain (5-year peak mean 1991/2 - 1995/6)
- Slavonian Grebe *Podiceps auritus*, 20 individuals representing at least 5.0% of the wintering population in Great Britain (5 year peak mean 1984/85-1988/9)

Assemblage qualification: A wetland of international importance.

- The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl

Over winter, the area regularly supports 23,513 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Black-tailed Godwit *Limosa limosa islandica*, Dunlin *Calidris alpina alpina*, Lapwing *Vanellus vanellus*, Grey Plover *Pluvialis squatarola*, Oystercatcher *Haematopus ostralegus*, Red-breasted Merganser *Mergus serrator*, Wigeon *Anas penelope*, Dark-bellied Brent Goose *Branta bernicla bernicla*, Cormorant *Phalacrocorax carbo*, Avocet *Recurvirostra avosetta*, Slavonian Grebe *Podiceps auritus*, Whimbrel *Numenius phaeopus*.

(Natural England, 2014)

Saltmarsh present upstream of the Axe Estuary, north of the Axe Harbour, and near to the study area, has been classed as supporting habitat for SPAs (Natural England, 2015. Data viewed via magic.co.uk). Connectivity between the Axe Estuary and the Exe Estuary SPA, may be likely. The BMP will require consideration of adjacent saltmarsh habitat and bird features which may be present.

- East Devon Heaths SPA is situated approximately 16 km from the BMP study area. It is designated under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:

- Dartford Warbler *Sylvia undata*, 128 pairs representing at least 8.0% of the breeding population in Great Britain (Count, as at 1994)
- Nightjar *Caprimulgus europaeus*, 83 pairs representing at least 2.4% of the breeding population in Great Britain (Count, as at 1992)

Due to the distance of the site from the BMP study area, and no similar habitat that may provide habitat connectivity with the BMP study area, this site will not require further consideration by the BMP options.

2.3.2 Nationally Designated Sites

Within the BMP Study Area:

- **Sidmouth to Beer Coast SSSI** designation protects the cliffs within the far western section of the BMP study area and underpins the Sidmouth to West Bay SAC (see section 2.3.1) The site contains important geological, stratigraphic features and is famous for its fossil deposits and important biological features. The notified features of this site are:

- *Geological features*

- EC - Aptian – Albian
- EC - Cenomanian-Maastrichtian
- EC - Mesozoic - Tertiary Fish/Amphibia
- EC - Permian - Triassic Reptilia
- EC - Non Marine Permian Triassic (Red Beds)
- ER - Non Marine Permian Triassic (Red Beds)

As described by the SSSI citation, ‘...These cliff sections provide the finest exposures of the Foxmould Sands and Chert Beds (Upper Greensand) in South- West England...The quality of exposure allows particularly good opportunities to study the sedimentology of Upper Greensand Chert and hardground formation. The site is also of importance as it contains some of the most westerly major Upper Cretaceous exposures in England, which are of great stratigraphic importance.’ (Natural England, 1989). It should be noted that not all of the features of interest described in the SSSI citation lie within the BMP study area.

- *Biological Features*

- Tilio-Acerion forests of slopes, screes and ravines. (Mixed woodland on base-rich soils associated with rocky slopes)
- Lowland calcareous grassland (CG2, CG6 and CG7)
- H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts
- Soft maritime cliff and slope
- Vascular plant assemblage
- Invertebrates
 - Invert. assemblage F111 bare sand & chalk
 - Invert. assemblage F112 open short sward
 - Population of Schedule 5 crustacean - *Chirocephalus diaphanus*, a freshwater fairy shrimp (within a seasonally flooded freshwater pool)

(Natural England, 2017)

There are two SSSI management units within the western section of the BMP study area. These units are mapped in Figure A.1 (Appendix A), followed by Table A.2 (Appendix A), which contains information on the condition of each unit from the most recent condition surveys undertaken by Natural England.

- **Axe Estuary rMCZ.** The Axe Estuary is situated in the far eastern section of the BMP study area and is being recommended as a MCZ to protect the following important habitats, coastal saltmarshes, saline reedbeds, intertidal coarse sediment, intertidal mixed sediments, intertidal mud, subtidal mixed sediments and Species of Conservation Importance, the European eel (*Anguilla anguilla*). The estuary is also known to be a nursery area for fish, including bass.

The rMCZ area overlaps with the Lyme Bay SAC no-tow area (see section 2.7.1).

- **Axmouth to Lyme Regis Undercliffs SSSI/NNR** Is the largest and most important landslip area on British coast and underpins the Sidmouth to West Bay SAC (see section 2.3.1) in the far eastern section of the BMP study area, east of the Axe Estuary. The site contains geological and biological features including exposures to lias and cretaceous rocks with a species-rich naturally developed ashwood, rich grassland and cliff flora.
 - *Geological features*
 - EC - Hettangian Sinemurian and Pliensbachian
 - EC - Jurassic - Cretaceous Reptilia
 - EC - Mesozoic - Tertiary Fish/Amphibia
 - EC - Rhaetian
 - IA - Mass Movement
 - *Biological features*
 - CG1 - *Festuca ovina* - *Carlina vulgaris* lowland calcareous grassland
 - CG2 - *Festuca ovina* - *Avenula pratensis* lowland calcareous grassland
 - CG6 - Dry grassland/ scrub transitions (MG1-related, CG2d-related)
 - CG7a,b,d,e - *Festuca ovina* - *Hieracium pilosella* - *Thymus praecox* grassland
 - Vascular plant assemblage:
 - W21 - *Crataegus monogyna* - *Hedra helix* scrub
 - W8 - *Fraxinus excelsior* - *Acer campestre* - *Mercurialis perennis* woodland

The Axmouth to Lyme Regis Undercliffs NNR describes the site as supporting woodland, lowland grassland, rocky shore and cliffs.

(Natural England, 2008)

There are three Axmouth to Lyme Regis Undercliffs SSSI management units directly adjacent to the eastern section of the BMP study area. These units are mapped in Figure A.1 (Appendix A), followed by Table A.2 (Appendix A) which contains information on the condition of each unit from the most recent condition surveys undertaken by Natural England.

The Axmouth to Lyme Regis Undercliffs NNR is described as one of the largest and most important active coastal landslip systems in Western Europe. It stretches 7 miles in length, between Axmouth in the west and Lyme Regis in the east, shaped by past and present day landslips. The site is internationally important for its geology, fossils, geomorphology and a mosaic of habitats including bare ground, grasslands and woodlands.

Near the BMP Study Area:

- **River Axe SSSI**, is situated approximately 2.7km from the BMP study area and underpins the River Axe SAC designation (see section 2.3.1). Migratory salmon, bullhead and sea trout and

otter are designated features of the site, and have potential to move downstream within the BMP study area. These species should be considered by BMP options.

- *Biological, hydrological and geomorphological features*
 - Bullhead, *Cottus gobio*
 - Flowing waters - Type II: slow-flowing, naturally eutrophic lowland rivers, dominated by clays
 - Flowing waters - Type IV: a degraded lowland river type that does not qualify for designation
 - Flowing waters - Type V: principally a lowland type, widespread over resistant rocks in England and Wales
 - IA - Fluvial Geomorphology
 - Invertebrate assemblage
 - Otter, *Lutra*
 - Population of Schedule 5 leech - *Hirudo medicinalis*, Medicinal Leech
- **Beer Quarry and Caves SSSI**, is situated approximately 1.8km from the BMP study area and underpins the Beer Quarry SAC in the same location and notified for its geological and biological features. The quarry provides one of the best exposures of a suite of clay filled chalk pipes in southern England, and also provides important roost habitat for bats. Notified features of the SSSI are:
 - *Geological features*
 - IS - Quaternary of South-West England
 - *Biological features*
 - Hibernating populations of bats - mixed species

The geological features of the Beer Quarry and Caves SSSI are situated inland, 1.8km from the BMP study area. Due to the distance of the site from the BMP study area and no likely connectivity with future BMP options, this site will not require further consideration in the BMP in terms of impact on geology. However, bats are mobile species, and there is potential connectivity with the Axe estuary (potential feeding and roost habitat), which should be considered by the BMP options.

- **Spring Head - Axmouth SSSI** is located approximately 1.7km north east of the BMP study area, west of Axmouth. The area is designated for woodland and grassland. As there is no likely connectivity with future BMP study options, it will not require further consideration.
 - *Biological features*
 - CG6 - Dry grassland/ scrub transitions (MG1-related, CG2d-related)
 - M13 - *Schoenus nigricans* - *Juncus subnodulosus* mire
 - W1 - *Salix cinerea* - *Galium palustre* woodland

2.3.3 Locally Designated Sites

Within the BMP Study Area:

- Axmouth to Lyme Regis Geological Conservation Review (GCR²) Block site (800: Mass movement). Notable for cliff landslips. The GCR description of the site underpins features of

the Sidmouth to Beer Coast SSSI and Axmouth to Lyme Regis SSSI, which in turn underpins the Sidmouth to West Bay SAC.

Near the BMP Study Area:

- Beer Quarry GCR site (1682). Notable for describing climate change. The GCR underpins features of the Beer Quarry and Caves SSSI, which underpins the Beer Quarry and Caves SAC.
- Beer Head County Wildlife Site (CWS) – Locally designated for semi-improved calcareous grassland.
- Seaton Wetlands Local Nature Reserve - Attracts an abundance of birds and wildlife. Habitats include saltmarsh, freshwater grazing marsh, saline lagoon with a self-regulating tidal exchange gate and freshwater pond
- Nature Conservation Review (NCW) Sites - The following sites aim to locally conserve wildlife not afforded statutory protection under the SSSI designation of the same name:
 - Axmouth to Lyme Regis Under Cliffs Nature Conservation Review (NCR)
 - Beer Quarry and Caves NCR site

2.4 Geomorphology and Coastal Processes

The BMP study area comprises a section of very dynamic coastline. Figure 2-2 shows the sediment transport processes within Seaton Bay and the surrounding area (SCOPAC, 2012).

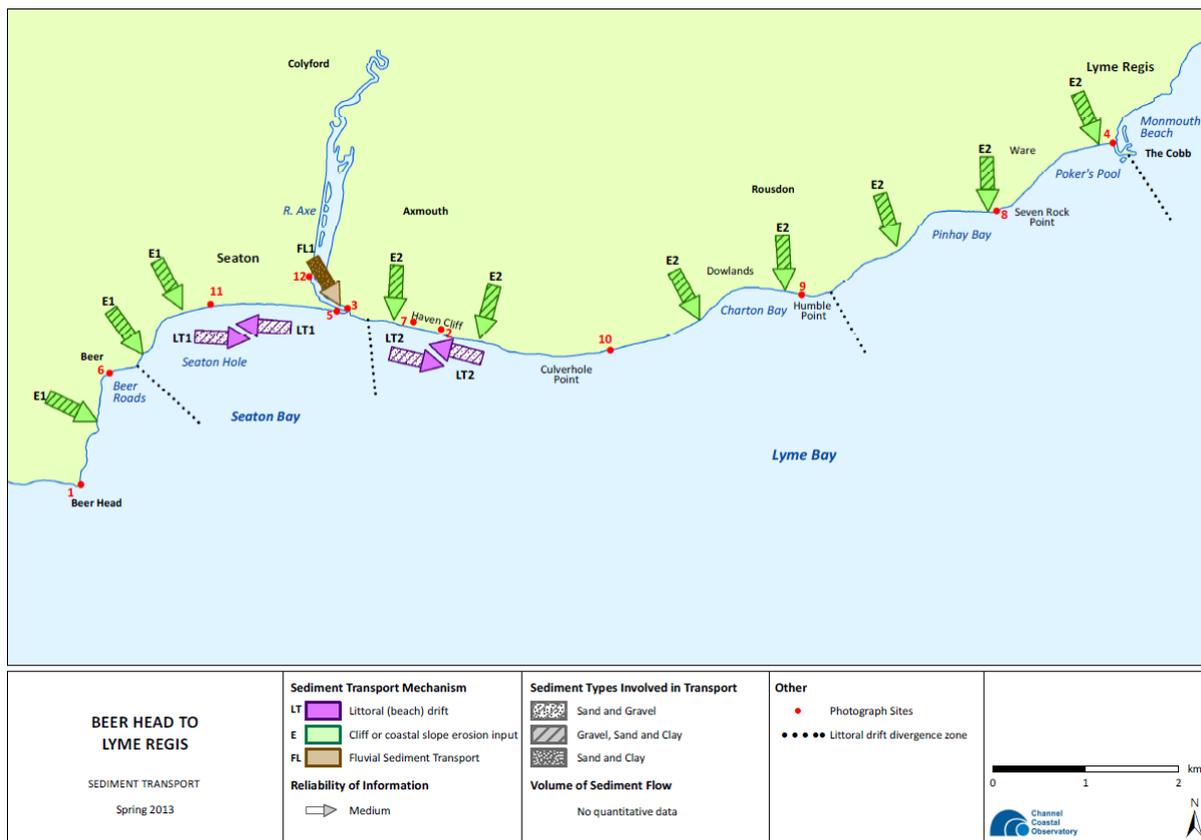


Figure 2-2 Beer Head to Lyme Regis Sediment Transport (SCOPAC, 2012)

For further detailed information on the geomorphology and coastal processes within the BMP study area, please refer to the Coastal Process Baseline, which covers the following topics:

- Geomorphology;
- Waves and Tides; and

- Sediment Dynamics.

2.5 Sediment Quality

As noted in Rogers *et al.* (2010), sediment quality data is not readily available for beach locations, unless the dredge material was sourced from capital or maintenance dredges (Andrews 1996, cited in SCOPAC, 2004 updated by SCOPAC, 2012). Axmouth harbour undertakes regular maintenance dredging every autumn/winter season, however sediment quality testing has not been undertaken since 1993 (since there has been no requirement under either the Marine Management Organisation (MMO) or the Environment Agency (EA) licensing exemption rules). Licensing exemption of the maintenance dredging was declared due to the small volume of dredged material involved and previous sediment quality testing being reported within the pass threshold. The dredge material is disposed of within a trench dug into the shingle spit. It is fed from the harbour by a pipe into the trench before being filled back in with the excavated material. This method has taken place over some 30 years, and over time the permeable and mobile shingle ridge has become unnaturally fixed and impermeable, so much so that a stable shingle ridge vegetation community has become well established (noted during the May 2017 site visit). This habitat is a UK Priority Inventory habitat, and a qualifying feature of the Sidmouth to West Bay SAC (although the spit is not part of the SAC designation, it does sit adjacent, on the eastern side of the Axe Estuary mouth within the study area), see section 2.5.1.1). The fixed shingle ridge has naturally eroded over time and has become 'cliffed' and difficult to walk on safely in parts.

More recently, the Environment Agency have become more conscious of the potential impacts of this dredging activity, and a licence for these works could now be required together with sediment quality testing of dredge material.

The latest guidance from the Environment Agency is that dredging operations (including both dredging and disposal) are excluded from an Environmental permit if there is a requirement as a Flood Risk Activity as the Harbour Authority (considered a statutory body), and the specific operation of dredging (considered statutory protection to maintain the operation of the harbour, and on the assumption that dredge material will be placed within the reception trench within the eastern end of the shingle spit.) would satisfy the exemption (Environment Agency, Pers. Comms., 2017). However, ahead of the outcomes of the Seaton BMP, the Environment Agency note that this exclusion may need to be reviewed if the assumed reception trench is deemed to be unsuitable.

2.6 Ecology

2.6.1 Priority Habitats Inventory

The following Priority habitats, which will require consideration in the BMP are present within, or in close proximity to the BMP study area, include:

- Mudflats (within the Axe Estuary)
- Coastal vegetated shingle (not shown on Figure 2-7 but present along the shingle spit, at the eastern end of the BMP study area, noted during June 2017 site visit. A likely positive outcome from the presence of dredge material providing a medium and stable environment for growth)
- Maritime cliff and slope (present along the western section of the BMP study area from Castle Hill, and west of the mouth of the Axe Estuary (see Section 2.5.1.1 and 2.5.1.2))
- Coastal saltmarsh (within the Axe Estuary, upstream of the Axmouth bridge, classed as supporting habitat of the Exe Estuary SPA)

Devon Biodiversity Action Plan habitats within the BMP study area include:

- Sea cliff and slope (within the far western section, and eastern section)
- Rocky foreshore (intertidal, within the far western section, and eastern section)

- Rocky seabed (subtidal, exact location within Seaton bay is not known)
- Rivers, streams, floodplains and fluvial processes (of the Axe River and Estuary)

Grazing marsh (within the Axe Estuary, upstream of the Axmouth bridge)

2.6.2 Other Protected and Notable Species

The Seaton BMP study area and surrounding area are likely to support a number of rare and protected species in addition to those found within the designated sites. Future phases of the BMP will require a detailed desk study to identify ecological risks and locate Biodiversity Action Plan species and habitats.

2.6.3 Fish Ecology

In addition to those fish species found within the designated sites of the River Axe and Axe Estuary (Salmon (*Salmo salar*), Sea trout (*Salmo trutta*), Bass (*Dicentrarchus labrax*), Eel (*Anguilla anguilla*)) there are commercially important fish nursery and spawning areas within Seaton Bay that will require consideration during the development of future options for the BMP frontage.

The Centre for Environment Fisheries and Aquaculture Science (CEFAS – UK) report ‘Spawning and nursery grounds of selected fish species in UK waters’ (Ellis *et al.*, 2012) reported the following species in the surrounding waters of the BMP study area:

Spurdog <i>Squalus acanthias</i>	Low intensity nursery area
Thornback ray <i>Raja clavata</i>	Low intensity nursery area
Spotted ray <i>Raja montagui</i>	Low intensity nursery area
Whiting <i>Merlangius merlangus</i>	Low intensity nursery area
Anglerfish <i>Lophius piscatorius</i>	Low intensity nursery area
Sandeels <i>Ammodytidae</i>	Low intensity spawning area
Mackerel <i>Scomber scombrus</i>	High intensity nursery area
Sole <i>Solea solea</i>	Low intensity spawning area and low intensity nursery ground

The Axe estuary is also an important nursery area for fish, including bass (see Section 2.3.2 Axe Estuary rMCZ).

2.7 Fisheries

There are important commercial and recreational fisheries present within, and adjacent to the BMP study area, and will require consideration during the development of the BMP.

2.7.1 Commercial Fishing

Lyme Bay (which includes all of Seaton Bay and the BMP study area) is a commercially and culturally important fishery to the local area. It is diverse in species and includes pelagic and demersal finfish, elasmobranchs (sharks, skates and rays), and shellfish including crustaceans, molluscs and cephalopods (cuttlefish and squid).

Pelagic fish (within the water column) include bass, herring, mackerel, horse mackerel, shad and sprat. Pelagic fish include bass, herring, mackerel, horse mackerel, shad and sprat. Demersal (bottom dwelling) fish include flatfish (brill, dab, flounder, lemon sole, plaice, sole and turbot) and roundfish (cod, haddock, whiting, ling, pollack, bib, John Dory, mullets, breams, wrasses, gurnard and monkfish). Demersal elasmobranch species (sharks, skates and rays) include Lesser Spotted dogfish, Smoothhound, Tope, spurdog, Blonde ray, Spotted ray, Small-eyed ray and Thornback ray.

The shellfish fishery includes bottom dwelling crustaceans such as brown crab, spider crab, velvet crab and lobster, brown and pink shrimp and common prawn, and molluscan shellfish King scallop (bivalves) and whelks (gastropods) living on or beneath the surface. Cephalopods ‘swimming’ molluscs include cuttlefish and squid

It is thought that three key ports of Beer, Lyme Regis and West Bay target fish and shellfish of the local area (Lyme Bay Consultants, 2014). The small fishing fleet operating from Axmouth Harbour, are likely to also target the area.

Axmouth Harbour is situated at the eastern end of the beach at the foot of the Haven Cliffs and within the mouth of the River Axe Estuary. At low tide the harbour bottom is exposed with just a narrow channel of river water making its way down to the sea. Two bridges cross the river (one old, one new) adjacent upstream of the harbour entrance, and prevents navigation up the river by larger vessels therefore keeping the fishing fleet based at Axmouth harbour (moored up along Axmouth Quay wall) to relatively small vessels and largely potters.

Lyme Bay is a closed area to Demersal Mobile Gear (for example scallop dredging and bottom-trawling) to protect the fragile reef ecosystems of the Torbay to Lyme Bay SAC (see Figure 2-3). Other fishing practises are permitted within the SAC, and the Lyme Bay Working Group (a collaborative body of local fishermen, scientists, regulators and the Blue Marine Foundation) have signed a memorandum of understanding (MoU) designed to ensure that Lyme Bay’s local fishing communities benefit from a sustainable approach to marine conservation, whilst recognising the need to balance commercial necessity with the need to protect the protected fragile habitats.

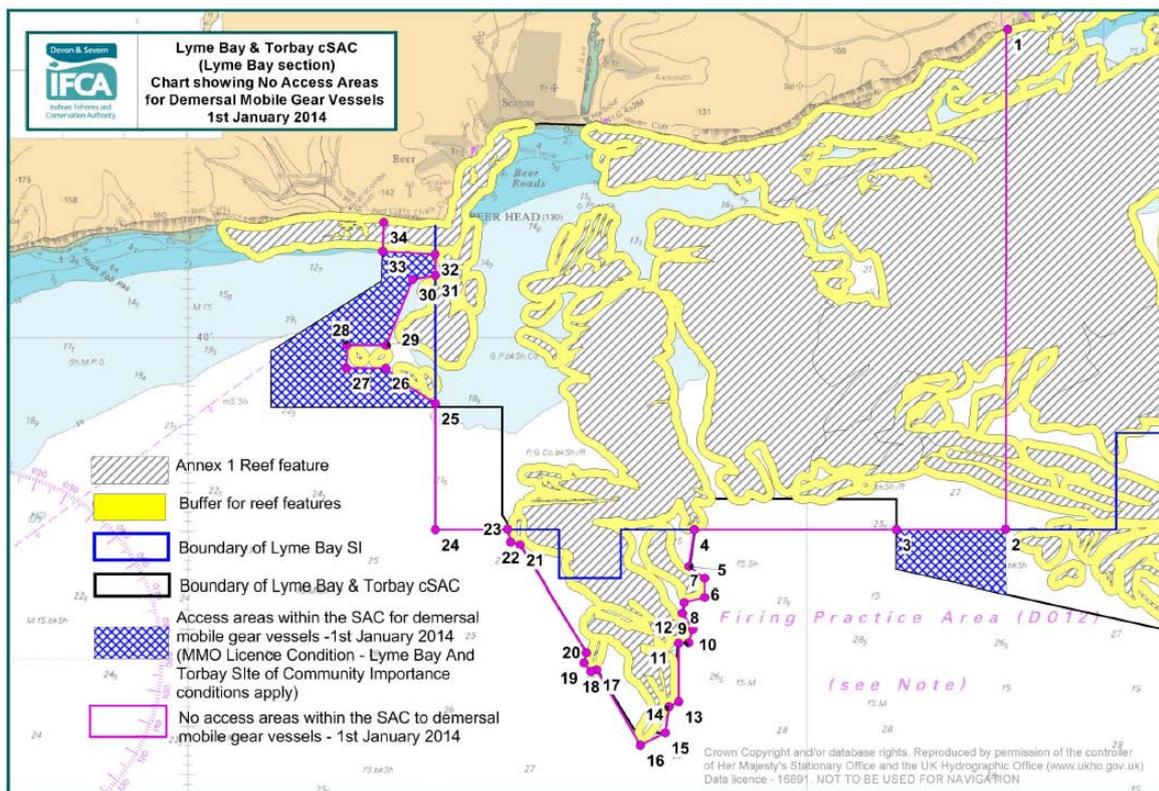


Figure 2-3: Lyme Bay and Torbay cSAC – No Demersal Mobile Gear Area: Lyme Bay Section

2.7.2 Recreational Fishing

Seaton Beach is a particularly popular local angling spot. Angling also occurs in Axmouth harbour for species such as mullet and, occasionally, flounder, as well as further up the river (Finding Sanctuary, 2012)

Beach fishing is popular across the entire frontage of the BMP study area. For fish species, see commercial fishing (section 2.6.1 above).

2.8 Navigation

2.8.1 Road Transportation

Local roads in the BMP study area include Harbour Road that runs parallel to the shoreline behind the promenade, and connects to the B3172 passing over the new Axe bridge (adjacent to the old Axe bridge) with access to the Axe Harbour (east side to the Axe Yacht Club and west side for the Fishermen's Association). Other local routes perpendicular to the shoreline include Sea Hill and Castle Hill, which connect to Old Beer Road in the centre of Seaton.

The Old Beer Road runs along the top of the eroding cliff within the western section of the Seaton BMP study area. The scenic road provides access to a number of properties along its route and was once thought to be of great tourist value to Seaton Town before the road was cut off by erosion. It is now used far less as a tourist/walking route.

Esplanade Road runs adjacent to the beach and East Walk promenade, and connects Seaton Town centre and the B3172 via a small number of side roads.

There are no motorways or major A-roads within the BMP study area.

2.8.2 Seaton Tramway

The Seaton Tramway attraction runs heritage trams from the town centre through the countryside at the rear of the beach and town.

2.8.3 Marine Navigation

Within the lower section of the estuary, and the BMP study area, is Axe Harbour. This is a relatively small harbour, with the Axe Yacht Club located on the western side and the Fishermen's Association located on the eastern side. Entrance and exit is limited to a relatively narrow window either side of high tide. Annual dredging is required to maintain safe navigation around the harbour and occasional dredging of the sand bar at the mouth of the estuary (see Section 2.4, Sediment Quality) (Finding Sanctuary, 2012).

Boat traffic within the Seaton BMP area, includes yachts, fishing vessels (based at Axmouth Harbour and Beer) and recreational water craft largely accessed from Seaton Yacht club. There are slipways and lifting areas utilised by pleasure craft within the harbour. There is also a small craft launch area to access the water from the harbour directly across the beach. Aside from fishing vessels (based at Axmouth Harbour and Beer) utilising the area, there is no other commercial navigation within the estuary, or Seaton Bay. Axmouth Harbour is however, also a designated refuge port. An area is maintained along the seawall for any fishing vessel (subject to size) to use in case of emergencies for example if crew are ill, or have a mechanical problem etc.

2.9 Landscape Setting

The importance of landscape to the Seaton BMP study area is recognised by a number of nationally and regionally important designations (see Figure 2-4), and these will need to be considered during by the BMP options.

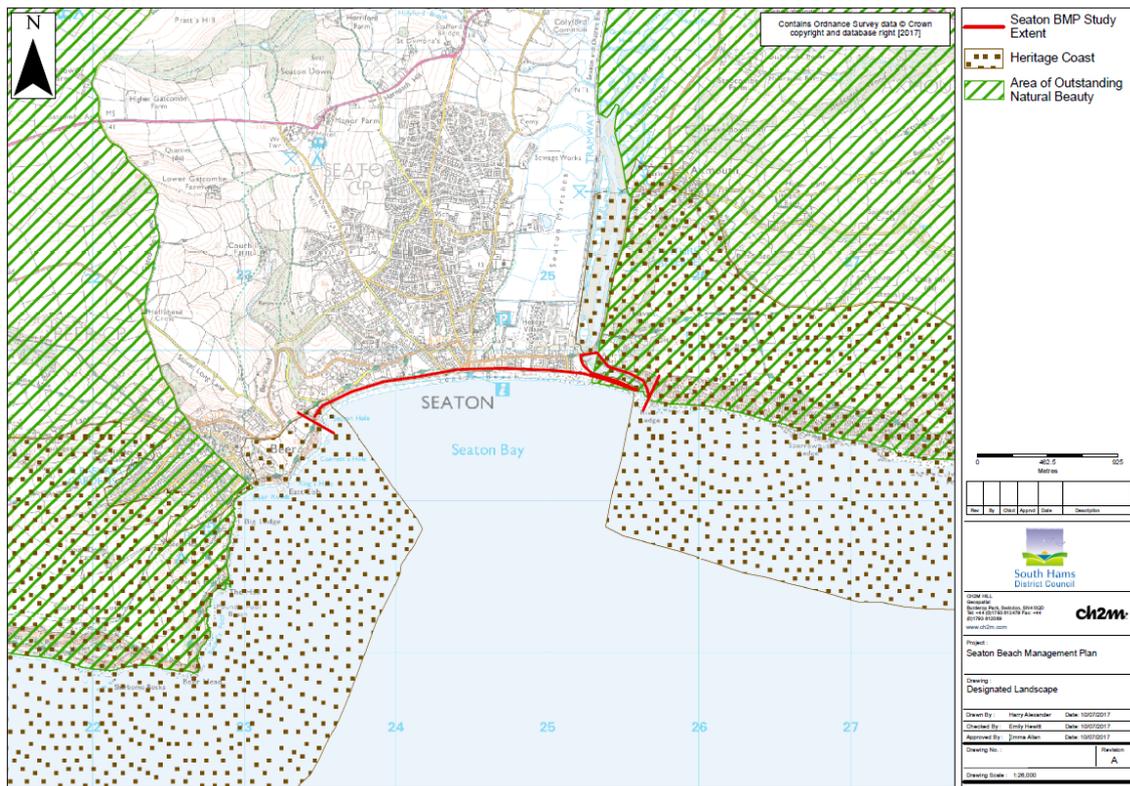


Figure 2-4: Seaton BMP Study Area: Landscape Designations

2.9.1 National Landscape Designations

2.9.1.1 East Devon Area of Outstanding Natural Beauty

East Devon Area of Outstanding Natural Beauty (AONB) is one of several protected landscapes in the UK. East Devon characteristics include ‘*wooded combes, vast areas of heathland, fertile river valleys and breathtaking cliffs and hilltops*’ (SMP2). The AONB designation, surrounds Seaton town and beach (see figure 2-9). In the east, the AONB designation is within the BMP study area. The designation includes the lower estuary and shingle spit at the mouth of the estuary, and adjacent coastal cliffs and following the River Axe north. The coastal border then runs along the coast to Dorset. In the west (not within the BMP study area, but seen from Seaton), the AONB designation runs along the coast (and inland) from Beer to Exmouth.

2.9.1.2 East Devon Heritage Coast

Heritage coasts are ‘defined’ rather than designated, established to conserve the best stretches of undeveloped coast in England. A heritage coast is defined by agreement between the relevant maritime local authorities and Natural England (Natural England, 2015). The designation covers the far western and eastern sections of the BMP study area which runs along the coast and out into Seaton Bay. The designation also includes the Axe Estuary, which is within the BMP study area (see Figure 2-4).

2.9.1.3 Landscape Character

The key characteristic features of Seaton BMP and surrounding coastal area is described by the following Landscape Character Zones, from the Devon County Council 2002 Landscape Appraisal Study:

- **Axe & Otter Valleys** – covers the Axe Estuary
 - Lowland rivers with noticeable flood plains and tightly meandering courses, unusual in most of Devon’s major rivers.
 - Shingle or pebble bars across estuaries, backed by ecologically important salt marsh.

- Historic settlements sited at old crossing points, just above the flood plain.
- Drainage channels.
- **Coastal Chalk Plateaux** - covers the coastal area west of Beer and between Axmouth and the Dorset boundary:
 - Long greensand ridges including heath and forestry, beech hedges and avenues.
 - Plateau landscape on ridge tops which includes common land, parliamentary enclosures, airfields and communications structures.
 - Steep valleys between ridges enclosing a varied farming landscape, with woodland, hedgerow trees and springline flushes.
 - • Historic farm buildings utilising local materials.
 - • Springline settlements.

2.10 Archaeology and Cultural Heritage

The importance of historic and cultural heritage to the Seaton and the surrounding area is recognised by the following national and regional designations.

2.10.1 Designated Archaeology and Cultural Heritage

The BMP will need to consider the following archaeology and cultural heritage designations (as shown in Figure 2-5) and described below.

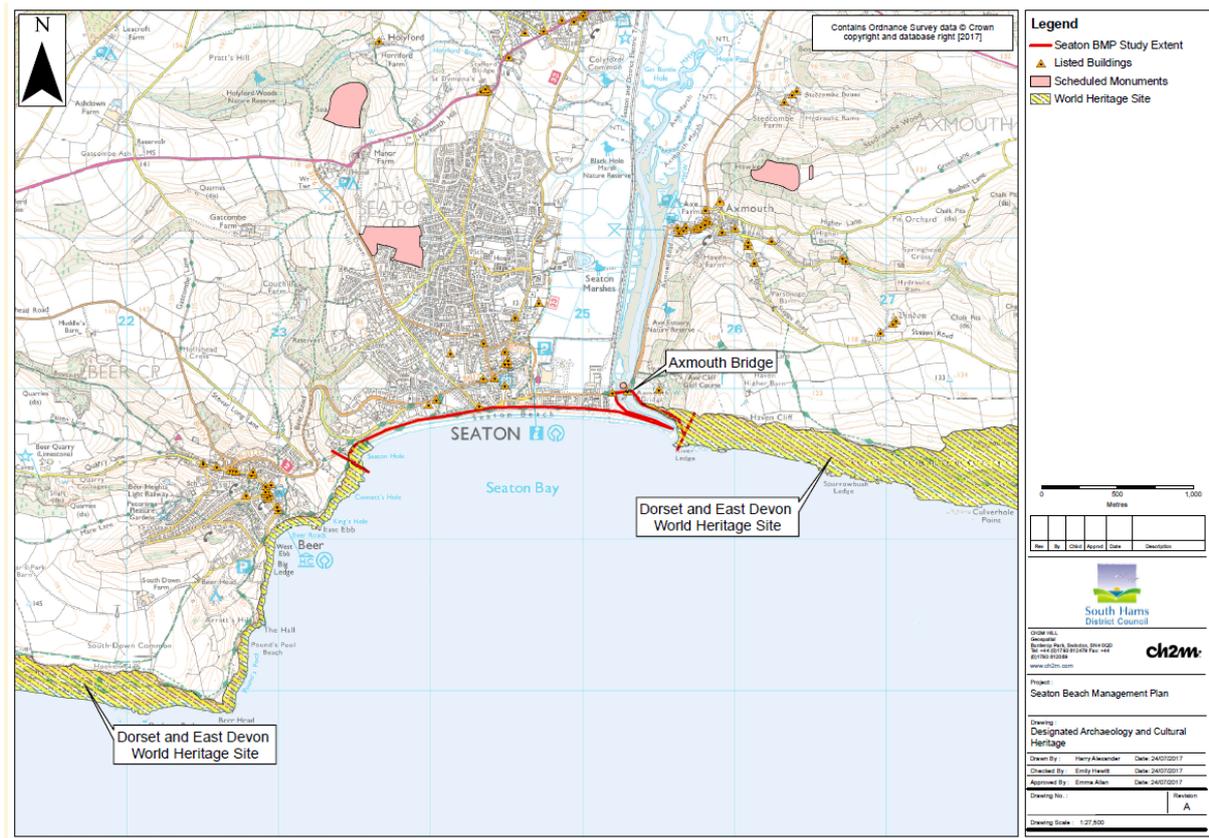


Figure 2-5: Designated Historical and Cultural Heritage in the BMP Study Area

Dorset and East Devon World Heritage Site, see Section 2.3.1

2.10.1.1 Scheduled Monument

There are two Scheduled Monuments in the BMP study area; Axmouth Bridge and The Axe Boat, 22m north of the Axmouth Road Bridge. Both Scheduled Monuments are situated directly adjacent along the estuary, north of Axmouth Harbour.

There are three further Scheduled Monuments in close proximity to the Seaton BMP area. The Roman and earlier settlement at Honeyditches Scheduled Monument is located at a minimum distance of approximately 1km north of the BMP study area and Promontory Fort on Seaton Down is located a further 0.7km northwest. The Scheduled Monument Hawkesdown Camp and associated outwork is approximately 1.7km north-east of the BMP study area.

2.10.1.2 Listed Buildings

The closest listed buildings to the BMP study area are Cliff Castle and St Elmo (Grade II) and Bridge Cottage (Grade II), which both lie within 50m of the beach. Further listed buildings lie within Seaton Town, east of Axmouth Harbour, and in Axmouth Village (see Figure 2-5). There are in the region of 64 listed buildings within 2km of the BMP study area.

2.10.1.3 Conservation Area

Conservation Areas (CA) are areas of special architectural or historic interest which the Local Planning Authority designates under the Listed Buildings and Conservation Areas Act 1990 with aim to preserve or enhance. **The seafront boundary of the Seaton CA borders the BMP study area** in the centre of the study area and includes Castle Hill and Esplanade to Beach Road. An EDDC figure showing the boundary of the Seaton CA is provided in Appendix Figure A.4.

2.10.2 Non-Designated Archaeology and Cultural Heritage

Within the Axe Estuary, there is a Roman/Medieval harbour, wrecks and potential palaeo-environmental deposits. The marine environment between Durlston Head and Rame Head has preserved countless underwater artefacts and potentially contains many buried landscapes (Halcrow, 2010). There is potential for underwater artefacts to be present within Seaton Bay.

A WWII Coastal Defence searchlight emplacement structure, with memorial plaque and public information board is located on the seafront promenade (West Walk). The searchlight emplacement was used to illuminate the sea and beaches to detect enemy ships and surfaced submarines.

2.11 Water

The following designated water body areas (see Figure 2-6 and detailed below in Section 2.11.1) will require consideration during development of the BMP options.

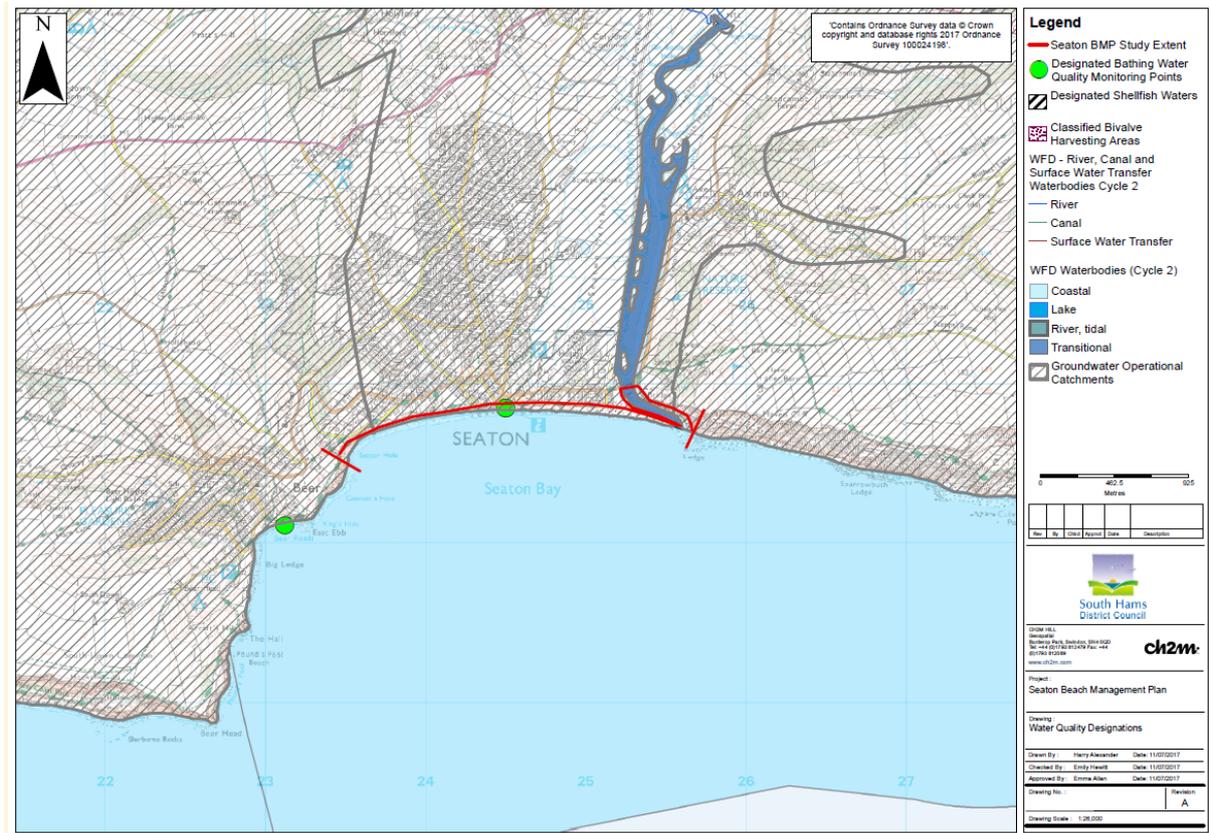


Figure 2-6: Water Designations in the BMP Study Area

2.11.1 WFD Estuarine and Coastal Water Bodies Cycle 2

There are six WFD water bodies in the Southwest River Basin District, within the BMP study area:

- The Axe WFD water body comprises the River Axe section of the study area:

Unique Waterbody ID: GB510804505400
Waterbody Name: Axe
River Basin District Name: South West
Waterbody Category: Transitional
Waterbody Type: Partly mixed, meso

- The Lyme Bay WFD water body runs one nautical mile along the coastline of the BMP study area:

Unique Waterbody ID: GB620806560000
Waterbody Name: Lyme Bay East
River Basin District Name: South West
Waterbody Category: Coastal
Waterbody Type: Exposed, Mesotidal

There are three WFD water bodies that protect the groundwater areas within the BMP study area:

- **Unique Waterbody ID:** GB40802G803000

Waterbody Name: River Yarty and Lower Axe - Mercia Mudstone
River Basin District Name: South West
Waterbody Category: Ground Water
Waterbody Type: Ground Water

– **Unique Waterbody ID:** **UKGB40801G802600**

Waterbody Name: Lyme Regis
River Basin District Name: South West
Waterbody Category: Ground Water
Waterbody Type: Ground Water

– **Unique Waterbody ID:** **GB40801G802400**

Waterbody Name: Devon East - Greensand
River Basin District Name: South West
Waterbody Category: Ground Water
Waterbody Type: Ground Water

Within the BMP study area, these waterbodies contain WFD Habitats considered of High and Low Sensitivity:

- High Sensitivity: Chalk Reefs, Subtidal Kelp Beds and Saltmarsh
 - Low Sensitivity: Gravel & Cobbles
- (see section 2.5.2.2)

The BMP options will need to consider the South West District River Basin (see section 5.5) Management Plan (RBMP) objectives for protecting and improving the coastal, river, groundwater and transitional Waterbodies (under the WFD) which includes designated recreational bathing waters (see Section 2.10.2 below) within the Seaton BMP area.

2.11.1.1 Water Framework Directive: Sensitive Habitats

Using the government web based data search (www.magic.gov.uk), the following Water Framework Directive 'Sensitive Habitats' are within, or adjacent to the BMP study area (see Figure 2-7 and Figure 2-8, and the supporting text below). These are important in the consideration of options for the BMP.

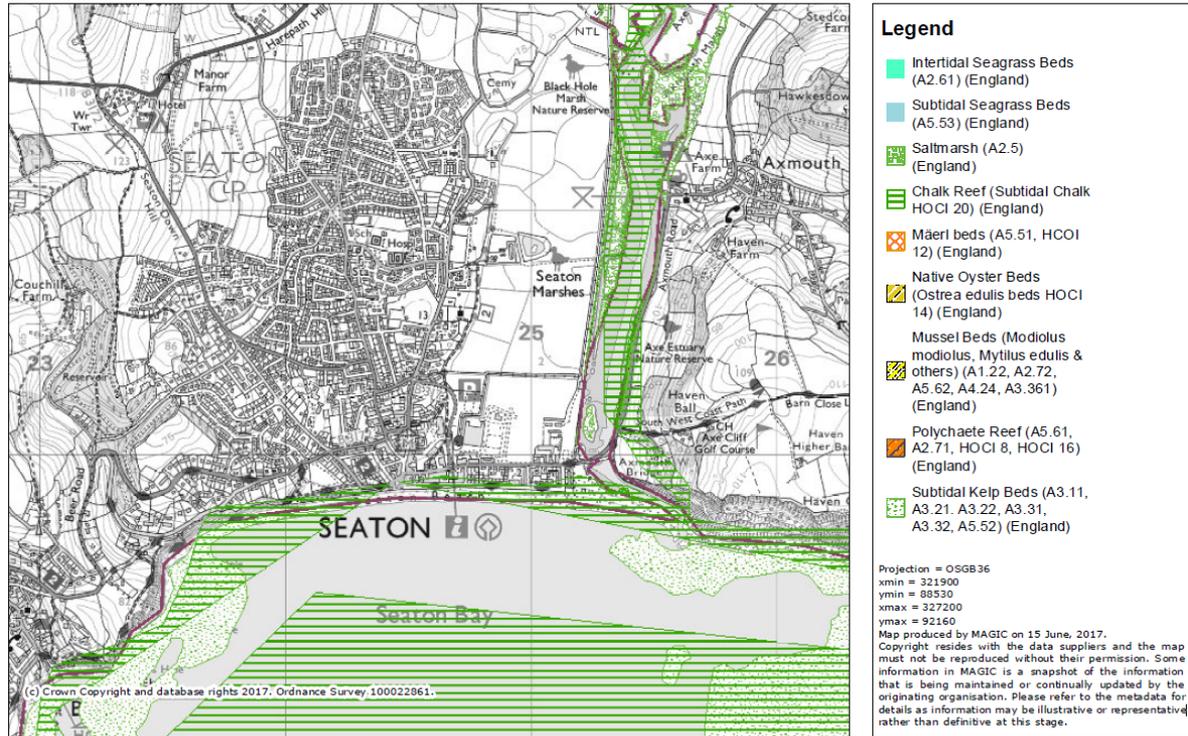


Figure 2-7: WFD Habitats: Higher Sensitivity

WFD Habitats: Higher Sensitivity (see Figure 2-7)

- **Chalk reefs** (rMCZ designated Habitat Feature of Conservation Importance (FOCI)) (see Section 2.3.2 Axe Estuary rMCZ).

Present within the BMP study area along the length of the BMP frontage and along the length of the Axe Estuary (ABPmer dataset, 2012).

- **Subtidal Kelp Beds** (linked to SAC designated reef habitat A3.11, A3.21, A3.22, A3.31, A3.32, A5.52) (see Section 2.5.1.1, Torbay and Lyme Bay SAC).

Present at the eastern and western sections of the BMP study area (Natural England dataset, 2014). Subtidal kelp beds, are associated with the presence of Subtidal Rocky Reef within the BMP study area (see below).

- **Saltmarsh** (SPA: Supporting Habitat and Priority Habitat (Environment Agency dataset, date unknown) (see section 2.5.1.1, Axe Estuary SPA).

Saltmarsh is present within the Axe Estuary. There is Saltmarsh near to the BMP study area, north of the Axmouth Harbour and the Axmouth Bridge.

WFD Habitats: Lower Sensitivity

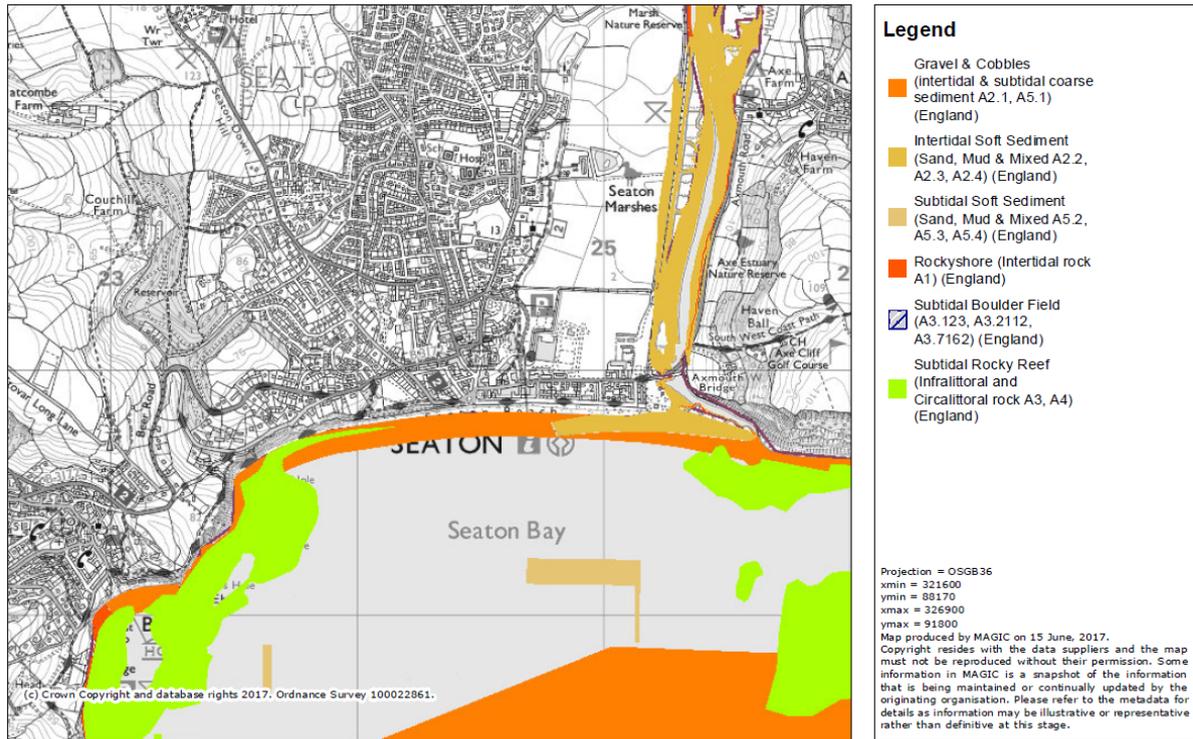


Figure 2-8: WFD Habitats: Lower Sensitivity

WFD habitats: Lower Sensitivity (see Figure 2-8)

- **Gravel & Cobbles** (also MCZ Broad habitat feature, (intertidal & subtidal coarse sediment A2.1, A5.1).
Present along the full length of the BMP frontage. (Natural England dataset, 2015).
- **Intertidal Soft Sediment** (also MCZ Broad habitat feature, Sand, Mud & Mixed A2.2, A2.3, A2.4).
Present within the Axe estuary and forms part of the shingle ridge (Natural England dataset, 2015).
- **Subtidal Rocky Reef** (also designated SAC feature, and MCZ Broad habitat feature Infralittoral and Circalittoral rock A3, A4).
Present within the far east and far west sections of the BMP study area. (Natural England dataset, 2015).
- **Rockyshore** (MCZ Broad habitat feature (Intertidal rock A1)
Present within the Axe Estuary, and fringes the Axmouth Harbour within the BMP study area. (Natural England dataset, 2013 - 2014).

2.11.2 Designated Bathing Water

The Seaton BMP study area is situated within the designated Seaton bathing waters, and adjacent to Beer bathing waters, which will require consideration during development of the BMP options.

The Bathing Water quality profile is tested from two different Environment Agency sampling stations within and adjacent to the BMP study area (see Figure 2-6). The results of water quality between 2013 and 2016 are presented in Table 2-1.

Table 2-1: Environment Agency Bathing Water Profile and Water Quality Classification Description within the BMP Study Area

Environment Agency Water sampling point Environment Agency Bathing Beach Profile (2017)	Water Quality Classification			
	2013	2014	2015	2016
<p>Seaton</p> <p><i>'Seaton is a resort town in Lyme Bay on the south coast of Devon. It is a shingle beach approximately one kilometre wide, and the River Axe Estuary enters the sea through a small harbour at the eastern end of the bathing water.'</i></p> <p><i>'The catchment surrounding Seaton is approximately 40,300 hectares. The River Axe is 35 kilometres long and rises near Beaminster in Dorset. It is joined by the Yarty and Coly tributaries and becomes tidal three kilometres inland at Colyford. The porous nature of the geology beneath the River Axe catchment causes the river to respond relatively slowly to rainfall compared with other rivers in East Devon. The Axe Estuary is a bar-built estuary containing extensive mudflats, saltmarsh and reed beds. At low tide, islands are formed across the intertidal mudflats, isolated by a narrow channel. The estuary enters the sea at Axmouth near Seaton.'</i></p> <p><i>'The Seaton STW outfall discharges to the River Axe Estuary...discharge is disinfected and designed to protect bathing water quality.'</i></p> <p><i>'...the storm/emergency overflow from the Harbour Road pumping station, discharges to the Axe Estuary'. (Environment Agency 2017)</i></p>	Good	Excellent	Excellent	Excellent
<p>Beer</p> <p><i>'Beer is in Seaton Bay on the south coast of Devon. It is a pebble and sand beach, approximately 1.2 kilometres wide, backed by cliffs and the village of Beer.'</i></p> <p><i>'The catchment surrounding Beer is approximately 400 hectares. The Beer Stream is approximately 1.2km long and is mostly channelled underground as it flows through Beer. The stream discharges via an outfall pipe just offshore approximately 100 metres (m) west of the Environment Agency monitoring point. The steep catchment means rain runs off rapidly into the Beer Stream.'</i></p> <p><i>'There is an emergency/storm overflow from the pumping station at Beer Car Park, that discharges to the Beer Stream and through an outfall at the beach.'</i></p> <p><i>'There is also an emergency/storm overflow from the pumping station at Beer Brook and Seaton Hole, that discharges 600m northeast of Beer beach.'</i></p>	Good	Excellent	Excellent	Excellent

2.12 Land Use

2.12.1 Amenity Value

Seaton's two main functions are as a residential base (popular with retired people, and commuters) and as a traditional seaside resort (East Devon District Council, 2013) supporting many small shops, restaurants and cafes.

The Axe Estuary is a popular area for wildlife watching, particularly bird watching over the estuary and adjacent marshes. There are viewing platforms and hides along the western bank of the estuary, provided as part of East Devon District Council's management of the local nature reserve. There is an existing programme of education events at the Axe Estuary, managed by East Devon District Council and run from the Field Studies Base and Wetlands Classroom (capacity: 50 people). This includes indoor and outdoor events and open days for the public and schoolchildren (Seaton Bay, 2012 via Finding Sanctuary, 2012). The Council's work on the Axe Wetlands Project has, over recent years, had huge impact, raising the biodiversity value, and the public's understanding and appreciation of this special area (East Devon District Council, 2013). Seaton Jurassic WHS discovery centre, Seaton

Jurassic, is the newest attraction to the area and Devon Wildlife Trust’s first flagship visitor centre. Seaton Marshes LNR wetland wildlife site is also important to the area receiving investment from EDDC and is also a recent addition (also see section 2.4.1.3). Both attractions are important tourist, community and education developments in Seaton.

In the summer, there are vintage open-air trams that run along the bank of the River Axe beside the marshes, across the river and then up to the medieval market town of Colyton. Redevelopment of the Harbour Road Victorian tramway terminus is due to start October 2017 for completion Easter 2018. Works include Demolition of existing terminus building, raise the site and track levels, construct a new terminus building on the site to shelter additional tramway platforms, a cafe, gift shop, storage areas and construction of an additional length of track (EDDC, 2015). Other recreational assets include the Axe Valley Museum, which is situated within Seaton Town Hall, and a Sea Discovery Centre located on the eastern side of the river, which displays the local sea life of Seaton Bay.

The South West Coastal Path currently runs along the BMP frontage, following the cliffs at Seaton Hole, then down along the beach to the seafront (an alternative route is available avoiding the eroding cliffs in the west section) of East and West Walk, and continuing along the Esplanade leading to the B3172 Harbour Road, across the estuary via the Old Axmouth Bridge (see Figure 1-1). Natural England has recently stated that the coastal path may be relocated inland at Seaton, due to cliff erosion (Natural England, 2017), and allow its continuation as an important tourist attraction (see Section 5.8). Seaton Beach front is a popular walking and running route. Seaton’s weekly community 5km parkrun takes place every Saturday morning at the Esplanade attracting runners of all ages and abilities averaging 140 runners per week (Parkrun, 2017).

Seaton’s pebble beach provides recreational opportunities for families, walkers and dog walkers (although certain areas are closed to dogs between May 1st to September 30th), wildlife watching, geology, beach fishing and access for swimming and surfing whilst the harbour slipways provide estuary and beach slipway access for local sea-going activities and water sports including, sailing and windsurfing. Seaton is home to a small harbour and port.

A number of EDDC owned beach huts are present on the beach at East Walk (mid-section of the BMP study area), and placed on the promenade itself, at the far end of West Walk. These are leased to individuals on a long-term basis. Huts are put up at the start of the season and taken down at the end.

2.12.2 Land Ownership

The land ownership along the BMP frontage is understood to be largely EDDC with exception to the western extent, where private landowners are currently dealing with serious erosion issues and loss of land with likely future loss of property:

Harbour Management

Axmouth Harbour is owned by EDDC, they in turn lease the Harbour to Axmouth Harbour Management Company Limited (AHMC). AHMC has an independent Chair and Treasurer/Secretary together with representation from the Axe Yacht Club (AYC) and East Devon Fishermen's Association (EDFA)

AHMC leases the western side of the harbour to the AYC and the Eastern side of the Harbour to (EDFA). There is also a sub-lease from AYC to Axe Vale Canoe Club. (www.axeyachtclub.co.uk, 2017)

2.12.3 Contaminated Land

From environment agency records (via www.data.gov.uk), there are no known authorised or historic landfill sites situated along the coastal frontage or within close proximity to the BMP study area (Environment Agency, 2017).

2.12.4 Services and Utilities

Services and utilities within the BMP study area include:

The Seaton STW outfall discharges to the River Axe Estuary (discharge is disinfected and designed to protect bathing water quality). The storm/emergency overflow from the Harbour Road pumping station, also discharges to the Axe Estuary.

Within the far western section of the BMP study area, there is an emergency/storm overflow from the pumping station at Beer Brook and Seaton Hole, that discharges 600m northeast of Beer beach (Environment Agency, 2017).

These should be considered within the BMP options.

2.13 Air Quality

There are no Air Quality Management Areas in the BMP study area.

2.14 Noise

No baseline data on existing ambient noise levels has been sourced for this baseline report. This may be required prior to any BMP activities depending on their scale, scope and proposed working methodologies.

SECTION 3

Construction Licensed activities

Construction works above the Mean High Water Spring (MHWS) require planning authority permission to be sought. Construction works proposed below the MHWS mark will require an application for a marine licence from the Marine Management Organisation (MMO) - see Section 6.6.

SECTION 4

Environmental Monitoring

Environmental monitoring requirements will be considered following the assessment of beach management options.

Other Relevant Documents

5.1 Durlston Head to Rame Head Shoreline Management Plan (SMP2)

The Durlston Head to Rame Head (South Devon and Dorset) Shoreline Management Plan (SMP) covering the BMP frontage (Halcrow, 2010) is a coastal management document formally approved by Defra. The SMP policy recommended for this section of coast is defined by the summary recommendations from the SMP2 for the units presented in Table 5-1 below:

Table 5-1: Summary of the SMP Policies that Apply to the BMP Study Area

Policy Unit	Short Term (to 2025)	Medium Term (to 2055)	Long-term (to 2105)
6a24 Monmouth Beach to Haven Cliff (West)	Allow natural coastal evolution to occur through No Active Intervention .	Allow natural coastal evolution to occur through No Active Intervention .	Allow natural coastal evolution to occur through No Active Intervention .
6a25 Axe Estuary (Mouth Breakwater to Axmouth North)	Continue to maintain defences through a Hold the Line policy.	Continue to maintain defences through a Hold the Line policy.	Continue to maintain defences through a Hold the Line policy.
6a26 Axe Estuary (Axmouth North to Seaton North)	Investigate and implement Managed Realignment in order to reduce flood risk in other parts of the estuary and provide habitat opportunities.	Continue the policy of Managed Realignment .	Continue the policy of Managed Realignment .
6a27 Axe Estuary (Seaton East)	Continue to maintain defences through a Hold the Line policy.	Continue to maintain defences through a Hold the Line policy.	Continue to maintain defences through a Hold the Line policy.
6a28 Axe Estuary (Spit)	Allow natural coastal evolution to continue through No Active Intervention .	Allow natural coastal evolution to continue through No Active Intervention .	Allow natural coastal evolution to continue through No Active Intervention .
6a29 Axe Estuary (Spit) to Seaton (West)	Continue to maintain existing defences under a Hold the Line policy to maintain protection to Seaton.	Continue to maintain existing defences under a Hold the Line policy.	Continue to maintain existing defences under a Hold the Line policy.
6a30 Seaton (West) to Seaton Hole	Continue to maintain existing defences under a Hold the Line policy.	Continue to maintain existing rock revetment, until it becomes ineffective; at this time consider moving the revetment back to the base of the retreating cliff toe under a Managed Realignment policy.	Continue to maintain existing rock revetment, until it becomes ineffective; at this time consider moving the revetment back to the base of the retreating cliff toe under a Managed Realignment policy.
6a31 Seaton Hole to Beer Head	Allow natural coastal evolution to occur through No Active Intervention .	Continue to maintain existing rock revetment, until it becomes ineffective; at this time consider moving the revetment back to the base of the retreating cliff toe under a	Continue to maintain existing rock revetment, until it becomes ineffective; at this time consider moving the revetment back to the base of the retreating cliff toe under a

Policy Unit	Short Term (to 2025)	Medium Term (to 2055)	Long-term (to 2105)
		Managed Realignment policy.	Managed Realignment policy.

5.2 Local Plan 2013-2031 - East Devon

The following planning East Devon Local Plan strategies and policies relevant for flood and coastal erosion risk management activities are defined below:

- Strategy 44: Undeveloped Coast and Coastal Preservation Area.
- Strategy 5 – Environment.
- Strategy 25.5 - Development at Seaton: Environment
- Strategy 45 - Coastal Erosion
- Strategy 46 - Landscape Conservation and Enhancement and AONBs
- Strategy 47 - Nature Conservation and Geology
- Strategy 48 - Local Distinctiveness in the Built Environment
- Strategy 49 – The Historic Environment
- Policy EN4 - Protection of Local Nature Reserves, County Wildlife Sites and County Geological Sites
- EN5 - Wildlife Habitats and Features
- EN6 - Nationally and Locally Important Archaeological Sites
- EN7 - Proposals Affecting Sites which may potentially be of Archaeological Importance
- EN8 - Significance of Heritage Assets and their Setting
- EN9 - Development Affecting a Designated Heritage Asset
- EN10 - Conservation Areas
- EN14 - Control of Pollution
- EN18 - Maintenance of Water Quality and Quantity
- EN21 - River and Coastal Flooding
- EN25 – Development Affected by Coastal Change
- TC4 - Footpaths, Bridleways and Cycleways

5.3 South Devon Catchment Flood Management Plan

The South Devon Catchment Flood Management Plan (CFMP) acknowledges sources of flooding from rivers in the South Devon Catchment. Properties at Seaton are thought to have the greatest concentration of flooding within the South Devon catchment with some 450 properties at risk from both river and tidal flooding. The plan notes the following issues that are relevant, and should be considered by the BMP options:

- *‘The Axe estuary, to the east of Seaton, extends from the beach on the coast upstream for three kilometres to the A3052 bridge at Colyford. The Axe estuary is influenced by both fluvial and tidal flooding, but towards Seaton the main source of flooding is from the sea’.*
- *‘The town is protected to a design standard of 1% annual probability by the Seaton Marshes flood defence scheme, although a recent investigation has suggested that the actual*

standard may be as low as 5% (1 in 20 years). Approximately 5% of the Seaton Conservation Area is at risk if the existing defences are overtopped'

- *'The main source of flooding is from the sea. A tidal flood warning service and a Major Incident Plan is in place for Seaton for this risk. There is no flood warning in Seaton for flood flows in the River Axe'.*
- *'...ensure that the sewage treatment works at Seaton continue to be protected from flooding, ensuring that water quality is not compromised'.*

5.4 South Marine Plan

The BMP area lies within the South Marine Inshore Plan area. This Marine Plan is currently being developed by the Marine Management Organisation (MMO) in parallel to the South Offshore Marine Plan Area, which together form the South Marine Plan. The plan consists of the Draft South Marine Plan which has been published and once adopted, the Marine Plan will be a statutory planning document used to guide licence and consent decisions within the marine environment up to the MHW mark including beach management activities. Consultation on the draft South Marine Plan is now closed and the MMO are currently analysing stakeholder feedback and responses for finalisation, adoption and publication of the plans. Depending on the options identified for appraisal as part of this BMP development for Seaton, different policies may apply, and this will need to be considered as part of the options appraisal process.

5.5 River Basin Management Plan

The South West River Basin Management Plan (Environment Agency, 2016) was prepared under the WFD as an update to the original programme produced in 2009 as part of a series of six-year planning cycles. It contains actions to improve the ecological status of water bodies in river basin catchments, including coastal waters from mean low water up to 1 nautical mile from shore. The BMP area lies within six WFD Water Bodies (one coastal, one river, one transitional and three groundwater) and all BMP activities need to comply with the requirements of this plan. Under the WFD, the BMP options will need to ensure that they do not 'cause or contribute to deterioration in water body status' or 'jeopardise the water body achieving good status'.

During the consideration of options the BMP must consider the potential risks to:

- Hydromorphology
- Biology – habitats
- Biology – fish
- Water quality
- Protected areas

5.6 Jurassic Coast: Dorset and East Devon Coast WHS Management Plan 2014 - 2019

UNESCO state that the *"Protection and management of World Heritage properties should ensure that the outstanding universal value, the conditions of integrity and/or authenticity at the time of inscription are maintained or enhanced in the future."*

The Dorset and East Devon Coast World Heritage Site (WHS) Management Plan 2014 – 2019 outlines how this is undertaken for the Dorset and East Devon Coast WHS and defines several aims, policies and the vision for the long term sustainable management of the site.

5.7 Coastal Access Program

Natural England has begun to investigate how to improve coastal access along a 109 km stretch of the South West Coast Path between Kingswear and Lyme Regis. This new access is expected to be ready in 2018. In relation to the Seaton BMP study area, Natural England recently published the Kingswear to Lyme Regis sensitive features report (2017) with the following information:

- **Sid Estuary to Axe Estuary (Sidmouth to Seaton)**

The Trail: *‘The route of the proposed trail follows the existing South West Coast Path, mainly following the coastline quite closely, and maintaining good views of the sea apart from near Sidmouth and Seaton where the route moves inland to avoid areas of landslip and private residences. No improvements to the route are proposed. Existing signage and waymarking will be retained. Some new plaques will be added to fingerposts at key locations to show that the route is part of the England Coast Path.’*

Coastal Margin: *‘All land seaward and some land landward of the trail will become coastal margin.’ ‘We do not expect any noticeable increase in public use of the land either side of the route as a result of the proposals because it is already accessible. There is no reason to suppose members of the public would be interested in exercising their access rights to the cliff slope at these locations, since they do not do so now. Where there are existing fences, these will remain in place, providing a physical barrier which is an effective deterrent to access. Because the extent of new access rights is in keeping with already established use and we don’t expect there to be any noticeable change in access as a result of our proposals.’*

- **Axe Estuary to Lyme Regis**

The Trail: *‘The route of the proposed trail follows the existing South West Coast Path between the Axe Estuary and Lyme Regis. The route provides views of the sea at some points, generally towards each end of this section at Axmouth and Lyme Regis. The majority of the route passes through the Axmouth to Lyme Regis Undercliffs National Nature Reserve (NNR), an active coastal landslip system, where there are limited sea views. No improvements to the route are proposed. Existing signage and waymarking will be retained. Some new plaques will be added to fingerposts at key locations to show that the route is part of the England Coast Path.’*

Coastal Margin: *‘All land seaward and some land landward of the trail will become coastal margin.’ ‘The route passes through the Undercliffs NNR for most of this section, where access is limited to the route of the trail by the density of the surrounding woodland and advisory signage. The route then leaves the Undercliffs and passes behind Monmouth Beach into Lyme Regis.’ ‘The nature of the seaward coastal margin along much of the coast is steep inaccessible cliffs and dense woodland, this means that walkers and other users will normally remain on the established trail particularly through the Undercliffs NNR. There is no reason to suppose members of the public would be interested in exercising their access rights to the cliff slope at these locations, since they do not do so now. Where there are existing fences, these will remain in place, providing a physical barrier which is an effective deterrent to access. Because the extent of new access rights is in keeping with already established use we don’t expect there to be any noticeable change in access as a result of our proposals.’*

5.8 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published on 27 March 2012 and sets out the government’s planning policies for England and how these are expected to be applied.

Chapter 10. Meeting the challenge of climate change, flooding and coastal change. Paragraphs 93 to 108 are particularly relevant to the Seaton BMP.

NPPF planning practice guidance categories that may be relevant (but not an exhaustive list) to the Seaton BMP include:

- Delivering Sustainable Development
- Flood risk and coastal change
- Climate change
- Conserving and enhancing the historic environment
- Natural environment
- Environmental Impact Assessment

Licences, Approval and Consents

There are no current activities licensed for coastal flood and erosion risk management purposes along the BMP frontage.

Above the MHWS, the planning authority would act as the Competent Authority and planning permission would be sought. Any planning application under these circumstances may require consideration under the Town and County Planning (Environmental Impact Assessment) Regulations 2017. In this regard, EDDC would likely act as the Competent Authority.

Any construction works determined by the options of the BMP that are proposed below the Mean High Water Spring (MHWS) mark will require a marine licence application to the Marine Management Organisation (MMO) under the Marine and Coastal Access Act 2011. The works below MHWS will also require consideration of The Marine Works (Environmental Impact Assessment) (Amendment) Regulations 2015 to determine whether a statutory EIA is required.

When working with other authorities, the MMO will follow the principles of the coastal concordat. If a project requires both a marine licence and planning permission from the local planning authority, MMO may defer to their decision. In these situations, MMO would not be able to make a marine licence decision until the local planning authority had made their decision regarding EIA. It is unknown if the EDDC have signed up to the Coastal Concordat.

The MMO will also assess the licence application for any impacts on the MCZ (there is an MCZ within the BMP study area, see section 3.2.1 and 3.4.1.2) to determine if an MCZ assessment may be required. The MMO will also ensure that the marine licence decision is compatible with the WFD and the RBMP (there are WFD water bodies within the BMP study area, see section 2.9).

References and Bibliography

7.1 References

Department for Communities and Local Government, 2012. National Planning Policy Framework viewed 4-7-17 online at <https://www.gov.uk/guidance/national-planning-policy-framework>

East Devon AONB Partnership, 2017. East Devon Area of Outstanding Natural Beauty (AONB). Viewed online 4-7-17 at <http://www.eastdevonaonb.org.uk/>

East Devon District Council, 1999. Seaton Conservation Area Report. Viewed online 1-8-17 at <http://eastdevon.gov.uk/media/561028/seatonca.pdf>

Ellis JR, Milligan SP, Readdy L, Taylor N and Brown MJ, 2012. Spawning and nursery grounds of selected fish species in UK waters. CEFAS Science series technical report no 147. Viewed online 24-5-17 at <https://www.cefas.co.uk/publications/techrep/TechRep147.pdf>

Environment Agency, 2017. Bathing Water Quality. Viewed online 20-6-17 at <http://environment.data.gov.uk/bwq/profiles/>

Environment Agency, 2016. South West River Basin Management Plan. Viewed online 19-6-17 at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/292791/gesw0910bstp-e-e.pdf

Finding Sanctuary (2012). Annex I2 from Finding Sanctuary, Irish Seas Conservation Zones, Net Gain and Balanced Seas. 2012. Impact Assessment materials in support of the Regional Marine Conservation Zone Projects' Recommendations. Viewed online 19-6-17 at <http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&ved=0ahUKEwj3ybzyt8nUAhWDKsAKHXhIAf4QFghHMAQ&url=http%3A%2F%2Fpublications.naturalengland.org.uk%2Ffile%2F2077597&usg=AFQjCNEXCiYUjFHWd8Bh4B62dH8oSONalw>

Halcrow, 2010. Shoreline Management Plan: Durlston Head to Rame Head SMP2. For South Devon and Dorset Coastal Advisory Group (SDADCAG). Viewed online 15-6-17 at <http://www.sdadcag.org/docs/html/frameset.htm>

Halcrow, 2010. Shoreline Management Plan: Durlston Head to Rame Head SMP2 Appendix D – SEA Environmental Baseline Report (Theme Review). Viewed 4-7-17 at http://www.sdadcag.org/docs/Appendices/Appendix_D_FINAL.pdf

JNCC, 2017. Natural England Conservation Advice for Marine Protected Areas Lyme Bay and Torbay SCI. <https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030372&SiteName=lyme%20bay&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

JNCC, 2016. Marine Habitats correlation. Viewed online 31-5-17 at <http://jncc.defra.gov.uk/marinehabitatcorrelation>

JNCC, 2015. The Geological Conservation Review (GCR). Viewed online 15-5-17 at <http://jncc.defra.gov.uk/page-2947>

JNCC, 2008. Geological Conservation Review, GCR Database: 800 Axmouth to Lyme Regis (Coastal Geomorphology of England). Viewed online 15-6-17 at <http://jncc.defra.gov.uk/default.aspx?page=4174&gcr=800>

Jurassic Coast Partnership, 2014. Jurassic Coast: Dorset and East Devon Coast WHS Management Plan 2014 – 2019. Viewed online 27-6-17 at <http://jurassiccoast.org/wp-content/uploads/2015/10/Jurassic-Coast-World-Heritage-Site-Management-Plan-2014-%E2%80%93-2019-Approved.pdf>

- Lyme bay Reserve Fisheries and Conservation Reserve, 2017. Memorandum of understanding. Viewed 26-6-17 at [http://www.lymebayreserve.co.uk/download-centre/files/Lyme Bay Fisheries and Conservation Reserve MoU.pdf](http://www.lymebayreserve.co.uk/download-centre/files/Lyme_Bay_Fisheries_and_Conservation_Reserve_MoU.pdf)
- Natural England, 1989. Designated Sites View. Axmouth to Lyme Regis Under Cliffs SSSI. Viewed online 19-6-17 at <https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1003733>
- Natural England, 2010. Axmouth to Lyme Regis Under Cliffs NNR. Viewed online 03-07-17 at <http://publications.naturalengland.org.uk/file/64041>.
- Natural England, 2014. Beer Quarry & Caves SAC Citation. Viewed 15-6-17 at <http://publications.naturalengland.org.uk/file/5799101673242624>
- Natural England, 2015. River Axe SAC. Natura 200 - Data Form. Viewed online 19-6-17 at <http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0030248.pdf>
- Natural England, 2017. Lyme Bay and Torbay SCI. Advice on operations. Viewed 15-6-17 at <https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK0030372&SiteName=lyme bay&SiteNameDisplay=Lyme+Bay+and+Torbay+SCI&countyCode=&responsiblePerson=&SeaArea=&FCAArea=>
- Natural England, 2017. Coastal Access Programme. Access and Sensitive Features Appraisal. Viewed online 20-6-17 at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/604634/kingswear-lyme-regis-sensitive-features-report.pdf
- Natural England, 2014. Exe Estuary SPA Citation and Exe Estuary SPA Conservation Objectives. Viewed online 20-6-17 at <http://publications.naturalengland.org.uk/publication/6369979498758144>
- Natural England, 2014. European Site Conservation Objectives for Sidmouth to West Bay SAC (UK0019864). Viewed online 27-6-17 at <http://publications.naturalengland.org.uk/publication/5076579893903360>
- Natural England, 2014. Sidmouth to West Bay SAC Site Improvement Plan. Viewed online 15-8-17 <http://publications.naturalengland.org.uk/file/5753086020681728>.
- Natural England, 1989. Designated Sites View. Sidmouth to Beer Coast SSSI. Viewed online 19-6-17 at <https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s1002767>
- Natural England, 1987. Designated Sites View. Beer Quarry and Caves SSSI. Viewed 27-6-17 at <https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1001396&SiteName=&countyCode=11&responsiblePerson=https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1001396&SiteName=&countyCode=11&responsiblePerson=>
- Standing Conference on Problems Associated with the Coastline (SCOPAC), 2012. <http://www.scopac.org.uk/sts/bh-lr-literature-review.html#E1>. Site accessed 21st June 2017.
- Marine Management Organisation, 2017. South Marine Plans. Viewed 27-6-17 at <https://www.gov.uk/government/collections/south-marine-plans>
- Marine Planning Consultants Ltd. (2014). Lyme Bay Fisheries and Conservation Reserve: Integrated Fisheries Management Plan. A report produced for the Lyme Bay Fisheries and Conservation Reserve Working Group, UK.
- Parkrun, 2017. Seaton Parkrun. Viewed 15-8-17 at <http://www.parkrun.org.uk/seaton/>
- Wildlife Trust, 2012. Axe Estuary rMCZ Factsheet. Viewed 27-6-17 at http://www.wildlifetrusts.org/sites/default/files/axe_estuary.pdf

7.2 Bibliography

S. Campbell, C.O. Hunt, J.D.Scourse, D.H.Keen & N. Stephens, Geological conservation Review: Quaternary of South-west England (1998), Volume: 14, Chapter 1

Cooper RG, 2007. Mass movements in Great Britain. Geological Conservation Review Series Volume: 33. Published by JNCC ISBN-13: 9781861074812

Finding sanctuary, 2012. Annex I2 Direct impacts arising from individual rMCZs (Finding Sanctuary): Axe Estuary. Viewed 27-6-17 at <http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwjB6oSQt7UAhXILMAKH5DJsQFggvMAE&url=http%3A%2F%2Fpublications.naturalengland.org.uk%2Ffile%2F2077597&usg=AFQjCNEXCiYUjFHWd8Bh4B62dH8oSONalw>

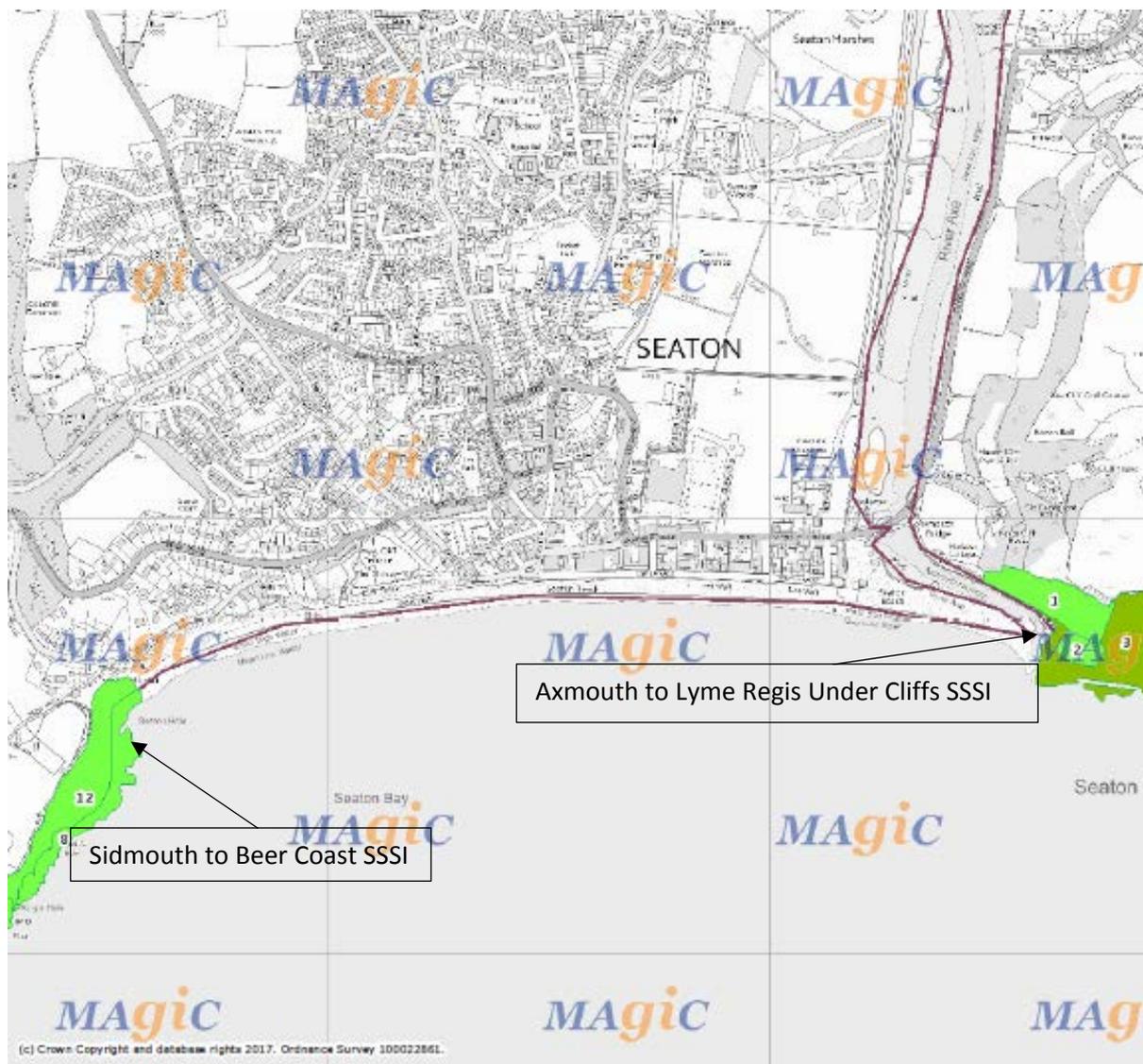
Natural England, 2017. Natural England Conservation Advice for Marine Protected Areas: Lyme Bay and Torbay SCI. Viewed online 18-5-17 at <https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030372&SiteName=torbay&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=>

Natural England 2016. Standing advice for protected species. Accessed online 23-5-17 at <https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications#standing-advice-for-protected-species>

Natural England, 2012. Lyme Bay and Torbay SCI UK0030372 Viewed online 18-5-17 at <http://publications.naturalengland.org.uk/publication/3263526>

Appendix A

Figure A.1 SSSI Management Units Map



Source: www.magic.gov.uk.

Table A.2 SSSI Management Unit Site Condition Report

SSSI Unit	Main habitat	Condition status	Reason for adverse condition	Condition assessment comment
Sidmouth to Beer Coast SSSI (geological and biological)				
008 Weston Mouth to Seaton Hole Foreshore	Littoral sediment	Favourable	n/A	<i>'No engineering works or other features affecting this unit, which is below MHW'</i> (Natural England, 2012)
012 Arrats Hill to Seaton Hole	Supralittoral Rock 6.1 ha	Favourable	N/A	<i>'No new engineering works damaging cliffs and exposed rock, new boulders protecting cliffs to the east towards Seaton abuts the SSSI but doesn't affect it. Some non-native species persist on the cliff (Holm oak and buddleia).'</i> (Natural England, 2012)
Axmouth to Lyme Regis Under Cliffs SSSI (geological and biological)				
001 Cliff, veg	Supralittoral Rock 2.22 ha	Favourable	No identified Condition Threat	<i>'Geology: favourable. Coastal scrub favourable. No woodland on the unit (TBC). Vegetated sea cliffs favourable. Natural processes are inhibited on this unit, as the harbour wall on the Axe runs along the foot of this unit, and just to west of unit 2, but there is no likelihood of this changing (would have been present for a long time prior to notification). Habitat remains suitable for Silene nutans (though species not noted on visit).'</i> (Natural England, 2011)
002 Cliff, scrub, veg	Supralittoral Rock 0.55 ha	Favourable	No identified Condition Threat	<i>Geology: favourable. Coastal scrub favourable. No woodland on the unit. Vegetated sea cliffs favourable. Natural processes are inhibited on this unit by the presence of harbour wall just to the west, but there is no likelihood of this changing. H1230 - vegetated sea cliffs of the Atlantic and Baltic coasts No comments Favourable. Lowland Mixed Deciduous Woodland No comments Not present. Scrub No comments Favourable</i>

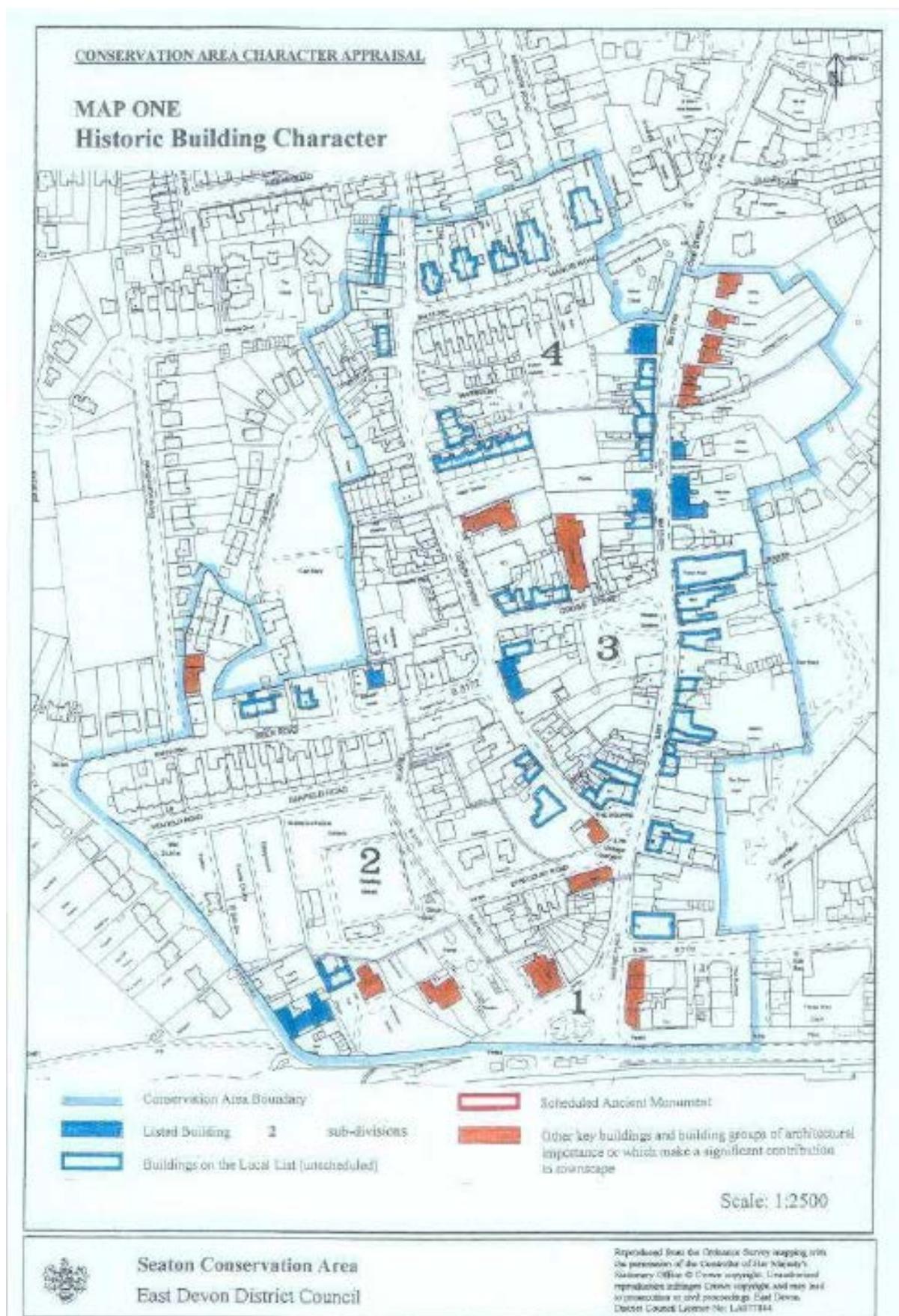
				<p><i>EC - hettangian sinemurian and plienschbachian No comments Favourable.</i></p> <p><i>IA - mass movement - No comments – Favourable</i></p> <p>(Natural England, 2011)</p>
003 Cliff, veg	Supralittoral Rock 75.71 ha	Unfavourable - Recovering	High Condition Threat	<p><i>'Geology favourable.</i></p> <p><i>Coastal scrub favourable.</i></p> <p><i>Woodland unfavourable recovering: structure and composition OK, but Holm Oak present and Sycamore 5% cover in eastern end of unit.</i></p> <p><i>Vegetated sea cliffs favourable (condition to be confirmed).</i></p> <p><i>Calcareous grassland (Goat Island) bare ground, litter cover, sward height, proportion of forbs and frequency of positive indicators all fine, but frequency of scrub and negative indicator spp exceeds threshold. Management is by mowing, so recovering. No sign Gentianella anglica or Campanula rotundifolia at this site, but habitat appears suitable.</i></p> <p><i>Invertebrate structural attributes favourable.'</i></p> <p>(Natural England, 2011)</p>

Figure A.3 Seaton BMP Extent: Lyme Bay and Torbay SCI Reef Features



Source www.magic.co.uk © Crown Copyright and database rights 2017. Ordnance Survey 100022861. Data source Natural England 2014. Update of Annex 1 habitat mapping in the Lyme Bay and Torbay SCI. Reef features (Green) and Western/Western BMP extent (Red line)

Figure A.4 Seaton Conservation Area



Sourced from EDDC (1999)

Appendix B

Main Report Figures 1-1 – 2.8 (Large View)

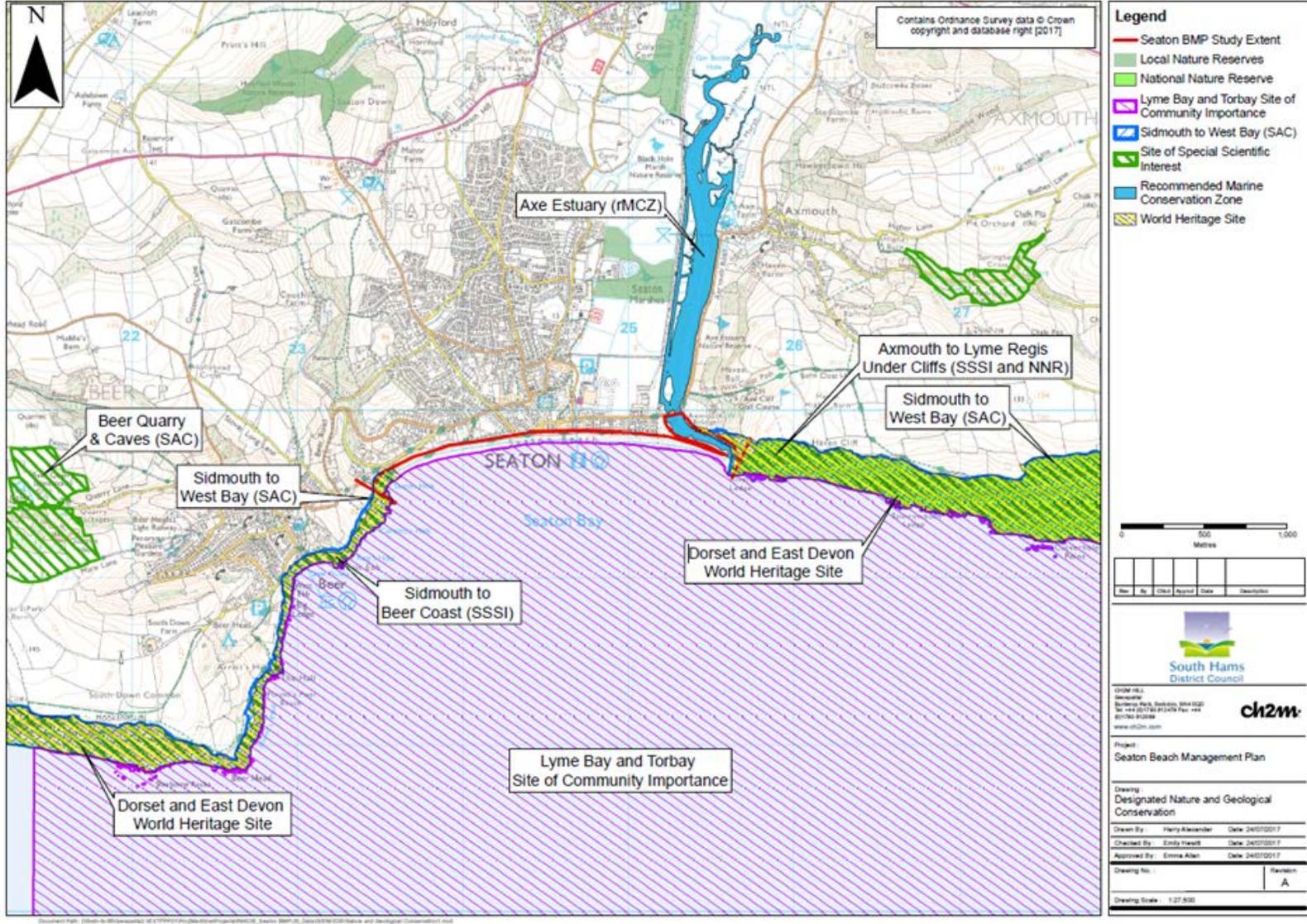


Figure 2-1 Seaton BMP Nature and Geological Conservation Designations

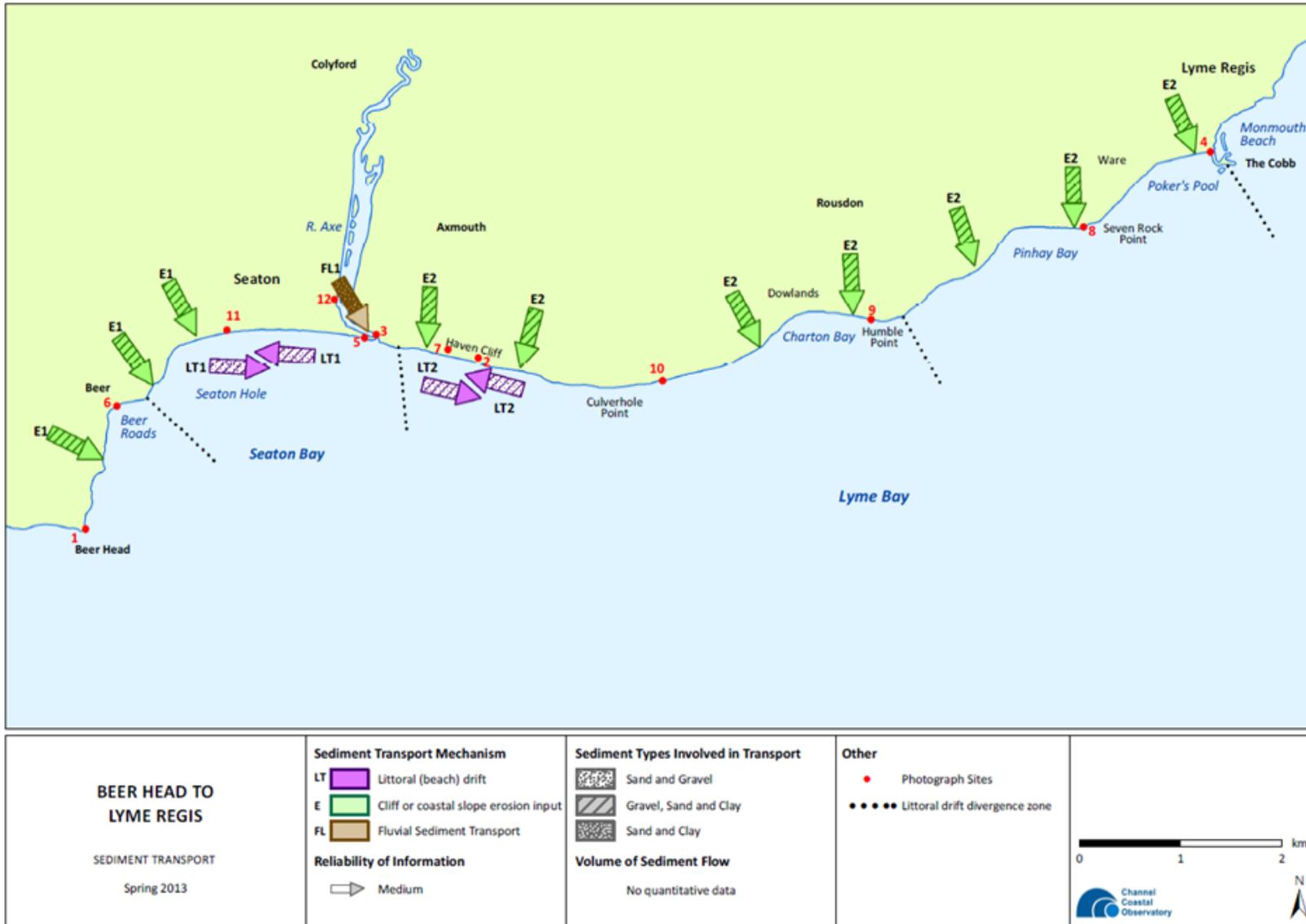


Figure 2-2 Beer Head to Lyme Regis Sediment Transport (SCOPAC, 2012)

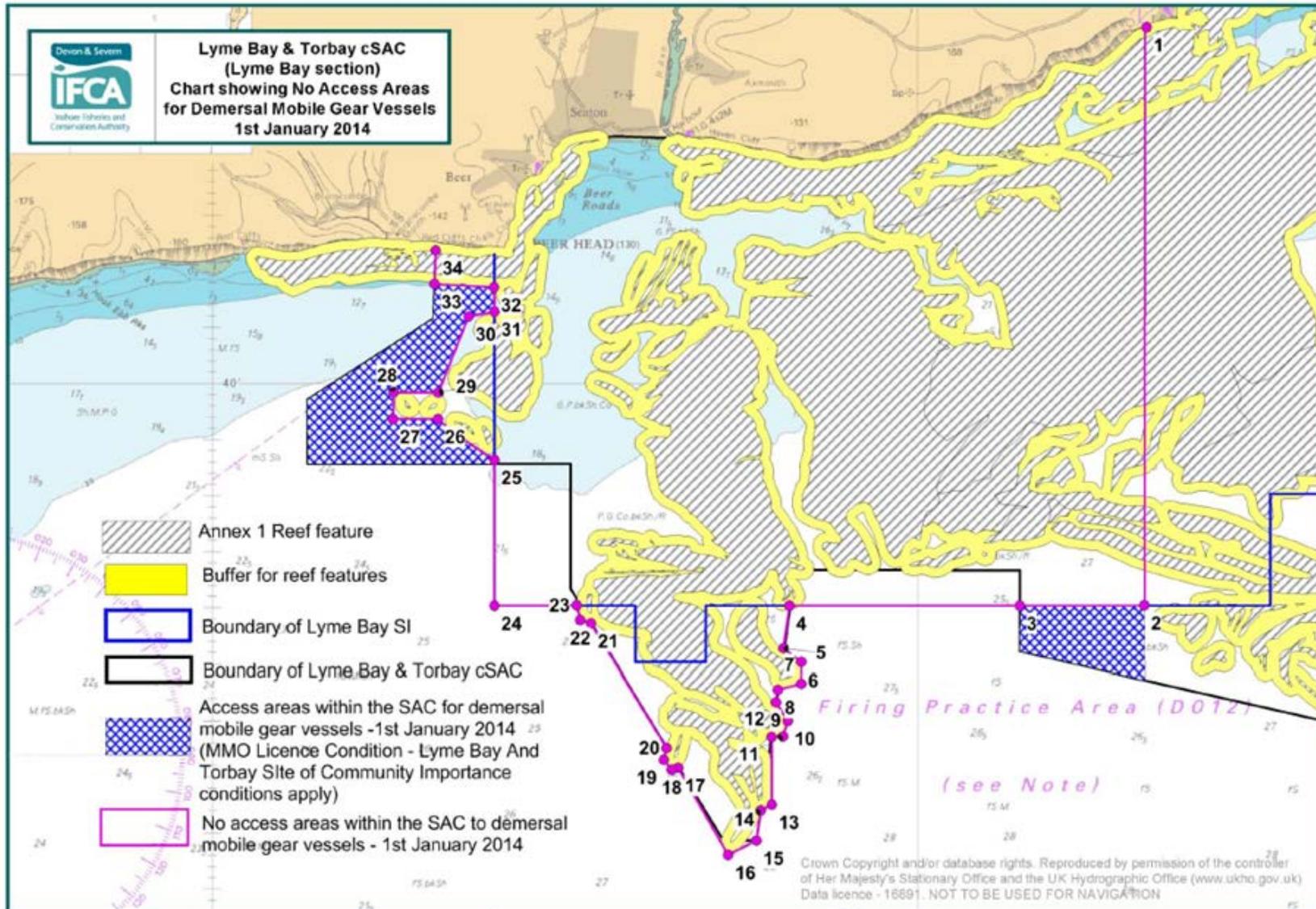


Figure 2-3: Lyme Bay and Torbay cSAC – No Demersal Mobile Gear Area: Lyme Bay Section

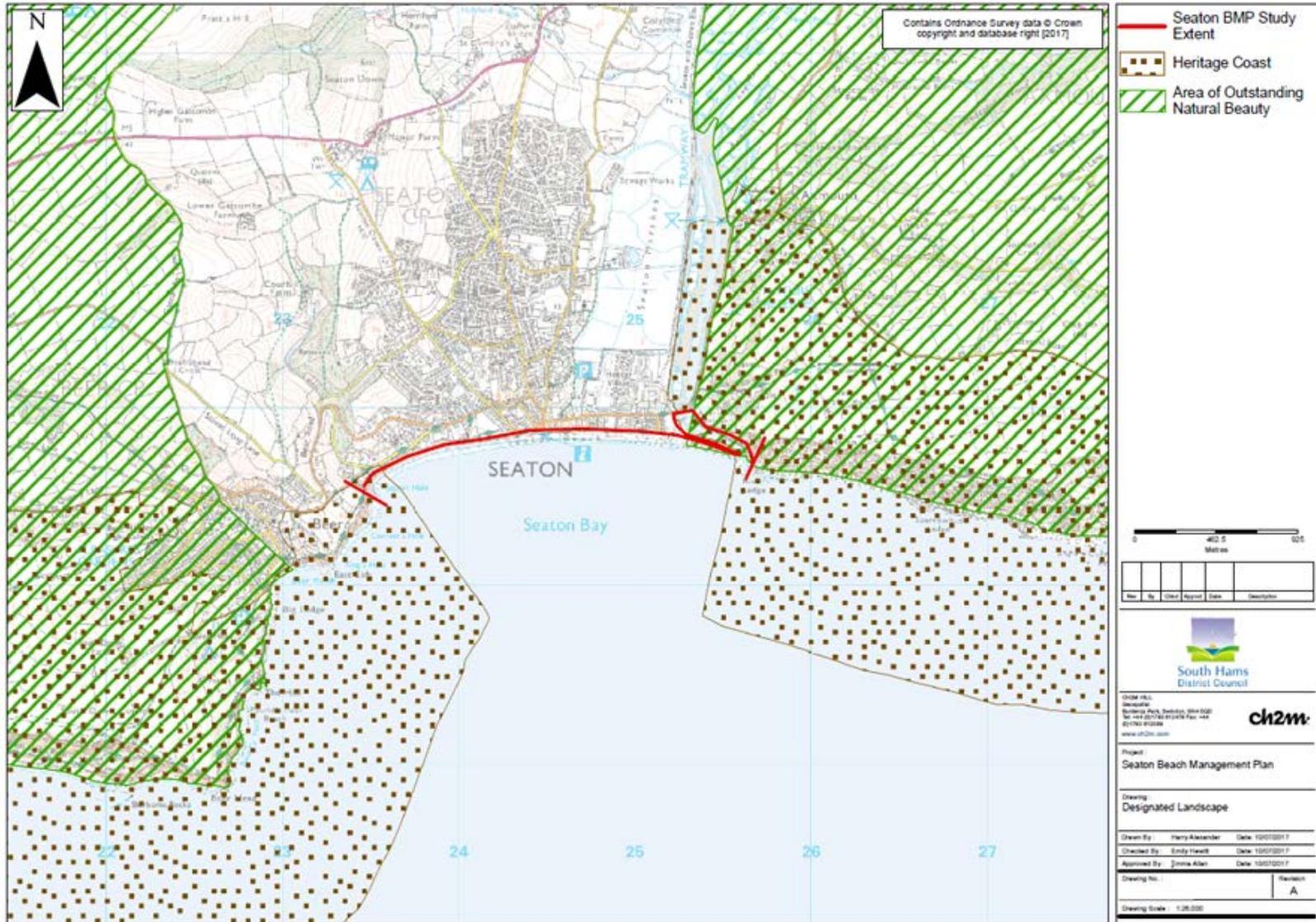


Figure 2-4: Seaton BMP Study Area: Landscape Designations



Figure 2-5: Designated Historical and Cultural Heritage in the BMP Study Area

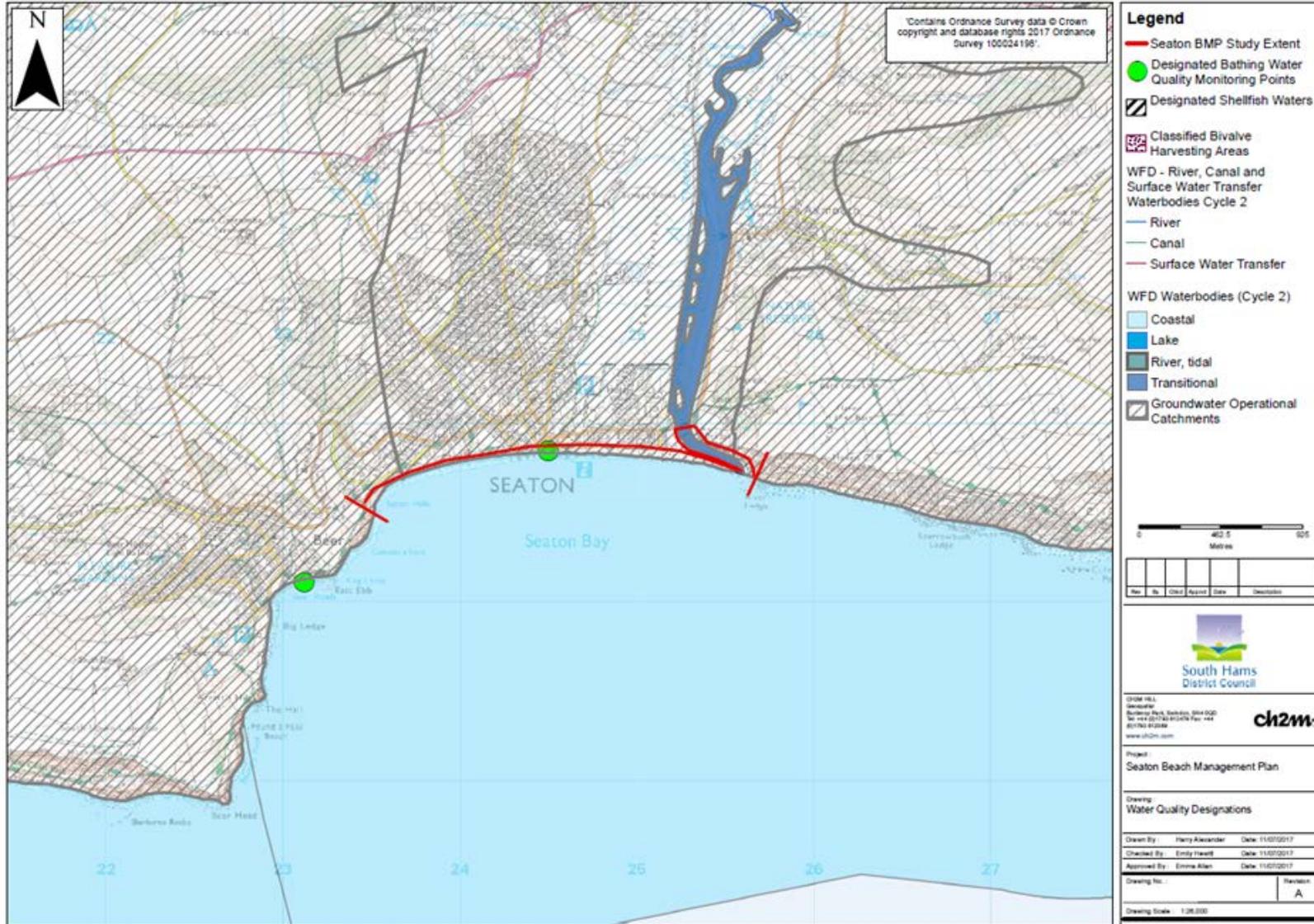


Figure 2-6: Water Designations in the BMP Study Area

WFD Habitats: Higher Sensitivity

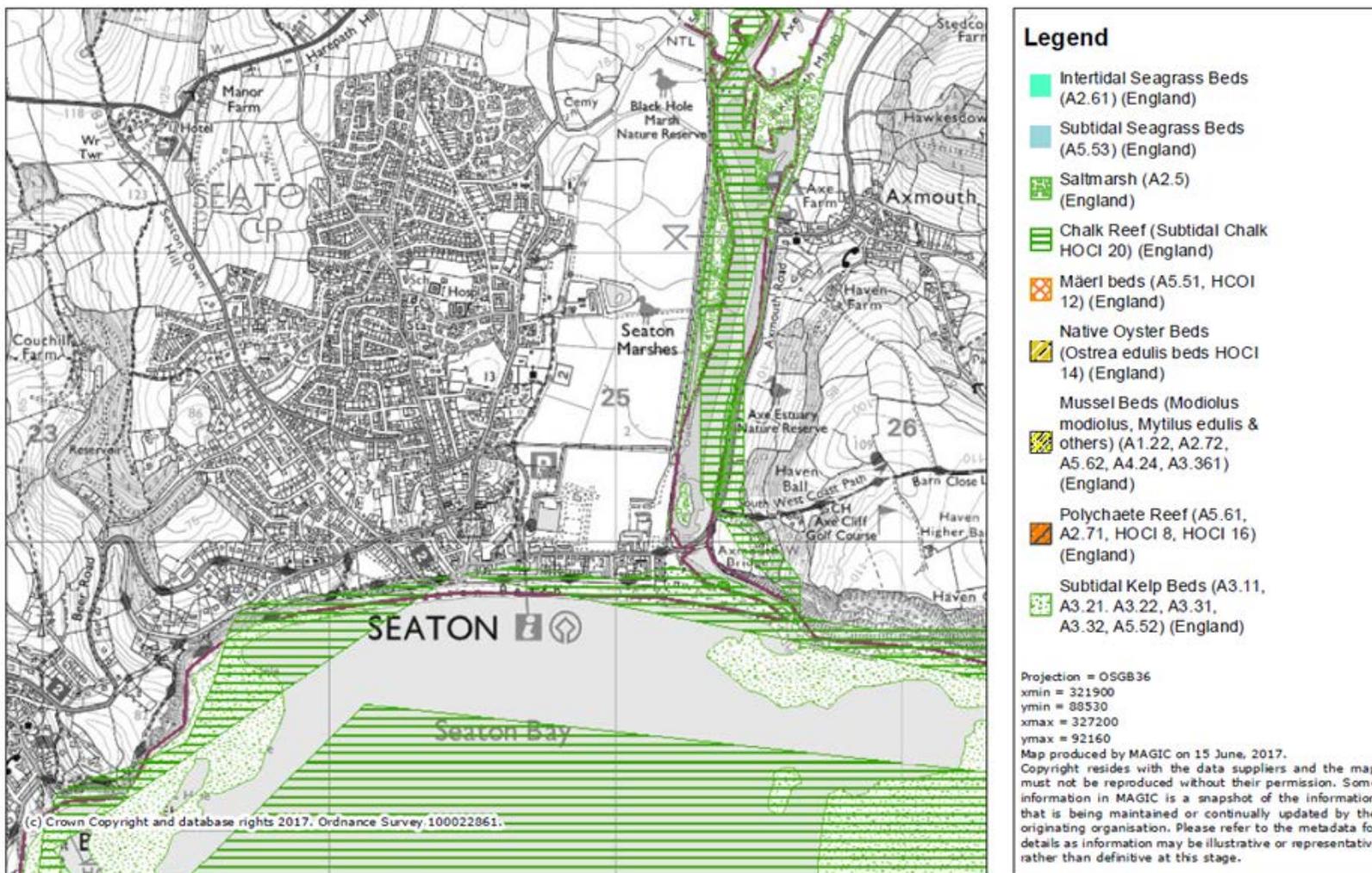
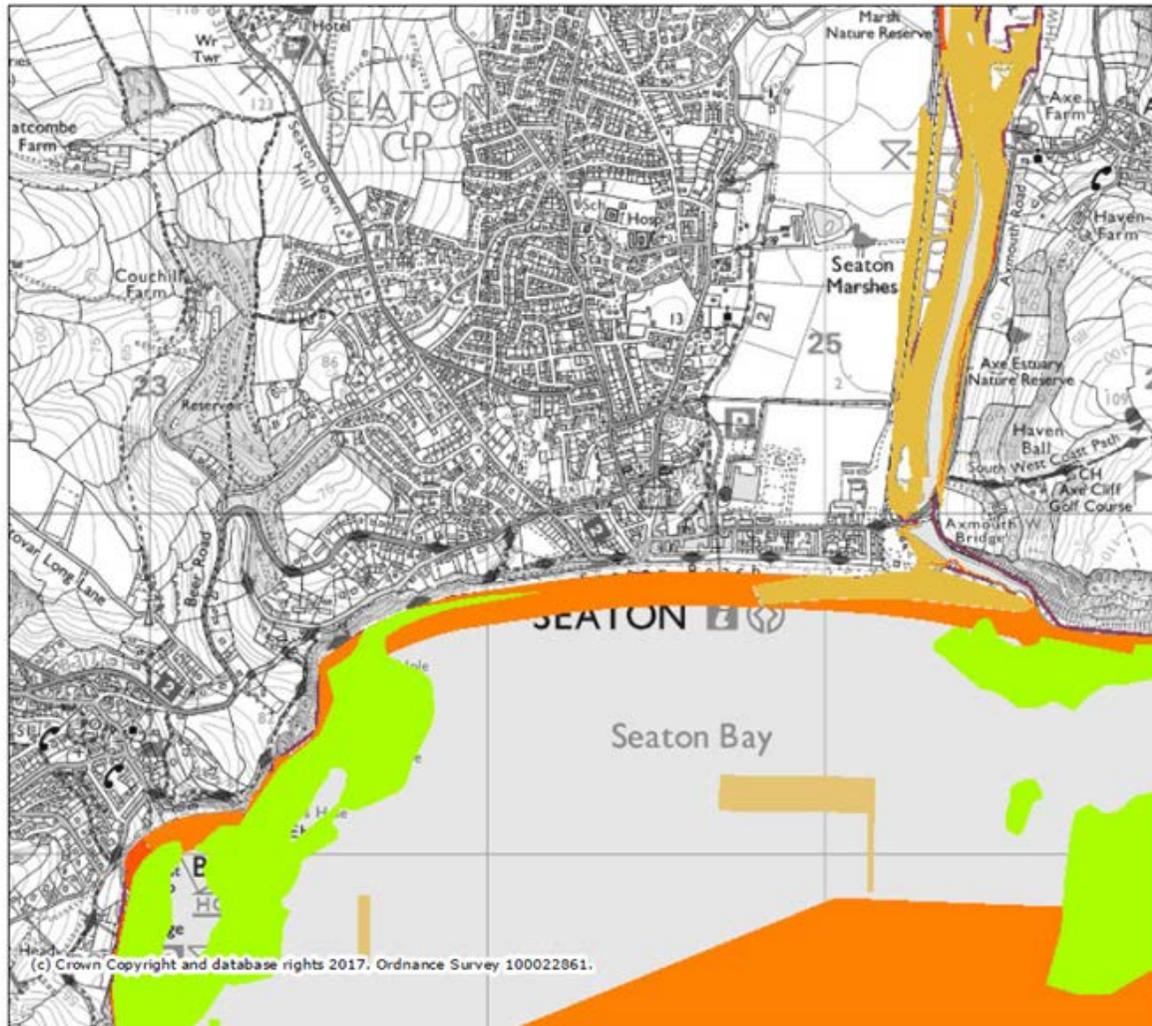


Figure 2-7: WFD Habitats: Higher Sensitivity

WFD Habitats: Lower Sensitivity



Legend

- Gravel & Cobbles
(intertidal & subtidal coarse sediment A2.1, A5.1) (England)
- Intertidal Soft Sediment
(Sand, Mud & Mixed A2.2, A2.3, A2.4) (England)
- Subtidal Soft Sediment
(Sand, Mud & Mixed A5.2, A5.3, A5.4) (England)
- Rockyshore (Intertidal rock A1) (England)
- Subtidal Boulder Field
(A3.123, A3.2112, A3.7162) (England)
- Subtidal Rocky Reef
(Infralittoral and Circalittoral rock A3, A4) (England)

Projection = OSGB36
 xmin = 321600
 ymin = 88170
 xmax = 326900
 ymax = 91800

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Figure 2-8: WFD Habitats: Lower Sensitivity