

Appendix S

Landscape Character Type S: Shoreline

The *Shoreline* landscape type comprises the narrow band of inter-tidal beach that occurs at the base of the steep chalk cliffs, between the cliff and the low water mark.

Description

Key Characteristics

- Inter-tidal shoreline occurring at the base of the steep chalk cliffs where the South Downs meet the sea.
- Characterised by flint shingle beaches, formed from erosion of chalk to reveal flint nodules that are eroded into pebbles.
- Chalk rubble, resulting from cliff falls, forms spits of land that extend into the sea.
- A dynamic and continually changing landscape featuring constant erosion and re-stocking of the beaches.
- An exposed, wild landscape which is open to the elements and whose character is governed by the weather.
- Engineered solutions to coastal erosion, sometimes extensive, such as wooden or concrete groynes and concrete retaining structures.
- Coastal features such as lighthouses, associated with coastal navigation, and anti-invasion defences.
- Extensive views out across the sea to the horizon.

Physical Landscape

S.1 The *Shoreline* is a rocky platform which gently slopes away from the base of the cliff. The platform has been eroded to a relatively level surface in places, although in detail it is irregular, with rock pools, steps and runnels into which the ebb and flow of the tide is channelled¹. On this platform lies chalk rubble and flint shingle. As chalk falls from the cliff, it is eroded by the sea leaving the hard flint nodules which accumulate on the shoreline where wave action erodes the flints into rounded pebbles to form a shingle beach. This is a constantly changing environment as a result of geomorphological processes, including longshore drift which moves the shingle along the beach from west to east. Where the chalk cliff has been or is under threat from erosion by the sea, a number of sea

defences have been introduced to control and prevent further retreat of the cliff.

Perceptual/Experiential Landscape

S.2 The character of the *Shoreline* is highly dependent upon the weather. On a winter's day, wind and waves buffet the shoreline resulting in an exposed, wild landscape which is open to the elements. On a warm summer's day, the microclimate on the beach creates a still and hot environment. However, whatever the weather, this is a remote landscape with a strong sense of wilderness and a sense of being close to nature, even along those areas close to urban settlement. There are long views along the coastline to the dramatic white chalk cliffs and even more extensive views out across the sea to the horizon.

¹ From <https://www.sevensisters.org.uk/habitats-and-landscape/seashore/>

Biodiversity

S.3 Features of ecological note include the maritime cliffs which support colonies of cliff nesting sea birds, such as fulmars and herring gulls, together with occasional patches of shingle vegetation that have colonised along the shoreline. The chalk cliffs have national and European importance for their ecology and geology (SSSI and Local Geological Sites)

S.4 The plant communities range from open and sparsely vegetated shingle along the strandline, where characteristic species include yellow horned-poppy, sea kale, sea beet, curled dock and sea mayweed, to closed grassland swards, which occur further inshore and support a range of grass, herb and moss species.

Key Biodiversity Features	Importance
Coastal habitat of sea cliffs and sparsely vegetated shingle (SSSI).	The coastal habitats support cliff nesting birds and rare plant communities adapted to survive in the harsh conditions.

Historic Character

S.5 This landscape differs from others in that change has been natural in many cases rather than human in origin. The soft chalk cliffs forming the coastline have been subject to erosion from natural forces, especially the sea, although there are sections along the coastline which are today largely controlled by manmade sea defences.

S.6 The *Shoreline* retains little evidence of human exploitation, other than at harbours where defences against coastal erosion defences or invasion are features. Lighthouses and shipwrecks are also features of the *Shoreline*.

Key Features of the Historic Environment	Importance
Coastal erosion defences	Reflects the exposed and changing nature of the coastline.
Anti-invasion defences	Reflects the vulnerable nature of the coastline in times of conflict.

Settlement Form and Built Character

S.7 This character area is too inhospitable for settlement, except for lighthouses.

S.8 The turbines of the Rampion Wind Farm form dominant vertical structures 13-20km off the Sussex coast. These large scale turbines affect views from the foreshore.

Evaluation

Ecosystem Services in the Shoreline

S.9 Ecosystem services are the benefits people and society get from the natural environment. The *Shoreline* provides:

Provisioning	<ul style="list-style-type: none"> ■ Food provision– intertidal rock habitats are important sources of larval plankton upon which commercially important fish species feed.
Regulating	<ul style="list-style-type: none"> ■ Natural protection -shingle beaches provide a natural form of protection from erosion by reducing the wave energy that reaches the shore. ■ Climate regulation – intertidal habitats such as macroalgal beds (seaweeds) contribute to carbon dioxide sequestration.
Cultural	<ul style="list-style-type: none"> ■ Sense of place – the shingle beach backed by the dramatic chalk cliffs of Beachy Head and the Seven Sisters with expansive views out to sea provides a strong sense of place. Defined as part of the Sussex Heritage Coast, the cliffs are particularly distinctive. ■ Tranquillity – the shoreline has a strong sense of wilderness despite the heavily urbanised character of the adjoining settlements. ■ Recreation -the tranquil beach at Cuckmere Haven, rock pools along the foreshore and the surrounding chalk cliff attract visitors to the marine environment.
Supporting	<ul style="list-style-type: none"> ■ Biodiversity – a variety of habitats, including sea cliffs and sparsely vegetated shingle, support an extensive range of important and nationally scarce flora and fauna species.

Sensitivities

S.10 This landscape has many sensitive physical and aesthetic/perceptual features that are vulnerable to change. Key landscape sensitivities include:

Key Landscape Sensitivities
1. The flint shingle beaches which are vulnerable to erosion.
2. The steep chalk cliffs which are vulnerable to erosion, often resulting in large cliff falls which deposit chalk rubble on the beach.
3. The exposed, wild character of the landscape which could be vulnerable to built development or insensitive engineering works.
4. The shingle vegetation community which is susceptible to trampling.
5. Geological interest associated with the chalk cliffs.
6. Long, scenic views along the coastline to the dramatic white chalk cliffs and extensive views out across the sea to the horizon which could be vulnerable to inappropriate development along the shoreline, or the adjacent open downs or offshore. The open nature of the shoreline makes this landscape particularly sensitive visually.

Change – Key Issues and Trends

Past Change

S.11 This is a constantly changing environment. Observable past changes include:

Past Change
1. Introduction of sea and coastal erosion defences including groins and concrete retaining walls.
2. Introduction of concrete anti-invasion defences by the military.

Past Change
3. Cliff falls onto the shoreline.

Future Landscape Change

S.12 The likely future changes are set out in the table below:

Future Change
1. Recent studies of the seafloor in this area suggest that the prehistoric coastline was not dissimilar to the present one, and that the acceleration of coastal erosion of the chalk cliffs is a recent phenomenon. An increase in heavy winter rainfall, increased storms and rough seas as a result of climate change, as well as sea level rises, will increase the rate of coastal erosion. In the longer term, change to the character of the shoreline will be dependent upon the approach taken to coastal management.
2. Coastal habitats such as inter-tidal chalk and maritime cliffs (BAP Priority Habitat maritime cliff and slope) are potentially vulnerable to erosion, rubble, landslides and permanent inundation as a consequence of climate change and sea level rise. This habitat is particularly vulnerable to "coastal squeeze" as there is often nowhere for the vegetation to retreat to. This is particularly relevant to Seaford to Beachy Head SSSI.
3. An increase in demand for outdoor recreation in summer may lead to congestion on beaches leading to erosion and trampling of the shingle vegetation community. The South Downs Way coastal route between the Cuckmere Estuary and Eastbourne is particularly vulnerable to increased rates of cliff erosion.
4. Although development is not envisaged, it could erode the wild and remote character of the <i>Shoreline</i> .
5. Pressure for additional offshore wind farm development in the English Channel affecting views from <i>Shoreline</i> , including a western extension to the existing Rampion Wind Farm.

Broad Management Objective and Landscape Guidelines

S.13 The overall management objective should be to conserve the exposed, wild character of the *Shoreline* and protect it from built development and insensitive engineering works.

Guidance for Landscape Management

- A.** Consider sensitive approaches to manage coastal erosion, supporting the development of naturally evolving coastlines and allowing for the realignment of shorelines. Avoid hard engineering solutions where a solution supporting more natural processes would be successful.
- B.** Protect the shingle vegetation community from effects of trampling and erosion.
- C.** Continue to monitor vegetated shingle habitats to control the spread of invasive species which are a cause of decline, such as Red valerian *Centranthus ruber*. Refer to the SDNP INNS Strategy.

Guidance for Integrating Development into the Landscape

- A.** Maintain the largely undeveloped character of the shoreline.
- B.** Consider the impact of offshore wind farms on views to and from the shoreline, particularly on iconic views of the chalk cliffs along the coastline.

Character Areas

The *Shoreline* landscape type is represented by two character areas in the South Downs – this area occurs where the South Downs meet the sea at their south-eastern extremity.

S1:	Seaford to Beachy Head Shoreline
S2:	Brighton to Rottingdean Shoreline

S1: Seaford to Beachy Head Shoreline

Location and Boundaries

The *Seaford to Beachy Head Shoreline* is the narrow band of inter-tidal shoreline that occurs at the base of the steep chalk cliffs between Seaford and Beachy Head. The northern boundary is defined by the base of the chalk cliffs (the high water mark) and the southern boundary is defined by the low water mark.

Key Characteristics

- A narrow band of inter-tidal shoreline that occurs at the base of the steep chalk cliffs between Seaford and Beachy Head.
- Characterised by flint shingle beaches, formed from erosion of chalk to reveal flint nodules that are eroded into pebbles, supporting a vulnerable shingle vegetation community.
- Chalk rubble, resulting from cliff falls, forms spits of land that extend into the sea. Birds crowd the relatively few stable cliff ledges suitable for nesting.
- A dynamic and continually changing landscape featuring constant erosion and re-stocking of the beaches. Wooden groynes are a feature of the beaches.
- An exposed, wild landscape which is open to the elements and whose character is governed by the weather.
- Wooden and concrete retaining walls and concrete anti-invasion defences at Cuckmere Haven indicating the vulnerable nature of the coastline in times of stress.
- The distinctive red and white striped lighthouse off at Beachy Head is a prominent landmark and indicates the importance of coastline in navigation.
- Long views along the coastline to the dramatic white chalk cliffs and extensive views out across the sea to the horizon.

Specific Characteristics Unique to the Seaford to Beachy Head Shoreline

S.14 The *Seaford to Beachy Head* character area is typical of the landscape type, comprising a rocky platform supporting chalk rubble and flint shingle which supports plant communities and cliff nesting sea birds. This narrow area of shoreline and associated steep chalk cliffs is recognised for its habitats and the floral and faunal communities they support through designation as part of the Seaford to Beachy Head SSSI.

S.15 Unlike the coastline west of Brighton, this area has not changed in millennia. Recent studies of the seafloor suggest that the prehistoric coastline was not dissimilar to the present one, and that extensive erosion of the chalk cliffs is a recent phenomenon. A particularly large collapse of the cliffs in 1999 deposited thousands of tons of chalk rubble onto the shoreline to form a new spit of land reaching almost up to the base of the lighthouse.

S.16 The mouth of the Cuckmere forms part of the shoreline of this character area. Human modification of the river mouth is evident in the wooden and concrete retaining walls, which prevent diversion of the river mouth eastwards, wooden

groynes on the beach and concrete anti-invasion defences at Cuckmere Haven.

S.17 This character area is also notable for the lighthouse at Beachy Head, built at sea level in 1902 to guide passing ships along the cliffs and replacing an earlier 19th century structure that was abandoned due to being frequently shrouded in mist. The earlier lighthouse still exists (as a private dwelling) on the cliff above. This red and white striped lighthouse, constructed from Cornish granite, is a distinctive landmark of the coastline and the light is visible for 25 sea miles.

Sensitivities Specific to the Seaford to Beachy Head Shoreline

S.18 All of the landscape and visual sensitivities listed in the landscape type evaluation apply to this character area. Specific to this character area are:

Key Landscape Sensitivities

1. The distinctive red and white striped lighthouse off Beachy Head which forms a prominent, and distinctive, landmark.

Key Landscape Sensitivities	
2.	The visibility of this landscape from popular viewing areas at Beachy Head, Belle Tout, Birling Gap and Cuckmere Haven.
3.	The anti-invasion defences at Cuckmere Haven which are of historic/archaeological interest.

Change Specific to the Seaford to Beachy Head Shoreline

S.19 In addition to the generic changes listed in the landscape type evaluation, specific changes to this area include:

Forces for Change	
1.	Future offshore wind energy development seen from popular viewing areas, including proposal for the Rampion 2 Wind Farm, which will impact on seaward views.

Landscape Management/Development Considerations Specific to the Seaford to Beachy Head Shoreline

S.20 In addition to the generic landscape management and development considerations for this landscape type, the following development considerations are specific to this character area.

- a. Conserve the anti-invasion defences at Cuckmere Haven which are of historic/ archaeological interest.
- b. Conserve the distinctive red and white striped lighthouse off at Beachy Head which forms a prominent, and distinctive, landmark.

S.21 The following development considerations are specific to this character area.

- a. Consider the impact of change on the long scenic views along the coastline from popular viewing areas at Beachy Head, Belle Tout, Birling Gap and Cuckmere Haven when planning any change, identified in the View Characterisation and Analysis report².
- b. Consider the impact of change in relation to offshore windfarms both in terms of their impact on visual amenity, landscape character and the effects of lighting on night-time views and dark skies.

² LUC. 2015 South Downs National Park: View Characterisation and Analysis. Views 1,3 and 25

S2: Brighton to Rottingdean Shoreline

Location and Boundaries

The *Brighton to Rottingdean* coastline is the narrow band of inter-tidal shoreline and concrete walkways that occur at the bottom of the steep chalk cliffs between Brighton Marina in the west and Rottingdean in the east. The northern boundary is defined by the top of the chalk cliffs and the southern boundary is defined by the low water mark.

Key Characteristics

- A narrow band of inter-tidal shoreline and concrete walkways that occur at the bottom of the steep chalk cliffs between Brighton and Rottingdean.
- The steep chalk cliff runs the length of this area, and the beaches have been formed by the retreating cliffline, which has left a wave cut platform.
- Along the foot of the cliff a seawall and concrete walkway protects the cliff and also provide access along this stretch of beach. Large rocks also line the edge of this walkway adding further protection.
- Shingle and sand characterise the small beaches located between large concrete or rock groynes.
- Forms part of the Brighton to Newhaven SSSI, largely due to its exposure of important chronological fossils, from the Upper Santonian and Lower Campanian, and is a nationally important reference section for the Upper Cretaceous.
- The cliff face provides habitats for a number of uncommon plants and supports colonies of breeding seabirds and colonies of beetles (forms part of the Brighton to Newhaven SSSI). Gullies and ridges also support a variety of invertebrates and algae.
- A dynamic and changing landscape featuring erosion and re-stocking of the beaches, however heavily controlled by sea defences.
- An exposed landscape which is open to the elements and whose character is often controlled by the weather, however significant urban and manmade elements influence this coastline.
- Long views along the coastline and extensive views out across the sea to the horizon. Views towards Brighton Marina in the west.

Specific Characteristics Unique to the Brighton to Rottingdean Shoreline

S.22 The *Brighton to Rottingdean* character area and associated cliffs are recognised particularly for their geological interest and are designated a Site of Special Scientific Interest (SSSI), a Regionally Important Geological Site (RIGS) and a Geological Conservation Review site (GCR). Although the main interest is geological, the cliff face provides important habitats for a number of uncommon plant species, breeding sea birds and diverse communities of beetles. Gullies and ridges also support a variety of invertebrates and algae. These cliffs (which form part of the Brighton to Newhaven SSSI), provide the best and most extensive exposures of the *Offaster pilula* Zone in England (a small and important zone fossil³ used in the Early Campanian). It is an important site for faunas

of the upper Santonian and lower Campanian and is a nationally important reference section for the upper Cretaceous⁴.

S.23 This stretch of coastline is largely controlled by concrete sea defences, which were first built in 1907 and have been progressively renewed. In the 1930s, the Undercliff Walk was developed, a scheme to enhance sea defences whilst also introducing an undercliff road/walk. A number of stabilisation and reprofiling schemes along the cliff have been recently completed along this section of coastline. However, the cliffs continue to experience periods of instability linked largely to the weather, and occasionally sections of the Undercliff Walk are closed.

S.24 Brighton Marina, developed in the 1970s at the base of the cliffs to the west of the character area, is a visual influence

³ A fossil which lived in a particular geologic age, and used to identify or date the rock/rock layer in which it is found.

⁴ Information taken from Natural England Sites of Special Scientific Interest Information 2011

<https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1003033.pdf>

on the character of this stretch of coastline. Although shingle and sand are located on small beaches between groynes, due to the effect of the Marina and the changes in water depth around this area, very little shingle comes onto this section of coast and some areas of beach have been created from imported material.

particularly the view from Brighton Marina which provides a view east along the cliffs and foreshore and identified in the View Characterisation and Analysis report⁵.

Sensitivities Specific to the Brighton to Rottingdean Shoreline

S.25 All of the landscape and visual sensitivities listed in the landscape type evaluation apply to this character area. Specific to this character area are:

Key Landscape Sensitivities	
1.	The cliffs which provide the best and most extensive exposure of <i>Offaster pilula</i> , a fossil sea-urchin, which is particularly important for biostratigraphy, the use of fossils to date rock formations.
2.	The cliff face which provide habitats for a number of uncommon plant species, breeding seabirds and diverse communities of beetles.
3.	The limited shingle and sand beaches which are vulnerable to further loss

Change Specific to the Brighton to Rottingdean Shoreline

S.26 Change specific to this area is likely to be as set out in the landscape type evaluation.

Landscape Management / Development Considerations Specific to the Brighton to Rottingdean Shoreline

S.27 In addition to the generic landscape management and development considerations for this landscape type, the following management considerations are specific to this character area:

- a. Conserve the geological and ecological interest of the chalk cliffs.
- b. Conserve the Undercliff Walk, which serves to protect the cliffs from erosion and provide access along the foot of the cliff.

S.28 The following development considerations are specific to this character area:

- a. Consider views to and from the shoreline when planning any change onshore or offshore,

⁵ LUC. 2015 South Downs National Park: View Characterisation and Analysis, View 70