

**Site Name:** Compton Chine to Steephill Cove    **County:** Isle of Wight

**Status:** Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 substituted by Schedule 9 to the Countryside & Rights of Way Act 2000.

**Local Planning Authority:** Isle of Wight Council

**National Grid reference:** SZ 489763    **Area:** 629.19 ha

**Ordnance Survey Sheet: 1:50,000:** 196    **1:10,000:** SZ 38NE, SZ38SE, SZ 48SW, SZ 47NE, SZ47NW, SZ57NW

**Date Notified:** 8 May 2003

### **Reasons for Notification:**

The site is notified for its vegetated maritime cliffs and slopes, species-rich unimproved chalk grassland, nationally rare plant species, an assemblage of nationally scarce plants, an outstanding assemblage of nationally rare and scarce invertebrates, exposed and moderately exposed rocky shores (littoral rock) and nationally important coastal geomorphology. In addition the cliffs and foreshore between Hanover Point to St Catherine's Point are a nationally important geological site for successions of the Wealden Group and the overlying Lower Greensand Group. The Wealden Group is of international importance for the diverse fauna of early Cretaceous dinosaurs that it has yielded, and also contains important elements of the flora present at the time these reptiles were alive.

The relevant National Vegetation Classification (NVC) communities of the vegetated maritime cliffs and slopes are *Armeria maritima* - *Cerastium diffusum* ssp. *diffusum* maritime therophyte community (NVC MC5); *Festuca rubra* - *Armeria maritima* maritime grassland (NVC MC8); *Festuca rubra* - *Holcus lanatus* maritime grassland (NVC MC9) and *Festuca rubra* - *Daucus carota* ssp. *gummifer* maritime grassland (NVC MC11). The communities for the species rich unimproved calcareous grassland are *Festuca ovina* - *Carlina vulgaris* grassland (NVC CG1), *Festuca ovina* - *Avenula pratensis* grassland (NVC CG2), *Bromus erectus* grassland (NVC CG3), *Brachypodium pinnatum* grassland (NVC CG4) and *Bromus erectus* - *Brachypodium pinnatum* grassland (NVC CG5).

### **General description:**

#### **Geology**

This site comprises steep coastal slopes formed of the Wealden Group and Lower Greensand Group which are subject to continuous slipping and erosion due to the differing strengths and permeability of the various clay, marl, shale and sandstone strata. The coast between Hanover Point and St Catherine's Point is dissected by a series of deeply incised "chines" or ravines. The site also includes the Upper Greensand inner cliff formed at the inland extremity of the landslip and Rocken End.

The complex mass-movement features including the Undercliff, the overlying lower part of the Chalk Group, and contemporary active coastal landslips and mudflows are of significant geomorphological interest.

The Wealden Group, exposed between Compton Chine and Atherfield Point, forms the core of the Brighstone Anticline. The lower part of the Wealden Group consists of the Wessex Formation and is overlain by the Vectis Formation. These formations show features indicating processes associated with the different environments under which they were formed.

Over the past 200 years the Wealden Group of the south-western coast of the Isle of Wight, and in particular the Wessex Formation, has been the source of numerous dinosaur remains. This is the richest early Cretaceous dinosaur fauna in the world, and is of particular value as many of the locations of the finds are well recorded, providing useful taphonomic and palaeoecological data. The remains occur as associations of disarticulated bones and partial skeletons, often associated with the plant beds, and occasionally as nearly complete three-dimensional skeletons (Hypsilophodon Bed). At least 20 dinosaur genera are known from here, including the ornithomichians *Hypsilophodon*, *Valdosaurus*, *Iguanodon* and *Polacanthus*, the sauropod saurichians *Óplosaurus*, *Pelosaurus*, *Ornithopsis*, *Pleurocoeleus*, *Eucamerotus*, *Chondrosteosaurus*, *Iuticosaurus* and *Titanosaurus*, and the theropod saurichians *Neovenator*, *Baryonyx*, *Ornithodesmus*, *Aristosuchus*, *Calamospondylus*, *Thecocoeleus*, *Calamosaurus*, and *Eotyrranus*. Other reptiles, including turtles, crocodylians and pterosaurs also occur.

In the vicinity of Hanover Point, the Wessex Formation has yielded a fossil flora that consists entirely of gymnosperms including cycads, bennettites, ginkgos and conifers. Much of what is known about the Cretaceous members of this family has arisen directly or indirectly from studies on specimens from Hanover Point. The fossil floras occur mainly in two plant beds and occur both as permineralised and carbonised material. The plant remains consist of wood in the form of logs, wood fragments and shoots; bennettitid, cycad and conifer cones; leaf cuticle and pollen. Fossilised remains belonging to ferns have also been recorded. One particular horizon exposed at low tide on Hanover Point contains the 'Pine Raft' a concentration of logs belonging to the conifer *Pseudofrenelopsis parceramosa*, a member of the Cheirolepidiaceae, and the dominant family of conifers during much of the Mesozoic Era.

The coastal section between Atherfield Point and Rocken End constitutes the finest Lower Greensand exposure in Britain, with the complete thickness of the formation clearly visible, and with the junction with the underlying Wealden Group being seen. This section is the standard reference section for the Lower Greensand Group in the Isle of Wight, and provides the type horizons for many of the ammonite zones of the Aptian Stage in the United Kingdom. Richly fossiliferous horizons occur throughout the sequence, with the Crackers Rock and Perna Bed being of particular note. Further northwest, the coast near Compton Chine also provides exposures of the Lower Greensand, but here the formation is much thinner than at Atherfield. The Compton section is of great value in demonstrating the rapid north-westward thinning of the

Lower Greensand, and provides important evidence of the palaeogeography of this part of the Wessex Basin during early Cretaceous times.

## **Geomorphology**

The south west coast of the Isle of Wight is of particular importance for its coastal geomorphology, and demonstrates a diversity of coastal landforms that reflect the varying geology, the changing intensities of the coastal processes, as well as the differing time-scales of coastal evolution. The lack of extensive coastal defences on this coast means that there has been little interference with the beach systems. As a consequence the site is particularly valuable for study and research.

Between Hanover Point and St Catherine's Point the cliffs and foreshore are composed predominantly of relatively soft clays, mudstones and sandstones belonging to the Wealden Group and Lower Greensand Group. To the east of Blackgang, the harder sandstones of the Upper Greensand Group rest on these sediments, and are themselves overlain by the lowest part of the Chalk Group. The soft nature of the rocks belonging to the Wealden Group and the Lower Greensand Group has led to the development of a broad shore platform.

This coast is one of only six major south west facing beach systems in the English Channel, and is distinctive by reason of the rapid rate of cliff retreat and the differentiated sources of sediment fed to the beach. The presence of the harder rocks formed by the 'Pine Raft' and the 'Perna Bed' at Hanover and Atherfield Point respectively demonstrate the effect of resistant rock units cropping out on the foreshore, and they provide a significant control on the development of the bays.

This coast is a classic area for the numerous chimes that emerge from the cliffs as waterfalls. Their presence is thought to be the consequence of cliff recession so rapid that streams reaching the coast cannot erode to base level.

The combination of clays with other lithologies in the cliffs has promoted a variety of styles of failure ranging from toppling at Gore Cliff through a series of major landslips at Blackgang and Walpen, and these have been the subject of several recent studies. A series of shallow and deep-seated landslides continue to be active north west of Atherfield Point.

## **Vegetated maritime cliffs and slopes**

The actively slipping and eroding cliffs and slopes support a complex mosaic of vegetation reflecting the wide range of rock types, age of the cliff exposure, aspect and drainage. On the most recently exposed cliff faces, scattered pioneer plant communities occur. These rapidly give way to open short sward grassland as the cliff slope becomes stabilised. Where water is trapped by slumped cliff debris or where cliff-face springs emerge there are open water, swamp and fen communities. On the longest established and most sheltered slopes, scrub and woodland communities have developed. This mosaic of habitats collectively form part of the composite vegetated sea cliff habitat.

Pioneer communities are varied in nature partly reflecting differences in rock hardness. The soft rock cliffs are characterised by an abundance of coltsfoot *Tussilago farfara*. Other pioneer species include bristly ox-tongue *Picris echioides*, sow thistles *Sonchus arvensis* and *S. oleraceus* and scattered tufts of creeping bent grass *Agrostis stolonifera*. The nationally scarce curved hard-grass *Parapholis incurva* is also found with these pioneer communities.

On harder substrates, such as the ferruginous sandstones and Upper Greensand outcrops, the pioneer cliff communities include species such as sea campion *Silene maritima*, rock sea-spurrey *Spergularia rupicola*, yellow horned-poppo *Glaucium flavum*, rock samphire *Crithmum maritimum*, sea radish *Raphanus maritimus* and two nationally scarce species, the white horehound *Marrubium vulgare* and hoary stock *Matthiola incana*.

On soft rock cliffs and slopes, these pioneer plant communities soon give way to more stable grassland vegetation. This is generally dominated by grasses such as red fescue *Festuca rubra*, cock's-foot *Dactylis glomerata* and Yorkshire fog *Holcus lanatus*, and also include thrift *Armeria maritima*, sea carrot *Daucus carota* ssp. *gummifer* and buck's-horn plantain *Plantago coronopus*. On calcareous soils associated with marls, chalk and Upper Greensand talus associated grassland species include yellow-wort *Blackstonia perfoliata*, lady's bedstraw *Galium verum*, kidney vetch *Anthyllis vulneraria* and, locally, the nationally scarce dwarf mouse-ear *Cerastium pumilum*.

Species typical of coastal grassland on more neutral soils include the nationally scarce nit-grass *Gastridium ventricosum*.

Other components of the vegetated sea cliff mosaic include an area of eroded perched sand dunes on the cliff top near Chale and the associated undercliff. These support an interesting acidic community dominated by sand sedge *Carex arenaria* with smaller areas of dune heath comprising a mix of sand sedge and the heathers *Calluna vulgaris* and *Erica cinerea*. The slumping cliffs and cliff-face springs create ephemeral ponds and seepages populated by great horse tail *Equisetum telmateia* and the local northern marsh orchid *Dactylorhiza praetermissa*. Around more permanent undercliff ponds, such as those near St Catherine's Point, a diverse reed swamp community occurs, often with abundant bulrush *Typha latifolia* and the nationally scarce galingale *Cyperus longus*.

The later stages of succession of the soft cliff vegetation in the more sheltered areas are characterised by scrub and woodland, dominated by species such as hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, grey willow *Salix cinerea* ssp. *cinerea*, wild privet *Ligustrum vulgare*, ash *Fraxinus excelsior* and pedunculate oak *Quercus robur*. The most extensive area of woodland is located on the undercliff between Castlehaven and Binnel Point and forms part of the largest urban landslip in northwest Europe. Here the woodland is dominated by a mix of native and introduced species. Two nationally scarce plants are also associated with these undercliff woodlands the ivy broomrape *Orobanche hederarum* and Italian lords-and-ladies *Arum italicum* ssp. *neglectum*.

## **Calcareous (chalk) grassland**

The site includes two areas of unimproved chalk grassland, one which is found on the slopes at St Catherine's Point and the other includes part of the top and face of the steep rear scarp, which characterises the Ventnor Undercliff landslide complex between St Catherine's Point and Steephill Cove. Species include abundant red fescue and sheep's fescue *Festuca ovina*, upright brome *Bromus erectus*, crested dog's tail *Cynosurus cristatus*, false brome *Brachypodium sylvaticum*, sweet vernal-grass *Anthoxanthum odoratum*, meadow oat-grass *Avenula pratensis* and frequent fern-grass *Catapodium rigidum*. Herbaceous species include mouse-ear hawkweed *Hieracium pilosella*, wild thyme *Thymus praecox*, common rock-rose *Helianthemum nummularium*, squinancywort *Asperula cynanchica*, bee orchid *Ophrys apifera*, carline thistle *Carlina vulgaris*, dwarf thistle *Cirsium acaule*, small scabious *Scabiosa columbaria* and burnet-saxifrage *Pimpinella saxifraga*. Populations of the endangered field cow-wheat *Melampyrum arvense* and nationally scarce bastard-toadflax *Thesium humifusum* and Nottingham catchfly *Silene nutans* are found on the steep scarp.

### **Assemblage of nationally rare plants\***

The endangered triangular pygmy-moss *Acaulon triquetrum*, is found on the south-facing open calcareous grassland at St Catherine's Point. The site supports two rare liverworts including the endangered *Celphalozia baumgartneri* and the vulnerable blackwort *Southbya nigrella*, otherwise only known from Portland, grows in a base rich flush at St Catherine's Point. These bryophytes are at their northernmost European range on the south English coast.

### **Assemblage of nationally scarce plants\*\***

The site supports an assemblage of nationally scarce plants including Nottingham catchfly, bastard-toadflax, hoary stock, white horehound, dwarf mouse-ear, ivy broomrape, Italian lords-and ladies, galingale, curved hard-grass and nit-grass and the moss *Pterygoneurum ovatum*.

### **Nationally rare and scarce invertebrates\*\*\***

The site supports an outstanding assemblage of invertebrates including a number of nationally rare and scarce species. Of particular importance are the species associated with the unstable soft rock cliffs, the active landslips, the south facing dry cliffs and associated cliff-top vegetation between Castle Haven and Steephill Cove. These include the nationally rare spider wasp *Priocnemis gracilis*, yellow-face bee *Hylaeus commuis*, the mining bees *Andrena proxima*, *A. nitidiuscula* and *A. alfenella* and a number of nationally scarce species such as the flies *Aphrostylius ferox* and *Bombylius discolor*, the club-horn wasp *Sapyra clavicornis*, mining bee *Lasioglossum malachurum*, cuckoo bee *Sphecodes ruficrus*, nomad bee *Nomada fucata* and flower bee *Anthorhophora quadrimaculata*, the weevil *Mononychus punctumalbum*, Roesel's bush cricket *Metrioptera roeselii* and the grey bush cricket *Platycleis albopunctata*, the long-winged conehead *Conocephalus discolor*, and the spider *Trachyzelotes pedestris*. Compton Chine to St Catherine's Point supports species which require the much drier and heat-retaining substrates of sandy cliffs, such as the Tiger beetle

*Cicindela germanica*. Landslips with the continual presence of early stages of vegetation succession, together with warm seepages and lightly vegetated flushes, support the crane fly *Limonia goritiensis* and the sand wasp *Psen atratinus*.

The nationally rare Glanville fritillary butterfly *Melitaea cinxia* is found at a number of locations along the length of the site and breeds on the chalk grassland scarp. The site also supports the rare spider *Episinus maculipes* and nationally scarce flies *Volucella inflata* and *Acanthiophilus helianthi* and nationally scarce spiders *Mymarachne formicaria* and *Micaria romana* which are associated with the scrub and woodland on the scarp.

### **Exposed and moderately exposed rocky shores**

The intertidal rocky shores formed by exposed clay bedrock, extensive and diverse sandstone and chert boulder areas provide a very diverse range of habitats which vary according to the local geology and exposure to wave energy. As a consequence this section of coast has a high marine conservation interest that is reflected in the large number of communities or biotopes, three of which are nationally scarce and one nationally rare.

Characteristic of exposed shores on this coastline are the lower eulittoral red algal turf communities, dominated by pepper dulse *Osmundea pinnatifida*, a red alga *Gelidium pusillum* and high abundance coral weed *Corallina officinalis*. A range of exposed rocky shore communities are found at Hanover Point, Watershoot Bay and east of the lighthouse at St Catherine's Point.

Hanover Point contains rockpools in the mid to low eulittoral. The southern species of barnacles *Chthamalus montagui*, *C. stellatus* and *Balanus perforatus* and limpets *Patella depressa* and *P. ulyssiponensis*, for which the region is an important scientific monitoring area, have been recorded. There are examples of deep fucoid and kelp dominated rockpools and numerous shallow pools containing the locally distributed brown alga *Padina pavonica*. The rock boring piddock *Barnea candida*, is found on moderately exposed clay bedrock areas in between boulders at Hanover Point. This represents a nationally rare biotope restricted to soft-rock shores.

### **Other information**

This site forms part of the South Wight Maritime candidate Special Area of Conservation.

The extension to the former Hanover Point to St Catherine's Point SSSI includes the Undercliff Site of Importance for Nature Conservation.

The coastline between Hanover Point and St Catherine's Point is a Geological Conservation Review (GCR) Site.

The site forms part of the Isle of Wight Area of Outstanding Natural Beauty.

- \* Endangered as defined in British Book Red Data Book: Vol 1 Vascular Plants 3<sup>rd</sup> edition (IUCN 1994).
- \*\* Nationally scarce species occur in 16-100 km squares in Britain as listed as Scarce Plants in Britain, (JNCC, 1994)
- \*\*\* Nationally rare species as listed in the British Red Data Book 2: Insects (Nature Conservancy Council, 1987).