

File ref:

County: Hampshire/Dorset
Cliffs SSSI

Site Name: Highcliffe to Milford

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act, 1981

Local Planning Authority: Hampshire County Council/Dorset County Council, New Forest District Council/Christchurch Borough Council

National Grid Reference: SZ 240928

Ordnance Survey Sheet 1:50,000: 195 **1:10,000:** SZ 19 SE, SZ 29 SE, SW

Area: 110.8 (ha) 273.7 (ac)

Date Notified (Under 1949 Act): 1953 **Date of Last Revision:** -

Date Notified (Under 1981 Act): 21 March 1991 **Date of Last Revision:** -

Confirmed: 10 December 1991

Other Information:

Site extended westwards to Friars Cliff.

Reasons for Notification:

The Highcliffe to Milford Cliffs Site of Special Scientific Interest extends for some nine kilometres along the cliffs at Christchurch Bay. Its entire length comprises steep coastal slopes and cliffs which are locally dissected by deeply incised 'bunnies' or ravines.

This coastal site provides access to the standard succession of the fossil rich Barton Beds and Headon Beds. Various exposures within the Site are considered important both in a national and international context. The principal features of interest are described below. The oldest rocks are described first. These rocks lie in the western part of the site, younger rocks being found progressing eastward.

Friars Cliff, Dorset, is a key Tertiary Site providing an opportunity to study the marginal marine sediments deposited during the terminal regressive phase of the Auversian (Upper Bracklesham) and the earliest, marine transgression phase of the Bartonian. The section provides a unique exposure of distributary mouth-bar sequences in the uppermost Bracklesham Beds, and, together with sections in Poole Bay, enable a good reconstruction of an ancient estuary to be made.

Within the sands of Friars Cliff and Highcliffe there is a particularly fine assemblage of plant fossils. These cliffs are the only known locality with a diverse flora from the Boscombe sands. Over fifty species have been recorded from these beds and this is the type locality for fourteen of these species and two genera; eleven species and three genera are unique to this site within the British Tertiary. Fruits, seeds, coniferous remains and fern pinnules found here represent wetland plants, but there are also lianas, herbaceous climbers, trees and shrubs. These are forms typical of early and early middle Eocene strata in Britain, but they were still surviving in late middle Eocene times at this site.

The coastal section from Friars Cliff to Milford on Sea is the type locality for the Barton Beds and is also the best exposure of the Lower Headon Beds. The Barton Beds yield the most diverse and best preserved fauna of the British Tertiary while

the Lower Headon Beds, which were deposited during a phase of coastal progradation in late Eocene time, demonstrate very clearly the relationship between the changing salinity of the coastal environments and the fauna inhabiting them. One of Britain's most important stratigraphic and palaeontological sites.

The cliffs in the vicinity of Chewton Bunny are the only sites to yield fossil plants from Lower Barton Beds. At least twenty-eight plant species occur and, for five of these, this is the type locality. Finds have been made mainly in one horizon but also rarely in four others. Fossil fruits, seeds and cones represent wetland plants but there are also some warm climate shrubs or small trees. The make-up of the flora here reveals the first indications of the climatic cooling which affected Britain in later Tertiary times.

Lying between Chewton Bunny (Hampshire) and Beckton Bunny the Barton Beds of Barton Cliffs are well known for their reptile remains. Turtles are particularly well represented (*Argillochelys*, *Eochelone*, *Puppigerus*, *Trionyx*), but snakes *Palacophis* and lizards have also been found. Numerous specimens have been collected recently. An important early Tertiary reptile site.

To the east of Beckton Bunny lies Hordle Cliff which is a locality for the Headon Formation, strata containing a diverse fossil mammal fauna. Thirty species have been recorded from these Eocene Beds, equitable with the Headon deposit faunas of the Isle of Wight, but noteworthy for the preponderance of larger perissodactyls and artiodactyles in the fauna. A nationally significant locality proving the presence of ten orders of Mammalia in the Hampshire Basin in Ludian times.

Hordle Cliff is also a key site for fossil birds: so far 13 families (representing 8 orders) have been identified. Still more material remains to be described but already this is the type locality for 12 species. The site has yielded the earliest known diver *Colymboides anglicus*, and also includes Falconiformes, Anseriformes and Charadriiformes. Several species that occur are common to both the Upper and Lower Oligocene. An important palaeontological and evolutionary site.

In addition to birds and mammals Hordle Cliff is one of Britain's best known Tertiary reptile sites. The finds include numerous specimens of turtles *Alloeocheles*, *Ocadia*, *Trionyx*, lizards *Iguana*, *Plesiolacerta*, snakes *Palaeophis*, *Paleryx*, and crocodiles *Diplocynodon* from the Lower Headon Beds. The specimens are well preserved, and this site has provided type specimens of over 15 species. This is one of Britain's most important Tertiary reptile sites.

The fossilised animals are complemented by fossil plant remains. This is a key locality for palaeobotanical studies and it includes the most important locality for plants from the Lower Headon beds. Fruit seeds, leaves and flowers, which are assignable to over eighty species, indicate the forest and woodland vegetation of the time. This is the type locality for forty-six species and six genera. Seven genera found here are limited to this site in Britain and many species found here are unique in Tertiary deposits world wide. In addition, coniferous trees which grew in swamps are preserved as *in situ* stumps, the only available exposure of this kind in the British Tertiary. Four other horizons in the Lower Headon Beds and one in the Upper Barton Beds all yield fossil plants; one contains the mineralised roots of an aquatic herb. At least eight horizons in the Lower Headon Beds yield charophytes, and this is the type locality for ten species which are of considerable value for biostratigraphic correlation between European Tertiary localities. Association of all these plant fossils with faunal remains, especially vertebrates, makes this a valuable site for palaeoenvironmental analyses. This is a critical site for European Tertiary palaeobotany and palaeoecology.

At the extreme east of the site lies Paddy's Gap at Rook Cliff. This site shows the thin *Limnocarpus* Band, within the Headon Beds, crowded with fruits of an extinct pondweed relative, to the exclusion of almost all other plant fossils. This is the only

site now exposing this horizon. This is a famous plant locality with abundant fossil fruit remains.

The Bartonian facies is not represented in some other parts of Europe because there is a hiatus at the top of the Bracklesham Beds caused by a drop in sea level at the end of the Eocene. At Barton there is a complete section with a continuation of marine rocks which contain a unique fish fauna. The nearest assemblage with similar fishes is in Georgia, North America. Like all these Eocene fish sites the faunal assemblage consists of great numbers of species, based on disarticulated remains of fish, particularly teeth and otoliths. However, these species are in the main unique to this site.

Throughout the SSSI the Cliffs are capped with a flight of Pleistocene terrace gravels. At the cliff tops these gravels are exposed in cross section. Opinions are divided as to the number of separate terraces represented, most authors claiming three or four, decreasing in height and age from west to east. The site enables studies such as gravel sedimentology to be combined with a wider geomorphological consideration of the terraces themselves. The cliffs around the Solent are the only place in Britain where large continuous exposures of Pleistocene terrace gravels are available for study. Furthermore, the gravel at Barton is one of the richest sources of Palaeolithic (Old Stone Age) artefacts in the Hampshire Basin.

In addition to the geological interest the cliffs and coastal slopes of this site are of contemporary biological interest. Within the coastal slopes and broad cliff terraces there are runnels and pools partially vegetated by plants such as willow *Salix* species, reed mace *Typha latifolia*, coltsfoot *Tussilago farfara* and cross-leaved heath *Erica tetralix*. These areas of open vegetation are the habitat of a range of invertebrates strongly associated with soft cliffs. There is a particularly rich assemblage of beetles including *Drypta dentata* and *Colon serripes*. The rare crane fly *Eonomyia conoviensis* is also present within the undercliff vegetation.