CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

PEMBROKESHIRE	**ARFORDIR NIWGWL - ABER BACH/ NEWGALE - LITTLE HAVEN COAST**
Date of Notification:	2002
National Grid Reference:	SM 854207 – SM 854128
O.S. Maps:	1: 50, 000 Sheet number: 157 1: 10, 000 Sheet number: SM 81 NE & SE SM 82 SE
Site Area:	205 ha (approx.)

Description:

Arfordir Niwgwl - Aber Bach/Newgale - Little Haven Coast is of special interest for its geology and marine biology including specialised rockpool, cave, overhang and under-boulder communities, which enhance the interest of the rocky habitats. The special geological interests consist of exposures of Upper Westphalian rocks, a section through the Irish Sea till deposits and two important exposures of features developed during the Variscan orogeny. The site extends south of the popular tourist beach at Newgale on the north-east of St Brides Bay coastline, to Little Haven in the south-east. Adjacent villages include Broad Haven and Nolton Haven lying approximately eight kilometres from Haverfordwest.

GEOLOGY:

Upper Carboniferous: Nolton Haven Coast

This is the only section of the upper Westphalian (Carboniferous) rocks in the western part of the South Wales Coalfield. Nine beds yielding non-marine bivalves and nine plant beds allow the section to be correlated with the lower part of the Pennant Measures in the main part of the coalfield. They are thus middle Westphalian C to lower Westphalian D in age, and this is probably the best natural exposure of the Westphalian C - Westphalian D boundary in northern Europe. The full sequence is about 700m thick and confirms the general trend of increasing thickness of upper Westphalian strata towards the western part of the basin. The section here also shows that, as in the central part of the coalfield, the sediments were deposited in deltas spreading out from the south. This information, which can only be determined from this section, is of vital importance for understanding the development of the South Wales Coal-Basin**.**

Quaternary of Wales: Druidston

Druidston is a classic site on the west-facing shore of St Bride's Bay, containing the largest and best- exposed section through Irish Sea till deposits in south-west Wales. The exposures extend laterally for about 150m and comprise a blocky lower head overlain by up to 15m of Irish Sea till

and outwash deposits. The sections are capped by head and a sandy loam. The till at Druidston, which contains abundant wood and marine shell fragments and a wide range of exotic rock types, provides very clear evidence demonstrating the incursion of an ice sheet from the Irish Sea Basin into Pembrokeshire. Whilst the precise dating of events at Druidston has not yet been established, the sequence provides detailed evidence for changing environmental conditions during the Late Pleistocene, and the site may be regarded as a reference site for Irish Sea till deposits in south-west Wales.

Variscan Structures: Druidston Haven

The cliffs at this site provide important exposures of a fault-bounded block of Ordovician slates confined between Carboniferous strata. This configuration was produced by a phase of extension which immediately preceded the Variscan mountain building episode (orogeny). The principle interest of this locality lies in the complex fold and fault structures displayed by the Ordovician slates. Most of these structures were formed during the Caledonian Orogeny, about 100 million years before the Variscan Orogeny. During the Variscan mountain building episode these early structures were overprinted by a second set of structures which can be clearly distinguished at this locality. This is the only site providing accessible, high-quality exposures which demonstrate the superimposition of Variscan orogenic structures onto Caledonian structures. The importance of pre-existing Caledonian structures on the evolution of the Variscan orogenic belt in Britain has long been debated. This site is recognised as a key locality providing a unique opportunity to study this phenomenon in detail.

Broad Haven to Settling Nose:

This coastal section provides cliff and foreshore exposures of Carboniferous sandstones and shales distorted by a complex sequence of folds and faults. These structures formed during the Variscan mountain building episode (orogeny) at the end of the Carboniferous Period in response to intense compressive stress. This section is important in exemplifying the structural characteristics of one of the major structural zones of the Variscan orogenic belt in Pembrokeshire. At the northern end of the site, at Black Point and Settling Nose, a group of folds and thrust faults correspond with the northern margin of the Variscan orogenic belt. This feature, known as the "Variscan Front" has attracted debate and controversy for many years and an appreciation of its significance remains critical to understanding the Variscan orogenic belt in Britain.

BIOLOGY:

The site consists of sedimentary cliffs, a series of small sandy bays that lie between rocky headlands, intertidal bedrock, boulders and extensive areas of lower shore sandflats.

The vertical rock sides and overhangs on lower mid-shore rock are the most extensive and phylogenetically rich in south and west Wales and support a rich variety of animal species including purse sponge *Grantia compressa*, white lace sponge *Clathrina coriacea*, boring sponge *Cliona celata*, and sea squirts such as gooseberry sea squirt *Dendrodoa grossularia*, *Morchellium argus* and *Trididemnum cereum*. Some of these overhangs are dominated by shade tolerant red algae and include species such as *Plumaria elegans*, *Lomentaria articulata* and pepper dulse.

Rockpool communities of particular interest occur throughout the site. Those characterised by the coralline alga *Corallina officinalis* and brown alga *Bifurcaria bifurcata* are rare in south and west Wales and Nationally. Other species found in theses rockpools are the sea oak *Halidrys siliquosa*, carragheen moss *Chondrus crispus*, common prawn *Palaemon serratus*, snakelocks anemone *Anemonia viridis* and flat top shell *Gibbula umbilicalis*. Other rockpools include those that are sediment floored, containing sand tolerant seaweeds such as *Polyides rotundus* and *Dumontia contorta*, along with species such as green shore crab *Carcinus maenas* and snakelocks anemone. Deep wrack and kelp-dominated pools occur in areas on the extreme lower shore.

Cave communities along the bottom of the cliffs that are also of interest, support species such as *Catenella caespitosa*, encrusting red algae *Hildenbrandia rubra*, lichens *Verrucaria mucosa* and pygmy lichen, barnacles and small periwinkle *Melarhaphe neritoides*.

The upper sand shore in these bays supports communities dominated by amphipods *Bathyporeia* sp. and isopods such as *Eurydice pulchra*. The lower to middle shore supports communities of segmented worms including catworms *Nephtys* sp., lug worm *Arenicola marina* and sand mason worm *Lanice conchilega*, together with molluscs such as thin tellin *Angulus tenuis* and striped venus *Chamelea gallina*. Between the bays, areas of the extreme lower shore are colonised by kelps such as dabberlocks *Alaria esculenta*, oar weed *Laminaria digitata* and *L. hyperborea*. Amongst the kelps clusters of common mussel *Mytilus edulis*, dahlia anemone *Urticina felina* and gem anemone *Aulactinia verrucosa* occur. Further up the shore many of the lower shore rocks are dominated by serrated wrack *Fucus serratus* and turf-forming red algae such as pepper dulse *Osmundea pinnatifida* and carragheen moss *Mastocarpus stellatus* along with common mussel.

A mussel dominated zone occurs higher up the rocky shores and at the base of the cliffs backing the sandy bays. Further up the rock, mussels are replaced by a zone of barnacles *Chthamalus* sp. and *Semibalanus balanoides*, interspersed with limpets *Patella* sp and pygmy lichen *Lichina pygmaea*. In areas of increased shelter there is an occurrence of the fucoids spiral wrack *Fucus spiralis*, bladder wrack *Fucus vesiculosus* and channel wrack *Pelvetia canaliculata*. The lichen zone at the top of the cliff consists of black tar lichen *Verrucaria maura* with bands of yellow and grey lichens in the splash zone above.

Further inland the vegetated coastal slopes support a mixture of maritime grasslands dominated by red fescue *Festuca rubra*, containing species such as thrift *Armeria maritima*, buck's-horn plantain *Plantago coronopus*, cowslip *Primula veris* and sea campion *Silene uniflora*. Western gorse *Ulex gallii* and European gorse *U. europaeus*, and blackthorn *Prunus spinosa* dominate in areas, along with species such as burnet rose *Rosa pimpinellifolia*, occasional heather *Calluna vulgaris*, and spring squill *Scilla verna*.

Species of interest occurring within the maritime grassland, scrub, coastal crevice and shingle communities include maidenhair fern *Adiantum capillus-veneris* and invertebrates such as the craneflies *Limonia (Dicranomyia) goritiensis, Gonomyia conoviensis, Thaumastoptera calceata*, pyrallid moth *Dolicarthria punctalis*, hoverfly *Eumerus sabulonum* and ground beetle *Aepus robini*. Nationally scarce mosses and liverworts occur on some of the exposed rocks and slopes around fresh water seepages within the site. These include the mosses *Weissia perssonii, Bryum dunense, Tortula viridifolia*, and *Tortula atrovirens* and the liverwort *Cololejeunea minutissima*.

Breeding peregrine *Falco peregrinus* and over wintering greater horseshoe bats *Rhinolophus ferrumequinum* have also been recorded within the site.

Remarks:

The site lies entirely within the Pembrokeshire Coast National Park.

The site is a component part of Pembrokeshire Marine/Sir Benfro Fôrol Special Area of Conservation for its shallow inlets and bays, mudflats and sandflats not covered by seawater at low tide, reefs and sea cave features.

Greater Horseshoe Bats are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and on Annex IIa of the EC Habitats Directive (Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora).