

CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

GWYNEDD GLANLLYNNAU A GLANNAU PEN-Y-CHAIN I GRICIETH

Date of Notification: 1990, 2001

National Grid Reference: SH437353 to 500375

O.S. Maps: 1:50,000 Sheet number: 123
1:10,000 Sheet number: SH43 NE & NW

Site Area: 141.7 ha

Description:

This site is of special interest for its geological and marine biological features. It consists of an 8km length of shoreline with nationally and regionally important intertidal communities between the headlands at Pen-y-chain and Criccieth Castle. Geologically this site is important for the glacial deposits exposed along the coastal cliffs at Glanllynau and the associated glacial landforms found inland. The site is a south and south-easterly facing, moderately exposed mixed rock and sediment shore, the majority of which is backed by low soft sediment banks.

Geology:

Glanllynau is one of the most important sites for studies of the late Devensian in Wales. A low coastal cliff reveals a sequence of glacial deposits. The lowest layer is of grey till, interbedded at the top with stratified sediments; the upper part of this unit is weathered and contains ice-wedge structures. This is overlain by sand and gravel which shows folding and faulting. The uppermost layer is of till. At the top of the cliff, and inland, kettle holes contain a succession of late-glacial and early Holocene inorganic and organic deposits. The glacial sediments have been interpreted as the product of separate ice advances, but recent work has shown that the sequence can also be explained in terms of a single glaciation during the late Devensian. This site may therefore provide a valuable model for reinterpreting other multiple till sequences in Wales. Radiocarbon analysis and studies of pollen and Coleoptera in the late-glacial sediments further enhance the significance of the site for environmental reconstructions. Glanllynau has yielded the earliest radiocarbon date ($14,468 \pm 300$ Before Present) for deglaciation in Wales. Further, it is the only site in Wales where Coleoptera have been studied to produce a detailed palaeo temperature reconstruction.

Marine Biology:

The marine biology of the site is of special interest because the shoreline is the largest extent of moderately exposed mixed rock and sediment shore in the Bardsey Island to St David's Head Area of Search. In addition, it is the most typical, and has the best variety of biotopes (seashore and seabed habitats and their associated communities) expected to occur on this type of coastline. A complete community zonation of biotopes across the shoreline and a variety of specialised biotopes associated with rock and boulders occur on this shore. The nationally

important *Sabellaria alveolata* (marine worm) reef biotope, is found in extensive reaches with outcrops of the nationally important 'clay with Piddocks' (mollusc) biotope also present.

At the western boundary of the site are southerly facing rocky outcrops which show a good zonation from the splash zone to the lower shore. The upper zonation is represented by lichens such as the orange lichen, *Xanthoria parietina*, sea ivory *Ramalina siliquosa* and tar lichen *Verrucaria maura*. Below these and within the upper shore are acorn barnacles *Chthamalus montagui* and *Semibalanus balanoides* in association with bladder wrack *Fucus vesiculosus* on more sheltered outcrops and the common mussel *Mytilus edulis* in more exposed areas. On the mid to lower shore serrated wrack *Fucus serratus* dominates and is interspersed with the red algae, pepper dulce *Laurencia pinnatifida*, Irish moss *Chondrus crispus* and coral weed *Corallina officinalis*. Oarweed *Laminaria digitata* overlies these algae lower down the shore.

A similar distribution occurs across a wider intertidal area directly in front of the holiday centre and towards the mouth of the Afon Wen. This area is backed by soft sediment cliffs and artificial sea defences. Below this on upper shore cobbles and boulders the acorn barnacle *Semibalanus balanoides* occurs, with the sponge *Ophlitaspongia seriata* occurring in high densities below boulders. Bladderwrack dominates the mid shore. Rock outcrops in the lower shore are overlain by serrated wrack which is interspersed with coral weed *Chondrus crispus* and Irish moss *Mastocarpus stellatus*. The shrimp *Eulimnogammarus obtustus* occurs under cobbles in this zone. A small area of the nationally important biotope *Sabellaria alveolata* (honeycomb worm) reef occurs within the lower wrack area.

Areas of sand on this shore are also well zoned. At the rear of the shore is a narrow strandline with the sand hopper *Talorchestia deshayesii* above a narrow band of barren sand. A relatively wide expanse of upper to mid shore sediment is dominated by lugworm *Arenicola marina*, catworm *Nephtys* species and amphipods. Mid to lower shore sediments are dominated by sand mason worms *Janice conchilega* and catworms. A rich bed of sea potatoes *Echinocardium cordatum* and pod razor shells *Ensis siliqua* occur on the lower shore. The small sandy coves between the rocky outcrops exhibit reduced zonation but include sea potato and a small bed of eelgrass *Zostera* species.

With the exception of the Afon Dwyfor mouth, the shore to the east of and including Glanllynau, shows a characteristic zonation of dominant biotopes as far as the promontory at Criccieth. The base of the predominantly unprotected soft earth cliffs exhibit a narrow banding of strandline dominated by sand hoppers *Talorchestia deshayesii* or *Talitrus saltator* with barren sand immediately seaward. A high proportion of the shore here is made up of boulders, the mid to upper shore is dominated by various biotopes which always include bladderwrack. Under boulder species include the breadcrumb sponges *Halichondria panicea* and *Hymeniacidon perleve*, the broad clawed porcelain crab *Porcellana platycheles*, and fauna such as beadlet anemone *Actinia equina*, sea squirt *Botryllus schlosseri*, long clawed porcelain crab *Pisidia longicornis*, dog whelk *Nucella lapillus* and the barnacle *Verruca stroemia*. The winkle *Littorina littorea* and the acorn barnacles *Semibalanus balanoides* and *Chthamalus montagui* are common throughout. Overhangs on stable boulders and cobbles to the west of Criccieth Castle headland support sponges such as *Hymeniacidon perleve*, *Halichondria panicea*, *Ophlitaspongia seriata* and *Leuconia nivea*, the bryozoa *Electra pilosa*, and *Bugula* sp. and the worm *Sabellaria alveolata*. The lower shore is invariably dominated by serrated wrack with the red algae Irish mosses *Mastocarpus stellatus* and *Chondrus crispus*. Areas of sand between boulders are usually dominated by lugworm, catworm and amphipods. However damp barren sands are

occasionally replaced by reduced amphipod communities with the polychaete worm *Scolelepis squamata*. Additionally, narrow low shore bands of razor shell *Ensis siliquosa* and sea potato occur towards the western fringe of the Afon Dwyfor. Of special interest are the well formed reefs of the nationally important biotope *Sabellaria alveolata* (honeycomb worm). These extend for c. 2.5 km along the mid and lower shore.

At the mouths of both the Afon Wen and Afon Dwyfor, typical zonation of both rock and sand biotopes is interrupted, with large areas of either barren sand or ephemeral green algae predominating within areas of fresh water influence. The nationally important Piddocks in clay biotope with *Barnea candida* (a mollusc) occurs in small outcrops of clay near the Afon Wen. Beds of common mussel are abundant at the mouth of the Afon Dwyfor.

Bonus features include a cobble bank in front of Glanllynau which contains a deep rockpool holding species more commonly found in sublittoral areas. Seaweed species include *Cystoclonium purpureum*, sea beech *Delessaria sanguinea*, *Hypoglossum woodwardii*, *Taonia atomaria*, *Dictyota dichotoma* and *Dictyosiphon* agg.. In addition this area and the littoral region to the east is a popular seal haul out. A further bonus feature is the occurrence of small beds of seagrass *Zostera* species below the low water mark at Pen-y-chain.

Remarks:

The intertidal section of this site is part of the Pen Llŷn â'r Sarnau Special Area of Conservation (SAC) under the EC Habitats Directive (Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna).

Sabellaria alveolata reefs are a Biodiversity Action Plan habitat.

*This document is **NOT** a definitive legal version and has been formatted, updated and partially edited for use on the CCW Web site. This document should not be used in any legal proceedings, public enquiry or any other hearing or appeal. If you require a full legal copy of the document please contact CCW in writing.*