

SITE NOTIFIED TO THE SECRETARY OF STATE ON THE 26TH MAY 1995

COUNTY: CORNWALL **SITE NAME:** AIRE POINT TO CARRICK DU

DISTRICT: PENWITH

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

Local Planning Authority: Cornwall County Council, Penwith District Council

National Grid Reference: SW 360279 to SW 513410 **Area:** 704.81 (ha.)

Ordnance Survey Sheet 1:50,000: 203 **1:10,000:** SW 32 NE, SW 33 SE,
SW 33 NE, SW 43 NW,
SW 43 NE, SW 44 SE,
SW 54 SW

Date Notified (Under 1949 Act): 1972 **Date of Last Revision:** –

Date Notified (Under 1981 Act): 1995 **Date of Last Revision:** –

Other Information:

Site added in the 1972 Supplement, includes the former Botallack Head to Cape Cornwall SSSI (first scheduled in 1967), Gurnard's Head and Porthmeor Cove, and Trevega and Trowan Cliffs SSSI (first scheduled in 1951). Includes Nature Conservation Review Site and eight Geological Conservation Review Sites. Site previously known as 'Cape Cornwall to Clodgy Point' SSSI. Boundary amended by extensions and deletions. In Cornwall Area of Outstanding Natural Beauty. Within Penwith Heritage Coast. Partly within West Penwith Environmentally Sensitive Area. Parts owned by the National Trust.

Description:

Introduction:

Aire Point to Carrick Du is located on the west and north coast of the Penwith peninsula, extending from a point approximately 3km north east of Land's End to St Ives. The site is dominated by vertical sea cliffs formed by the Land's End granite mass. The cliffs are topped by steep slopes punctuated by sheer castellated granite caps. Associated Devonian slates and basaltic rocks, altered by the intrusion of the granite, display fine examples of the effects of contact metamorphism. The soils, which are often thin, are generally acidic, well drained with a gritty, loamy texture and a humic surface horizon. Iron panning has impeded drainage locally and peaty soils have developed where wet flushes occur. Exposure to salt spray and the prevailing south westerly winds have resulted in a dwarfed vegetation. The site supports populations of Red Data Book (RDB) (*) and nationally scarce plants and animals.

Geology:

The rocks exposed at the coast between Aire Point and Carrick Du show an unparalleled range of geological features associated with the igneous activity affecting Britain in the Variscan Orogeny.

During the early part of the orogeny, Britain was in an area of active extension in the Variscan foreland, where basinal oceanic crust formed. Between Carrick Du and Clodgy Point, the minor cliffs and platforms of both areas exhibit lenticular, variably flattened and sheared pillow lavas (intercalated with sediment), formed in a foreland basin and now within the Land's End Granite aureole. The lavas are characteristic of the low-grade effects of contact metamorphism and are now predominantly spotted

actinolite hornfels cut by late hydrothermal amphibole veins. Although the lavas have been affected by pre-granite deformation and metamorphism, they retain and display in a variety of cross-sections many features indicative of an extrusive submarine origin. Igneous rocks of this age are also found at Gurnards Head. Two large masses of basic igneous rocks (greenstones) are separated by a zone of laminated purplish metasediment with variably developed adinoles at the upper contact. Change from massive to pillowed greenstone can be seen in the upper body. The greenstones are thermally metamorphosed by the Lands End Granite. A particular feature is the development of metasomatic biotite replacing amphibole, together with diopside in relict vesicles.

In the later stages of the Variscan orogeny, crustal shortening was accompanied by intrusion of the Cornubian batholith, a major part of which is the Land's End Granite. At Porthmeor Cove, two small granitic bodies are the only well-exposed complete cupolas known to occur in the Permo-Carboniferous Cornubian granite. The more southerly of these 'mini-plutons' is the more accessible and is composed of megacrystic biotite granite with an aphyric, slightly banded, variant in its central part. A roofing pegmatite zone demonstrates the effects of late-stage concentration of volatiles and *in situ* differentiation. The plutons and associated dykes illustrate, in microcosm, many characteristic features and processes associated with the emplacement of the Cornubian granites.

The classic section of the Land's End granite aureole is at Botallack Head to Porth Ledden, and contains various exotic metamorphic and metasomatic assemblages of calcium rich and iron+magnesium rich hornfels, developed from massive and pillowed greenstones. In the south of the coastal section is a contact with underlying sediment and in Porth Ledden, the marginal tourmalinised facies of the megacrystic Land's End granite. The area is well-known for the development of cordierite-anthophyllite, cummingtonite-plagioclase and diopside-grossularite assemblages from degraded greenstones, as well as more normal biotite-hornblende hornfels assemblages of high grade contact metamorphism. Replacement textures and gradational assemblages between the normal contact hornfels and the more exotic assemblages are displayed. The mineralised area of the Crowns demonstrates that late-stage mineralisation was associated with localised metasomatism involving calcium-boron-fluorine rich fluids. At Cape Cornwall, the emplacement of the Land's End granite in two distinct pulses induced tilting and thermal metamorphism of the country Mylor Formation mudstones. An unusual feature is the presence locally of corundum (sapphire), which can be seen in the cliffs above Priest's Cove. Volatile migration along the granite contact affected a potassium metasomatism resulting in the production of feldspar megacrysts and pegmatitic bands and pods. Later-stage boron-rich fluids produced lenses of quartz-tourmaline rock. Finally, greisen-bordered veins were emplaced. A particularly important site for the late-stage igneous activity and its relationship to the subsequent mineralisation is at Priest's Cove. Here, a faulted contact between the megacrystic Land's End granite and Mylor metasediments has been mineralised and hydrothermally brecciated. Two joint sets in the granite are occupied by early pegmatites and later quartz-tourmaline, greisen-bordered veins carrying mineralisation. The relationships of several periods of mineralisation and pegmatite development to several different types of granite are exposed in the extensive rock-platform at the base of the cliff. The importance of the site lies in the evidence it provides on the relationship of magmatic tourmalinisation to later hydrothermal growth of tourmaline associated with tin mineralisation.

The cooling of the Cornubian granite was accompanied by extensive tin and copper vein mineralisation. There are superb examples of tin vein material from spoil tips at Wheal Cock in the Botallack Mine and Wheal Owles section. These contain amethystine quartz along with rare beryllium and copper chloride minerals. The tips are the world type locality for botallackite and paratacamite. Roscommon Cliff (Wheal Cock Zawn) is the world type locality of the rare tin silicate mineral stokesite. Wheal Owles dumps have also yielded interesting minerals, particularly the western section of the mine at Wheal

Edward where rare uranium minerals are recorded. Opencast tin working at Gryll's Bunny expose the only example of a 'tin floor' deposit on view in England, whilst the cliffs between Crowns Mine Engine House and De Narrow Zawn expose several tin lodes. This is an internationally important locality demonstrating the varying styles of mineralisation seen in the tin zone and lower part of the copper zone. The mineralisation clearly postdates both the Variscan granites and the contact metamorphic effects seen in the cliff sections.

The cliff and foreshore at Porth Nanven is important for Quaternary geomorphology and stratigraphy, providing a particularly good example of an unusual type of raised beach facies, namely a raised boulder beach. It comprises a coarsening-up sequence of deposits with an upper two-metre thick layer of boulders (up to 0.6m long), overlying four metres of smaller cobbles and gravels. The beach deposits are overlain by a substantial thickness of fining-upwards head, with coarse angular boulders at the base. The deposits at Porth Nanven demonstrate Quaternary changes in relative sea-level, wave energy, sediment supply and climate.

Biology:

The vegetation of the cliffs exhibits a complex of maritime and sub-maritime communities. The cliff slopes and tops are characterised by maritime grassland, heath and scrub communities with frequent species rich flushes, particularly on the north coast.

The cliff faces support a maritime rock-crevice community with thrift *Armeria maritima*, rock samphire *Crithmum maritimum*, sea aster *Aster tripolium* and sea spleenwort *asplenium marinum* as common components. On the shallow soils of rock ledges and outcrops, a maritime therophyte community occurs where typical species include English stonecrop *Sedum anglicum*, thrift, buck's-horn plantain *Plantago coronopus*, and kidney vetch *Anthyllis vulneraria*.

The grassland communities of the cliff slopes are dominated by red fescue *Festuca rubra* which often forms a matresy sward, and Yorkshire fog *Holcus lanatus*. Thrift, wild carrot *Daucus carota*, sea campion *Silene maritima*, sea plantain *Plantago maritima* and oxeye daisy *Leucanthemum vulgare* are common. Where trampling occurs, or on thin soils, the grassland is characterised by buck's-horn plantain, ribwort plantain *Plantago lanceolata*, kidney vetch and spring squill *Scilla verna*. Bluebell *Hyacinthoides non-scripta* is found in more sheltered areas and on upper slopes where it is typically associated with coarse grasses, mainly cock's-foot *Dactylis glomerata* and scrub communities.

Extensive areas of heath occur generally higher up the cliff profile and on the cliff tops. These are dominated by heather *Calluna vulgaris*, bell heather *Erica cinerea* and western gorse *Ulex gallii* and often display the waved structure characteristic of exposure to salt-laden winds. Spring squill, common bird's-foot-trefoil *Lotus corniculatus*, sheep's bit *Jasione montana* and wild thyme *Thymus drucei* are abundant.

The maritime communities support the RDB (*) species eyebright *Euphrasia vigursii* and early meadow grass *Poa infirma* and nationally scarce plants including lanceolate spleenwort *Asplenium billotti*, hairy bird's-foot-trefoil *Lotus subbiflorus* and pale dog-violet *Viola lactea*.

Between Boscaswell Cliffs and Clodgy Point the site is characterised by a number of wet flushes and can extensive area of mire at Boswednack. The flushes are dominated by purple moor grass *Molinia caerulea* and typical species occurring include cross-leaved heath *Erica tetralix*, tormentil *Potentilla erecta*, sharp-flowered rush *Juncus acutiflorus* and royal fern *Osmunda regalis*. Other species of note associated with the wet flushes include bog asphodel *Narthecium ossifragum*, cottongrass *Eriophorum angustifolium* and pale butterwort *Pinguicula lusitanica*. The nationally scarce plants

Cornish moneywort *Sibthorpia europaea* and yellow bartsia *Parentucellia viscosa* are found at Boswednack.

Scrub communities, including pure stands of bracken *Pteridium aquilinum* occur on the cliff slopes and tops and particularly in the valleys. European gorse *Ulex europaeus*, bramble *Rubus fruticosus* and blackthorn *Prunus spinosa* are frequent, associated with cock's-foot, bluebell and, locally, honeysuckle *Lonicera periclymenum* and ivy *Hedera helix*.

The site supports a typical Cornish cliff bryophyte flora and includes a number of rarities, most notably the RDB (*) moss *Tortula solmsii*.

The west facing section of the coast between Aire Point and Kenidjack Castle displays examples of fully exposed rocky shore communities. The plants and animals are typical of a wave beaten coast with the lower shore characterised by the brown seaweeds dabberlocks *Alaria esculenta*, tangle *Laminaria digitalis* and pools containing coralline algae *Corallina officinalis* and pink encrusting *Lithothamnion spp.* Limpets *Patella aspera* are abundant and barnacles, mainly *Chthamalus stellatus*, are plentiful on the upper shore.

The range of land habitats, many of which are floristically rich, support a diverse and abundant invertebrate fauna, including RDB (*) species: mud snail *Lymnaea glabra*, a bug *Heterogaster artimisiae* and a hoverfly *Microdon mutabilis*. Nationally scarce butterflies including the pearl-bordered fritillary *Boloria euphrosyne* and silver-studded blue *Plebejus argus* and the nationally scarce jewel beetle *Trachys troglodytes* also occur.

Cliff ledges provide nesting sites for seabirds including fulmar *Fulmaris glacialis*, shag *Phalacrocorax aristotelis*, kittiwake *Rissa tridactyla* and gulls *Larus spp.* Peregrine *Falco peregrinus* and raven *Corvus corax* nest on secluded cliff slopes and carns. Areas of scrub on the cliff tops and in the valleys provide nesting sites for many species, including stonechat *Saxicola torquata* and warblers such as whitethroat *Sylvia communis* and sedge warbler *Acrocephalus schoenobaenus* Grasshopper warbler *Locustella naevia* breeds in the scrub associated with the mires at Boswednack, which also provides suitable conditions for wintering water rail *Rallus aquaticus*, woodcock *Scolopax rusticola* and curlew *Numenius arquata*. The location of this site at the southern-western tip of the British mainland makes it an important resting and feeding area for migratory birds, the more sheltered valleys being of particular importance.

Grey seals *Halichoerus grypus* are known to breed on this stretch of coast. Offshore islands, notably The Brisons and The Carracks, provide haul out sites for this species. The disused mines provide roosting sites for bats, including the greater horseshoe bat *Rhinolophus ferrumequinum* and Daubenton's bat *Myotis daubentonii*.

(*) These plants and invertebrates are included in the Red Data Book listing of rare and endangered species.