Hook Head

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Introduction and Location

Hook Head (Grid Ref: S 73 97) is a long, narrow, low headland located at the western end of the South Wexford Coast in the south-east corner of the island of Ireland. The seaward end of the Hook peninsula is 5km long, is about 1km wide and has a maximum altitude of just 16m[1 & 2].

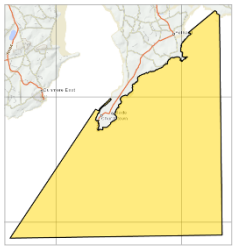
Location map: screenshot from https://maps.wexford.ie/imaps/. Ordnance Survey Ireland Permit No 9018.

Meaning of the placename

The placename in English is 'Hook Head'; in Irish 'Rinn Duáin'[3]. 'Rinn Dubháin' was the placename in use to the late Middle Ages. Dubhán was a fifth century Welsh monk who established a monastic foundation on the headland. Rinn in Irish means 'a headland' so the area was called Rinn Dubháin after Dubhán[4]. Dubhán's feast day is celebrated on 11 February[5]. The church ruin at Churchtown (pictured), formerly the medieval parish church of Hook, is dedicated to St Dubhán[6]. The similar-sounding word 'duán' is the Irish for a fishing hook so Hook Head is interpreted as an incorrect translation of 'Rinn Dubhán'[5].

Definition

From a nature conservation perspective the site known as 'Hook Head' is candidate Special Area of Conservation (cSAC) No IE000764 comprising the eastern sea cliffs of the peninsula, part of the western extremity of Ballyteige Bay and an extensive area of seabed offshore (see page 3 below for details). The grid on the map (right) has sides 10km long.



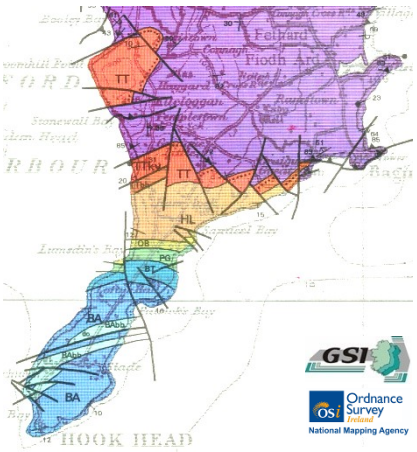
cSAC site: screenshot from http://webgis.npws.ie/npwsviewer//. Ordnance Survey Ireland Permit No 9018.

The foundation of rock

The bedrock geology is diverse[7, 8 & 9]. The landward base of the peninsula is underlain by mudstones and siltstones dating from the Cambrian Period (541-485 million years ago) (purple colour on the map below).

Rocks from both the Ordovician Period and the Silurian Period are absent so there is a gap or discontinuity of some 66 million years.

The remainder of the rocks date from the Devonian Period (419-359 million years ago) when the area was above sea level (orange and pale brown) and the Carboniferous Period (359-299 million years ago) when the area slowly sank beneath the waves (greens and blues). At low tide it is possible to walk along the seashore and see excellent exposures of rocks of seven different formations in the 120-million-year succession from the sandstones of the land-based Devonian deserts to the limestones of the underwater shallow shelf of the Lower Carboniferous sea.



Bedrock geology: Tietzsch-Tyler and Sleeman, 1994. Geological Survey of Ireland permission and Ordnance Survey Ireland Permit No 9018. © Ordnance Survey Ireland/Government of Ireland.

Devonian fossils

The late Devonian rocks at Hook Head have yielded evidence of forests of tree ferns called lycophytes. *Wexfordia hookense* is a small, woody, fossil tree first discovered during the summers of 1982 and 1983 at Sandeel Bay (pictured below) and is known only from that location [10 & 11]. Another fossil tree, *Archaeopteris hibernica*, a progymnosperm, formed extensive tall forests in Ireland and has been recorded from mudstones on Hook Head. Both of these ancient fossil trees date from very late in the Devonian Period over 350 million years ago.


Sandeel Bay

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SWC Promotions: promoting the natural heritage resource values of the South Wexford Coast.

Carboniferous fossils

The thick beds of Carboniferous limestones support a diverse range of fossils of life forms that lived on a carbonate ramp in a shallow, sub-tropical sea. Many hundreds of species have been identified. Sea lilies (crinoids and blastoids), lamp shells (brachiopods), sea mats (bryozoans) and corals comprise the dominant element of the fauna. Sea shells (bivalves), sea snails (gastropods), nautiloids, trilobites, sea urchins, sharks' teeth and several micro-fossils have also been recorded.

Hook Head is important for the study of crinoid and sea urchin fossils as their presentation is unrivalled elsewhere[12].

Hook Head lighthouse

Limestone rock can be examined and fossils may be found on the surface of the bedrock exposed around the tip of the headland by the lighthouse. For their safety, visitors should keep away from cliff edges and be aware that freak waves can occur. Rock outcrops should not, of course, be hammered or damaged in attempts to remove fossils as souvenirs.

All of the rocks near the lighthouse belong to the Ballysteen Formation, are rich in fossils and are inter-bedded limestones and shales.

Limestone and shale rock

Limestone is a sedimentary rock rich in lime. The limestones found at Hook Head formed underwater on a lime-rich shelf in a warm, shallow, sub-tropical sea.

The seabed consisted of mud, clay and fine silt deposited by southward-flowing rivers from mountains that lay to the north and east. These sediments teemed with life. Carbonate minerals formed naturally in seawater but being poorly soluble they precipitated out and became part of the sediment. Many life forms also extracted lime from the seawater and used it to form hard parts of their bodies, shells, etc.

The most common fossils at Hook Head are fragments of the lime-rich skeletons of dead marine animals. Such fragments of skeletons are called bioclasts. Undersea currents, probably generated by periodic storms, worked and reworked the bioclasts gathering them up, transporting them and incorporating them into the surface layers of the beds of muddy sediment to form bioclastic limestones.

Shale is a fine-grained rock formed by the compaction of clay or silt and splitting readily along closely-spaced, parallel planes.

Fossil brachiopod shells.

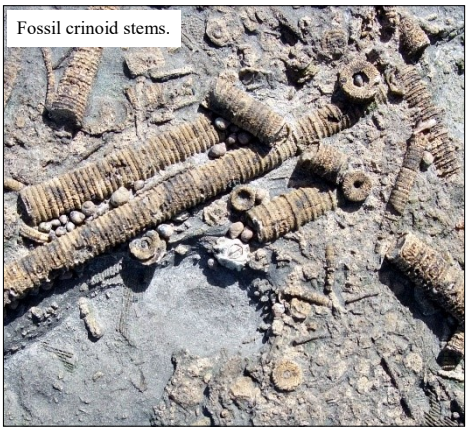
The parent materials of limestone rock were laid down on the sea floor in a multi-storey succession of thin horizontal beds. These beds were subsequently distorted and tilted and are now dipping gently to the south.

The rock-forming process was repeated in a regular way resulting in the multi-storey succession of regularly-stacked beds of alternating limestone and shale that we see today. The beds were originally laid down horizontally but a subsequent mountain-building event called the Variscan Orogeny tilted the beds causing them to dip gently to the south[13].

Sea lilies or crinoids

Sea lilies or crinoids are marine animals related to starfish. In the adult form, the upside-down 'starfish' was supported on a stalk or stem attached to the sea floor.

In shape, fossil crinoid stems are long, narrow cylinders. They look somewhat like bolts. In side view they are rectangular; in section they are either circular or elliptical. Forty-eight species of crinoid, including several new ones, have been recorded at Hook Head[14 & 15].



Fossil crinoid stems.

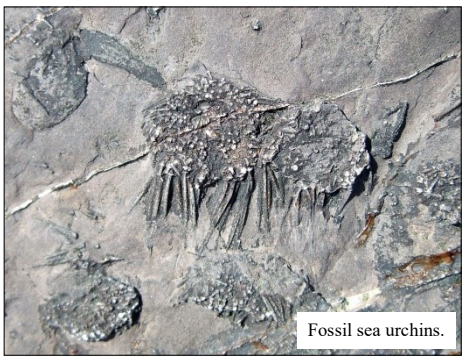
Like a field of lilies waving in the breeze, colonies of crinoids swayed in the current of the Carboniferous seas waving their arms in the plankton-rich water feeding on suspended particles of food.

Other fossils

Beds of limestone of different ages support different communities of fossils and these beds can be dated in that way.

The rocks immediately south of the lighthouse and north-east to Conigear are part of 'the *Linoproductus* beds'[16]. These beds are characterised by a well-defined fauna dominated by the presence of fossil brachiopods or lamp shells belonging to the extinct genus *Linoproductus* together with several other brachiopods, large horn corals, crinoids, sea shells and sea urchins.

These beds are believed to be about 340 million years old.



Fossil sea urchins.

Somewhat like a modern oyster shell or scallop shell, *Linoproductus* shells are distinctive in that one valve is strongly convex and the other valve is slightly concave. The strongly convex valve is very finely ribbed. The *Linoproductus* beds at the lighthouse dip very gently (8-10^0) to the south[16].

Modern sea bed sediments

Today, the nearshore sea floor is a complex mosaic of exposed rock and sediments from the last ice age strewn with wave-worked sands and gravels[17].

Sunny South East

Regional differences in climate in Ireland are small but can be biologically significant. In general, the South Wexford Coast differs from national averages in that it tends to be drier (rainfall 800-1000mm/year) with fewer rain days (<150/year), milder (mean temperature 10-11°C/year) and much sunnier (bright sunshine >1550 hours/year)[18].

Soils

The soils at Hook Head are Luvisols and well drained Brown Earths[19].

Drainage

The Hook peninsula is part of the Ballyteige/Bannow Water Management Unit. The landward end of the peninsula is drained by three small streams: the Tintern Abbey Stream disgorging at Saltmills, the Battlestown Stream disgorging at Poulfur and the Graigue Great Stream disgorging at The Glen, Fethard.

The status of water quality in the streams is rated Moderate to Poor[20]. The seaward end of the peninsula is exceptionally flat and low-lying (<16m) and is drained directly to the sea.

Coastal erosion

Being rocky, the annual rate of coastal erosion is negligible[21].

Nature conservation

In 2000, an area of 16,940.17ha comprising about 15km of the eastern coastal fringe of the peninsula and a large area of offshore seabed were designated candidate Special Area of Conservation (cSAC), Site Name: Hook Head, Site Code: No IE000764, for the following three habitat types of European Community interest annexed in the 1992 EU Habitats Directive (92/43/EEC):

- Large shallow inlets and bays (Code 1160; area 1,694.02ha),
- Reefs (Code 1170; area 5,929.06ha) and
- Vegetated sea cliffs of the Atlantic and Baltic coasts (Code 1230; area 169.40ha).

Nearly all (99.78%) of the cSAC is marine. The vertical extent of the protected area extends from a clifftop altitude of +34m to a submarine depth of -42m[22].

In 2016, Hook Head was identified a County Geological Site (CGS) and was recommended for designation as a geological Natural Heritage Area (NHA)[23].

Vegetated sea cliffs

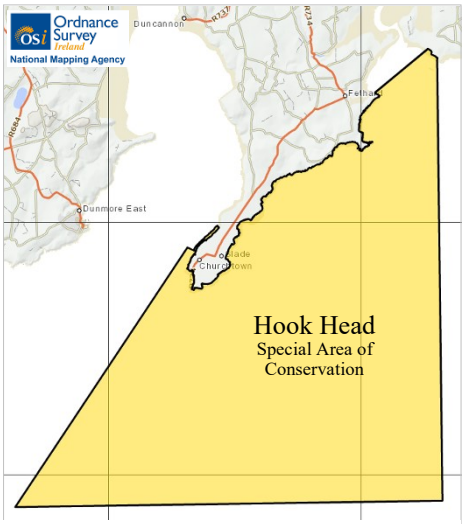
The cliffs extending northwards from Hook Head to Ingard Point and Fethard Dock are rated a good-quality Irish example of the EU Annex 1 habitat type 'Vegetated sea cliffs of the Atlantic and Baltic coasts (1230)'.

Most of the cliffs are relatively low (10-20m) but they rise to 30m at Baginbun[22].

Some 300 species of wild plants have been recorded on the Hook peninsula[24]. Notable species on the cliffs include Golden-samphire *Inula crithmoides* (pictured below), Rock Sea-lavender *Limonium binervosum*, Rough Clover *Trifolium scabrum,* Western Clover *T. occidentale* and Wild Madder *Rubia peregrina*[25].

Marine life in the bay

The habitat type 'Large shallow inlets and bays (1160)' is represented by part of the western portion of Ballyteige Bay. The seabed of that large, south-facing bay supports diverse underwater communities of both fine and coarse sediment. Communities associated with both exposed, tide-swept patches of gravel and moderately exposed silty sand with only weak tidal streams are also well represented[26].



cSAC site: screenshot from http://webgis.npws.ie/npwsviewer//. Ordnance Survey Ireland Permit No 9018. © Ordnance Survey Ireland/Government of Ireland.

On the rocks

Reefs (1170) are exposed bedrock both on the seabed and on the seashore. Rock pools on the shore support a diverse flora and fauna. Underwater *"The reefs around Hook Head have excellent examples of tide-swept communities and species richness is high in both shallow and deep-water communities"*[26]. The reefs and surrounding seabed are notable for the following 13 species[22 & 26].

- *Schizymenia dubyi*, a red seaweed
- *Axinella dissimilis*, a sponge
- *Aglaophenia kirchenpaueri*, a hydroid
- *Gymnangium montagui*, another hydroid
- *Alcyonium glomeratum*, a soft coral
- *Eunicella verrucosa*, a sea fan
- *Isozoanthus sulcatus*, a tiny sea anemone
- *Crimora papillata*, a sea slug
- *Pentapora foliacea*, a sea mat
- *Amphiura securigera*, a brittle star
- *Neopentadactyla mixta*, the Gravel Sea Cucumber
- *Distomus variolosus*, the Lesser Gooseberry Sea Squirt
- *Stolonica socialis*, Orange Sea Grapes, another sea squirt

Conservation objectives

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of European Community interest. Targets for various attributes have been published by the National Parks and Wildlife Service for the conservation of each of the three habitat types that the Hook Head cSAC has been designated for[27].

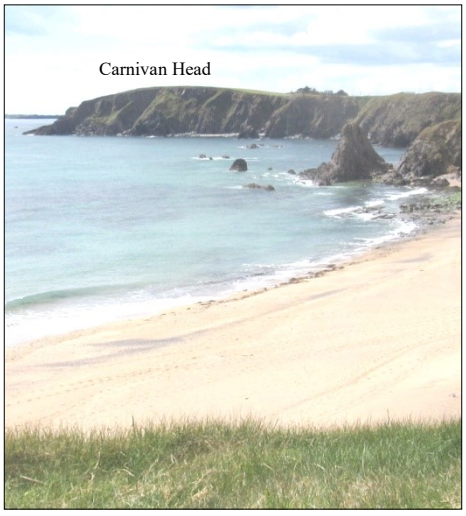
Wild birds

Over 200 species of wild bird have been recorded in the Hook Head area[28].

Since the peninsula is one of the closest landfalls to Britain and mainland Europe, Hook Head is an important entry and exit point for migrant birds arriving from and departing to southern climes. The main arrival and departure times for migrants are mid-April to mid-May and late August to early November respectively. The best time for seeing spring migrants arriving is early morning between mid-April and mid-May, especially after an extended period of south-easterly winds and following a night with fog and late rain.

The fact that it sticks out into the sea, the headland is also a good spot for sea watching for passing seabirds.

In addition to breeding Peregrine Falcon, Raven and Chough, the cliffs near Carnivan Head (pictured below) and Baginbun Head support small colonies of breeding seabirds including Northern Fulmar, European Shag, Herring Gull, Great Black-backed Gull, Black Guillemot, Common Guillemot and Razorbill.



Cetaceans

Cetacean is an umbrella term for whales, dolphins and porpoises.

Twenty-five species of cetacean have been recorded in Irish territorial waters; 16 of them on the South Wexford Coast.

Hook Head is regarded a hot spot for seeing large whales[29]. Herring and Sprat shoal off Hook Head and Baginbun Head in January and February and Fin Whales and Humpback Whales irregularly arrive to feed on the shoaling fish. The movement of whales along the south coast of Ireland mirrors the movement of fish as they move eastward to their shoaling grounds[30]. The feeding whales are regularly accompanied by dolphins. The presence of the fish also attracts Grey Seals and seabirds. Sightings of cetaceans at Hook Head are logged on a very regular basis and can be followed on the website of the Irish Whale and Dolphin Group[29].

Golden-samphire *Inula crithmoides* a rare and local wild plant.

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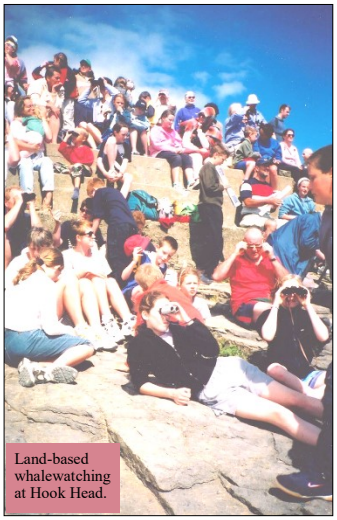

Land-based whalewatching at Hook Head.

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Nature conservation

The National Parks and Wildlife Service (NPWS), one of the technical services of the Department of Arts, Heritage and the Gaeltacht, is the central government body responsible for nature conservation in the Republic of Ireland.

A description or 'Site Synopsis' of the Hook Head protected area is available on the NPWS webpages together with the Natura 2000 Standard Data Form, Conservation Objectives for the site, map, aerial photo and supporting documentation[31].

Visiting Hook Head

Information about visiting Hook Head may be accessed at http://hookheritage.ie/ and http://hookpeninsula.com/.

Concerns regarding nature conservation should be addressed to Tony Murray, the local National Parks and Wildlife Service (NPWS) Conservation Ranger, e-mail Tony.Murray@ahg.gov.ie, telephone (076) 100 2662.

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Petit's Bay near Baginbun Head.