

**FIELD GUIDE TO
FOSSIL COLLECTING
AT WALTON-ON-THE-NAZE
IN ESSEX**







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The town of Walton-on-the-Naze, in northern Essex is bordered along its northern edge by a stretch of rapidly eroding cliffs and foreshore known as The Naze. The Naze tower is a prominent landmark and the car park, situated in Old Hall Lane, CO14 8LJ is right next to it. Erosion along this stretch of coast is prevalent and has caused the cliff to retreat as much as 0.5 metres per year in recent years. Buildings and land are threatened, as a result.

The clays and sands exposed in the cliffs of the Naze are highly fossiliferous although sometimes the site can be disappointing, despite fossils occurring in the rocks found here. The Naze area is blessed with rocks from two formations; the London Clay and the Red Crag. The location has been of interest to scientists and fossil collectors for hundreds of years, especially as there are rare bird fossils to be found here. As a result, the site has been awarded an SSSI status (Site of Special Scientific Interest), meaning that there is to be no digging in the cliff or bedrock. Only ex-situ (i.e. loose) fossils can be picked up and collected.

The London Clay Formation exposed here represents a time in the Earth's history when life was abundant, During Eocene times the nearby land was covered by lush tropical vegetation, providing habitat for mammals, birds and insects, whilst in the sea marine life also flourished. The Red Crag exposed above the clay was deposited much later in a warm, shallow sea, very close to land around 2.5 mya during the Piacenzian Stage of the Pliocene epoch.

This fossil-rich site needs little in the way of equipment, in order to collect. For the most part it's a hands and knees operation, sorting through the pyrite accumulations on the beach. A small penknife or similar for prising fossils from the clay, along with some collection boxes or bags will suffice.

GEOLOGY

The cliffs at the Naze are a geological Site of Special Scientific Interest. They are constantly slumping and eroding due to layers of Red Crag and Tertiary and Quaternary sands and gravels overlaying London Clay.

Due to the difference in their consistency and age these erode at different rates and reveal many different sorts of fossil. The London Clay can be seen running out into the beach at the base of the cliff. This material is about 50 million years old and is renowned for its early bird fossils, hence the site's SSSI designation. Over 150 bird species had been discovered.

The London Clay Formation is approximately 54 million years old, whereas the Red Crag is more recent formation at around 2.5 mya. The London Clay is exposed right across the foreshore; a bluish grey clay, which is extremely sticky. It was laid down beneath a warm, shallow sea during the early Eocene Epoch of the Palaeogene Period. It provides a stark contrast to the vivid red-orange colour of the Red Crag, which was laid down on top of the clay around 51 million years later. In the interim, the London Clay was eroded and the more resistant material, such as pebbles, phosphatic nodules and robust fossils were left behind, to form a pebble bed upon which the Red Crag could be laid down.





This unconformity is known as the Pebble Bed and is also referred to as the 'junction Bed'. Today, the Junction Bed is often obscured beneath loose material but it actually forms a distinct layer of several centimetres in thickness, which can contain fossils derived from earlier (now absent) sediments. The Red Crag was laid down on top of the Pebble Bed and comprises a shelly, quartz-rich sand, stained orange with iron oxides, deposited in a warm, shallow sea very close to land around 2.5 mya.

The beach entry point lies next to the Naze Tower and once at beach level turn left (if facing the sea). This is the best place to start looking. Gradually work your way along the foreshore. The London Clay yields a large volume of pyritised material which accumulates as loose pebbles in narrow channels and holes eroded into the foreshore, which is a good place to search. Also search among debris washed into the many small embayments along the cliff line for accumulated material. As with all coastal locations a fossil hunting trip is best timed to coincide with a falling or low-tide.







The London Clay Formation at Walton-on-the-Naze mostly yields shark teeth, fossilised twigs and small vertebrae of fish. Twigs and fragments of wood begin to wash out of the clay and, at first retain a proportion of carbon which soon washes away to leave the pyrite behind. These are then sorted by wave action into the pyrite drifts that accumulate on the beach. Here is a representative sample of the fossils from this formation.



Jaekelotodus londonensis



Isurolamna affinis



Otodus obliquus



*Anomotodonn sheppeyensis*_



Lamniform Shark
vertebra



Otodus sp.

Squatina prima



*Odondaspis winkleri*_





***Nipa* palm fruit with pyrite disease**

Fossils from the Red Crag Formation are mostly restricted to the left-handed spiral shells of the whelk, *Neptunes* and bivalves, although other fossils do occur. Here are some of the most common fossils found.



Neptunea contraria

Turritella incrassate





Carcharodon hastqalis



Ear bone of whale



Glycymeris glycymeris



Colus curtus.



Natica multipunctata.



Searlesia costifera

CLEANING & STORING YOUR FINDS

Cleaning & preservation

To the vast majority of collectors visiting Walton-on-the-Naze, the most common finds will be shark teeth, which require no additional treatment, other than a wash in tap water in order to remove any sea salt. Desalination is important for any finds found at coastal locations.

The fossils preserved in iron pyrites from the London Clay can be prone to 'pyrite disease' or 'pyrite rot,' a process where the pyrite oxidises on contact with air. The pyrite (iron persulphide FeS_2) forms iron sulphate (FeSO_4), which results in crystal growth and expansion of the fossil, causing the specimen to fracture and crumble. The process is more or less irreversible and fossils can turn into a pile of dust in a matter of weeks. This particularly applies to fossil fruit from the *Nipa* palm.

Carefully ensure that all fossils affected by 'pyrite disease' are disposed of, as the process can quickly spread to other fossils in your collection. Varnish might help to delay the oxidation of fossils and, conversely, some specimens in pyrite do not decay at all but it is worth some vigilance.

Storage

Storage is a matter of preference and small boxes of card or plastic are probably a good place to start (See <https://earthlines.com>). Most importantly, your specimens need a label. A fossil collection will be worthless if you do not, at least, record where you found the fossil, even if you don't know the fossil names - you can always name them at a later time. A simple label like this example will be useful.

Name: *Neptunea contraria* (Fossil gastropod)

Location: Walton-on-the-Naze, Essex

Geology: Red Crag Formation

Age: Pliocene, . Placenzian Stage,

Date found: February 2025

DISCLAIMER

This downloadable PDF is one of a series of general guides to fossil collecting localities and not an extensive manual for health and safety when visiting such sites.

Furthermore, because potential hazards may change over time, prior to undertaking any fossil collecting activities, you need to make yourself aware of any RISKS, DANGERS, HAZARDS and LEGAL IMPLICATIONS associated with visiting and collecting fossils at any particular site.

UK Fossils, authors or any associated parties cannot be held responsible for your failure to do so, nor any consequences thereof.

Enjoy your fossil collecting safely and responsibly.

Locations such as this always provide 'spare' fossils which can be donated to schools and are gratefully received. Details can be found here; <https://earthheritagetrust.org/fossil-resources-boxes-for-schools/>