

### ThG13 Purfleet Submerged Forest

**Site location:** Purfleet Submerged Forest, on the Thames foreshore immediately west of the confluence of the Mar Dyke River.

**Grid reference:** TQ 5445 7871

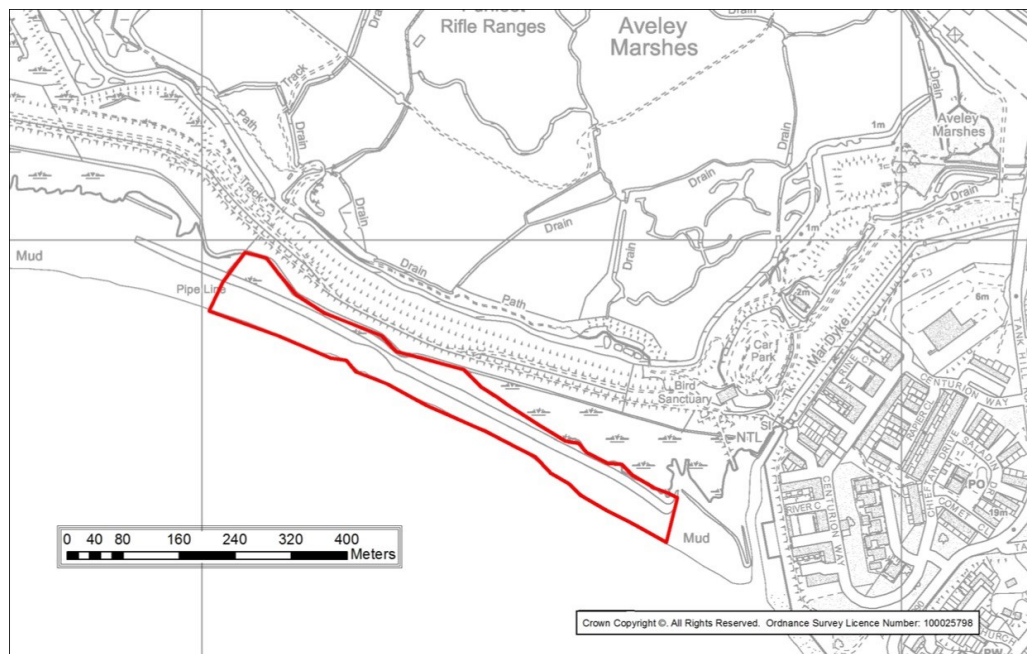
**Status:** Accessible at low tide when the reserve is open

#### **Summary of the geological interest:**

Part of a submerged forest, up to 6,000 years old, consisting of fallen tree trunks and roots, is exposed on the Thames foreshore at Purfleet, immediately west of its confluence with the Mar Dyke river. The forest is of Neolithic age, a time when sea level was much lower.

Following the end of the last glacial period some 10,000 years ago, alluvium (silts and clays with seams of sand and gravel) was laid down by the River Thames on its flood plain. Trees colonised the mud flats when there were minor temporary falls in sea level and died when sea level rose again and flooded the forests. Submerged forests such as this occur at other places along the Thames estuary but this is the best example in Essex. Evidence of human occupation has been found in the vicinity in the form of Neolithic axes and flints.

This site is of interest in demonstrating the effects of sea level changes during the Holocene, the current warm period that started when glaciers retreated from Britain some 10,000 years ago. The forest can be seen only at low tide.



**Site Assessment.** Local Geological Sites (LoGS) in Essex are assessed using criteria based on DEFRA guidance. An assessment form is used which asks key questions under four value categories: scientific, educational, historical and aesthetic. This site has been assessed and qualifies under these criteria.

### **Further information and site importance**

This site and other submerged forests along the Thames (e.g. at Rainham Marsh nearby) have been studied since 1665. Trunks and roots of ash, alder, yew and other trees are found in a layer of brown peat about 1 metre thick representing the remains of valley floor woodland. The top of this peat layer is concealed beneath the sea wall. The peat crops out at approximately ordnance datum and can therefore only be seen at low tide. A sample of wood from the base of the peat has been radiocarbon dated and was found to be almost 4,000 years old. Neolithic artifacts from the site indicate some human activity in the woodland but there is no evidence of woodland clearance. Below the peat bed on the lower shore is a grey, silty clay which accumulated in an estuarine environment between 5,000 and 6,000 years ago. Drifted tree trunks occur in this sediment that must have drifted from woodland further upstream.

This site has educational importance in the study and interpretation of evidence for global sea level change during the Holocene. The Thames area was also a region of subsidence during this period which has to be taken into account when assessing the rate and timing of sea level rise and fall.

### **Other information**

The forest is on the foreshore and is only visible at low tide. It is adjacent to the RSPB Rainham Marshes nature reserve and can be reached by the footpath from the new RSPB visitor centre. The same submerged forest is also exposed on the Thames foreshore nearby at Rainham Marsh in the London Borough of Havering (TQ 5160 7950). Logs of the same age were also occasionally encountered during the digging of drainage trenches in the area now occupied by the RSPB reserve.

Great care must be taken if traversing intertidal mud. Group leaders are advised to consult the document *Health and Safety Guidelines for the Thames and its Foreshore* produced by the Thames Explorer Trust on behalf of the Thames Estuary Partnership.

### **References**

WILKINSON, T.J. and MURPHY, P.L 1995. The Archaeology of the Essex Coast, Volume 1: The Hullbridge Survey. *East Anglian Archaeology Report No.71*. Essex County Council. Pages 90-100.



*The submerged forest on the Thames foreshore at Purfleet.*

*Photo © G. Lucy*