Groyne Deterioration

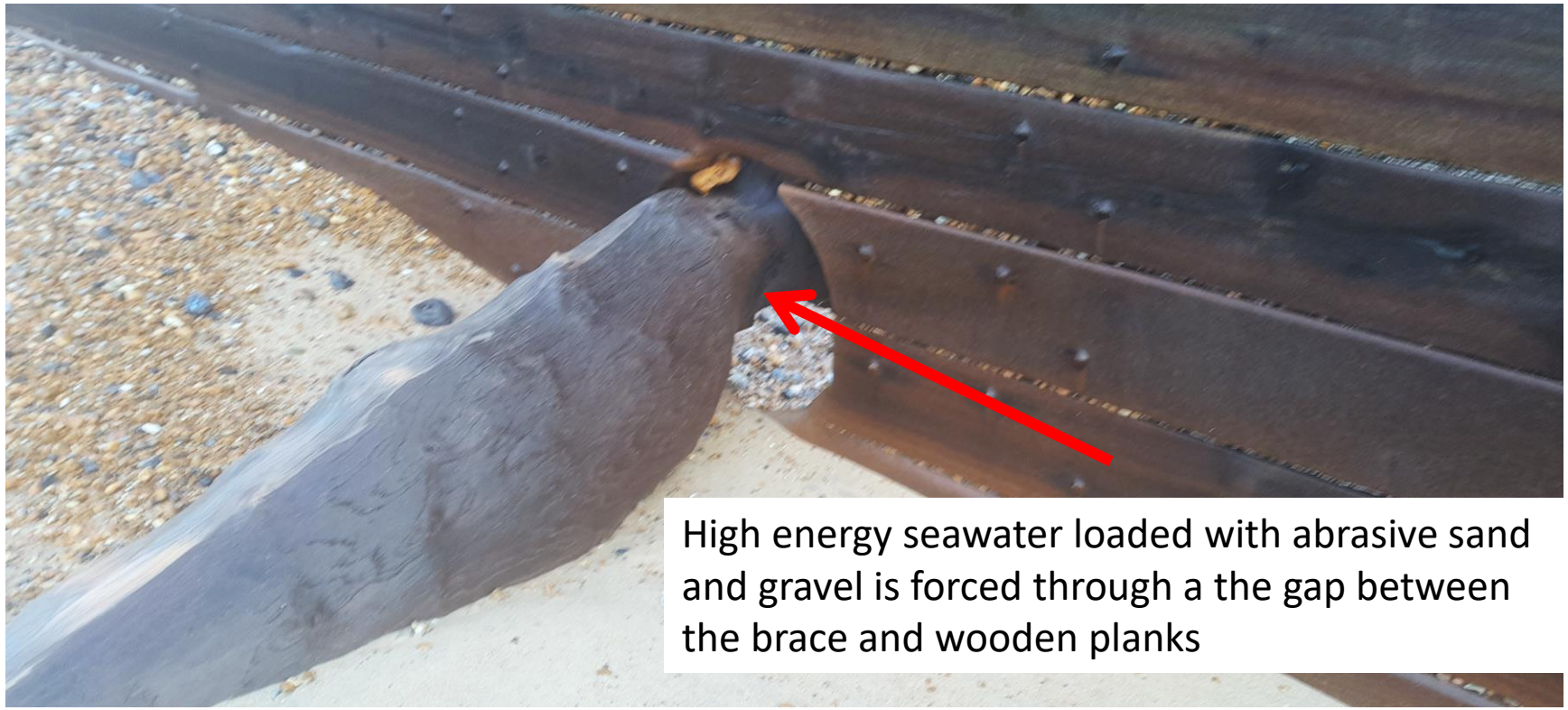
The tropical greenheart timber groynes were installed over twenty years ago.

They have been subject to a number of erosive agents which are now starting to reduce the integrity of the structures.

Wave Impact

The hardwood groyne is partially supported by braces over one meter in circumference.

Sand and gravel assimilated within the breaking waves and back-wash have effectively sanded away more than 50% of the brace in the two decades since construction.



High energy seawater loaded with abrasive sand and gravel is forced through a the gap between the brace and wooden planks

The three affected braces are situated along a section of the beach where the slopes induce surging waves, that are loaded with abrasive sediments. As the gaps become larger the erosion accelerates. This problem is due to two factors; exposure and high content of abrasive fines within the beach sediments. The problem is not encountered on the beaches which are stabilised with cobbles.

Wear on Metal Fastenings

The nuts and most of the washers have been worn away by the action of water-borne flint clasts and sand . In time these wooden elements will become separated.

The same abrasive force has also worn off the nuts securing the trough bolts that secure the wooden elements.

Through bolts are no longer secured with nuts.

Sediment Loading

The drifted ballast moves from west to east, loading the western side of the groyne structure, resulting in significant loading along the western face of the groyne, which has moved some elements a noticeable distance. In some cases there is more than a 3 meter drop.

After installation the vertical posts were aligned. Degradation of the iron fastenings combined with sediment loading on the western face has displaced the posts and adjoining planks towards the east. The ballast is washed to the opposite side of the beach during a run of easterly winds, releasing the loading. Gaps between the elements will appear and stones forced into these, further reducing the integrity of the groyne. This process may be repeated several times over the course of a year further weakening the structure.

Biogenic Attack

The wooden planks affected have recently been exposed and illustrating that degradation occurred whilst buried. A species of wood boring organism has eaten into the tropical hardwood. There are a variety of native marine wood boring organisms and recently invasive species have been reported within UK waters. The red line indicates the level of sand prior to the storms that caused the erosion.

The deterioration is confined to the buried section reducing the resistance to the loading described above. The exposed timber is relatively soft and will therefore, be worn away at a faster rate than the unaffected timber sections.