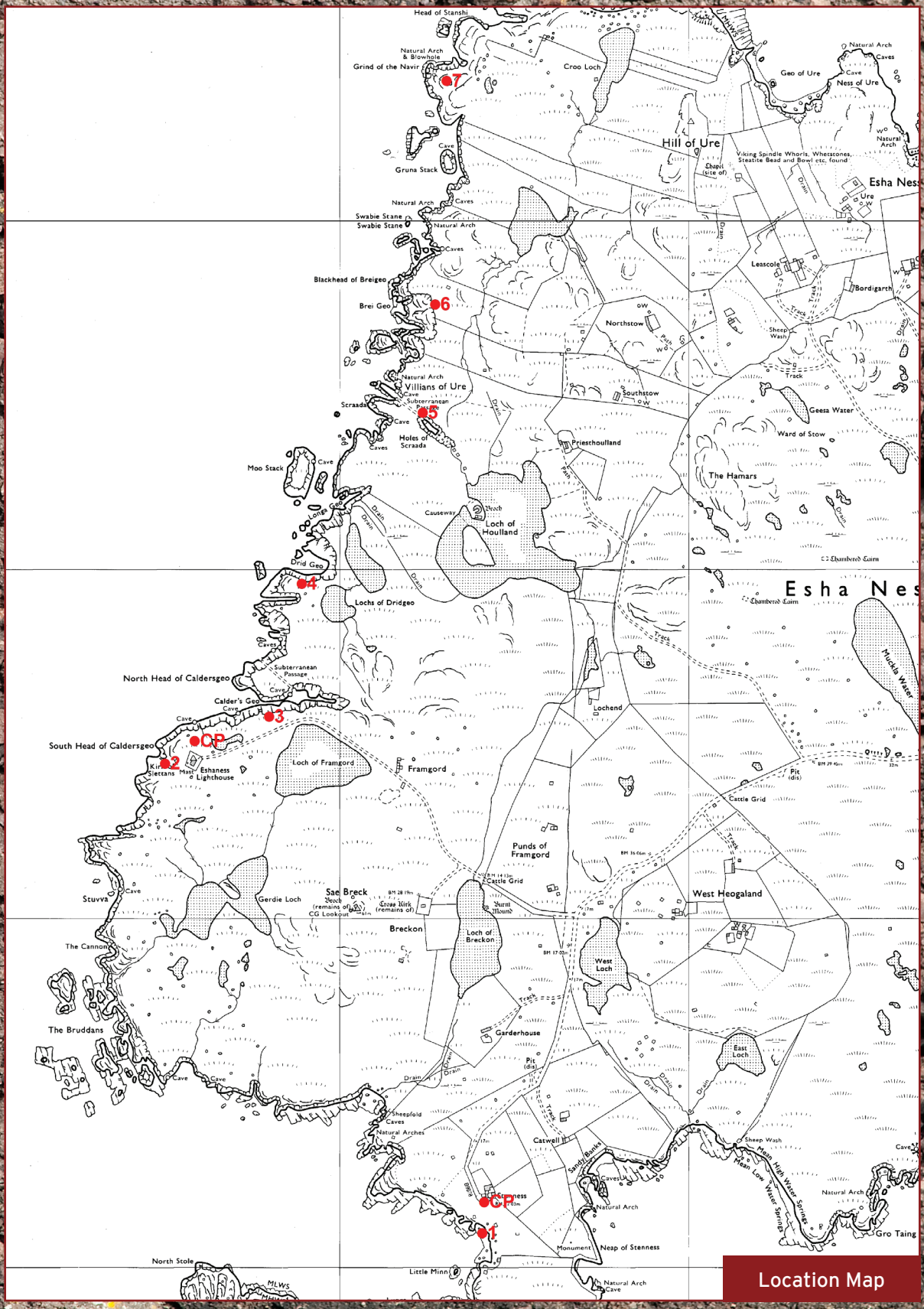
Eshaness Coast

Teacher's Sheet

The locations below are numbered from south to north, beginning at Stennes and ending at the Grind o da Navir.

At Stennes, students will see a headland formed from vesicular andesite lavas and on the beach they may find agates among the pebbles. Between Eshaness Lighthouse and the Grind o da Navir, students will see a sequence of lavas, tuff (volcanic ash) and agglomerate that were laid one on top of another to form a volcanic cone.



Location Map

Teacher's Notes

SUGGESTED STOPS	POINTS TO NOTE
Access:	The whole route may be accessed on foot, though considerable time can be saved by visiting site one (Stennes Beach) separately, before accessing the remaining sites from the car park at Eshaness Lighthouse. Stiles and gates are located throughout the route, allowing fences/dykes to be crossed.
1	**Stennes Beach** The headland at the far side of the bay is formed from andesite lavas containing vesicles. These lavas erupted from the Eshaness volcano during the Devonian some 360 million years ago. Vesicles are small cavities formed by the expansion of bubbles of gas or steam during the solidification of the lava as it spewed out of a volcanic vent. Often vesicles are twisted into strange shapes by the movement of the solidifying lava. After the lava cooled, water percolated through the rocks depositing minerals in the vesicles (gas cavities). Once vesicles are filled with minerals they are known as amygdales. Sometimes the minerals build up in concentric layers (see image) over time to produce beautiful banded agates. On the beach, students may find agates among the pebbles. Any agates found must be returned to the beach. Andesite lavas have moderate amounts of aluminum and silica, and are usually rich in magnesium and iron. This type of lava often occurs on steep composite volcanoes, such as those in the Andes today. They are associated with subduction zones.
2	**Kirn o Slettans** The Kirn o Slettans blowhole can be found below and west of the Eshaness Lighthouse. In stormy weather water is blown out of the hole by waves hitting the cliff face. The rock around it is agglomerate, built up from volcanic bombs and blocks – lumps of lava and hot rock thought to have been blasted from a side vent in the Eshaness volcano by explosive eruptions during the Devonian around 400 million years ago. Take care – the hole is deep and the rocks are slippery! Some of the rocks below the lighthouse are stained with white. This is carbide waste from the chemical process that produced acetylene gas for the light in the days before it was electrified. Eshaness Lighthouse was built in 1929 under the direction of David and Charles Stevenson, of the famous Stevenson family of lighthouse engineers. It was built to replace a temporary structure intended to give a warning to ships to avoid running aground on the Ve Skerries - a group of islands north west of Papa Stour about 10 miles from the Eshaness shore. The light flashes white every 12 seconds, and has a visibility of up to 25 nautical miles. The light was fully automated in 1974.
3	**Calders Geo** As the lava cooled, joints and fractures formed in the rocks. The sea has exploited these to carve out caves, stacks, blowholes and geos (or narrow coastal inlets). At Calders Geo, the sea has cut a deep gash in the cliffs, exposing layers of andesite lava, tuff (previously volcanic ash) and agglomerate (accumulations of large blocks of volcanic material). The rocks here have been folded and tilted. As you walk north you will be passing through progressively older lava flows. The rocks closest to you are the youngest. You may notice fulmars nesting on ledges in the vertical rock faces of Calders Geo and in the summer the cliffs are transformed by a carpet of sea pinks, red campion and birds foot trefoil.
4	**Drid Geo** At Drid Geo you can count individual lava flows stacked one upon the other. You will notice that there are different coloured layers within the rock. After each lava flow solidified, its top was exposed to the elements and weathered for many years before being buried by the next lava layer. The middle and bottom of each lava flow have remained unaltered as they are not as exposed to the elements.

5

Hols o Scraada

Hols o Scraada is a partially collapsed sea cave. Waves roll down a subterranean passage to break on the beach 100 metres inland. The name dates from the time when the inlet was in fact two holes with a land bridge between. The natural arch between the hols collapsed on 9th October 1873, allegedly shortly after it was crossed on horseback.

6

Brei Geo

Brei Geo is an amphitheatre-shaped inlet displaying a spectacularly domed lava flow at its base. In the cliffs, many thin lava flows overlie a weak zone of extremely weathered lava, which allows wave action to undercut and collapse the cliff face. All of the rock within Brei Geo is andesite.

7

Grind o da Navir

The headland of the Grind o da Navir is formed from a distinctive red rock called ignimbrite. It was created from pyroclastic flows - searingly hot clouds of gas, blobs of molten lava and fragments of pumice that swept down the side of the volcano at over 100km/hr.

When the cloud settled as a layer several metres thick, the particles welded together and the lava droplets were squashed into candle-flame shapes or 'fiammé'. If you look closely you can make out the individual drops. Today water plays a bigger role than fire at the Grind o da Navir. Two bastions of cliff stand above a sea-cut amphitheatre shaped intlet framing a grind (or gateway) to the Atlantic below. During violent storms, waves are driven through the grind, tearing huge blocks from the bedrock and hurling them inland to form ridges or 'storm beaches'. Much of the rock at the Grind o' da Navir is coloured black by lichen but clean, pinkish-orange rock faces reveal the places where rock has recently been torn away by wave action.