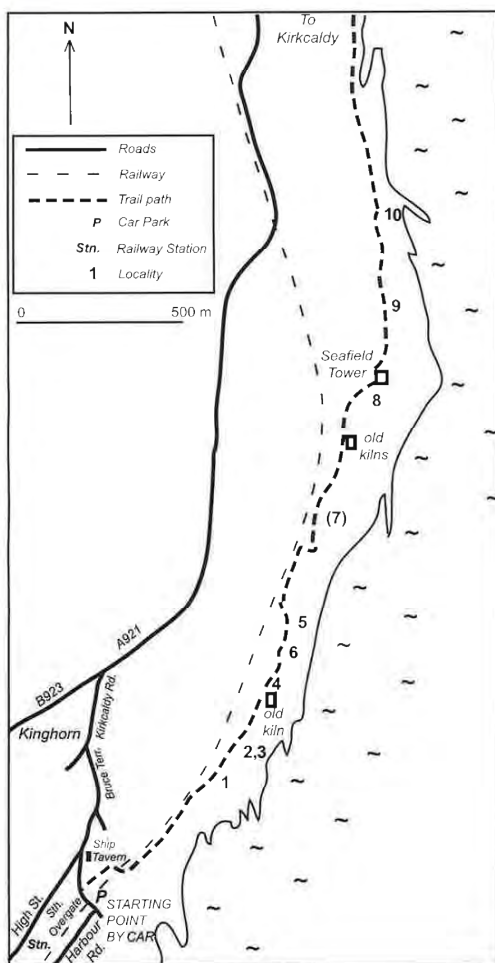


LOCALITY MAP



geoHeritage Fife

was set up in 2000 to:

- * publicise Fife's geological heritage
- * provide educational resources in geology
- * promote geotourism

If you would like to assist with these aims, consider joining the group by contacting geoHeritage Fife
 T: 01334 828623
 E: geoheritagefife@btinternet.com

Scottish Charity No. SC 032509

Fife LGS/RIGS

RIGS were Regionally Important Geological and Geomorphological Sites, but are now known as Local Geodiversity Sites (LGS).

Fife LGS is concerned with identifying and assessing important sites and notifying the statutory planning authority of these sites. Fife RIGS was incorporated into **geoHeritage Fife** in 2005.

Contact: Mike Browne (maeb@bgs.ac.uk)

SAFETY INFORMATION

This trail, about 5km long in total and undulating, follows part of the Fife Coastal Path. Choose a low tide for the walk. You must wear stout footwear and clothing appropriate for the current weather conditions. A walking pole could be useful. **DO NOT HAMMER OR REMOVE ROCKS.**

TRAVEL INFORMATION

Rail: Scotrail serves Kinghorn with trains from Kirkcaldy, Inverkeithing and Edinburgh. Kirkcaldy is served by trains from Edinburgh, Dundee and Aberdeen.

Bus: Stagecoach services 7 and 7A serve Kinghorn from Leven, Kirkcaldy and Dunfermline.

ACKNOWLEDGMENTS

geoHeritage Fife acknowledges the assistance of The Curry Fund of the Geologists' Association (www.geologistsassociation.org.uk) and also the support of Fife Council through its Community Grants scheme (www.fifedirect.org.uk)

Kinghorn - Kirkcaldy Geological Trail



MAEB

See evidence of tropical seas teeming with corals at a time when this part of the world was near to the equator about 325 million years ago. There were also volcanoes spewing out molten lava.

Later earthquakes cracked the rocks to create faults which you can see preserved today.



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<If travelling by car, turn off the main road at the Ship Tavern and park at the P [NT272 870] just beneath the railway bridge. To reach the first locality walk uphill on South Overgate, under the railway arch, then turn right at the Fife Coastal Path sign, through a playground. Walk along the coastal path for about 440 metres past the caravan site, until the path descends towards the beach. At a grassy patch (45mx18m) turn sharp right at the end of the fence and follow path down to beach, cross the beach aiming for the sea for 25 m to a bluff (marked * on the profile below) on the foreshore.>



Locality 1



The bluff is made of volcanic ash. Hot liquid lava erupted under the sea and fragmented explosively into fine-grained ash, and rounded lumps of "pillow" lava. On the rocky beach between the bluff and the path, there are good examples of these "pillows", formed when red-hot liquid lava chills rapidly under water. When the ash and pillows built up above sea level, massive compact lava formed on the new land.



Pillow lava

<Return to the main path and continue N>

Locality 2

View to locality 2, showing a white limestone (called the First Abden) overlain by basalt lava in the distance. The strata dip towards the north-east.

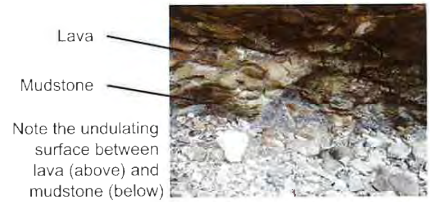


<At the point where the path rises more steeply, take the small grassy path on the right, down to the beach [NT2750.8740]>



Close-up view of the (First Abden) limestone overlying greenish-grey ashy mudstones; both were deposited in a marine environment. Another mudstone overlies the limestone. Fossils of various shells occur in the underlying shales.

If you explore above the limestone, you can see a lava flow which has sunk into the underlying mud, creating an undulating surface.



<Retrace your steps to the main coastal path and turn right uphill. Where the path takes a sharp left-hand turn, you will see this view ahead>

Locality 3



View of the red bole locality. It is **optional** to descend to see the bole close-up (see below)



M. Kenicer

Red bole (also known as laterite) usually forms as the result of weathering of the top of a basalt lava flow in humid, tropical environments. Laterite consists mainly of aluminium and iron oxides and is related to bauxite, from which aluminium is smelted.

Locality 4 (viewpoint)

<Immediately after Locality 3, take the right-hand path down to a ruined lime kiln. Do not go down to the beach here. (If you reach some steps going up the cliff on the main path you have gone too far).>



The reef facing you (at low tide) is formed by the Hurllet (Second Abden) Limestone. Underneath is a dark mudstone which contains marine fossils.

<Look north to see modern coastal erosion in action >



This is a landslip showing how soft and loose rock material is easily eroded by the weather and the sea.

<Retrace your steps to the main path and turn right. The path climbs steeply with steps then descends. After about 250m you reach a set of steps and fence going downhill. Descend to the beach and turn right along the foreshore.>

Locality 5

As you reach the foreshore, the rocks beneath you contain white spots.



These are lavas with gas bubbles which were filled with minerals. The spots are called amygdales.



Siphonodendron colonial corals

Look closely and you will see that it contains a mesh-work of small tubes. These are the fossilised remains of a colonial coral named *Siphonodendron* which lived about 325 million years ago in warm tropical seas at a time when Scotland lay close to the equator.

<Return to the steps in the cliff up to the main path, turn right, and proceed to the concrete steps. At the top, walk through the gap in the stone wall then follow the north side of the wall downhill *.>

*At the lower end of the wall, it is worth noticing the view across the Forth Estuary. On a clear day ahead of you can see Arthur's Seat, an extinct volcano in Edinburgh, with the Pentlands Hills behind. Further to the left (NE) you can see the outline of Largo Law (another volcano) in Fife, then further right isolated stumps of volcanic rocks form the Bass Rock and North Berwick Law.

<At this point, decide whether or not you wish to inspect Locality 7, as the rock steps can get slippery. If not, walk back uphill along the wall to the main path. Turn right and walk northwards. >

Locality 7 (optional)

<At the bottom of the wall, turn left downhill and follow concrete steps to the metal bridge.>

A cave has formed along the line of a small fault which cuts through a basalt lava flow. The fault weakened the rock which has allowed the sea to erode into the cliff. Look out



The limestone (Mill Hill Marine Band) just beneath the cliff at Seafield Tower is full of crinoid (sea lily) ossicles (also known as St Cuthbert's beads).

< Return to the main path, turn right, and walk past the ruined tower.>

Locality 9

<Walk along the wide coastal path past the new houses. Look out to sea and there is a prominent bed of limestone [NT 2798.8882]. This is not visible at high tide.>



This view shows a limestone bed which has been broken in two places by compressional forces. This feature is called a thrust fault, where the rocks on the left and the right have been pushed towards each other so that the hard limestone had to crack and slide under itself.



A small fault (indicated by the black line) cuts through the Hurlet Limestone. The limestone in the fault zone is red, due to an abundance of the iron oxide haematite, but is yellow nearby. (NOTE: This view is taken from the main path, but the trail takes you along the beach).



The rock at the fault contains blocks of limestone broken up during ancient earthquakes.

< Walk south until you see an expanse of white rock (below).>

Locality 6



This white rock is the Hurlet Limestone. Modern algal coatings may make it difficult to see the fossils.

to sea and the line of the fault is clearly marked by a cleft in the reef.



<Retrace your steps to the wall and walk uphill to regain the main path. Turn right and continue N. As you approach the ruins of Seafield Tower, you will see a cliff of reddish rock 30m before the tower. Take a short track down to the beach.>

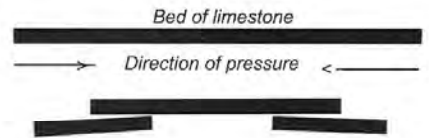
Locality 8



The red sandstone shows cross bedding features (see below). These were created by sand deposited by a large river which brought its sediment from a long distance north of Fife.



This view shows cross-bedding which represents sand bars migrating in shifting river channels.



<Walk farther north-eastwards along the path. Just before you reach a large concrete breakwater descend to the beach.>

Locality 10



basalt sill
sandstone

Just south of the breakwater, there is a reef formed by molten rock (basalt) which has intruded into horizontal beds of sandstone. This feature is called a sill.



A close-up view of the basalt shows crystals and remains of gas bubbles.

< Return to Kinghorn along the main path (2.5km), or continue towards Kirkcaldy for a train or a bus (2.5km)>