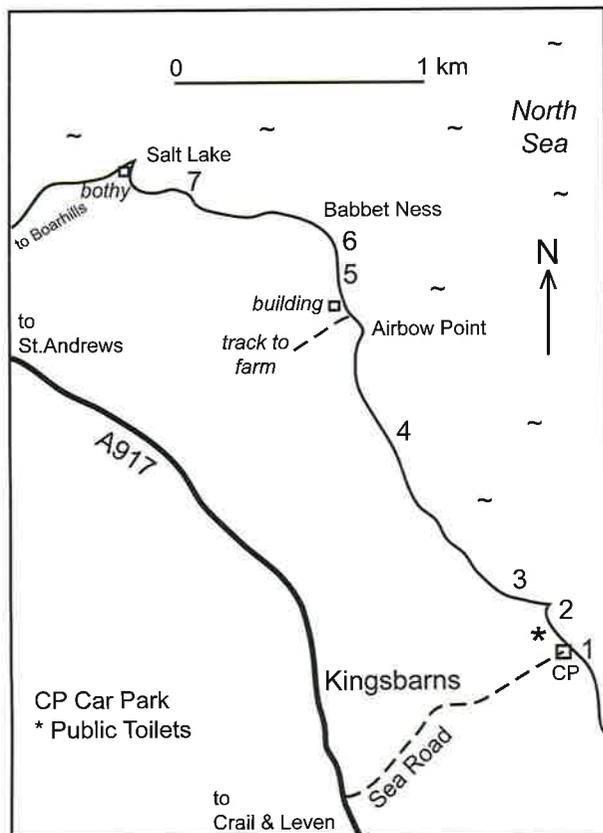


## Locality Map



### SAFETY INFORMATION

This trail, about 6 km long, begins at the public car park and follows part of the Fife Coastal Path (FCP). **Choose a falling tide or a low tide for the walk.** You must wear stout footwear and clothing appropriate for the prevailing weather conditions. **DO NOT HAMMER THE ROCKS.**

### TRAVEL INFORMATION

Stagecoach service 95 serves Kingsbarns village from St. Andrews and Anstruther. To reach the beach on foot involves a 1km walk along Sea Road at the south edge of the village. By road, Kingsbarns lies on the A917 St. Andrews to Leven road, 6 miles (9.5 km) SE of St. Andrews. There is a public car park at the end of Sea Road.

**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**

01334 828623  
geoheritagefife@btinternet.com

Scottish Charity No. SC 032509

### Fife RIGS/LGS

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)

# Kingsbarns Geological Trail



*See fossilised beach shells, a coal seam, footprints of giant millipedes and remains of tropical forests from 330 million years ago.*

*During the Ice Age rocks from afar were carried and then dumped by the receding glaciers.*



## Locality 1 Tropical swamp

<The trail begins at the public car park [NO 603125]. Descend by the steps directly to the beach, turn right and walk 40m SE. This exposure occurs at the top of the beach and below the dunes.>



Here is a sequence of sedimentary rocks deposited in layers. The lowermost soft, pale-grey layer represents a fossil soil known as *seat earth*. The plants which grew in it eventually died and were compressed to form the overlying coal seam. The pale brown rock above this is a limestone. It contains marine shell fossils which indicate that the sea then flooded the land.

<Return to the steps but then continue along the sandy beach, over a collapsed harbour wall, past the public toilets and towards an iron pipe. Climb onto the rocky slabs.>

## Locality 2 Fossil plants log-jam



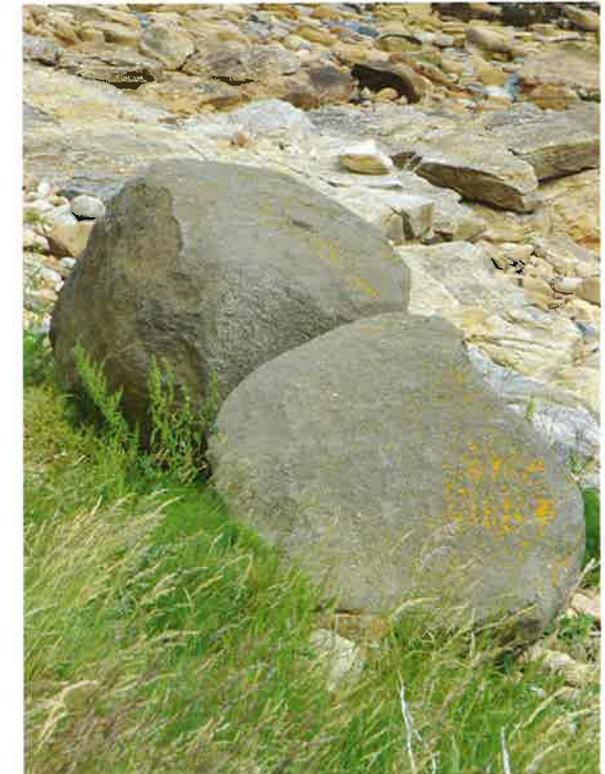
Slabs of sandstone contain many plant fossils.



The black streaks on this sandstone represent fragments of woody/plant material which have been converted into coal. The chaotic arrangement suggests that this was a mass of plant debris which accumulated on the sandy banks of a river or delta.

<Climb up to the path by the iron pipe and join the coastal path. Walk NW for about 200 metres along the edge of the golf course and look out for two large boulders below the path.>

## Locality 3 The work of Ice



These two large boulders were brought here by hitching a ride on a glacier during the last ice age. When the ice melted and receded about 16000 years ago, these boulders were dumped. The larger boulder is about 1.5m (5 ft) across. These boulders are made of dolerite, a coarse-grained igneous rock which formed from the slow cooling of molten magma rich in iron and magnesium minerals. These isolated boulders are known as *glacial erratics*.

<Walk 400 metres NW to a Fife Coastal Path signpost, at which point descend to the sandy beach. Continue walking along the beach for about 140 metres towards another broken iron pipe.>

## Locality 4 Modern rock



The rock comprises a mixture of sand, pebbles and boulders. This is an example of "beach rock" which has formed naturally by the action of lime-rich water cementing together the sand grains and rocks of the beach.

Unlike the sandstones which form the rocky foreshore, this rock is only a few thousand years old.

*<Continue on along the sandy beach, past a wooden building and a FCP post. Stay on the beach to the next headland, cross a rocky platform and aim for a tall FCP signpost, where you return to the grassy path which here follows a wire fence. Walk towards a low cliff, and descend to it at the end the sandy bay just before Babbet Ness [NO 594 139]>*

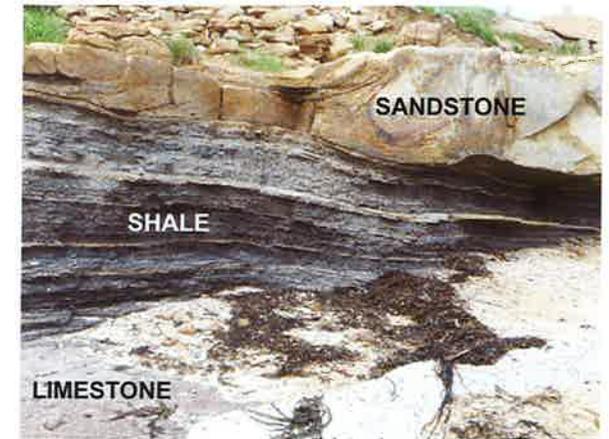
*<As you approach the iron pipe, look to your left, above the High Water Mark but below the grassy cliff, and look out for rock that looks like concrete.>*



## Locality 5 Fossil shells



*<View of low cliff. Descend to the beach just before you reach the cliff and walk to its base.>*



At the base of the cliff is a flat bed of limestone which was deposited in a shallow, warm sea. The overlying shale represents mud which was then deposited on top. A drop in sea level allowed the deposition of sand from rivers and deltas. The disturbed layering in the sandstone may be the result of contemporary earthquake activity.

The limestone bed contains fossilised shells (see below).



These white fragments are the remains of a bivalve called *Naiadites* which resembles a modern-day mussel.

*<Return to the coastal path and continue N along the top of the cliff. Where the path takes a first left-hand turn, stop and look down to the rock platform below.>*

## Locality 6 Fossil forest floor



These half-tube-like impressions with dimples are called *Stigmaria*. They are the root moulds of Carboniferous trees called *Lepidodendron* which grew up to 40 m (130'), and are the ancestors of the modern clubmosses. The dimples are where small rootlets grew out of the main root. It is possible to see a radial pattern in some of the root traces, indicating the position of the original tree trunk.

<With care, it is possible to scramble down to this outcrop.>



Glasgow District Council

A *Lepidodendron* tree showing the root system which is preserved today as *Stigmaria*.

## Locality 7 Fossil millipede footprints

<Continue along the coastal path NW for about 700m until you see this view of a sandy bay and a fishing bothy in the distance. Here the sea wall is stabilised with large stone blocks. Descend to the rocky slabs. (The sandy bay is marked "Salt Lake" on OS maps. [NO586143]>



The surface of the sandstone contains many pits which form parallel rows about 20cm (8") apart. Some rows criss-cross one another. These pits represent the footprints of a large millipede-type animal called *Arthropleura* which lived during the Carboniferous Period about 330 million years ago. The animal was about 1.5m long and 30cm wide and it scavenged for food in the forest litter of the Carboniferous forests.



Keith Sillar

Close-up of a pair of footprints. The tracks are about 20cm (8") wide.  
NOTE: The imprints show up better if viewed looking at them against the sunlight.



An artist's impression of *Arthropleura*, the Carboniferous "millipede" which left its footprints in Fife 330 million years ago. It resembles a modern-day woodlouse!

<Return to the coastal footpath and retrace your steps to the car park. Alternatively, it is possible to continue along the FCP to Boarhills.>