

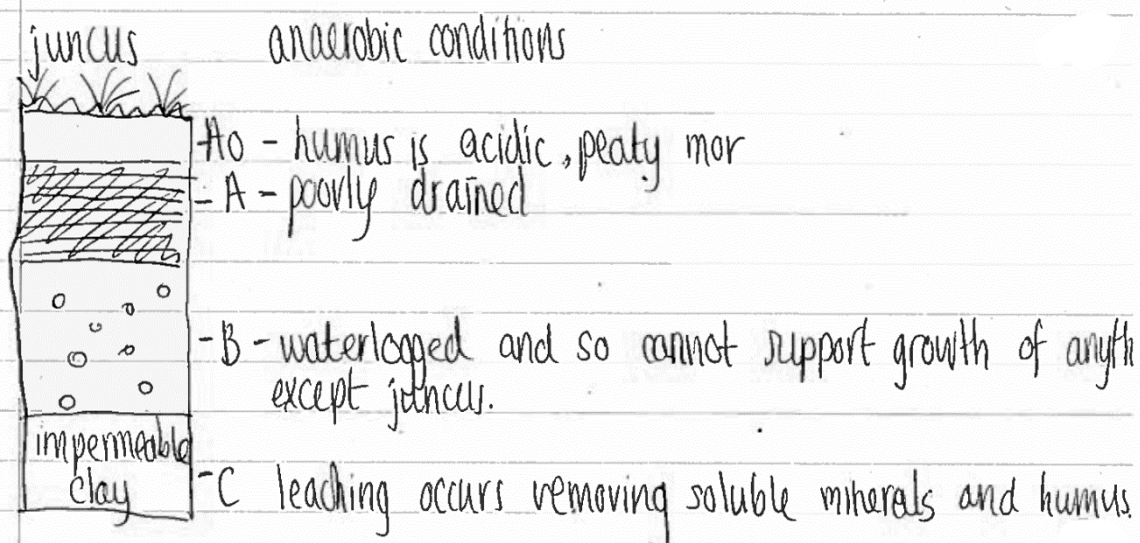
Candidate 1 evidence

Higher Geography Assignment

title Study of the Kippford to Sandyhills Coastal Path

background The Kippford to Sandyhills coastal path is a short walking path which is very popular with locals and tourists and is well known for its scenic views, so much so that the Solway Firth has been given 3 NSAs (National Scenic Awards). Walking Britain described the path as a "five star walk... often described as the best in Scotland" which helps to promote the trail and other online advertisement attracts a wide variety of people to come and use the path as well as the health benefit of walking. As a result, of the vast numbers of people using the path there is an economic benefit on the local communities e.g Kippford as there is a positive impact on the 'multiplier' effect because the local businesses thrive on the income that tourists bring which is why it is so important for the path to be well maintained.

The maintenance of the path is done mostly by Dumfries and Galloway Council; some of the management issues centre around the overall erosion such as drainage, surface erosion and over-growth. To deal with poor drainage many strategies were used such as a stone waterbar, small ditches (to prevent surface runoff), piped culvert (allows water to move through the path to the draining side) as well as small wooden bridges in the areas where there was too much runoff from fields. This strategy was particularly effective because the water could still drain away following its natural course whilst at the same time the path was not flooded, however it is more expensive. The soil in most of the poorly drained areas is gley which forms at the bottom of hills/slopes where the precipitation exceeds evaporation.



To deal with poorly drained soils shrubs (gorse) can be introduced because they can grow on the acidic, sandy soil and then absorb some of the water on the path. However, gorse is a sprawling shrub which can easily obstruct the path and so to deal with overgrowth the gorse can be burned (under close supervision) which also helps to germinate the gorse seeds, speeding up the cycle and so more water can be absorbed. Also the ash returns nutrients to the soil. To deal with surface erosion a topcoat - of gravel, wood-chip etc - can be added to protect the path from human erosion as well as steps can be added for steep gradients. Both methods are effective however they are very expensive and can be unappealing because they don't blend into the natural environment. Also, "one size fits all" steps are very difficult to build and can result in excess erosion.

Method 1 We measured the depth of erosion using a measuring tape and a ruler at each of our 42 sites to see which sites were eroded the most/least. An advantage to this method was that it allowed us to clearly see which sections of the path had the most erosion and we could compare them to other sites to make correlations. However, because we only

measured the path every 20 cm across, not all of our results were representative because some of the sites were only 40cm wide so it was difficult to get an accurate representation with so few measurements.

method 2 We created and carried out a questionnaire on the management and use of the path and asked walkers to fill it in to see ~~how~~ what condition the path and its facilities were in. ~~The~~ An advantage to this method was that because we carried out the questionnaire first hand, we received primary data which we knew was reliable and accurate, and it was easy to do so. However, because we gathered data mid November we only captured a snapshot of the path's usage i.e. not during peak summer season when in use by lots of tourists and DofE group etc, so it was difficult to relate to some of our data as we couldn't see the full picture.

analysis 1 From graph 2 you can see that the majority of people, 19 out of 27, thought that the path was well managed and in good condition further explaining why the path is so popular and that in order for locals to benefit from the path it has to be well maintained. Half of the local daily path users felt the path was in a good ~~of~~ condition where as the other half are the only ones to say it is not. This is because the locals only walk the paths between Kippford and Rockcliffe (Muckle loop) which is shared by mountain bikers, there is conflict between the two because the bikers churn up and catalyse the erosion of the path making it boggy underfoot and also they come up at high speeds behind the walkers, startling them. Hence, the solution (suggested by locals) is to designate one path to cyclists preventing the rapid erosion of the walking paths and avoiding disputes between the two path users.

analysis 2 From graph 4, you can see that the minority of people park at Sandyhills which is because there is only one ~~the~~ 19 km return route from Sandyhills to Kippford which does not suit people of different capabilities. Whereas, most people park at Rockcliffe and Kippford which is because there is a wide variety of routes/distances available attracting more people because there is no limitations to a person's physical ability. When gathering questionnaire data, we discovered that very few people actually walk the whole path; majority of them only walk a small section around Rockcliffe due to the flexibility of the path. This links to graph 1 as 13 people said the litter situation on the path was good/very good which is because they only walk the path between Kippford and Castlepoint there is no excuse/desire for them to leave litter over such a short distance because there are already plenty of bins around and about. As for the people who walk the whole path, are generally not the kind of people who leave litter and so there is next to none on the path.

analysis 3 From graph 3 you can see that the site with the greatest average depth of erosion is site 8 at 36 cm and from C8 you can see that the left side of the path is more eroded - goes down 20 cm. This is because site 8 is on flat land the surface runoff sits on top of the soil (mixture of clay and bedrock) and because the bedrock is impermeable, the water cannot drain away which results in the B horizon being waterlogged. As a result of the saturated soil, scour occurs (when the water erodes the soil) and gullies form explaining why the left side of the path is further eroded. Braiding then occurs as a result of humans so there is more erosion caused which scars the land and visually pollutes the landscape. Hence, the simple solution would be to improve the drainage at the site however, it is not that easy

because site 8 is in the middle of the path, it is not easily accessed by maintenance groups especially since there are no car parks nearby, so the path has to be ~~waiting~~ walked which is time-consuming. This is similar to sites 11 and 12 which have the average erosion at 22 cm and 20 cm because they are very close to the popular tourist ~~area~~ beach, Sandlyhills, during the peak summer season there are hundreds of people using that section of the path which causes erosion by humans and is very difficult to maintain. Also because site 11 is on a downhill, during high precipitation season it is badly eroded because the topsoil is washed away which leaves the soil lacking humus and so the path is continually worn away. This causes the formation of a gully (eroded channel) caused by the surface runoff which you can see from C11 runs down the left hand side and is 4 cm deep.

analysis 4 Castlepoint is a viewpoint on the clifftops which is very popular with tourists because of its great scenic views and it is also a fairly low-level walk which isn't too challenging, which is why the average depth of erosion at site 5 is 23 cm and from C5 you can see the middle of the path is further ~~eroded~~ eroded and goes down ~~210cm~~ ~~because of the~~ ~~large masses of pe~~. There is a relatively steep 21 cm arcend to the point which is why the path is eroded because of the large masses of people walking to the point the topsoil is broken down by feet and is then exposed to the wind at the slightly higher ~~altitude~~ altitude causing more erosion. The constant exposure the these elements removes the nutrients from the soil required for regeneration and so the cycle of erosion continues. This cycle will be particularly bad during the summer months due to the increased number of people using the path and because the drier, dustier so is more

easily blown away. On the contrary to site 5 is sites 9 and 10 which are almost completely flat (uneroded) due to less people walking the whole path and so the average erosion at site 9 is 1cm and at site 10 is 2cm. Another reason why these sites are uneroded is because they are less than 1km from Portling which means that they are easily accessed for maintenance and so it takes less time and effort to maintain them. A topcoat of gravel had been used at the sites as well as steps for the steep gradient coming into Portling.

conclusion From this study of the Kippford to Sandyhills coastal path, I discovered that the distance from the nearest carpark affects the erosion of the path in 2 ways: the further away generally a site is the more erosion there is because it is more challenging to access it for maintenance however, in some cases e.g site 12 which is used by lots of people, the more popular an area is the more erosion there is generally despite being close to a carpark. I also discovered that the main cause of erosion on the path was poorly drained soils which is affected by gradient. Overall, the Kippford to Sandyhills coastal path ~~was~~ well maintained as there is a good balance between maintenance and the surrounding environment because sometimes too much development of a path will cause more harm than good.

