

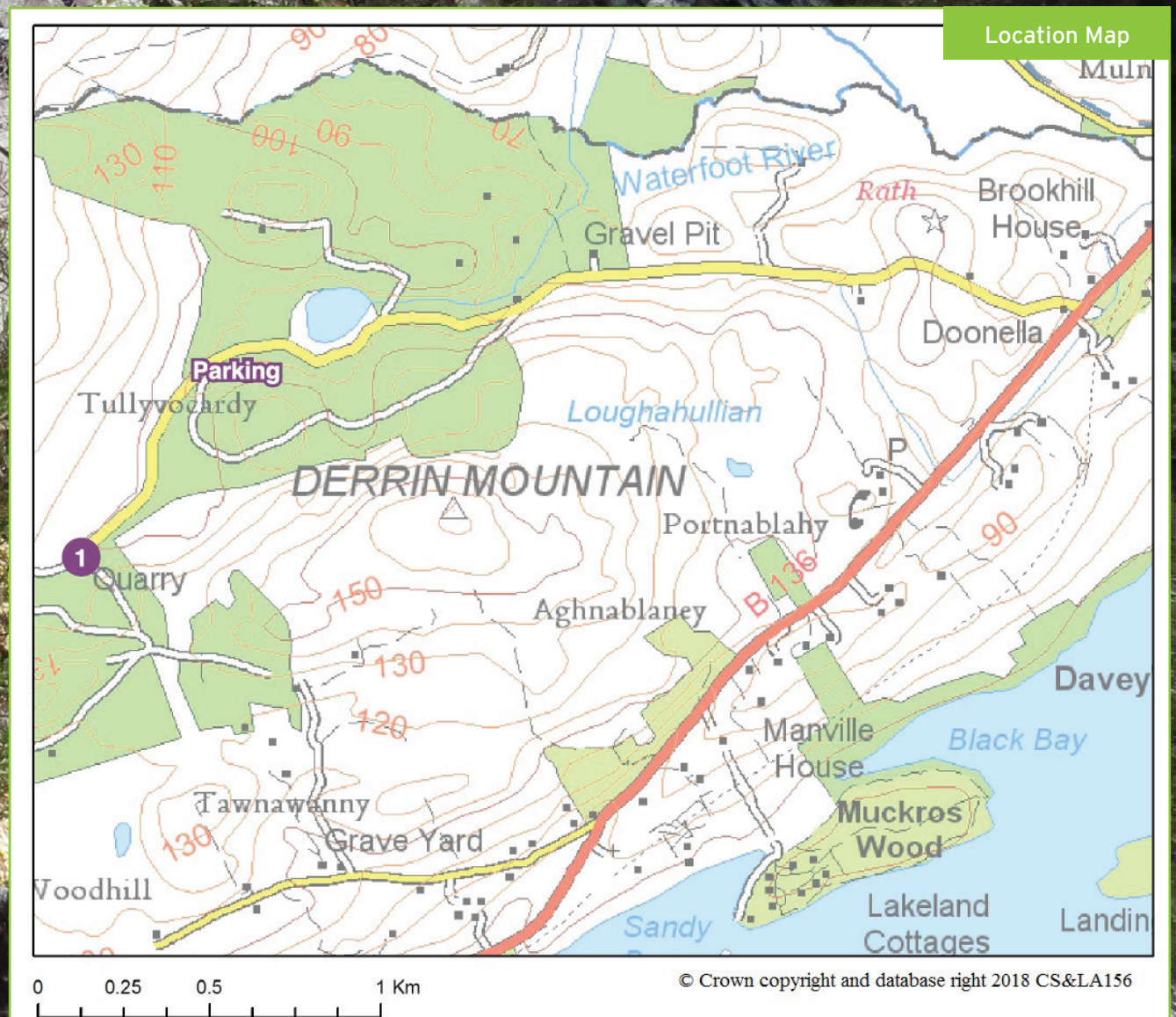
# Tullychurry Forest

## Teacher's Sheet

Visit Time: 1 hour

Tullychurry Forest offers the rare opportunity to see some of the oldest rocks on the island of Ireland. The landscape here is very different to that found elsewhere in the Marble Arch Caves UNESCO Global Geopark, and this disused quarry is a good place to investigate the metamorphic rocks responsible for this.

The site is accessible from a small layby beside the quarry.



SUGGESTED STOPS	POINTS TO NOTE
Access:	<p>Take the Brookhill Road off the Letter Road (B136). Parking is available at a forest entrance on the left hand side of the Brookhill Road as you drive past the lough which is on your right. To reach the quarry follow the Brookhill Road beyond the parking area and take the next left through a forest gate, the quarry is then 100 yards ahead on the right hand side.</p>
Intro	<p>The rocks that underlie the area around Tullychurry Forest form part of the Lough Derg Inlier, inlier being the term given to an area or formation of older rocks completely surrounded by younger ones.</p> <p>Those of the Lough Derg Inlier are the oldest rocks exposed in Northern Ireland at 895Ma but the oldest rocks on the island of Ireland are located just off the coast of county Donegal, on Inishtrahull, dated at around 1.8 billion years old (1,800 million years old).</p> <p>The rocks of the Lough Derg Inlier form the basement of the region, the foundation underpinning all later rock formations. The inlier allows a window through the 'shallow' sub-surface rocks to reveal deeper and older formations. The rocks seen here are from the Lough Derg Group, Slishwood Division, which belongs to the last major division of the Precambrian, called the Proterozoic.</p> <p>All of the rocks of this age are metamorphic rocks. The grade or intensity of metamorphism is reflected in the mineralogy of the rock, as characteristic suites of new minerals become stable with changing temperatures and pressures. There is clear evidence in the Lough Derg Group of two entirely separate episodes of metamorphism. The first was intense, creating granulite facies showing a granoblastic texture (when rock is recrystallized into a mass of equal grain sizes). Also within the rock are clear indications of a second episode of metamorphism, less intense than the first but of medium to high grade, producing amphibolite facies.</p> <p>Veins of unaltered pegmatite (coarsely crystalline granitic rock produced in the final stages of cooling from the molten state) are found throughout the Lough Derg Group, cutting through all the earlier rocks and their structures. They contain quartz, microcline feldspar and the micas biotite and muscovite. It was the microcline feldspar that provided the original raw material for the porcelain produced at Belleek Pottery, but the volume was insufficient to sustain the demand.</p>
1	<p>The disused quarry in Tullychurry Forest contains psammite, a quartz-rich gneiss (metamorphic rock) found within the Lough Derg inlier.</p> <p>The quarry faces are covered by large amounts of vegetation but it is possible to notice that this quarry is very different to anything else seen in the Geopark. In contrast there is no obvious bedding and the style of weathering also differs in the limestone quarries.</p> <p>The rocks have undergone high grade regional metamorphism (meaning that they reached very high temperatures under high pressures, almost approaching the molten state). The resultant pressure caused many of the crystals within the country rock to realign and form a type of rock called gneiss, characterized by a banded appearance.</p> <p>This gneiss is quartz rich which means that it can be called a psammite and it contains the minerals plagioclase (a feldspar) with muscovite and biotite (micas). There are also some thin horizons of mica schist. The rocks have a tendency to weather into flags.</p> <p>The original rocks before this intense metamorphism were almost certainly pure sandstones with rare and thin shale or mudstone horizons.</p> <p>At the time of deposition the island of Ireland would have almost certainly been in the far south of the southern hemisphere and would have been part of a much larger continent together with much of North America and Europe.</p> <p>The quarry exposed here is within an area that is owned and managed by Forest Service NI and is one of many that was created to produce aggregate to make forest roads. This was carried out in the 1950s and 1960s when an extensive afforestation programme was carried out right across Northern Ireland.</p>

