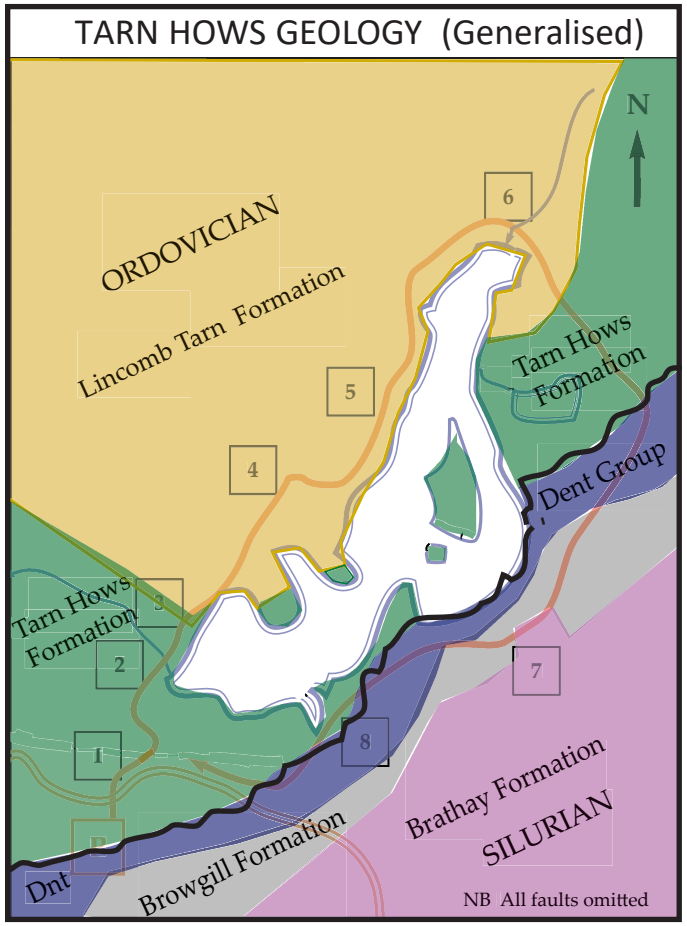
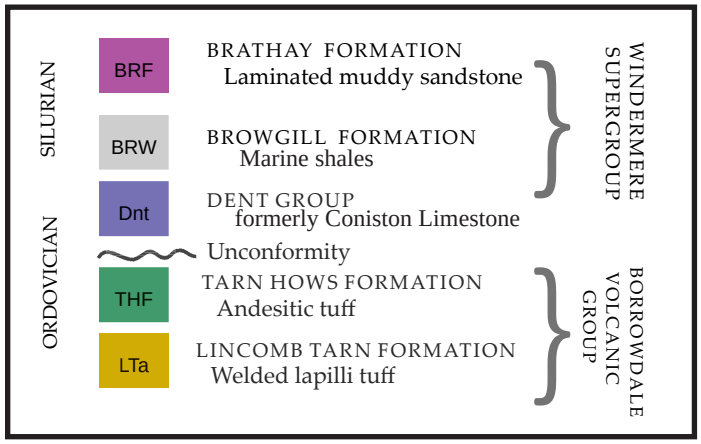




About Tarn Hows

Owned and managed by the National Trust, Tarn Hows allows views over several of the major rock types of the Lake District.

Stretch your mind while you take a tour around Tarn Hows. Take a journey back in time to a 450 million year old volcano, a huge time gap in the rocks, and admire the ice-scoured scenery.

The rocks to the north-west of the tarn are **Ordovician Borrowdale Volcanic Group** (BVG),a complex group of rocks formed by volcanic eruptions around 450 million years ago. As you go north you go over progressively older rocks. To the south-east side of the tarn are younger **Silurian** sedimentary rocks of the **Windermere Supergroup**, (WSG), which formed around 5 million years later in a shallow sea which deepened rapidly. The return route passes over the 5 million year time gap between the Ordovician volcanic rocks and the younger Silurian sediments that overlie them. The path down the east side of the tarn runs through these Silurian sediments, but to your right the tarn itself lies in the older volcanic rocks.

About 20,000 years ago, the climate was much colder than it is now and the whole of the Lake District was covered by ice, in what we now call the last Ice Age. The moving glaciers wore away some of the rocks they passed over into distinctive shapes. You will see several ice smoothed rocks which geologists call 'roches moutonnées'. As the ice flowed over the rock it smoothed the upstream side, but prised away fragments of rock on the downstream side. The name comes from the wigs that were popular in the 17th and 18th centuries, which had a smooth part on top and then curls lower down. The hair was smoothed with mutton fat, hence the wigs were called moutonnées.

National Trust

Cumbria GeoConservation

This leaflet was produced by
Cumbria GeoConservation.
www.cumbriageoconservation.org.uk

TARN HOWS

A Geology and Landscape Trail
(*The trail is fully wheelchair accessible*)

From the car park cross the road carefully and take the main track left down to the small dam.

Stop to look closely at the rocks either side of the path. Consider how the rocks have influenced the scenery.

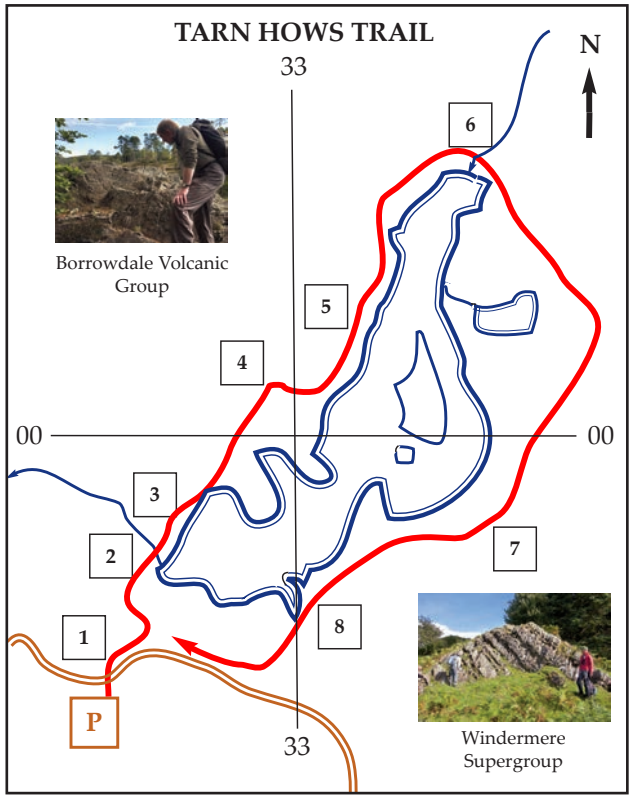
Content by Sylvia Woodhead
Design by John Shippen **October 2022**

1. Tarn view SD 3272 9965 Pause on the path to look at the view ahead. You are looking at the eroded remains of volcanic terrain which erupted masses of lava and ash around 450 million years ago. These rocks form the high craggy mountains of the central Lake District. They have endured deep burial, pressure, tilting, faulting and uplift followed by millions of years of erosion. During the last Ice Age, glaciers moved south over this area and smoothed and scratched the rocks.

2. Volcanic tuff SD 3271 9977 Go through the gate and see if you can get a close look at the rocks near the tarn outflow. These are Tarn Hows tuffs. Blown out of volcano, volcanic ash fell to the ground and has hardened to a rock called tuff. It weathers to a greyish-green colour.

3. Ice smoothed rock SD 3273 9973 Look right to see a lump of volcanic tuff smoothed by ice which moved south over this area during the last Ice Age. Note the faint scratches gouged onto the surface of the tuff by rocks carried along at the base of the moving glacier.

4. Rock exposure NY 3293 0009 Trees which blew down in Storm Arwen in November 2021 have revealed a new exposure of volcanic rock on your left. There is much to see here. White quartz veins, intruded into the volcanic rock, have been offset by small faults. Colour changes in a broken rock show how chemical weathering from the surface has altered the rock.



5. Rock in a root plate NY 3304 0017 Lighter coloured Lincomb Tarn tuffs can be seen to your right. This is the oldest rock on this trail.

6. Fault at head of tarn NY 3327 0048 Quartz veins can be clearly seen in the volcanic rocks to your right. To your left you can see a small stream entering the tarn. The stream, and the tarn itself, lie on the line of a major fault which runs NE-SW through the rocks here. Glacial erosion picked out this line of weakness, producing the rock basin in which the tarn lies. ***As you return on the east side of the tarn, you are looking for an important rock boundary. Look for craggy Ordovician volcanic rocks to your right, and bedded Silurian rocks to your left.***

7. Small quarry in Silurian rocks SD 3324 9983. As you continue southwards along the path you are passing through gently dipping beds of sediment formed in an ancient ocean in Silurian times. These are exposed just left of the path. Silurian sediments also form the low hills to your left. To your right the tarn itself lies on the older Ordovician volcanic rocks we saw earlier.

The boundary between the volcanic rocks and the Silurian sediments runs NE-SW, roughly parallel to the track and close the southeastern shore of the tarn.

8. Roche Moutonnée SD 3298 9965 To your right adjacent to the path is a good example of an ice smoothed rock. This outcrop gives us important clues as to the direction of ice flow during the Ice Age: the ice left faint scratches on the rock surface. Also, as the ice moved over the outcrop, it smoothed its surface, but prised away pieces of rock on the downstream side to leave a more craggy downstream face. We can tell therefore that the ice was flowing from north to south. The ice melted in this area about 15,000 years ago. Since then the climate has oscillated between warmer and cooler; plants and trees have grown, and people have moved in and have managed the scenery ever since.

As you continue on the track back to the car park, pause to admire the view and reflect on the environmental changes to the area over the millions of years of geological time.