

Geology, geomorphology and soils of Wellington Park



The geology of Wellington Park forms the physical foundations for the landscape and the soil. Millions of years of erosive processes and change have shaped the area to form the landforms we know today.

The foothills feature sedimentary sandstones and mudstones laid down during the Permian Period (230-280 million years ago). These are now visible in the foothills of the Mountain around Fern Tree, South Hobart and Lenah Valley. Creamy white to grey in colour these mudstones and sandstones are visible in horizontal or gently dipping layers, sometimes up to a metre thick. In some places brachiopods and bryozoans may be seen.

Sandstones rich in quartz formed during the Triassic (180-230 million years ago) and covered the mudstones. Today these can be seen above approximately 600m in the cliffs and promontories around the Springs (including Rocky Whelans Cave), Sphinx Rock, Crocodile Rock and Snake Plains. On the western slopes of the Glen Dhu Rivulet valley the Yellow Cliffs are 50m high and extend for 1km, making it the highest and longest sandstone cliffs in the State.

A thick sheet of dolerite intruded during the Jurassic Period 170 million years ago. Shrinkage cracks developed while the molten magma cooled, forming large vertical columns with polygonal cross-sections.

Block faulting is in part responsible for the main landform trends of eastern and central Tasmania. Mount Wellington and the Derwent Valley were formed some 150 million years ago by block faulting. This has influenced the erosional development of the size and form of the Wellington Range. Individual faults have vertical displacements up to 600m.

Erosion has since exposed the 350m thick horizontal sheet of dolerite, featuring the Organ Pipes on the eastern face of the Mountain. This area has been eroded back approximately two kilometres since the escarpment was produced 10-15 million years ago. Some of the faults are considered significantly older than this.

When exposed to the elements dolerite is the colour of rust. Unweathered it is blue-grey. It is a hard, compact rock which is significantly more resistant to surface erosion than the clay-rich and sandy Parmeener Supergroup sedimentary rocks into which the dolerite magma intruded. Large dolerite sheets are globally unusual, though reasonably common in Tasmania and are also found in the Central Plateau, the sea cliffs on the southern tip of the Tasman Peninsula and Bruny Island. (Dolerite has been significant in substantiating the theory of continental drift and plate tectonics through its occurrence in Tasmania, Antarctica, South Africa and South America.)

It is estimated that more than six glacial stages have occurred in Tasmania over the last few million years. The Wellington Range has not been subject to extended periods of ice accumulation however a small amount gathered during the last Ice Age in the Pleistocene (10,000-250,000 years ago). Glaciers were not produced however dolerite forms were considerably eroded by water freezing and expanding within the columnar cracks. This resulted in the dolerite talus evident on the higher slopes. Where the soil and detritus has been washed from the crevices, block fields or Ploughed Fields have been produced.

The cliff-base talus at the Lost World, on the eastern slopes of Mount Arthur is also significant. Beneath the 30m dolerite columns is a maze of underground passages ('pseudo-karst- boulder caves) extending up to 360m long and 42m deep. These are believed to be the most extensive non-carbonate terrestrial caves in Tasmania.

A small volcanic vent was active about 300m south of the Pinnacle during Tertiary times, between 50 and 10 million years ago.

While the bedrock of Wellington Park is not unique or unusual in Tasmania, it provides the character for which the visual landscape is valued. It also provides the foundation for local soils, an important component of the living ecosystems that operate in the Park. Dolerite, sandstone and mudstone soils occur throughout the area in connection with the local bedrock.

Alpine peat soils, best developed around Dead Island, are highly significant being the most south-eastern alpine peats in the State. As these soils can be dated, they may provide new information on Holocene climates, rates of soil development in alpine areas, and post-glacial climatic change. As the substrate for a string bog biological community, they are also significant.

Landslips and rock slides are evident throughout the Park. Soil movement affects water catchment health and drinking water quality. Erosion is managed where necessary to ensure impacts are minimised.

Sourced from :

- Behind the Scenery – Tasmania’s landforms and geology, Dept of Education and the Arts, 1990
- Draft Wellington Park, Values, Use and Management Inventory, 1996
- Mount Wellington Walk Map and Notes, Geology, D.E. Leaman and K. D. Corbett, 2004