

Warrumbungle Volcano

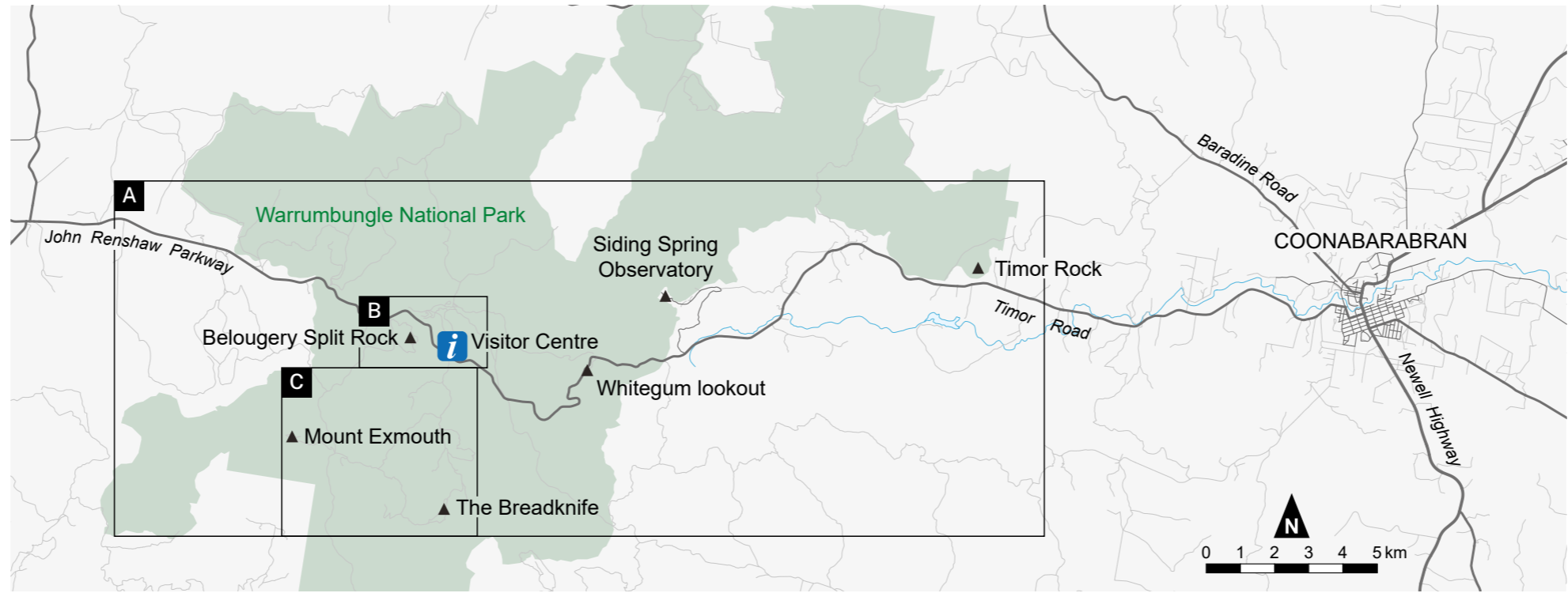
The Warrumbungle National Park geotrails tell the fascinating story of Warrumbungle Volcano. The volcano was active during the Miocene epoch, around 18 to 15 million years ago, due to a hot spot below Earth's crust. Erosion since that time has produced some of the most outstanding scenery in New South Wales and revealed the volcano's inner workings. By exploring the geotrails you will see evidence of dynamic volcanic processes including lava flows, destructive mud flows and exploding lava domes. You will travel into the heart of the volcano, see rocks that formed in the central vent, and witness the effects of volcanic activity on the ancient sandstone landscape that formed the volcano's foundations.

The geotrails

Five geotrails are available as separate downloads, so you can pick whichever suits your interests or fitness level. One is a driving geotrail, 3 are walking geotrails and one links 3 areas in Warrumbungle National Park's central valley – you can walk or drive between these. Each geotrail reveals different aspects of the park's geology.



Sun rising over The Breadknife in Warrumbungle National Park. Source: Destination NSW.



Warrumbungle Self-drive



Source: Robert Cleary, Department of Planning, Industry and Environment (DPIE).

Central Valley



Source: TKD Architects. Photographer: Brett Boardman.

Stops 6–11: Wambelong Nature Track

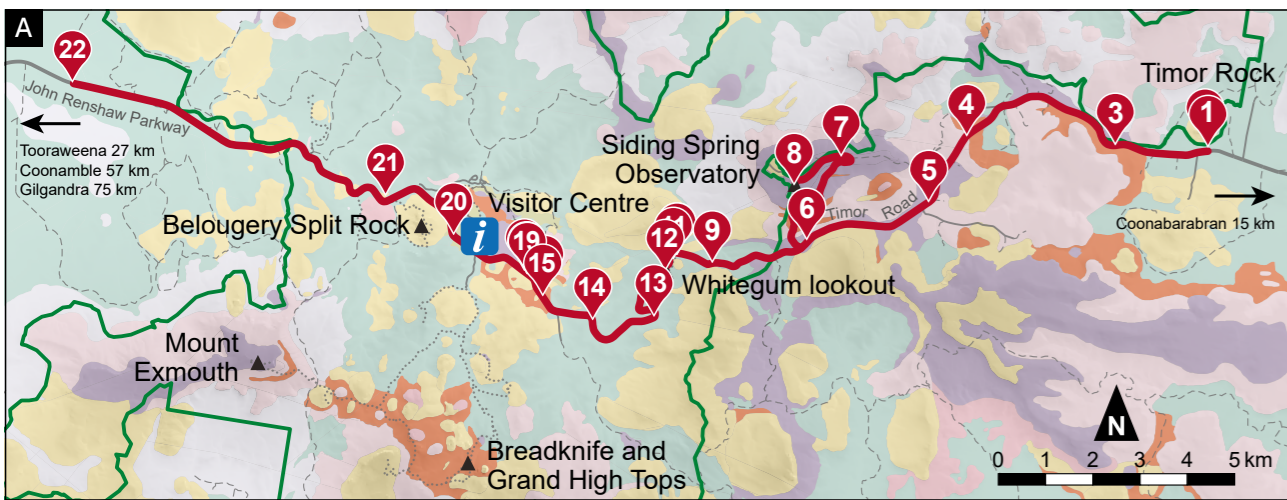
Wambelong Nature Track, beside Canyon Picnic Area, makes an easy circuit through and over rock formed from a thick trachyte lava that may have flowed from nearby Beloungery Split Rock, once a minor vent of the volcano.

From the picnic area, follow Wambelong Creek through a small, sheltered gorge eroded through the ancient lava. After swinging left past cliffs of columnar-jointed lava rock, the track rises steeply to the top of the lava deposit to reveal an awe-inspiring vista of the central valley and Beloungery Split Rock.

Beloungery Split Rock



Source: Stewart Watson.



22 stops ↗ 40 km one way

Whether approaching the national park from Coonabarabran in the east, or from the west, this geotrail takes you on a scenic drive across the ancient Warrumbungle Volcano, with access to picnic spots, walking tracks and wheelchair accessible park facilities.

This self-drive geotrail includes 22 stops, either directly beside or a short distance from the road. They are numbered sequentially from the east, as if coming from Coonabarabran. If travelling from the west, you'll begin at Stop 22 and work backwards.

Starting in Coonabarabran, you'll drive through the picturesque Timor Valley to the first stop at Timor Rock Picnic Area, where you can get up close to this prominent peak formed by an outlying minor vent of Warrumbungle Volcano. Further on, don't miss the side trip to the Anglo Australian Telescope at Siding Spring Observatory, which sits atop ancient lava flows. A lookout there provides terrific views of the highly eroded central part of Warrumbungle Volcano.

Arriving at the entrance to Warrumbungle National Park, stop at the wheelchair accessible Whitegum lookout. Here, you'll enjoy a wonderful panorama over the 'crooked mountains' including the impressive Breadknife dyke and Mount Exmouth, the highest remnant of the Warrumbungle shield volcano.

Continuing into the park, you'll drive into the central vent area of the volcano, now eroded to a broad valley. You'll pass the turn-off to Warrumbungle Visitor Centre. Visit there later to explore the Central Valley Geotrail that links with nearby Camp Blackman and Wambelong Nature Track.

Stretch your legs or enjoy a picnic at Camp Wambelong, where you'll be near imposing Beloungery Split Rock, a lava dome. If you plan to climb it, download the Beloungery Split Rock Geotrail, which tells the story of how it formed.

At the final stop, west of the park, you'll get a different view of the Warrumbungle Mountains and what happened after volcanic activity waned.

11 stops ↗ 3.8 km one way ↗ Grade 3

Warrumbungle Visitor Centre, Camp Blackman and Wambelong Nature Track make up this geotrail.

This geotrail, located in the heart of Warrumbungle Volcano, includes 3 nearby areas. You can walk the tracks linking these areas or drive between them. Either way, watch out for the abundant wildlife!

Highlights include the Geology Garden at the visitor centre, evidence in Wambelong Creek near Camp Blackman that the area was once Warrumbungle Volcano's central vent, and spectacular views across the valley from the top of the thick trachyte lava deposit seen along Wambelong Nature Track.

Stops 1–2: Warrumbungle Visitor Centre

Warrumbungle Visitor Centre is a great place to start your geotrail experience. Here, you can see vivid displays about the natural and human history of Warrumbungle National Park, purchase the Geology of Warrumbungle National Park map, and get your bearings with the help of the friendly staff. Note that only basic provisions are available.

Outside, in the Geology Garden, you can see large samples of many of the park's common rock types set in landscaped surrounds. Use the app to learn more about these varied rocks so that you will recognise them as you explore the park.

A short stroll along the adjacent Gurianawa Track will take you to some sandstone outcrops.

Stops 3–5: Camp Blackman

You can sleep in the volcano's central vent! Camp Blackman is a popular base from which to explore the park, well equipped with barbeques, picnic tables, hot showers and resident kangaroos.

Take a stroll to a nearby creek bed where you will find breccia thought to have formed in the vent. Part of the campsite sits on ancient landslide deposits, possibly formed by the collapsing crater walls. There is also an old lava flow deposit nearby.

8 stops ↻ 4.6 km return ↗ Grade 4

Beloungery Split Rock Geotrail offers stunning views and some terrific birdwatching.

For walkers with moderate fitness and a head for heights, this geotrail follows the Beloungery Split Rock walking track, taking you on a circuit up and over an imposing lava dome, formed by sticky lava piling up over a minor volcanic vent. You'll have the satisfaction of climbing one of the park's most distinctive peaks, get up close to features that show how it formed, and be rewarded with excellent views of the Grand High Tops, Pilliga Sandstone cliffs and the central valley.

A side trip to the summit involves a scramble up steps carved into the side of a rocky knoll. This Grade 5 track should only be attempted during dry weather. Once you reach the top, you'll see it was worth the effort. The panoramic views are spectacular, showing off the Warrumbungle Mountains and the seemingly infinite western plains stretching into the distance. Note: there are no geotrail sites on the summit side trip.

The geotrail walks are graded from 1 (easiest) to 5 (most difficult). Refer to the NSW National Parks and Wildlife Service website for more information.

Glossary

Breccia a rock made up of angular fragments >2 mm in diameter.

Central vent the main opening in the centre of a volcano.

Coherent volcanic rock that forms from solidification of lava or magma.

Deposit the rock or sediment resulting from a volcanic or sedimentary process.

Dyke a cross-cutting, commonly vertical, intrusion.

Erosion the action of wind, water, gravity or ice that moves soil, sediments and rock.

Felsic an igneous rock composed mainly of light-coloured minerals.

Flank the side of a volcano.

Intermediate an igneous rock with a composition between felsic and mafic.

Intrude how magma rises through Earth's crust to cool beneath the surface.

Lahar a mudflow made up of water and volcanic materials that flows down the slope of a volcano.

Lava dome a round mass of lava that extrudes slowly from a vent.

Mafic an igneous rock composed mainly of dark-coloured minerals.

Magma molten rock beneath Earth's surface.

Mineral a naturally occurring solid material with a specific chemistry and structure.

Plug body formed when magma hardens within a vent.

Pyroclastic material produced by an explosive volcanic eruption.

Sandstone a sedimentary rock made up of sand-size grains of mineral, rock or organic material.

Sedimentary rocks are formed by the build-up of sediments, fragments of minerals and rock that are moved by wind, water, gravity or ice.

Shield volcano a gently sloping volcano shaped like a flattened dome (or recumbent shield).

Vent an opening at Earth's surface through which volcanic products are erupted.

Volcaniclastic rocks are made up of fragmented volcanic materials.

Credits

Authors: Alexa Troedson and Kate Bull
Editing: Simone Meakin
Figures and cartography: Stewart Watson
Layout: Carson Cox

This collaborative geotrail project is led by the Geological Survey of NSW with support from NSW National Parks and Wildlife Service, local Aboriginal traditional owners and the Warrumbungle National Park Environmental Education Centre. We acknowledge the Gamilaraay people, Traditional Custodians of this land, and pay our respects to their Elders past, present and future.

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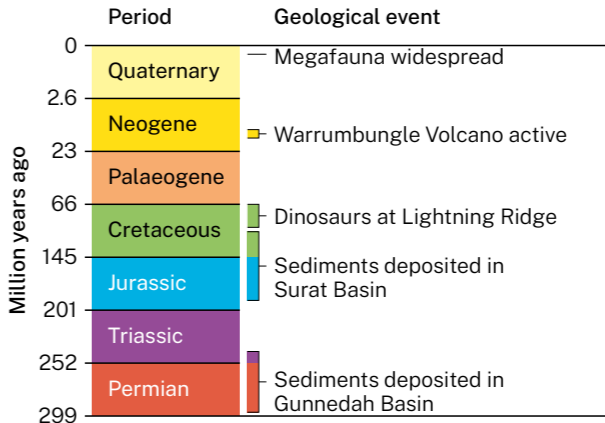
NSW GeoTours

Download our free app! Explore the geotrail at your own pace, with a tour guide at your fingertips.



Caution! Wildlife, weather and unstable ground can pose risks. Be sure to carry plenty of water.

Timescale of major geological events in the region



Note: All ages are approximate. Not to scale.

Further information

For a more detailed look at the rocks of Warrumbungle Volcano and its eruption history, grab a **Geology of Warrumbungle National Park 1:50 000 map**.

Hardcopy (\$11): warrumbungle.nsw.gov.au/products/9255 and shop.regional.nsw.gov.au/products/9255

Free download: search.geoscience.nsw.gov.au/product/9255

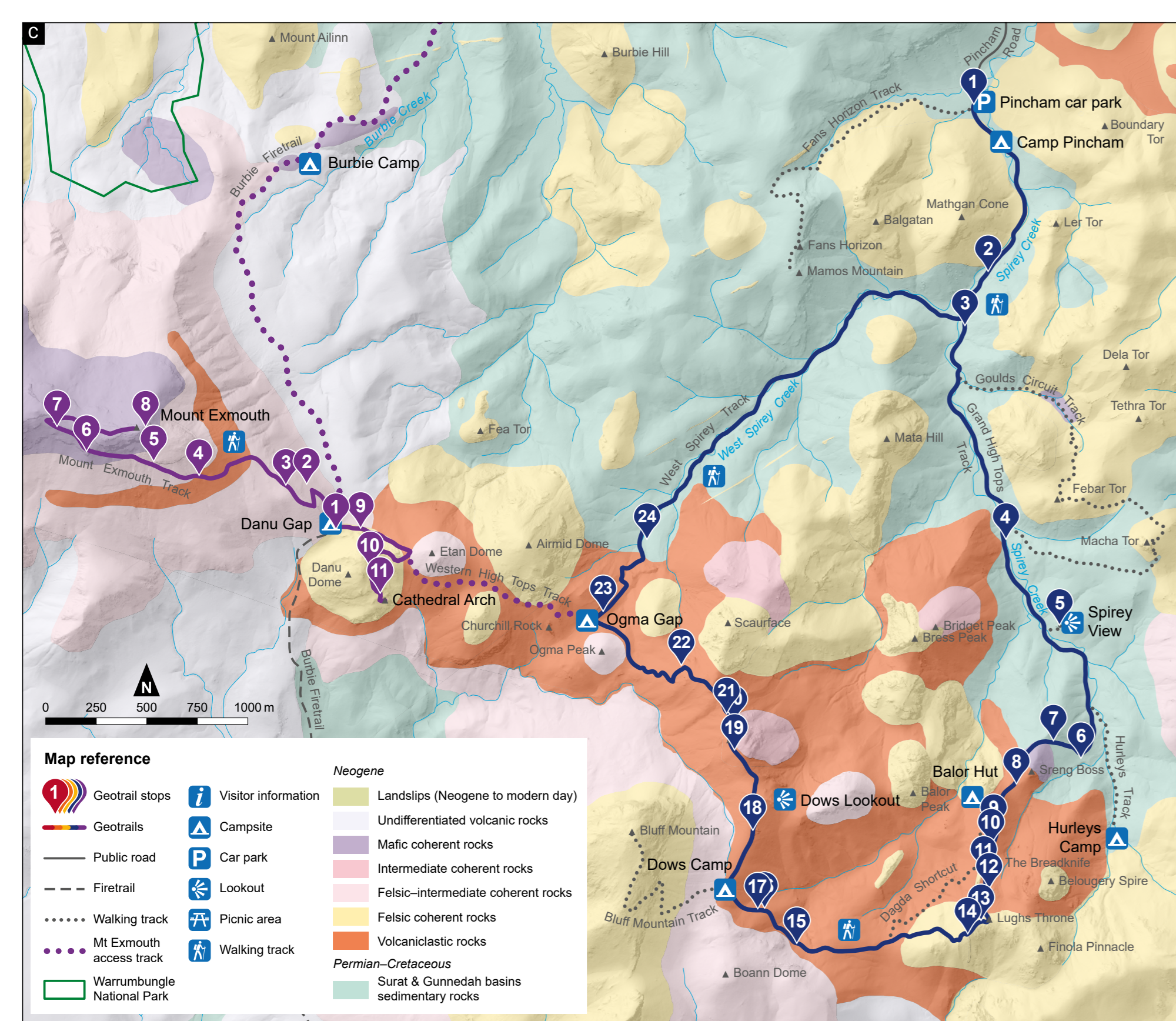
Cover photo: view from Lughs Throne south to Crater Bluff, Grand High Tops Circuit. Source: Guy Fleming.



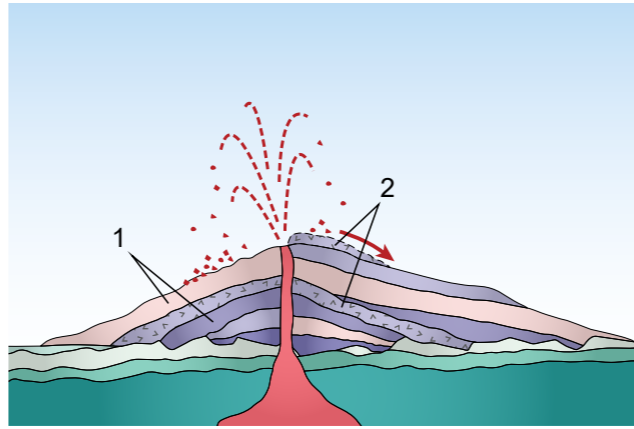
Warrumbungle National Park Geotrail



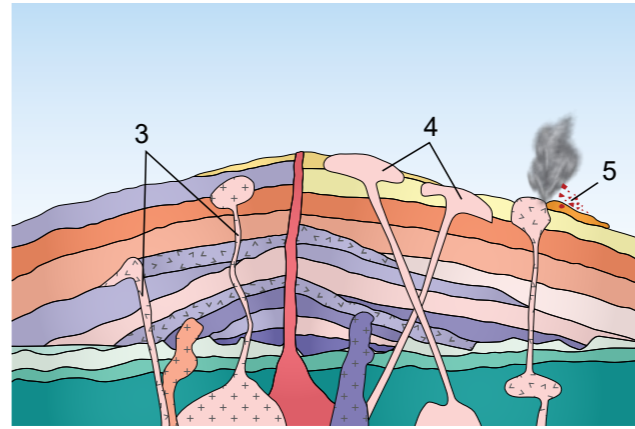
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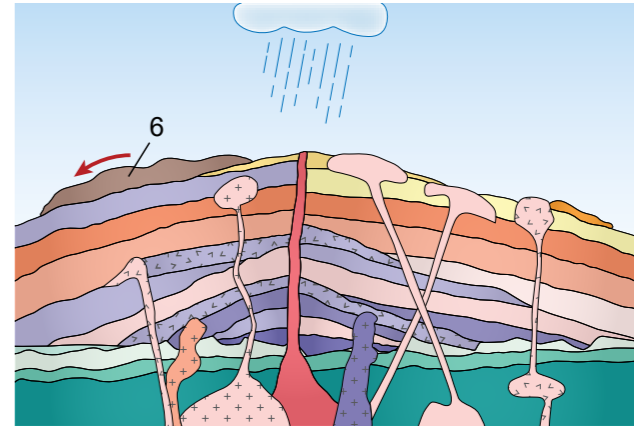
How did the volcano grow?



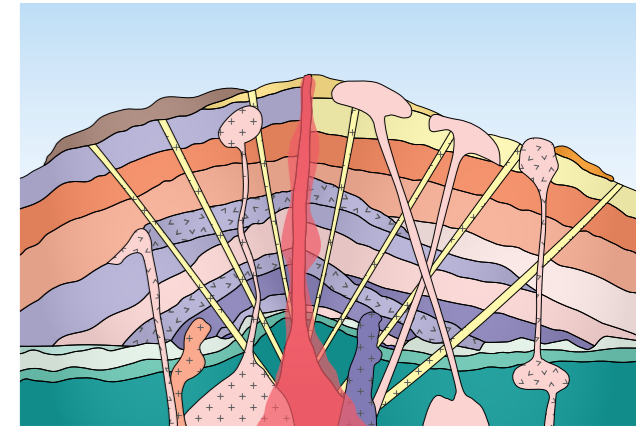
Warrumbungle Volcano began by erupting layers of lava flows (1) and explosive volcanic (pyroclastic) deposits (2) about 18 million years ago. These layers built up to form a broad mountain shaped like a shield lying down – known as a shield volcano.



In time, silica-rich magma intruded the volcanic pile, mainly as thin vertical dykes (3) and broad lava domes (4). Some domes exploded as they grew, sending volcanic ash and debris onto the volcano's flanks (5).



High rainfall events, common during and after volcanic eruptions, caused violent mud flows called lahars. These transported large amounts of volcanic ash, boulders and other debris down the volcano's flanks (6).



Late in the volcano's history, numerous dykes intruded the volcano in a radial pattern around the vent. This may have been associated with uplift of the central part of the volcano as magma built up below.

Grand High Tops Circuit



Source: May Fleming, DPIE.

24 stops 14.5 km return Grade 4

Grand High Tops Circuit Geotrail offers close up views of the park's iconic rock formations.

This geotrail follows the renowned Breadknife and Grand High Tops walking track, regarded as one of the best bushwalks in NSW. It's a demanding hike, but you will be rewarded with spectacular views and insights into how this landscape came to be.

From Pincham car park, the track follows the valley cut by Spirey Creek into the volcano's Jurassic sandstone foundations before climbing steeply towards the 'tops' (a local term for high country). On the way you'll be close to an almost kilometre-long dyke popularly known as The Breadknife, which now protrudes tens of metres into the air like a giant stone wall. Climbing on, you will arrive at the high point known as Lughs Throne, where you will find yourself surrounded by a complex panorama of volcanic remnants. Belougeri Spire and Crater Bluff loom large, while other plugs and lava domes dot the landscape. Views extend to the distant central valley and well beyond to the north,

and to Tonduron Spire on the national park's southern edge. You can see just how big Warrumbungle Volcano once was.

Walking on, you can choose to complete the Grand High Tops Circuit or return via Dagda Shortcut back down into the valley below. If you stay high, you will traverse the remaining high 'tops' and gain a more complete picture of the volcano, including evidence of explosive volcanic processes. Varied volcanic views from the western 'tops' include the massive jointed face of the Bluff Mountain lava dome and layered Mount Exmouth, the park's highest peak. The final section of the walk takes you down off the volcano and back through older sandstone rocks.

Mount Exmouth



Source: Sue Brookhouse, DPIE.

11 stops 6.4 km return Grade 4

This geotrail has 2 sections: the rewarding hike up to the mountain summit (4.6 km) and a short side trip to Danu Dome (1.8 km). Both start from Danu Gap, about 6 km along Burbie Firetrail from Split Rock car park, or 1.5 km from Ogma Gap on the Grand High Tops Circuit.

The climb up Mount Exmouth crosses many different volcanic rock layers before culminating in stunning panoramic views from this highest remnant of Warrumbungle Volcano. The side trip to Danu Dome allows you to see interesting landforms, including Cathedral Arch, formed by erosion of this ancient lava dome.

Stops 1-8: Mount Exmouth

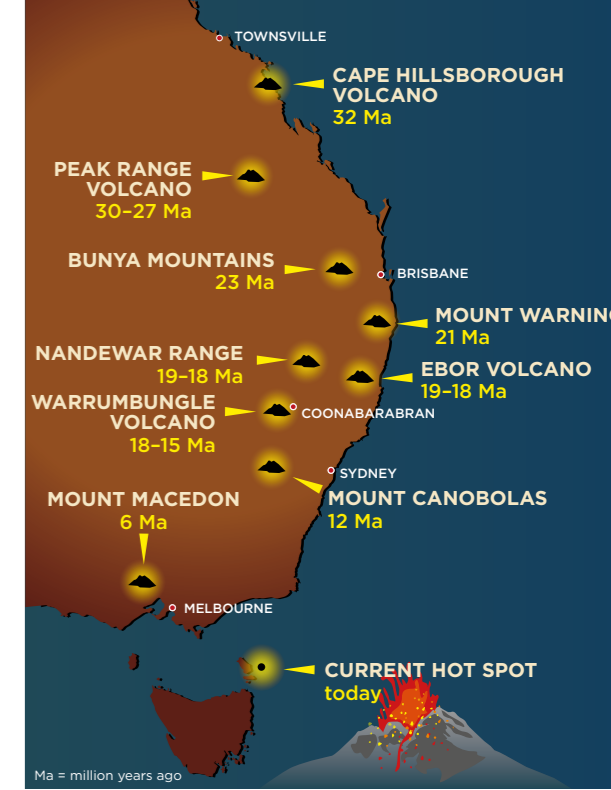
At around 1,200 m, Mount Exmouth is the highest point in Warrumbungle National Park. It also represents a modern high point of the original layered shield of Warrumbungle Volcano, most of which has been removed over time by erosion. As you climb up the mountain you will travel through the volcanic sequence – a layer cake of lava flow and volcaniclastic deposits. On the way, you can see slopes of volcanic talus, a flat-lying lava terrace, pyroclastic deposits formed from explosive eruptions, and layered cliffs of solidified lava flows. Grass trees (*Xanthorrhoea glauca*) are a beautiful botanical feature of the walk.

Enjoy spectacular sweeping views from the rocky lava flow plateau at the summit. Around fifteen million years of erosion has carved this magnificent scene. The view extends across the cleared central valley, once the volcano's central vent, to Siding Spring Observatory, which sits atop another layered shield remnant. The many resistant spires and domes, each representing a minor vent, were once buried beneath softer volcanic layers. The agricultural plains stretching west to the horizon form a stark contrast to this rugged volcanic landscape.

Stops 9-11: Danu Dome

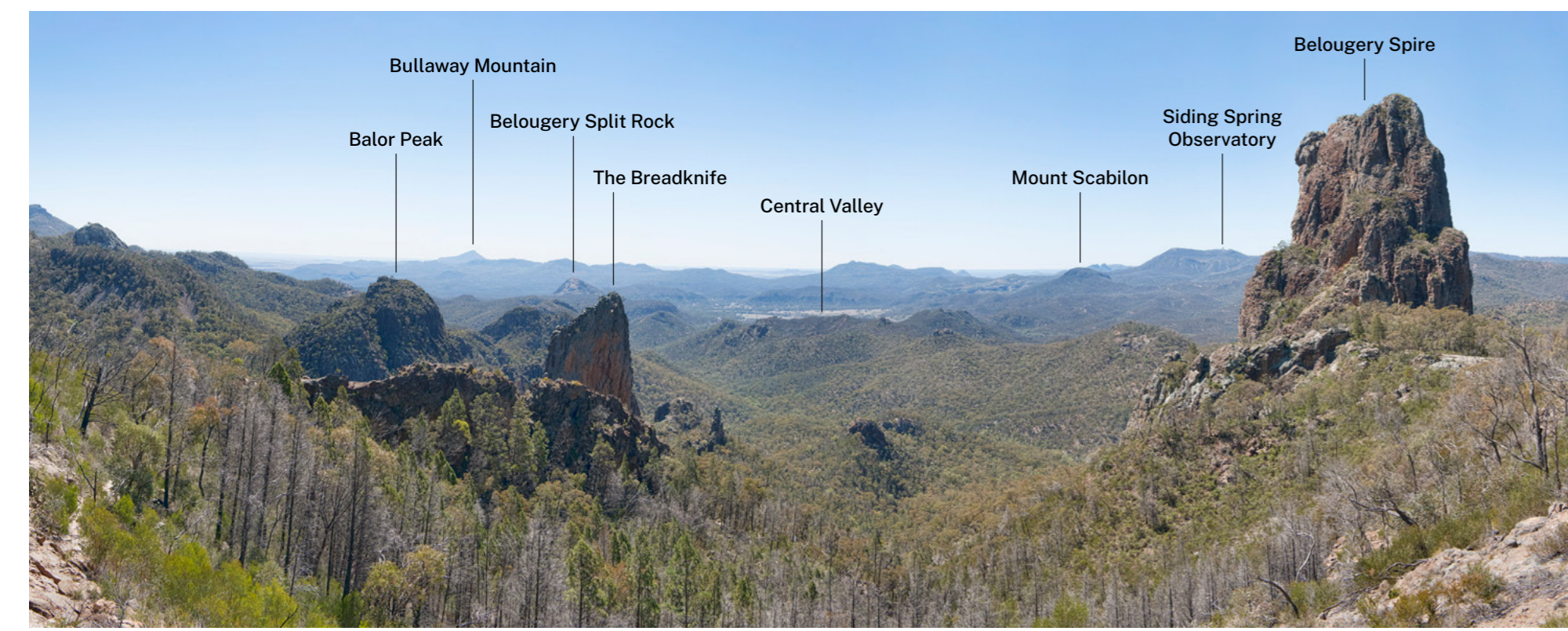
On the Danu Dome section you can explore the features of this ancient lava dome and learn about some unusual landforms along the way.

Why did a volcano erupt here?



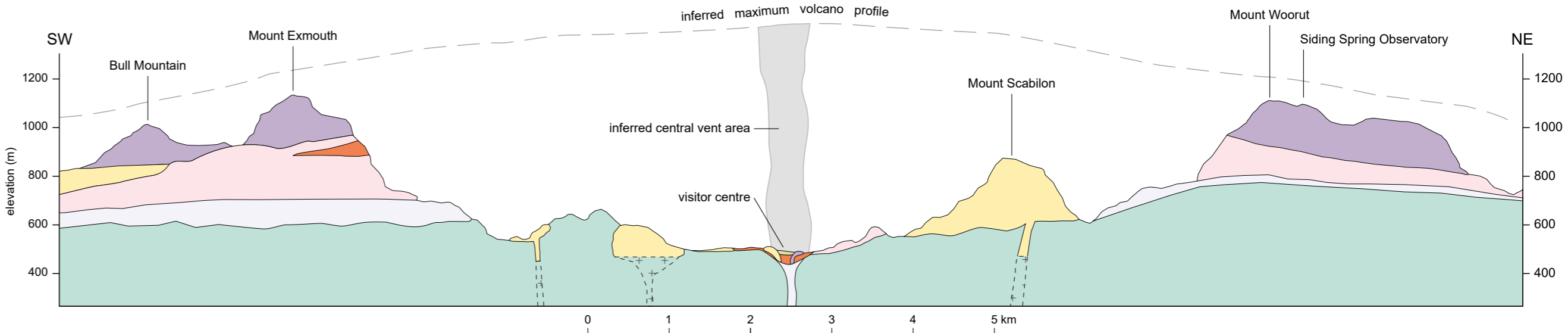
The eastern Australian hot spot volcanoes don't form a continuous chain. Their locations may coincide with areas of weaker or thinner crust. Today the hot spot lies below Bass Strait! Source: NSW National Parks and Wildlife Service.

Points of interest



Panoramic view northwards from Lughs Throne on the Grand High Tops Circuit. Photo source: Guy Fleming.

How big was Warrumbungle Volcano?



Simplified geological cross-section across Warrumbungle National Park. The lower green layers represent older sedimentary rocks which form the volcano's foundations.