

# HFNC Excursion to Lake Bolac and environs, April 2015

Diane Luhrs, Ken Grimes and Dave Munro

**Date and time:** Sunday 19<sup>th</sup> April, depart Hamilton Visitor centre 9.00 am; **Temperature** 8-13°C (only a little skiff of rain)

**Leader:** Ken Grimes (with reconnaissance by Rod Bird)

**Participants:** Ken Grimes, John Cayley, Glenys Cayley, Hilary Turner, Diane Luhrs, David Munro, Lyn Munro.

**Apologies:** Rod Bird and Janeen Samuel

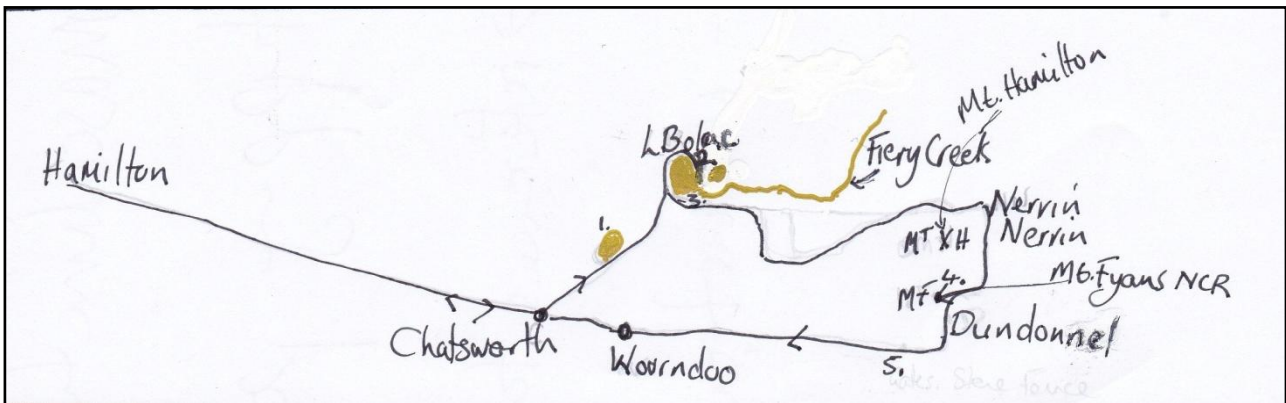


Figure 1: Sketch map of excursion with main stopping point at 1,2,3,4 and 5.

Ken led us out of Hamilton and onto the Chatsworth Rd where we met up with David and Lyn. The **first stop** was north of Chatsworth on the Chatsworth Lake Bolac Rd to inspect the inter-dunal wetland close to the roadside (Lake Tim Dunn, Photo 1). This was part of a sequence of old foredunes and swales formed on a prograding coastal plain about five million years ago (green area on map) and just before the volcanoes started erupting. Only one species of duck (170 shelduck) was present and there were no other water birds; a brown falcon flew overhead.

**Stop 2a:** Lake Bolac - east beach to inspect the lunette, calcareous rocks on the lunette and the basalt rocks leading down the lake's edge. Ken also pointed out the beach cusp patterns formed by wave action and rip currents on the water's edge). Many water birds present: silver gulls, 380 coot, 270 chestnut teal, 1 red-capped plover and superb fairy wrens, red wattlebird, magpie, ravens.

**Stop 2b:** Fiery Creek entrance to Lake Bolac. Fiery creek is one of several streams that would originally have been running southward to the old coastline, but were blocked and diverted westward by the lava flows of Mt Wyvern (W on map) and Mt Hamilton (H on map) to form Lake Bolac. For a summary of the geological history of this area see the "[Lake Bolac & Skipton Geological History](http://www.hamilton-field-naturalists-club-victoria.org.au/images/pdf/D/Lake_Bolac_Geol_Hist_KG.pdf)" PDF in the HFNC web site ([http://www.hamilton-field-naturalists-club-victoria.org.au/images/pdf/D/Lake\\_Bolac\\_Geol\\_Hist\\_KG.pdf](http://www.hamilton-field-naturalists-club-victoria.org.au/images/pdf/D/Lake_Bolac_Geol_Hist_KG.pdf)). There were many small waders on the beach: 120 red-capped plovers, 50 red-necked stints and 60 chestnut teal, 1 egret (possibly great). Many other small waders further along but without a scope it was difficult to identify them – possibly many hundreds more, further south. David noted some small sharp rock fragments and wondered if they may have been worked tools. The place certainly looked as if it would be a perfect place for shelter and food. Many young wattles with extra long phyllodes were growing along the creek's edge (??).

**Stop 3:** South Beach road (including sightings from the road and from the beach): many water birds: ducks (~ 700 = 80 pink ear, 100 mixed grey and chestnut teal, 250 grey teal, shelduck), 15 pelican, 65 swan, 1 royal spoonbill, 16 yellow spoonbills, 16 cormorants, 18 masked lapwings, 5 hoary-headed grebes, many welcome swallows, many tree martins (in the rocks), ~ 10 whiskered terns and red wattlebird (calling), whistling kite (calling).

The water level was low enough for us to look at an exposure of deep-weathered Cambrian sandstone on the wave-cut platform (near where Whites Lane joins to South Beach Road). The sandstone was folded so the beds were nearly vertical (Photo 3c), which gave us a nice cross-section of the bedding structures. Small cross beds showed that the original current had been mainly from south to north. In one place we saw a cross-section of a small scour channel cut into the underlying beds (Photo 3d). The rock had a brilliantly coloured mottled pattern of red, orange, brown, purple, cream & white (see photos). This was the result of a deeply weathered surface that probably formed just before the lavas from Mt Wyvern flowed across the area and dammed the lake. At the base of the cliff we saw the actual paleo-soil that had formed on top of the sandstones. This also had mottled colours, but the bedding had been destroyed and instead we found various soil structures, including shrinkage cracks that had been infilled by a white clay (Photo 3g). Boulders of basalt may have been part of the Wyvern flow, but given the proximity to the road we could not be sure these had not been introduced to protect the cliff from erosion.

From Lake Bolac we drove south-east on a zig-zag route that took us over progressively younger volcanic lava fields (see map). None of the local volcanoes have been numerically dated, but we can guess at the relative ages from the overlapping patterns and from the changes in the soil (the details were worked out by a student, Kate MacInnes, in 1985). The initial volcano which dammed the lake was Mt Wyvern, which may have erupted 2-3 million years ago. We drove over the top of this hill but it was not at all obviously a volcano as all traces of the crater etc had been eroded off. But we noted that there was a thick heavy caly soil with hardly any rock remaining. Beyond this we came onto the lavas from Mt Hamilton. Here the soil was also well-developed, but there were many cobbles & boulders of basalt – this was particularly obvious where the farmers had raked & pushed them up into mounds to allow cultivation of the soil. From the degree of soil cover, I think Mt. Hamilton probably erupted about a million years ago (give or take half a million). We circled around Mt Hamilton and then drove south and came onto much stonier country with lots of lava mounds and hollows. These were the lavas from Mt Fyans, which has a similar degree of soil cover to Mt Rouse, so is probably about half a million years old.

**Stop 4:** Mt Fyans Nature Conservation Reserve. Black-shouldered kites swooped and hovered above the fields as we drove along the road to this reserve. Manna gums lined the roads and were the main trees in this reserve. We followed Ken onto the rim of the crater and then walked into the quarried section of this mount. David spotted a very handsome bird which flew up to perch on a rock high on the scoria wall. It had us somewhat puzzled as to what it could be – we missed Rod and Jane's bird-identification skills. It turned out to be a southern boobook. A pair of peregrine falcons and a nankeen kestrel flew overhead.

Ken led us to various features in this area. The quarry has removed much of the original; cone, but has exposed some interesting features. The scoria cone was been intruded by several dykes of different sizes at the end of the eruption and these fed a small lava flow that coats the scoria cone. The largest dyke (Photo 4c) hosts a small lava cave which was found on an earlier HFNC trip in 2000 (a report is in the HFNC library). We saw the underside of the lava in one place. And the remains of a vertical pipe that was coated on the inside with spatter and dribbles of lava (Photo 4d). Other features included a lava bubble, and ropey and

pillow lava over scoria. For more information on the cave, and the associated volcanic features see Grimes (2006) at <http://helictite.caves.org.au/pdf1/39.1.Grimes.P.pdf>.

**Stop 5:** We headed south through Dundonnell and shortly after turned westwards back toward Woorndoo, where we paused a while to enjoy a magnificent stone fence and three stone pillars marking the entrance to one of the old grazing properties of the region.

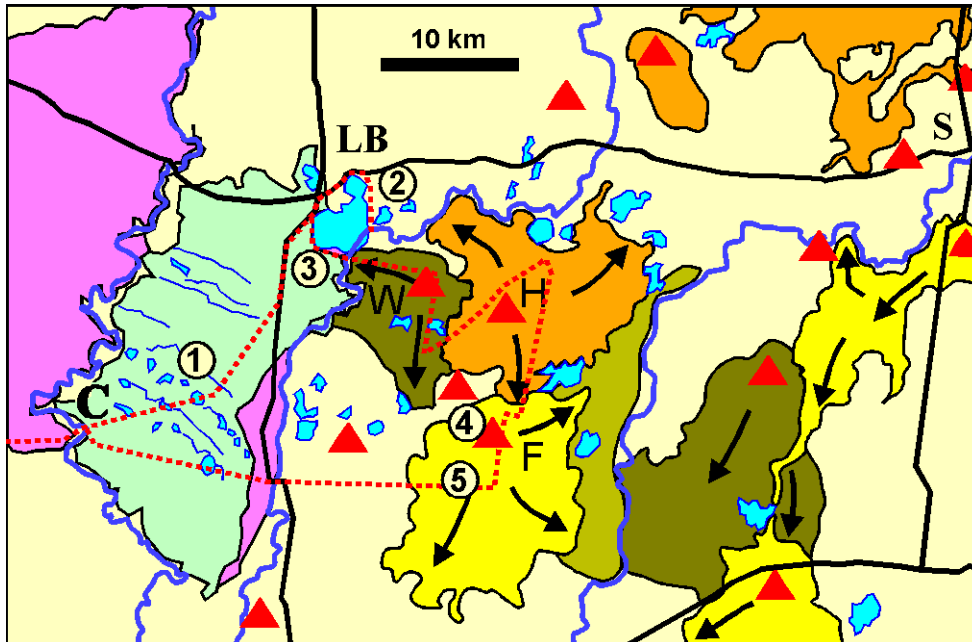


Figure 2: Geological map of Lake Bolac area. Purple is the Cambrian folded sediments, Green is the 5 Ma (Million years) old coastal plain. Pale cream is oldest volcanics (5-3 Ma), dark green – orange – yellow are progressively younger lava flows (2 – 1 – 0.5 Ma). Red triangles are volcanoes. **LB** = lake Bolac, **C** = Chatsworth, **S** =Skipton. **W** = Mt Wyvern (2-3Ma), **H** = Mt Hamilton (1Ma), **F** = Mt Fyans (0.5 Ma). Red dotted line is our route, with numbered stops.

**Chatsworth/Lake Bolac Rd**



1. Lake Tim Dunn, an Inter-dunal salt lake on a 5 Ma coastal plain

**East side Lake Bolac**



2a. Basalt rocks and lunette East shore of Lake Bolac



2b. John David, Hilary and Ken



2e. Lunch at 12°C: John, Glenys, Hilary, Ken, Lyn and David.

**South Beach**



2c.



3a. Pelican, swans and ducks aplenty



2d. Fiery Ck where it enters the lake – the channel seems to have been artificially enlarged & straightened.



3b. Cambrian sandstones exposed on a wave-cut platform at southern end of Lake Bolac



3c. The steeply dipping beds expose sedimentary structures



3d. ... such as this infilled stream channel, cut into the underlying beds (the scratch marks the base of the cut).



3e. The lateritic paleo-soil that overlies the sandstone



3f. These fine cracks are a result of shrinking of clays in the old soil, and have been unfilled with a white clay.

#### **Mt Fyans Nature Conservation Reserve**



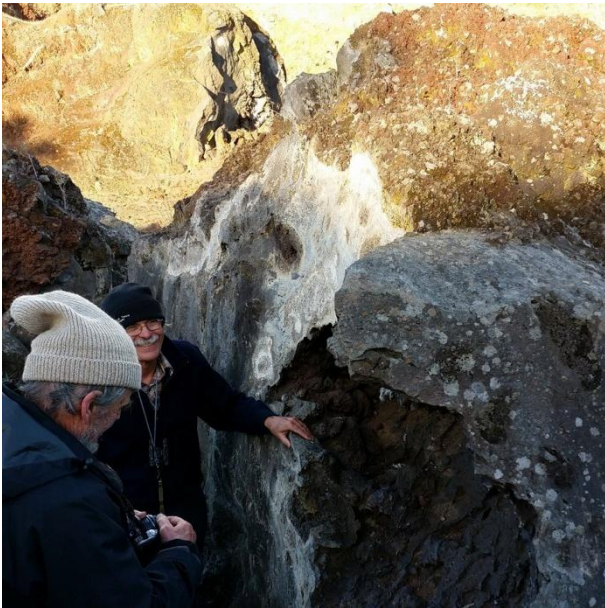
4a.



4b. Rubble (partly from broken up dykes) within the quarry. Ken is looking at a small lava bubble.



4c. The largest of the dykes.



4d. Dave & Ken examine a broken part of the pipe.



### Dundonnell stone fences



**Sun 19 April** A Hamilton FNC excursion to Lake Bolac and district. Ken Grimes took the role of leader and did his usual good job of interpreting the geology for us. Rod Bird was originally intended to be co-leader but unfortunately had a dose of the lurgi so he was absent. Dianne was under instructions to record and count the birds encountered during the day. The weather forecast was for a maximum of 14degrees with a 20% chance of showers pushed along by a southerly breeze. It turned out to be quite a chilly day but we avoided most of the precipitation.

Lyn and I have travelled the road between Chatsworth and Lake Bolac many times but have never recognised that it crosses a series of stranded beach dunes running more or less SE to NW with associated swales between them. The first stop was at a lake which illustrated the geomorphology very well. We have never seen many birds on it but today there were over 170 Shelducks but nothing else. We inferred that it may well be a quite saline body of water.

We motored through lake Bolac township and stopped at Fishermans Point on the eastern shore. Dianne had stopped to count a flock of Chestnut Teal on the way. Here we examined a lava flow which made up much of the shore line. In places it had been capped by a calcrete layer formed as part of a lunette. There were a couple of very photogenic gnarled Manna Gums which may well have been remnants.

Moved on to a reveg site just south of the East Beach facility. A Pine plantation had been removed along the foreshore and was being replaced with hundreds of natives. The tree guards being used were new to us being a single sheet of stiff plastic bent into a circle and fixed by a single wooden stake. Sadly only about 25% of the plants were still alive. We had a good view of the beach sand cusps, crescents of sand along the edge of the lake.

We then drove down to where the Fiery Creek runs into Lake Bolac. The water in the clearly man made channel was extraordinarily bright green. Signs nearby warned of the presence of Blue-green algae so perhaps this was the explanation. We noted some regrowth of Acacia stumps with particularly long phylodes, up to 30 cms. The ID is not known. On the fore dune adjacent to the mouth of the creek we picked up some quartz fragments some of which could have been worked. It would have been an obvious spot for a camp; indeed there is evidence that it still is.

A number of makeshift hides were erected along the shoreline reminding us that the duck killing season was in progress.

The lunch break was back at the East Beach facility. We were glad that Dianne had parked her van on the windward side of our picnic table. The wind was noticeably affecting the chill factor.

A squall of icy rain sent us scurrying to our vehicles.

We then motored over to the west side of the lake where we came across more species of birds and in bigger numbers. I will leave the exact list and numbers to Dianne but the sight of a Pelican armada and a group of statuesque cormorants have to be remarked on. Ken showed us an outcrop of deeply weathered Cambrian sandstone and siltstones exposed on the shore. The bedding was clearly seen along with examples of crossbedding and stream cuts. Some nice specimens of plum pudding rock composed of buckshot gravel embedded in a matrix of limy concretion were found. ( A specimen of this now holds pride of place in the Cayley's bird bath).

We then took a tour round various volcanoes to the south and east of Lake Bolac. We drove round Mt Hamilton and could clearly see the crater at the summit. The last stop as at the summit of Mt Fyans. To get there we drove up through grassy woodland with Manna Gums and Blackwood the main trees. Unfortunately the ground cover looked rather weedy and a big flock of sheep was not improving it. The summit proved to be a huge scoria quarry with a large basalt dyke running into the middle of it. Just as we arrived I startled a pair of birds one of which landed on the cliff face about 75 metres away. There was much conjecture as to its identity. With luck I managed a couple of reasonable shots and once the image was enlarged we were able to positively name it a Boobook Owl. Ken showed us a lava tube which would have been part of the vertical vent when the dyke was erupting. There was also a cave running part way along the length of the dyke.

On the way home we stopped to admire the drystone walls and gateway on the Dundonnell-Woorndoo Rd. Altogether a cool but invigorating and interesting day.