The Hamilton region of south-western Victoria:
the landscape and flora

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Introduction

My objective is to provide a glimpse of the natural history of the Hamilton region. One may then reflect on how, in our future use of the land, we might strive to preserve what we have and seek to restore the elements that have been severely depleted or degraded.

If our objective is to expand the population, business activity and prosperity of people in the Hamilton region then we need to remind ourselves that quality of life is not only measured in terms of money and the built environment. We must live in way that will also be good for future generations. To do that we need to look after our natural world which, in this area, has an enormous potential to attract visitors. Hamilton is fortunate in the host of natural attractions on offer. Foremost are the volcanic attractions (basalt plains grasslands, lakes, swamps, scoria cones, lava canals, waterfalls, tumuli, flora) which have too long been unrecognised by local government and the people as being significant tourist attractions.

What do we need to do if we are to 'exploit' our natural assets in an appropriate and sustainable way?

1. Provide less intrusive access (people should walk from parking areas remote from the attraction – e.g. in northern Scotland visitors usually walk considerable distances from their vehicles.
2. Managers need better environmental knowledge to manage natural areas and the visitors.
3. Provide better interpretive signage and educational material to inform the public.
4. Arrange access to sites that are on (or accessed through) private properties – in the UK the landholders allow visitors to walk along defined paths, and accept that to be a community service. That tradition needs to be developed here.
5. Invest in large restoration projects, such as the Great Swamp (the 3,000 ha now drained Buckley Swamp) that would have a huge visual, conservation and cultural impact (it suported a large Aborigine village and was an important meeting place, hunting ground and food-gathering site). Such a project would surpass Bool Lagoon in SA and attract a host of bird observers and other visitors interested in volcanology, Aborigine culture and landscape and be a huge benefit to migratory and local waterbirds. Some 90% of wetlands have been lost from the basalt plains since settlement. More than 50% of wetlands have been lost in SW Victoria due to drainage.
6. Attract investment in projects that attract recreational cyclists – there is a large system of unused rail reserves in the region. The Hamilton-Wannon section of one trail is in development. Rail trails provide for conservation and recreation, attracting visitors who stay in the towns.

I shall illustrate some significant landscape features – for detail, please read the articles that geologist Ken Grimes has made available in the **HFNC website** [**hamilton-field-naturalists-club-victoria.org.au**]. The website also has many articles on the natural history of this region, including the papers from which this talk has been prepared. The historical detail is found in *The Hamilton region of south-western Victoria: an historical perspective of landscape, settlement and impacts on Aborigine occupants, flora and fauna (2011*) by Rod Bird.

- Photo 0 – handprint in ochre Burrunj (Black Ra) 02@ 1974 – the first people

The handprint at Burrunj (Black Ra) reminds us that this land was occupied when the first Europeans invaded and claimed the land for themselves. That story of dispossession of the natives through disease, murder, warfare and deprivation of food resources (exclusion from waterholes, hunting grounds and gathering of Yam Daisy tubers by the women) is told elsewhere (see above).

Landscapes

The landscapes of the Hamilton region are broadly represented by 5 geological land-zones:

1. *Volcanic Plains, Hills & Wetlands*
2. *Laterised Tablelands* (*e.g.* Dundas Tableland – the characteristic 'Red Gum' landscape)
3. *Casterton Rolling Hills* (*e.g.* Coleraine area)
4. *Grampians Ranges & Plains* (*Currewurt*, Dundas Ra., Western Black Ra. & Eastern Black Ra.)
5. *Sedimentary Rises & Plains* (sandy soils of Glenthompson-Wickliffe-Woorndoo-Mortlake)

1. Volcanic Plains, Hills, Waterfalls & Wetlands

Older basaltic plains, with a crust of basic lava from 4-40 m thick resulting from ***Phase 1 lava flows*** 4.6 million years BP, overlying *Tertiary* sediments (limestone, sandstone and shales), and ***Phase 1 basaltic hills*** (*e.g. Al.low.ween*, Mt Pierrepoint). Laterised clayey soils developed on the basalt.

The view from Mt Sturgeon to Lake Linlithgow & Mt Napier:

1. The fringe of River Red Gum on the sandy outwash slope from the Grampians (formed from mudstones & sandstone 500 mya in Gondwana super-continent)
2. The basaltic plains – where flocks of sheep were grazing by 1838 (1 sheep/acre). Aborigine women once dug Yam Daisy (Murnong) bulbs there but were evicted by the squatters.
3. The wetland remnants – Lake Linlithgow and The Great Swamp at the foot of Mt Napier. Mitchell's party had much difficulty in travelling with their drays over that wet country.

The view from the Victoria Range to Mt Sturgeon:

1. The Red Gum fringe on the outwash slope – beyond that Swamp Gum colonised the clay.
2. Bryans Swamp, still a major wetland and repository of many ancient trees on the banks.
3. Wannon River displaced north by the lava flow 2-3 mya from the south. The flow extended up the Victoria Valley. Much of this was covered later by a thin mantle of outwash sand.

The basalt plains and hills:

1. The plains have impeded soil drainage and thus were fundamentally a grassland (*Themeda*, *Poa*, *Austrostipa*, *Austrodanthonia* and other species). About 550 plant species were present.
2. There were some trees (Swamp Gum, Drooping Sheoak, Blackwood, Black Wattle, Sweet Bursaria and especially a stunted form of Silver Banksia) on these clay plains.
3. The few watercourses where drainage or water supply was better had some River Red Gum, Woolly Tea-tree, Prickly Tea-tree and Prickly Moses (*A. verticillata*).
4. The rises had Manna Gum, Blackwood, Drooping Sheoak and Cherry Ballart.

Basalt Plains Native Grassland:

The native grasslands have all but disappeared; <1% remains, mostly on road and rail reserves. The grasslands are regarded as 'critically endangered' under the Federal EPBC Act 1999. These narrow reserves are constantly being degraded by landholder actions – herbicides, cultivation and grazing. The Kanawalla section and Hamilton-Sandy Creek section of disused railway are vital remnants. There is pressure from some landholders to alienate even these areas.

The use of the degraded central rail track for a bike trail would be a great way to benefit from these assets, while helping to conserve the native species on the flanks.

- Photo 1 – Mt Sturgeon to LLinlithgow & Buckley Swp – RRGum outwash plain Jun74
- Photo 2 – Vic Ra to Bryans Swp – *E. camaldulensis* RRGums on outwash plain Nov85
- Photo 3 – RRGum at Bryans Swp MGunn LKE photo 1962
- Photo 4 – RRGum at Dwyers Ck – largest diameter RRG in region Oct06
- Photo 5 – *E. ovata* Swamp Gum on the basalt clay plains, impeded drainage
- Photo 6 – *B. marginata* Silver Banksia remnant 'treeless' basalt plains Feb82

- Photo 7 – *Stackhousia monogyna* Nigretta Oct77[10c+s] grasslands ~550 sp on plains
- Photo 8 – Roadside Forest Ln Jan04 – <1% native grasslands left on plains
- Photo 9 – Native grassland at Forest Lane; damage from herbicide Oct06
- Photo 10 – Hamilton-Coleraine Rail Res map 2013 Feb13
- Photo 11 – *Themeda australis* (Kangaroo Grass) Hamilton-Wannon Rail Res Dec12
- Photo 12 – Hamilton-Wannon Rail Trail ride Feb13

Wannon Falls from *Phase 1 lava flows* 4.6 million years BP – Wannon Falls resulted from the flow of lava up the Wannon Valley from a volcano in the region of the lower Grange Burn. Over time, the flow of water progressively undercut the lip of the 2-3 m thick lava flow, so that the falls has moved upstream by several hundred metres.

The flora of the 65 ha Scenic Reserve (and both sides downstream) comprises 213 native species. It is an important local remnant of Dundas Tableland flora. It is currently managed by the Shire of Southern Grampians. Much work is needed in the reserve to remove weeds and damaging activities.

- Photo 13 – Wannon Falls in flood Jul95
- Photo 14 – Wannon valley below falls Sep09
- Photo 15 – Wannon Falls ScRes – *Thelymitra aristata* (1 of 200 native flora) 1995
- Photo 16 – Wannon Falls ScRes – *Caladenia carnea* Pink Fingers Oct10
- Photo 17 – Wannon Falls ScRes – *Bossiaea prostrata* Creeping Bossiaea Vasey Sep09

Lakes formed by *Phase 2 basalt* 2 million years BP (e.g. Lake Repose volcanoes) flowing over Phase 1 basalt and blocking streams (e.g. *Jenawarra*, Lake Linlithgow).

Lake Linlithgow (1015 ha) was formed when a flow of lava from volcanoes in the area of Lake Repose, SE of Dunkeld, left a large 'island' of the older basalt uncovered. The lake is filled by Boonawah Creek. This is an important recreational lake and feeding area for waterbirds. (see *History, fauna and flora of Lake Linlithgow (Jenawarra) and associated wetlands in south-west Victoria* – Rod Bird, Steve Clark & Murray Gunn, 2008).

- Photo 18 – Lake Linlithgow view to Grampians Dec00
- Photo 19 – Lake Linlithgow E bank & HFNC planting Feb95
- Photo 20 – Lake Linlithgow BW Stilts Dec07
- Photo 21 – Lake Linlithgow Sharp-tailed sandpiper flock Jan08
- Photo 22 – Lake Linlithgow Sharp-tailed sandpiper Jan08
- Photo 23 – Lake Linlithgow *Eutaxia microphylla* Dec07
- Photo 24 – Lake Kennedy & view to Mt Napier Feb07

Stony rises, scoria cones and lava flows, arising from ***Phase 3*** eruptions from ~32,000 years BP (*e.g. Tappoc*, Mt Napier & *Budj Bim* Mt Eccles) to ~330,000 years BP (Mt Rouse).

Mt Napier, Mt Rouse and Mt Eccles are 'newer volcanics' – scoria cones that have released ash, scoria and molten lava. They have produced lava channels that have flowed for tens of kilometres, as well as broader-based flows producing 'stony rises'. The Mt Eccles flow extended into the sea at Tyrendarra; the Mt Rouse flow ran into the sea at Port Fairy.

Byaduk Caves sit in the lava-filled Harmans Valley west of Mt Napier. The collapsed lava tubes are a smaller version of the much longer system at Undara NP in Queensland. Our caves are home to Bentwing Bats, now a threatened species in Victoria. Ferns flourish in the environment here.

Wallacedale Tumuli lie further downstream – lava 'blisters' that rise dramatically from the lava field. This area abuts a former swamp, now drained. Aborigine stones houses occur in the area.

The flora of the 'new' lava fields is simple; the total number of native species does not greatly exceed 100 species. There is a single eucalypt species (Manna Gum (*E. viminalis*) growing on this jagged landscape. Drooping Sheoak (*Allocasuarina verticillata*) still grows near the summit of Mt Eccles and appears also to have grown on Mt Napier (see Mitchell's etching). Swamp Gum (*E. ovata*) grows nearby on the old lava and occasionally along a water course amidst stony rises in the Condah-Tyrendarra area. Blackwood (*A. melanoxylon*) is the only tall acacia on the new lava. Black Wattle (*A. mearnsii*) is usually absent, except where the new lava has not covered the older basalt.

A legacy of fire from arsonists and, in past decades, from adjoining landholders, has greatly modified these forests, resulting in bracken dominance and the loss of Blackwood. The last major fire over Mt Napier itself was in 1972. Trees have proliferated since then in the area around the mount. The summit of Mt Napier was denuded of trees by Major Mitchell in 1836, who wished to have a clear view. The photo taken in 1922 shows it was still bare then. The Hamilton Field Naturalists re-planted Manna Gums grown from the local trees in the 1985-90 and a few Blackwoods have volunteered.

The stones and forests of Mt Eccles and Mt Napier may be the last habitat of the Spot-tailed Quoll. Oddly, the Red-necked Wallaby has appeared in the area in the last 5 years. The Black Wallaby occupied the area from the mid 1980s, while the Eastern Grey Kangaroo population has also expanded since the park was declared in 1989. Oddly, leeches have also appeared in the last 10-20 years.

- Photo 25 – Mt Napier cone from SW corner May75
- Photo 26 – Mt Napier Major Mitchell's etching of the summit 1836
- Photo 27 – Mt Napier track & treeless summit 1922
- Photo 28 – Mt Napier forest *E. viminalis* (Manna Gum)
- Photo 29 – Mt Napier Koala in Blackwood Jan11
- Photo 30 – Mt Napier *Pelargonium australe* (Austral Pelargonium)
- Photo 31 – Mt Napier *Viola hederacea* (Ivy-leaf Violet) Nov74
- Photo 32 – Byaduk Bridge Cave 1995
- Photo 33 – Byaduk Church Caves *Cassinia longifolia*
- Photo 34 – Byaduk Caves *Blechnum chambersii* (Water Fern) Apr76
- Photo 35 – Byaduk Caves *Histiopteris incisa* (Batswing Fern) Apr76
- Photo 36 – Harmans Valley from Pt Fairy Rd
- Photo 37 – Wallacedale Tumuli Jun77
- Photo 38 – Mt Eccles Lake Surprise 1974
- Photo 39 – Mt Eccles Sugar Glider in a dead Manna Gum tree 1994
- Photo 40 – Spot-tailed Quoll 1975

Peat swamps and lakes formed from a *Phase 3 flow* damming a valley (*e.g.* Mt Napier lava and *Ko.nung.i.yoke*, Buckley Swamp); Mt Eccles and Condah Swamp and Lake Condah).

Buckley Swamp (3,000 ha) was formed after the Mt Napier eruption blocked the ancient stream in Harmans Valley. This wetland was regarded as the most significant feature of the Hamilton area before drainage was started in the 1880s. It was a major meeting and camp place for the Aborigines of the area and it was home to 'a myriad' of wildfowl. George Augustus Robinson visited the area in 1842 and wrote in his journal details of the meeting and the country.

The drainage was achieved by landholders digging a trench through a hill, to drain the water into Muddy Creek. This magnificent swamp could be restored now by the installation of a weir on the channel. About 80% of the swamp is freehold and any restoration would require acquisition of land. The long-term environmental and tourism benefits would be great. It would help compensate for wetlands lost to past and on-going drainage. Landuse decisions made 100 years ago may not be relevant today.

Lake Condah (about 250 ha) has been partially restored in process and works extending from 2002 to 2010. This has been a major achievement for the Gunditjmara people. The lake edge had a complex system of stone channels in which eels were caught. The system may have been in use for up to 8,000 years, making it perhaps the oldest known aquaculture system on earth.

- Photo 41 – Buckley Swamp centre and drain Aug04
- Photo 42 – Buckley Swamp drain Aug 04
- Photo 43 – Buckley Swamp drain to Muddy Ck Feb07
- Photo 44 – Lake Condah restored Vaughans Rd Oct10
- Photo 45 – Lake Condah weir functioning Oct10
- Photo 46 – Lake Condah eel traps area Nov11
- Photo 47 – Lake Condah eel trap gap Nov11
- Photo 48 – 'Alambie' wetlands on the fringe of the stones Sep08
- Photo 49 – 'Alambie' stone dwelling base Jun08

Grange Burn & Muddy Creek erosion of *Phase 1 basalt*
Stream erosion has cut through the older basalt and revealed the underlying marine Heytsbury Sediments. Marine fossils (shells and teeth) have been found there in sediments formed about 20 mya.

Plant fossils (including Cellery-topped Pine, now found only in Tasmania) occur in the limestone/mudstone sediments beneath the basalt. A layer of ash (volcanic tuff) is seen also at Muddy Creek, arising perhaps from a volcano at Yulecart.

- Photo 50 – Muddy Ck fossil bed excursion Apr03
- Photo 51 – Grange Burn marine sediment on rhyolite Mar03
- Photo 52 – Muddy Creek Yulecart volcanic tuff Feb03
- Photo 53 – *Leptospermum lanigerum* (Woolly Tea-tree) Muddy Ck 1975

Rhyolite/ignimbrite/trachyte outcrops (acid lava cooled above ground), such as the 400 million-year-old Mt Cavendish, extrusions at Nigretta Falls and Wannon Rapids, and Giant Rock.

Nigretta Falls – a flow of Devonian acid lava (ignimbrite) blocked the Wannon River and, at this western edge, the stream flow has resulted in several blocks being dislodged to create a cascade.

The flora of the Nigretta Scenic Reserve (8 ha) has been compromised by development over time but still retains much of interest. Conversely, the Flora Reserve (2 ha) on the northern side of the Wannon River contains over 200 native species representative of the Dundas Tableland. This is another important grassland/woodland remnant in otherwise mostly cleared farmland.

Wannon Rapids Flora Reserve – this is another area where a rhyollitic extrusion has created spectacular rapids and pools in the river. The rugged nature of the site has also allowed preservation of much of the native flora, which includes outlier species from the north (e.g. Northern Grampians and Little Desert). These species include *Pimelea stricta (*Gaunt Rice-flower) and *Philotheca angustifolius (*Small-leaved Wax-flower).
Other unusual species not found elsewhere locally are *Pultenea dentata* (Clustered Bush-pea), *Myoporum viscosum* (Sticky Boobialla), *Dodonaeae cuneata* (Wedge-leaved Hop-bush), *Dillwynia cinerascens* (Grey parrot-pea) and *A. exudans* (Varnish Wattle).
There is no public access to this reserve and, until management and supervision of our reserves is greatly improved, neither should there be because it would soon result in the trampling of the botanic gold or loss in the creation of parking areas. A solution may be to have pedestrian access on the unused road reserve from Kearneys Rd. If visitors have to walk they may be more likely to respect the object of their ultimate attention. The distance is only 1 km, a commonplace situation in the UK.

Giant Rock –this Jurassic trachyte plug is one of several in the Coleraine area. The volcanic plug is what is left of the acid lava that was extruded, the surface material having been eroded away long ago. There is public access through farmland. The only notable flora species here in 1999 was Wedge-leaved Hop-bush. The exotic pines that once dominated the reserve were cut down in 1999 and local native trees and shrubs were planted.

- Photo 54 – Nigretta Falls in flood Aug78
- Photo 55 – Nigretta Falls *Ptilotus macrocephalus* Jan81
- Photo 56 – Wannon Rapids in flood Nov 03
- Photo 57 – Wannon Rapids pool Nov03
- Photo 58 – Wannon Rapids scar tree Nov03
- Photo 59 – Wannon Rapids *Pimelea stricta* Gaunt Rice-flower Sep07
- Photo 60 – Wannon Rapids *Philotheca angustifolius* Small-leaved Wax-flower Oct93
- Photo 61 – Wannon Rapids *Pultenea dentata* Clustered Bush-pea Nov77
- Photo 62 – Wannon Rapids *Myoporum viscosum* Sticky Boobialla Nov77
- Photo 63 – Wannon Rapids *Dodonaeae cuneata* Wedge-leaved Hop-bush Nov77
- Photo 64 – Wannon Rapids *Dillwynia cinerascens* Grey parrot-pea Nov03[10c+s]
- Photo 65 – Giant Rock, Coleraine-Balmoral Rd Dec00

2. Laterised Tablelands (*e.g.* Dundas Tableland – the characteristic 'Red Gum' landscape).

Laterised *Tertiary* sediments – acid, shallow, sandy loam over clay (old duplex soils). The plateau is dissected below the laterite, forming U & V-shaped, salt-prone valleys.

The flora of the Dundas Tableland is represented locally at:

- Points Reserve Coleraine,
- Sandy Creek to Baulchs Rd sections of the Hamilton-Coleraine Rail Reserve,
- Gatum Flora Reserve,
- Gringegalgona Settlers memorial Reserve,
- Wannon Flora Reserve (opposite the Boomerang Gate at the Wannon)
- Various frontages along the Wannon River from Wannon Falls to Red Rd Bridge (see *Indigenous vascular flora of the Wannon River frontages* by PR Bird, 2011).

Further afield, the Claude Austen State Forest (west from the Rocklands Reservoir) has a magnificent Yellow Gum woodland and wildflowers. The Fulham Streamside Reserve (860 ha) also has a magnificent stand of native flora (325 species).

These reserves are all threatened by weeds, including variously Cape Tulip, *Sparaxis* (Harlequin Flower), *Oxalis purpurea*, *Vinca major* and pasture grasses (Phalaris, Cocksfoot, etc.). The inherent infertility of the sites provides some protection from invasion by exotic species. *Disa bracteata* (African Weed Orchid) is a new arrival (from about 2005) that relishes sandy, infertile soils and may be impossible to control since it sets an enormous number of seeds and (unlike our native orchids) requires no fungus to assist its growth.

- Photo 66 – River Red Gums on Kenilworth Station Sep09
- Photo 67 – River Red Gum woodland N of Nigretta Oct12
- Photo 68 – *Glycine latrobeana* (Clover Glycine) Wannon Nigretta FR Oct09
- Photo 69 – *Thelymitra ixioides* (Dotted Sun-orchid) Wannon 4Posts Oct76
- Photo 70 – *Diuris sulphurea* (Tiger Orchid) Wannon 4Posts Nov77
- Photo 71 – *Diuris punctata* Purple Diuris at McCutheons Rd Oct80
- Photo 72 – *Thelymitra rubra* (Salmon Sun-orchid) at Gatum FR Oct80
- Photo 73 – *Dillwynia hispida* (Red Parrot-pea) Dundas Ra Oct80
- Photo 74 – *Caladenia irridescens* (Bronze Caladenia) Claude Austen SF 1988

- ❖ Photo 75 – *Hybanthus floribundus* (Shrub Violet) Claude Austen SF Aug76
- ❖ Photo 76 – *E. melliodora* (Yellow Box) at Beear SF Sep94
- ❖ Photo 77 – *E. leucoxylon* (Yellow Gum) at Beear SF Sep94
- ❖ Photo 78 – *Xanthorrhoea australis* (Austral Grass-tree) Beear SF Nov94[a+20c-10b)
- ❖ Photo 79 – *E. pauciflorus* (Plains Snow Gum) Satimer Rd Wando Hts 1986

3. Casterton Rolling Hills (*e.g.* Coleraine area)

- Steep grasslands dissected below the Dundas Tableland;
- Alkaline, brown, sandy clay loams or dark cracking clays in the valleys, arising from soft *Mesozoic* sediments or *Permian* glacial deposits. Land-slip and gully erosion is common.

The Koroite Decline east of Coleraine marks the departure from the plateau of the Dundas Tableland. This is experienced when passing the Coleraine Race Track on the Glenelg Highway and decending the steep run into Coleraine. Another viewing is from the old railway line a little way west of Baulchs Rd, where it slopes down to the wide valley. Original remnant vegetation on parts of that Rail Reserve include old *Banksia marginata* (Silver Banksia), the showy *Acacia exudans* (Varnish Wattle), the prostrate *A. aculeatissima* (Thin-leaf Wattle) and Featherheads. The last 3 species grow on a steep area not degraded by cattle grazing since the line closed in 1977.

Driving west from Coleraine towards Casterton one drives up onto remnants of the Dundas Tablelands – plateau areas dotted with River Red Gums – and away to the north and south, across the deeply dissected landscape that is the Casterton land-system, one sees other Dundas Tableland remnants.

- ❖ Photo 80 – Koroite Decline Rail Res, Coleraine Featherheads and Varnish Wattle Nov07
- ❖ Photo 81 – *Acacia exudans* (Varnish Wattle) at Nolans Ck, Sep04

4. Grampians Ranges & Plains (incl. Dundas Ra., West Black Ra. & East Black Ra.)

- Quartzose sandstone mountains ranging 350 m above the plains – these were exposed after the upper layers were eroded away in the mid-Cainozoic (about 20 mya);
- Granite outcrops (acid lava cooled below ground) near Mirranatwa, Zumsteins, Eastern Black Ra – these rocks were exposed by erosion of the overlying sediments;
- Infertile, deep, acidic, sandy soils on outwash slopes;
- Alluvial silty-loam flats along the creeks;
- Infertile sandy-loam over dense clay on the plains.

Soils –- The reserve owes its existence to the impoverished nature of the soil. Unlike the basalt plains which were more fertile, settlers found it hard to scratch a living on acid sandy soils that were later also found to be relatively unresponsive to phosphate additions.

Flora – there are more than 900 native species (some 25 species being endemic) in the 225,000 ha National Park, It is a grand island of nature in a sea of cleared farmlands. This reserve supports about 190 species of birds, 35 species of mammals and 11 species of frogs. A danger here is the unsympathetic use of fire – landscape-style burning of huge areas rather than a mosaic of smaller burns that allow fauna and flora to recolonise burned areas. A true mosaic pattern also reduces the incidence of widespread fires from other causes (lightning, arson, excapes from camp fires).

- ❖ 82 Grampian Range Mt Abrupt slip Feb11 042[10c-20b]
- ❖ 83 Grampians Northern Vic Range cliffs May09 017[10c]
- ❖ 84 Grampians Northern Vic Range sandstone May09 06[10c+5h]
- ❖ 85 *Micromyrtus* platforms Black Ra Sep93[a+10c-10b)
- ❖ 86 *Micromyrtus ciliatus* Black Ra Aug76[10c+s]
- ❖ 87 *E camaldulensis* Forest Lodge Apr93[a+10c]

- 88 *E alaticaulis* (Grampians Grey Gum) Sawmill Tk Grampians Apr76[10c]
- 89 *E serraensis* (Grampians Gum) Mt Abrupt Sep89[a+10c-10b]
- 90 *E pauciflora* (Snow Gum) Mitchell Plateau Sep92[a+10c]
- 91 Grampians Gang Gangs Serra Ra May08 026(1+10c)
- 92 *B marginata* (Silver Banksia) Grampians Wallaby Rcks May79[10c]
- 93 *B saxicola* (Grampians Banksia) Grampians May79[a+10c]
- 94 *B ornata* (Desert Banksia) Craigs Rd Rclds Aug75[10c-10b]
- 95 *Tasmannia lanceolata* (Mountain Pepper) Major Mitchell Plateau south side 1995[10c]
- 96 *Pultenea subalpina* (Rosy Bush-pea) Major Mitchell Plateau Nov76[10c]
- 97 *Grevillea confertifolia* (Grampians Grevillea) Major Mitchell Plateau Nov76[10c]
- 98 *Clematis aristata* (Mountain Clematis) Stockyard Ck Dec77[10c]
- 99 *Epacris impressa* (Common Heath) Mt Sturgn Jun74[20c+s]
- 100 *Epacris impressa* v grandiflora (Common Heath) Black Ra Aug76[10c+s]
- 101 *Xanthorrhoea australis* (Austral Grass-tree) Halls Gap Rd Grampians Oct06[10c]
- 102 *Caleana major* (Large Duck-orchid) Mt Difficult, Grampians Oct75[10c+10b)
- 103 *Caladenia cucullata* (Hooded Orchid) Mt Difficult Grampians Oct75[10c+s)
- 104 *Prasophyllum* sp (Short-lipped Leek Orchid) Glenisla Flat Oct79[10c+s)
- 105 *Caladenia fulva* (Grampians Spider Orchid) Henham Tk Grampians Oct07[10c+s)
- 106 *Thelymitra benthamiana* (Blotched Sun-orchid) Henham Tk Oct07[10c-10b+s)
- 107 *Pterostylis sanguineus* (Ruddyhood) Black Ra Jun79[10c+s)
- 108 *Diuris pardina* (Leopard Orchid) Henham Tk Grampians Oct07[10c+s)
- 109 *Leporella fimbriata* (Fringed hare-orchid) Black Ra Jun76[10c+s)
- 110 *Triodia bunicola* (Porcupine Grass) Teddybear Gap Rd Grampians Sep78[10c]
- 111 *Lissanthe strigosa* (Peach Heath) Rocklands SF Sep77[10c+s)
- 112 *Bauera sessiliflora* (Grampians Bauera) Strachans Grampians Sep77[10c+10b+s]
- 113 *Glycine clandestina* (Glycine) Strachans Huts Grampians Nov79[10c+s]

5. Sedimentary Rises & Plains (Glenthompson-Wickliffe-Woorndoo-Mortlake)

- *Ordovician* sandy sediments on hills (sandstone, shales, metamorphic rocks) & *Silurian* sandstone plains
- Old, laterised, infertile soils prone to erosion by wind and water, with saline gullies.

Back Creek area near Wickliffe

The roadsides in this area present a fantastic display of wildflowers in spring-summer. Damage has been done some ten years ago by an adjacent andholder spraying the roadside and cultivating up to 10 m from the fence. Those actions are utterly counter-productive because they allow pasture grasses to invade and that increases any fire hazard. In any case, this roadside has been burned every summer for many decades as a fire break and that practice should continue. The grassland flora there has adapted to that regime and is stable but perhaps not as diverse as grasslands that are burnt less often. Fire-sensitive native species (including shrubs) were long ago excluded from this reserve by the use of frquent fire. Fire prevents many pasture grasses from setting seed and, apart from excluding pasture weeds, its use is a good way of keeping diversity in a native grassland so that it is not dominated by the more aggressive species such as Themeda.

- 114 *Allocasuarina muelleriana* (Slaty Sheoak) & *A. pycnantha* (Golden Wattle)
- 115 *Leucochrysum albicans* (Hoary Sunray), Streatham Rd/Woorndoo Rd Oct06
- 116 *Chrysocephalum apiculatum* (Common Everlasting) Woorndoo 24A 22Oct06
- 117 *Ptilotus macrocephalus* (Featherheads) Wickliffe 91
- 118 *Veronica gracillis* (Slender Speedwell) Kanawalla 16Nov08 007[1]
- 119 *Thelymitra* sp. (Blue Sun-orchid) Nigretta Flora Res 14Oct11 074[10c+5b+s]
- 120 *Diuris chryseopsis* (Golden Moth Orchid) Old Ararat Rd 12Oct08 005[1]