4. Ben More Hills

This unit describes a number of separate ridges on sedimentary rocks which occur throughout the study area. Most of the ridges have resulted from contact metamorphism adjacent to the granitic regions. These metamorphosed ridges are frequently cleared, especially on the Ben More Range, although areas of native forest have been retained within this land unit in the western regions of the study area.

The map unit is characteristically steep and rocky and this may make access difficult. Agricultural productivity is low due to the excessive site drainage, surface rock and stone and the shallow soils. Sheet erosion is common where the native vegetation has been cleared. The Department of Conservation and Environment considers that by virtue of its shallow stony soils and fractured bed-rock, the unit has a high permeability to water, and such vegetation clearance has allowed increased quantities of water to infiltrate into the groundwater systems, upsetting the hydrological balance and contributing to salting in adjacent area. On the other had the soils in this unit can be up to 1 metre deep, have a thick B horizon with a heavy clay texture and produce large amounts of runoff (which is the cause of large amounts of soil erosion whenever the land is cleared). From the study conducted in this Unit it is considered most likely that large areas are affected by tunnel erosion which at present has only rarely progressed to gully erosion.

Geology: Variously metamorphosed Ordovician sedimentary rocks, including gneiss and schist.

Slope: 20%

Landforms: 90% sharp crest and steep often rocky slopes
10% Gentle lower slopes, minor drainage depression, saddles

Soils:
Dominant: Gn4.31, Gn3.14, Gn3.74. Red or yellow gradational soils on the broader crests and gentler slopes are typically shallow to moderately deep, contain fragments of stone throughout, and are weakly to moderate structured; they may exhibit a pale A_2 horizon below the grey-brown clay loam A_1, and medium to heavy clay subsoils.

Minor: Dy4.11. Yellow duplex soils on the steeper slopes are moderately deep contain fragments of stone throughout, and are weakly to moderate structured with medium to heavy clay subsoils. Um5.51. Uniform stony loam soils found on the steeper slopes and sharper crests: very shallow and contain large amounts of stone fragments. They support low productivity pastures, have low waterholding capacities, low fertility and excessive site drainage.

See appendices 5, 5 and 7 for typical soil profile descriptions from this unit.

Stone rock outcrop: Average10%, range 0-40%

Pans: Nil

Land use: The cleared areas are used for grazing, but the shallow stony soils frequently inhibit pasture improvement and native pastures of low productivity prevail: the remaining native forests supply very limited quantities of timer products.

Observed land deterioration: Overgrazing and trampling of the cleared areas have promoted high run-off, leading to sheet erosion on the slopes and gully erosion in the drainage lines of adjacent map units; the Department of Conservation and Environment considers that the clearing of the native vegetation since settlement has contributed to increased water percolation and the mobilisation of soluble salts to groundwater systems, resulting in an increased incidence of salting in adjacent low-lying areas.

Susceptibility to land deterioration:
On-site
Sheet erosion (moderate to high)
Tunnel erosion (moderate to high)
Wind erosion (low)
Slope failure (low)

Off-site
Gully erosion (moderate to high)
Salting (moderate to high)

Land capability classification:
Generally, land capability class 4 with soil depth as the main determinant factor (see Table 1). However, the land capability classes in this Unit range between 3 and 5, with the class 3 areas being located where the average soil depth is >0.4 m and where both the slope is <30% and the surface rock is <25% (mainly in areas of the mid and lower slopes in this Unit). The class 5 areas in this Unit mainly occur where the average soil depth is <0.2 m: such areas generally occur on or near the crests.