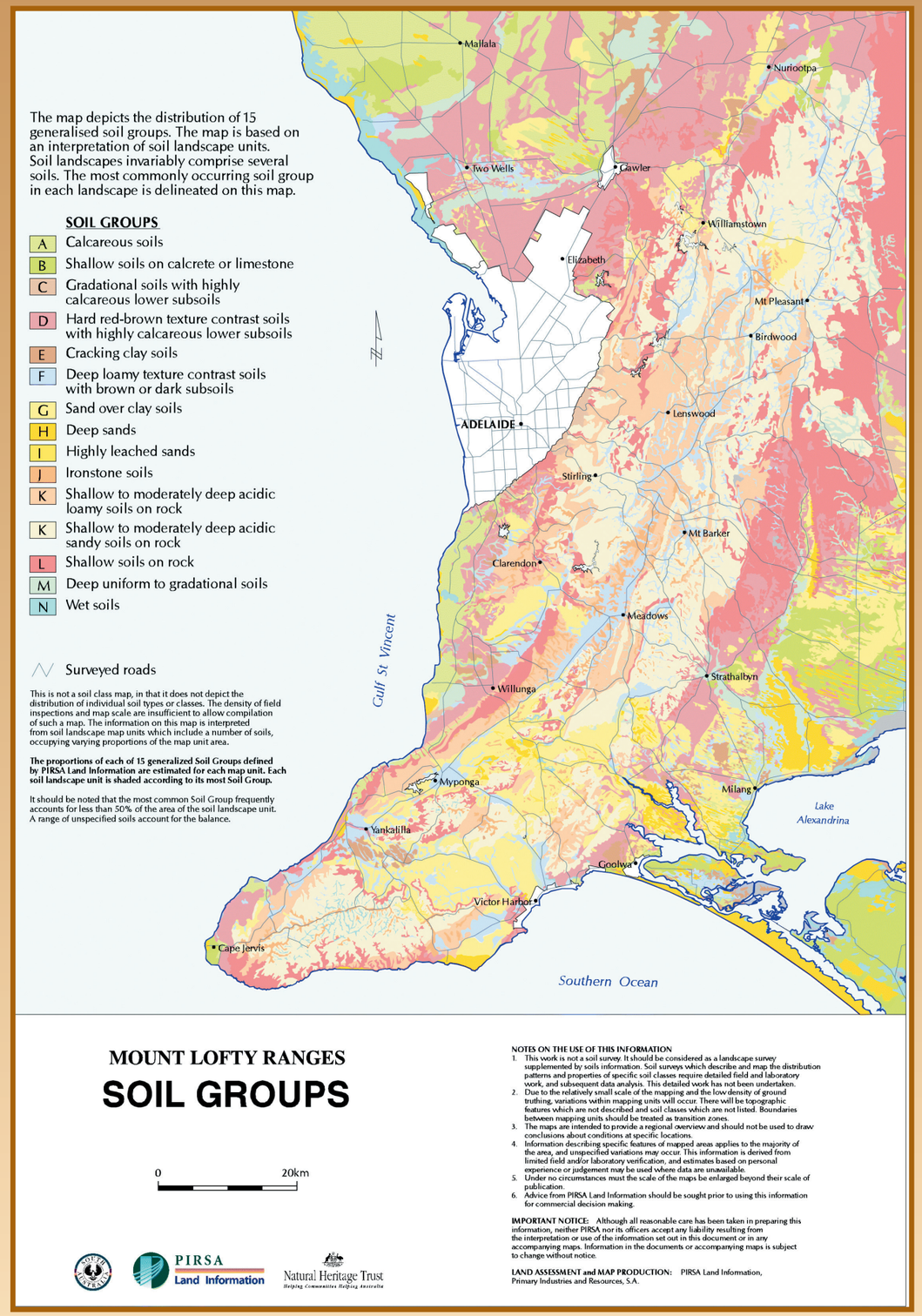

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UPPER RIVER TORRENS LANDCARE GROUP

Data Sheet

Soils

of the Mount Lofty Ranges

An understanding of the nature of our soils should be a valuable management tool. To properly maximise productivity and minimise degradation, the assets and limitations of soils must be understood. This data sheet will provide a brief and informed overview of the main soil types in the greater Mount Lofty Ranges, Barossa Valley, Adelaide Plains, Lakes Plains and Southern Vales.

Soils form as a result of the decomposition of rocks or sediments through contact with the atmosphere. Common compounds that result from this degradation include various types of clay minerals, silica (sand), calcium carbonate (which may precipitate to form limestone), and compounds such as iron, aluminium and magnesium oxides. These and other compounds such as organic products are further affected by water, gravity, air and even plant and animal life to form a medium for plant growth, i.e. soil.

So, a lot of factors contribute to the creation of soils. Each soil has different properties and, of particular importance to land managers, different reactions to the continued effects of decomposition, and of human impacts.

One of the influences that determine the separation of plant species is their adaptation to various soils. Consequently, thought must be given when considering the maintenance or introduction of plants on your land. Various plants (and combinations of plants such as agro-forestry or pasture with natural vegetation) will respond differently to a soil's structure, texture, water holding capacity, drainage, depth and fertility (including pH). For example, on most soils exotic annual grasses will not provide enough groundcover or maintain watertables

A soil profile being analysed in the field

The distribution of soils over such a large area as the Mount Lofty Ranges is too complex to map. Instead, soil scientists generalise by naming only the most common soil of an area with shared topography (i.e. the alluvial valley floors of a particular geological area in a range of hills). This is called a "soil landscape unit" even though it may contain several different soils. The product is a soil landscape map.

The map we have provided is small in scale and shows the major soil groups. A soil group is generalised according to the most prevalent soil landscape unit in a local area. So keep in mind, that the map on the back page is only a guide.

Some Typical Soils of the Mount Lofty Ranges and Adjacent Plains

Over 200 different soils occur in this region. Each has its own potential and management requirements. To give some idea of the variability across the region, twelve of the most common soils are illustrated below. This information has been supplied by David Maschmedt (PIRSA Land Information).

A Calcareous soils

Occur on flat to gently undulating land in the lower rainfall areas of the Northern Adelaide Plains, Lake Plains and Southern Vales. They are usually formed over clayey or sandy sediments capped by soft or rubbly lime.

Typical profile – A4 (Figure 1)
0-28 cm: Reddish brown calcareous sandy loam.
28-40 cm: Light brown calcareous sandy loam with carbonate rubble.
40-150 cm: Reddish yellow very highly calcareous sandy clay loam.

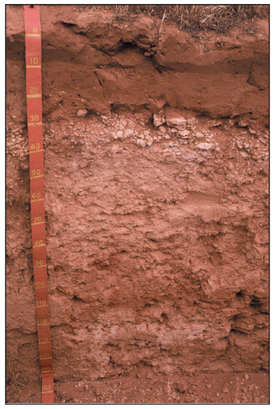

Figure 1: (A4) Calcareous Soil

Calcareous throughout. Well drained, but high pH and sodicity in subsoil can limit root depth. Lime induced fixation of some nutrient elements reduces fertility.

D Hard red-brown texture contrast soils with highly calcareous lower subsoils

Occur on flats and gentle slopes (over alluvial sediments), and on rising ground (over basement rock). Characteristic of the eastern and western slopes of the ranges, adjacent footslopes and alluvial plains.

Typical profile (on rock) – D1 (Figure 2)
0-25 cm: Reddish brown hard sandy loam.
25-55 cm: Dark reddish brown well structured medium clay.
55-75 cm: Soft weathering rock with pockets of calcareous clay.
75-130 cm: Weathering sandstone.

Typical profile (on alluvium) – D3 (Figure 3)
0-14 cm: Reddish brown hard sandy loam.
14-50 cm: Dark red heavy clay with coarse prismatic structure.
50-160 cm: Dark red calcareous medium clay.

Moderately deep to deep soils with high inherent fertility. Hard setting surfaces restrict infiltration and crop establishment. Subsoil clay can impede root growth and drainage in D3 types

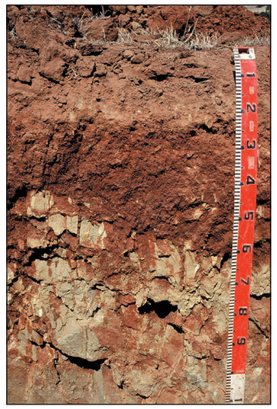

Figure 2: (D1) Hard red-brown texture contrast soils with highly

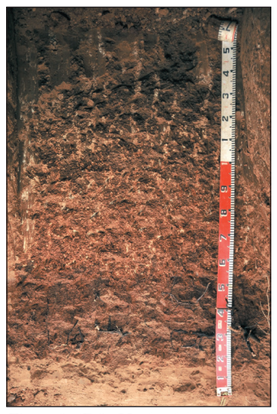

Figure 3: (D3) Hard red-brown texture contrast soils with highly calcareous lower subsoils

F Deep loamy texture contrast soils with brown or dark subsoils

Occur in valley flats over alluvial sediments in the higher rainfall areas.

Typical profile – F2 (Figure 4)
0-16 cm: Dark brown massive fine sandy loam, bleached at the base.
16-60 cm: Brown mottled heavy clay with coarse prismatic structure.
60-100 cm: Olive and grey mottled heavy clay.

Deep moderately fertile soils prone to waterlogging due to heavy clay subsoils and low-lying position in the landscape.

Figure 4: (F2) Deep loamy texture contrast soils with brown or dark subsoils

G Sand over clay soils

Occur on slopes on the Fleurieu Peninsula (in the old glacial valleys), and on undulating land in the Barossa Valley, Southern Vales and on the Lake Plains.

Typical profile – G5 (Figure 5)
0-20 cm: Dark grey soft loamy sand.
20-40 cm: Very pale brown sand with coffee rock nodules.
40-65 cm: Yellowish brown and red clay.
65-180 cm: Yellow and red fine sandy clay.

Deep soils, with low natural fertility and prone to acidification and water repellence. Drainage usually good (G5) but other Group G soils (eg Lake Plains) develop perched water tables.

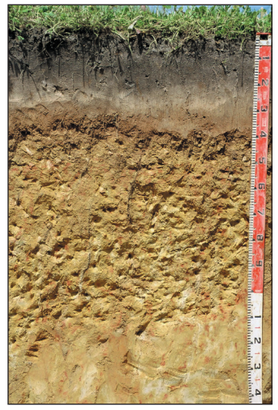

Figure 5: (G5)G Sand over clay soils

H Deep sands

Occur mainly on the Lake Plains where they occur on either low sand dunes or low irregular rises on the Angas Bremer flood plains and in the Mt. Compass area.

Typical profile – H3 (Figure 6)
0-20 cm: Grey brown loose sand.
20-100 cm: Pale yellow loose sand.
100-140 cm: Brownish yellow soft sand.

Deep soils with low to very low natural fertility, and highly susceptible to water repellence, acidification and wind erosion. Drainage is rapid and commonly excessive.

Figure 6: (H3) Deep Sands

J Ironstone soils

Occur mainly on upper slopes and plateau surfaces in the Mt. Crawford, Kuitpo and Parawa areas, where they are formed over highly weathered rocks.

Typical profile – J2 (Figure 7)
0-24 cm: Grey brown sandy loam with abundant ironstone nodules.
24-90 cm: Yellowish brown clay with variable ironstone nodules.
90-190 cm: Yellow, red and white mottled kaolin clay grading to weathered sandstone.

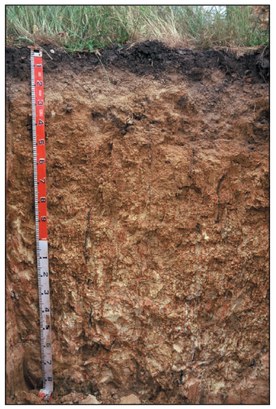

Figure 7: (J2) Ironstone soils

Deep soils but with low natural fertility and high capacity to lock up phosphate. Some types are highly susceptible to waterlogging.

K Shallow to moderately deep acidic soils on rock

Occur on hillslopes throughout the ranges from Delamere to Angaston. Loamy types predominate on the western side of the ranges, and sandier types on the east.

Typical profile – K1 (Figure 8)
0-10: cm Dark brown loam.
10-25: cm Brown clay loam.
25-80: cm Orange well structured clay.
80-120: cm Soft weathered siltstone.

Figure 8: (K1) Shallow to moderately deep acidic soils on rock

Moderately deep soils formed on fine grained rocks with moderately high fertility and satisfactory drainage. Susceptible to acidification and moderately erodible.

(K: Shallow to moderately deep acidic soils on rock)

Typical profile – K3 (Figure 9)
0-18 cm: Dark brown sandy loam.
18-30 cm: Bleached gravely light sandy loam.
30-70 cm: Red and brown mottled heavy clay with coarse prismatic structure.
100-140 cm: Weathering sandstone.

Moderately deep soils formed on coarser grained rocks resulting in sandier surfaces and lower natural fertility. Drainage is commonly impeded. Susceptible to acidification and highly erodible.

Figure 9: (K3) Shallow to moderately deep acidic soil on rock

Typical profile – K4 (Figure 10)
0-10 cm: Dark brown sandy loam.
10-35 cm: Light grey loamy sand.
35-110 cm: Brown, yellow and red strongly structured clay.
110-120 cm: Weathering sandstone.

Moderately deep to shallow soils formed on coarse grained rocks, often with very sandy surfaces and consequent low fertility. Drainage is usually satisfactory. Susceptible to acidification and highly erodible.

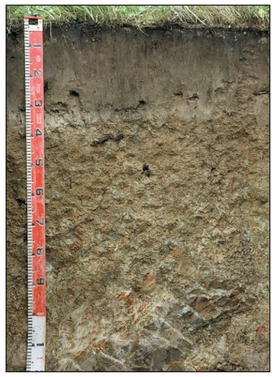

Figure 10: (K4) Shallow to moderately deep acidic soil on rock

L Shallow soils on rock

Occur throughout the ranges but especially on steeper slopes and on even very gentle slopes on the eastern side where there is extensive rocky outcrop.

Typical profile – L1 (Figure 11)
0-30 cm: Reddish brown stony sandy loam.
30-70 cm: Sandstone with pockets of sandy loam.

Shallow and stony with limited water holding capacity and often occurring on inaccessible terrain.

Figure 11: (L1) Shallow soils on rock

M Deep uniform to gradational soils

Occur extensively on creek flats where they are formed on variable alluvium.

Typical profile – M1 (Figure 12)
0-10 cm: Dark reddish grey loamy sand.
10-150 cm: Brown, red and yellow loamy sand.

Deep sandy to loamy soils with moderate water holding capacity and low fertility.

Typical profile – M2 (Figure 13)
0-10 cm: Black clay loam.
10-85 cm: Black well structured medium clay.
85-140 cm: Dark grey heavy clay.

Deep loamy to clayey soils with high fertility and water holding capacity. Drainage is variable.

Figure 12: (M1) Deep uniform to gradational soils

Figure 13: (M2) Deep uniform to gradational soils