

ha

HAWKESBURY

Colluvial



Landscape—rolling to very steep hills with slope gradients ranging from 25–70% on Hawkesbury Sandstone. Crests and ridges are convex and moderately narrow (<300 m). Valleys are narrow and incised. Rock outcrop occurs as horizontal benches and broken scarps up to 10 m high. Boulders and cobbles cover up to 50% of the ground surface. Local relief is up to 200 m. Mostly undisturbed open-woodland with pockets of tall open-forest and closed-forest.

Soils—shallow (<50 cm) Lithosols (Uc1.21) occur on crests and ridges. Yellow Podzolic Soils (Dy4.11) and Yellow Earths (Gn2.21) occur on sideslopes. Red Podzolic Soils (Dr4.41) and Yellow Podzolic Soils (Dy5.41) occur on minor shale lenses associated with high sides of some benches. Siliceous Sands (Uc1.21) occur in valley flats.

Limitations—extreme soil erosion hazard, mass movement (rock fall) hazard, steep slopes, rock outcrop, shallow, stoniness, highly permeable soil, low soil fertility, high aluminium toxicity.

LANDSCAPE

Geology

Hawkesbury Sandstone—medium- to coarse-grained quartz sandstone with minor shale and laminite lenses.

Topography

Rolling to very steep hills with slope gradients ranging from 25–70%. Crests and ridges are convex and moderately narrow (<300 m). Valleys are narrow and incised. Rock outcrop occurs as horizontal benches and broken scarps up to 10 m high. Boulders and cobbles cover up to 50% of the ground surface. Local relief is up to 200 m.

Vegetation

Mostly undisturbed open-woodland with pockets of tall open-forest and closed-forest in sheltered locations. Common species of open-woodland and tall open-forest include sydney peppermint (*Eucalyptus piperita*), silvertop ash (*Eucalyptus sieberi*), red bloodwood (*Eucalyptus gummifera*), white stringybark (*Eucalyptus globoidea*), budawang ash (*Eucalyptus dendromorpha*), mountain grey gum (*Eucalyptus cypellocarpa*), and old man banksia (*Banksia serrata*). Common closed-forest species include coachwood (*Ceratopetalum apetalum*), sassafras (*Doryphora sassafras*), lillypilly (*Acmena smithii*), featherwood (*Polyosma cunninghamii*) and scattered native laurel (*Cryptocarya glaucescens*).

LOCATION

Steep, rugged sandstone slopes and ridges of the Illawarra Escarpment. Examples include Browns Mountain, Tapitalee Mountain and Mannings Lookout.

Land Use

Mostly undisturbed bushland which is used for nature conservation, education and bushwalking.

Existing Erosion

Minor gully erosion, often to bedrock, occurs along unpaved tracks and fire trails.

SOILS

Dominant Soil Materials

ha1—Loose brownish black coarse quartz sand (topsoil)

Colour brownish black (10YR 3/1) to brownish grey (10YR 6/1)

Texture sand to sandy loam
Structure apedal single-grained to weakly pedal, <2 mm crumb peds
Fabric sandy to rough-faced, porous
pH 4.0
Stones <2% 2–6 mm sandstone fragments, dispersed

Roots abundant, in-ped

ha2—Earthy, yellowish brown sandy clay loam

Colour yellowish brown (10YR 5/6) to yellow orange (10YR 6/4)

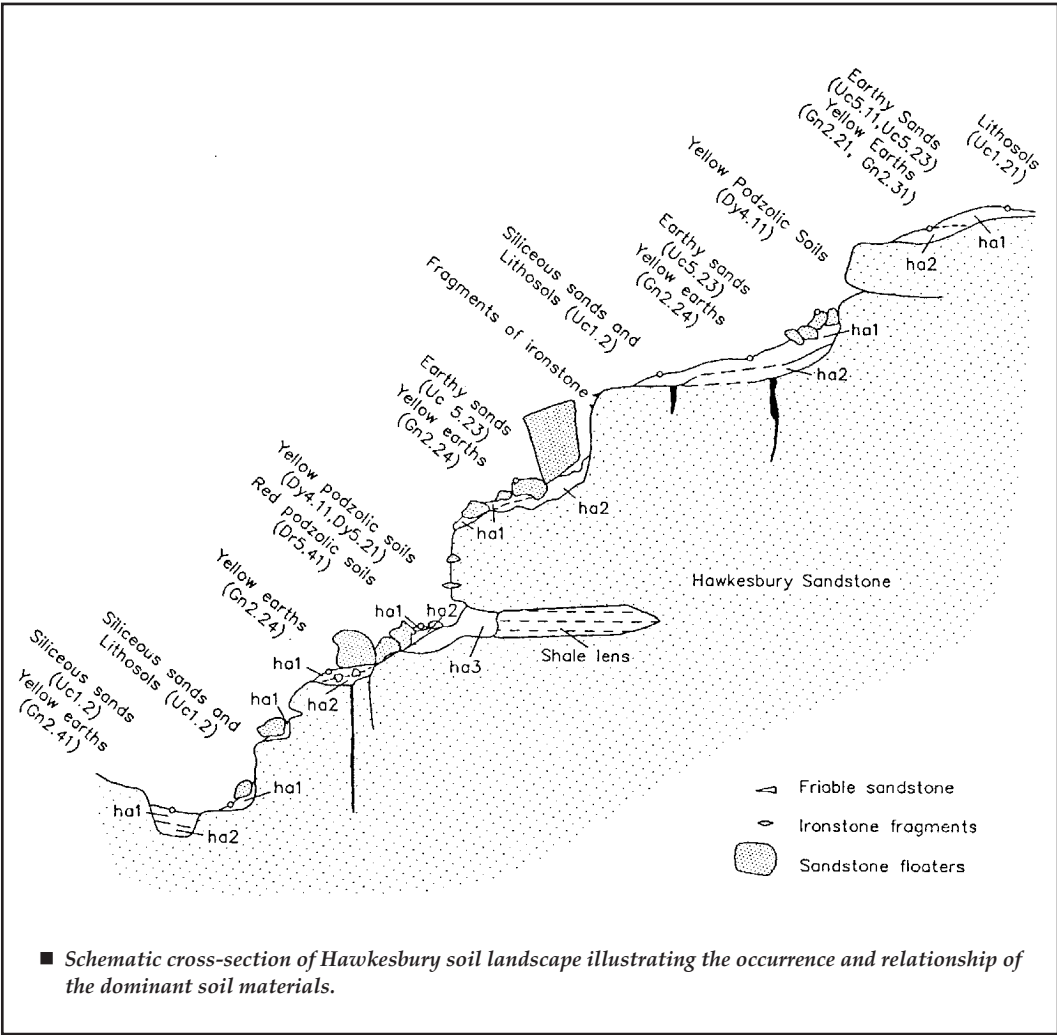
Texture sandy clay loam
Structure weakly pedal, 20–50 mm sub-angular blocky peds

Fabric earthy to rough-faced, porous

pH 4.5–5.5

Stones gravels are common

Roots nil



ha3—Bright yellowish brown light clay

Colour	bright yellowish brown (10YR 6/6) to bright brown (5YR 5/6)
Texture	light clay to medium clay
Structure	strongly pedal, 20–50 mm sub-angular blocky to angular blocky peds
Fabric	rough-faced, porous
pH	4.5
Stones	gravels are common
Roots	nil

Associated Soil Materials

Litter and decomposing organic debris
White loose sand

Occurrence and Relationships

Crests and ridges. Up to 20 cm of loose sand (**ha1**) is commonly present directly over solid bedrock [Lithosols (Ucl.21)]. Where erosion rates are lower, <30 cm of yellowish brown sandy clay loam (**ha2**) is overlain by <20 cm of brownish black loamy sand topsoil (**ha1**). Boundaries are clear [Yellow Earths (Gn2.21)]. Where higher rates prevail, bare rock or a few centimetres of **ha1** are often present. Total depth is <50 cm.

Sideslopes. Soil is discontinuous because of sandstone outcrop and surface fragments. Rock fragments occur throughout the soil. 10–30 cm of loose to weakly coherent sand topsoil (**ha1**) overlies bedrock [Lithosols (Ucl.21)]. Up to 30 cm **ha1** overlies 30 cm of **ha2**. Boundaries are either gradual or clear [Yellow Earths (Gn2.21), Yellow Podzolic Soils (Dy4.41)]. Total soil depth, although variable, is usually <70 cm.

Minor shale lenses associated with high sides of some benches. Up to 30 cm of loose to weakly coherent sand topsoil (**ha1**) overlies <50 cm of light to medium clay (**ha3**). Boundaries are clear [Red Podzolic Soils (Dr4.41), Yellow Podzolic Soils (Dy5.41)]. Total soil depth is <50 cm.

Valley flats. Depositional sands (**ha1**) (usually deeper than 100 cm) occur [Siliceous Sands (Ucl.21)]. These are often swampy with a high organic matter content.

LIMITATIONS TO DEVELOPMENT**Soil Limitations**

- ha1** High permeability
Low available water-holding capacity
Low fertility
High erodibility
Strongly acid
High aluminium toxicity
- ha2** Stoniness (localised)
High permeability (localised)
Very low fertility
High erodibility
- ha3** Very low fertility
Strongly acid
High erodibility

Fertility

General fertility is very low. Soils are extremely to strongly acid with a low to very low nutrient status. They are severely deficient in nitrogen and phosphorus and have very low CEC. They are also shallow and stony with low available water-holding capacities and high aluminium toxicity.

Erodibility

The topsoil (**ha1**) has low erodibility for non-concentrated flows. It consists of highly permeable, loose, coarse sands and organic matter. **ha1** is highly susceptible to concentrated flow erosion, especially when the organic matter is removed by bushfires. **ha2** and **ha3** have moderate erodibility. They have low organic matter contents and weak fabrics.

Erosion Hazard

Erosion hazard for non-concentrated flows is generally very high and ranges from moderate to extreme. The calculated soil loss for the first 12 months of urban development ranges up to 100 t/ha for topsoil and 400 t/ha for subsoil. The soil erosion hazard for concentrated flows is extreme.

Surface Movement Potential

The shallow sandy soils are stable to slightly reactive.

Landscape Limitations

Steep slopes
Mass movement hazard
Rock fall
Seasonal waterlogging
Shallow soil
Rock outcrop

Urban Capability

Generally high to severe limitations for urban development.

Rural Capability

Generally high to severe limitations for regular cultivation and grazing.