

Digital Library

Land resources series

Natural resources research

1992

Land resources map in the southern section of the Peel-Harvey catchment, swan coastal plain, Western Australia

Dennis van Gool

Bev Kipling

Follow this and additional works at: https://library.dpird.wa.gov.au/land_res

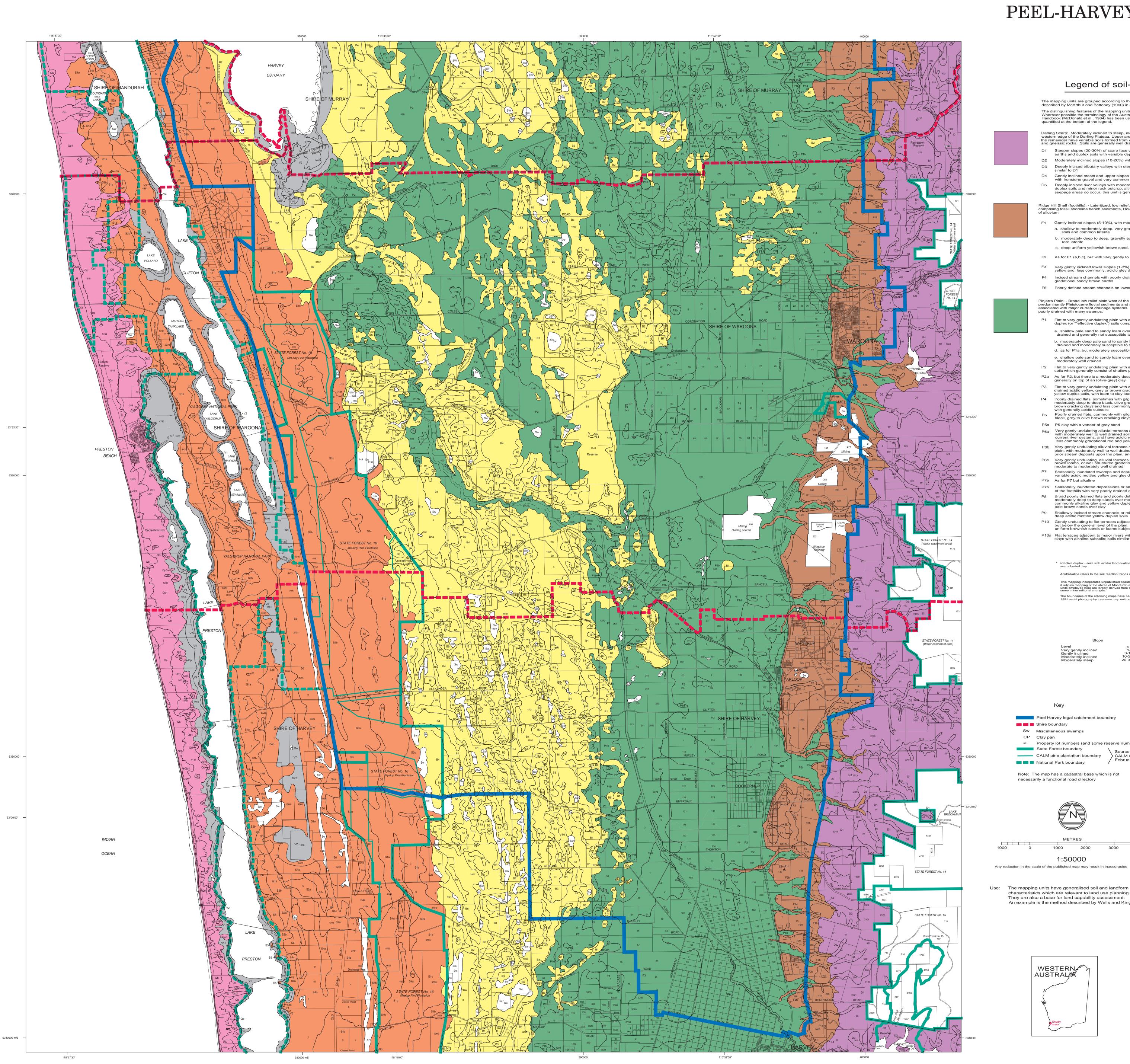
Part of the Agriculture Commons, Natural Resources Management and Policy Commons, and the Soil

Science Commons

Recommended Citation

van Gool, D, and Kipling, B. (1992), Land resources map in the southern section of the Peel-Harvey catchment, swan coastal plain, Western Australia. Department of Primary Industries and Regional Development, Western Australia, Perth. Map.

This map is brought to you for free and open access by the Natural resources research at Digital Library. It has been accepted for inclusion in Land resources series by an authorized administrator of Digital Library. For more information, please contact library@dpird.wa.gov.au.



LAND RESOURCES IN THE SOUTHERN SECTION OF THE PEEL-HARVEY CATCHMENT, SWAN COASTAL PLAIN, WESTERN AUSTRALIA

Dennis van Gool and Bev Kipling Division of Resource Management Department of Agriculture, Western Australia

Legend of soil-landscape mapping units arranged in physiographic order

The mapping units are grouped according to the geomorphic elements described by McArthur and Bettenay (1960) in order of decreasing age. The distinguishing features of the mapping units are shown below. Wherever possible the terminology of the Australian Soil and Land Survey Field Handbook (McDonald et al., 1984) has been used. Some of the terms are quantified at the bottom of the legend.

Darling Scarp: Moderately inclined to steep, incised, high relief slopes forming the western edge of the Darling Plateau. Upper areas are capped with laterite and the remainder have variable soils formed from weathering of Archaean granitic and gneissic rocks. Soils are generally well drained and rock outcrops commonly occur.

- D1 Steeper slopes (20-30%) of scarp face with gradational red and yellow earths and duplex soils with variable depth and common rock outcrop
- D2 Moderately inclined slopes (10-20%) with similar soils and rock outcrop to D1 D3 Deeply incised tributary valleys with steep sideslopes; soils and rock outcrop
- D4 Gently inclined crests and upper slopes with shallow uniform brownish sands with ironstone gravel and very common duricrust outcrop (block laterite)
- D5 Deeply incised river valleys with moderately inclined slopes with deep sandy duplex soils and minor rock outcrop; although swampy depressions or seepage areas do occur, this unit is generally moderately well to well drained

Ridge Hill Shelf (foothills): - Lateritized, low relief, foothills of the Darling Scarp

- F1 Gently inclined slopes (5-10%), with moderately well to well drained: shallow to moderately deep, very gravelly acidic yellow duplex soils and common laterite
- moderately deep to deep, gravelly acidic yellow duplex soils and rare laterite
- c. deep uniform yellowish brown sand, generally laterite and gravel free F2 As for F1 (a,b,c), but with very gently to gently inclined lower slopes (1-5%)
- F3 Very gently inclined lower slopes (1-3%) with deep, imperfectly drained yellow and, less commonly, acidic gley duplex soils
- F4 Incised stream channels with poorly drained acidic yellow duplex soils and
- F5 Poorly defined stream channels on lowest slopes with soils similar to F4

Pinjarra Plain: - Broad low relief plain west of the foothills, comprising predominantly Pleistocene fluvial sediments and some Holocene alluviu associated with major current drainage systems. Major soils are naturally

- P1 Flat to very gently undulating plain with acidic mottled yellow duplex (or *"effective duplex") soils comprising: a. shallow pale sand to sandy loam over clay; imperfect to poorly drained and generally not susceptible to salinity b. moderately deep pale sand to sandy loam over clay: imperfectly drained and moderately susceptible to salinity in limited areas d. as for P1a, but moderately susceptible to salinity e. shallow pale sand to sandy loam over very gravelly clay; moderately well drained
- P2 Flat to very gently undulating plain with alkaline mottled yellow duplex soils which generally consist of shallow pale sand to sandy loam over clay P2a As for P2, but there is a moderately deep silcrete or calcrete hardpan
- generally on top of an (olive-grey) clay P3 Flat to very gently undulating plain with deep, imperfect to poorly
- drained acidic yellow, grey or brown gradational earths and mottled yellow duplex soils, with loam to clay loam surface horizons P4 Poorly drained flats, sometimes with gilgai microrelief and with moderately deep to deep black, olive grey and some yellowish
- brown cracking clays and less commonly non-cracking friable clays P5 Poorly drained flats, commonly with gilgai microrelief and with deep
- black, grey to olive brown cracking clays with alkaline subsoils.
- P6a Very gently undulating alluvial terraces contiguous with the plain, with moderately well to well drained soils. These are associated with major current river systems, and have acidic red and yellow duplex soils, less commonly gradational red and yellow earths
- P6b Very gently undulating alluvial terraces and low rises contiguous with the plain, with moderately well to well drained soils. These are associated with prior stream deposits upon the plain, and have uniform brownish sands
- P6c Very gently undulating, alluvial terraces and fans with uniform friable brown loams, or well structured gradational brown earths; soils are moderate to moderately well drained P7 Seasonally inundated swamps and depressions with very poorly drained
- P7a As for P7 but alkaline P7b Seasonally inundated depressions or seepage areas near the base of of the foothills with very poorly drained deep bleached siliceous sands
- P8 Broad poorly drained flats and poorly defined stream channels with moderately deep to deep sands over mottled clays; acidic or less

variable acidic mottled yellow and gley duplex soils

- commonly alkaline gley and yellow duplex soils to uniform bleached or pale brown sands over clay P9 Shallowly incised stream channels or minor creeks and rivers with deep acidic mottled yellow duplex soils
- P10 Gently undulating to flat terraces adjacent to major rivers, but below the general level of the plain, with deep well drained
- P10a Flat terraces adjacent to major rivers with deep black cracking clays with alkaline subsoils; soils similar to P5

effective duplex - soils with similar land qualities that have a deep soil over a buried clay

Acid/alkaline refers to the soil reaction trends described by Northcote, (1979) The boundaries of the adjoining maps have been modified slightly using the 1991 aerial photography to ensure map unit continuity

Bassendean dune and sandplain system: - Pleistocene sand dunes with very low relief, leached grey siliceous sand intervening sandy and clayey swamps and gently undulating plains. These occur immediately west of, and partly overlie, the Pinjarra Plain. Topography becomes more subdued from west to

- B1 Extremely low to very low relief dunes, undulating sandplain and discrete
- sand rises with deep bleached grey sands sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than
- B1a As for B1, but with a more intensely coloured yellow B horizon occurring within 1 metre of the surface; marri and jarrah dominant (red gum rises)
- B2 Flat to very gently undulating sandplain and broad very low rises with moderately well to well drained deep bleached grey sands with a pale yellow B horizon or a weak iron organic hardpan at 1-2 metres
- B3 Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with an iron-organic pan, or clay at generally less than 1 metre depth; surface horizons are
- dark grey sand or sandy loam B4 Broad poorly drained sandplain with deep grey siliceous sands or
- bleached sands, underlain at depths generally greater than 1.5 metres by clay or less frequently a strong iron-organic pan
- B5 Shallowly incised stream channels of minor creeks and rivers with soils

B6 Sandplain (and broad extremely low rises) similar to B4 with imperfectly

Spearwood dune and sandplain system: - Gently to moderately inclined low hills and gently undulating plain located west of the Bassendean System associated with Pleistocene, Tamala Limestone. Hills consist of a core of friable aeolianite, capped by secondary calcite and overlain by variable depths of well to rapidly drained siliceous yellow-brown sands. The gently undulating plain is the surface expression of the consolidated marine

imestone component of the Tamala Limestone S1 Dune ridges with well to rapidly drained:

- a. shallow to moderately deep yellow-brown sands, very common limestone outcrop and slopes 5 to 15% b. deep yellow brown sands or pale sands with yellow-brown subsoil,
- c. deep bleached grey sands with yellow-brown subsoils, and slopes 5 to 15%
- d. moderately deep to deep yellow-brown sands, rare limestone outcrop and slopes 15 to 25% on the eastern slipface S2 Lower slopes (1-5%) of dune ridge with well drained:
- a. moderately deep to deep yellow-brown sands or pale sands with yellow-brown subsoils, and minor limestone outcrop b. shallow to moderately deep yellow-brown sands and common
- c. Deep bleached grey sands with yellow-brown subsoils usually occuring on the eastern edge of the Spearwood dune ridge S3 Inter dunal swales and depressions with gently inclined sideslopes and deep well drained siliceous yellow-brown sands
- S4 Flat to gently undulating sandplain (including minor depressions) with:
- a. deep, pale and sometimes bleached, sands with yellow-brown subsoils b. shallow to moderately deep yellow-brown and grey-brown sands with minor limestone outcrop c. deep, yellow-brown or dark brown sands that are seasonally inundated
- S5 Stony plain with extremely low ridges (relict beach ridges and shallow to moderately deep siliceous yellow-brown sands

Quindalup Dune System (coastal dunes): -Unconsolidated Holocene sand west of the Spearwood Dunes. The major formations are low relief complex parabolic dunes fronted by foredunes with moderately inclined to steep slopes.

- The soils are well to rapidly drained, uniform pale calcareous sands. Qf1 Foredune/blowout complex (semi erosional) with very low relief
- ridge and swale topography and deep calcareous sands
- Qf2a More prominent relict foredune ridges which occur within unit Qf2 Qp Flat to very gently undulating plain with variably leached calcareous sand
- generally overlying a calcrete horizon at 60-90cm depth
- Qp1 Complex of nested low relief parabolic dunes with moderate to steep slopes and deep calcareous sands with variable depth of darkening in the surface horizon Qp2 Long walled discrete parabolic dunes with similar slopes and soils to Qp1
- Qp3 Subdued parabolic dunes on the eastern margins of the dune system Qd Small gently undulating plains (deflation basins) enclosed by parabolic
- dunes with moderately deep to deep calcareous sands over Qd1 Flat to very gently undulating erosional floor of blowout or sandsheet with
- medium to coarse sand or calcrete pavement; seasonally waterlogged Qb Actively eroding, poorly vegetated, blowout with rim and bowl
- (parabolic) morphology with deep calcareous sands

Vasse estuarine and lagoonal deposits: - Low lying poorly drained terraces, flats and beach ridges fringing the Peel-Harvey Estuarine System, coastal lakes and river mouths. Soils are extremely variable, being formed on Holocene unconsolidated estuarine alluvium and lagoonal deposits. They are often highly saline and may be subject to periodic inundation.

- V1 Saline tidal flats with grey, black and brown foetid muds and humic sandy clays with locally common shell and limestone fragments
- with deep alkaline sands and clayey sands
- V3 Sand flats similar to V2, but marginally higher and commonly supporting stands of Melaleuca spp.
- V4 Low level storm beach ridges and terraces with minor limestone outcrop. Soils are deep, alkaline, black sandy loams overlying unconsolidated shell beds or clayey marl.
- V5 High level sandy terrace and gently undulating beach ridges with shallow to moderately deep grey siliceous sand overlying soft shelly limestone or shell beds V6 High level sandy terrace and gently undulating beach ridges with deep grey or bleached pale brown siliceous sands overlying soft shelly
- V7 Very broad shallow depression with deep, poorly drained, fine
- textured alkaline estuarine alluvium V10 Highest level terrace associated with the western margins of Lake Clifton and Lake Preston with shallow calcareous black sandy loam

overlying limestone

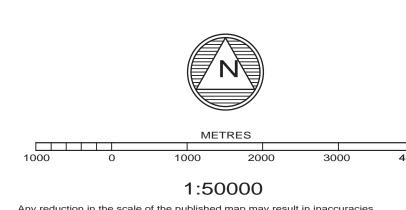
Qualification of descriptive terms



Key Peel Harvey legal catchment boundary Shire boundary Sw Miscellaneous swamps CP Clay pan Property lot numbers (and some reserve numbers) State Forest boundary CALM pine plantation boundary CALM office

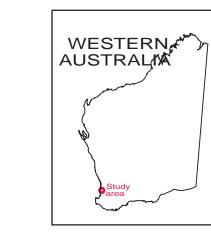
Note: The map has a cadastral base which is not necessarily a functional road directory

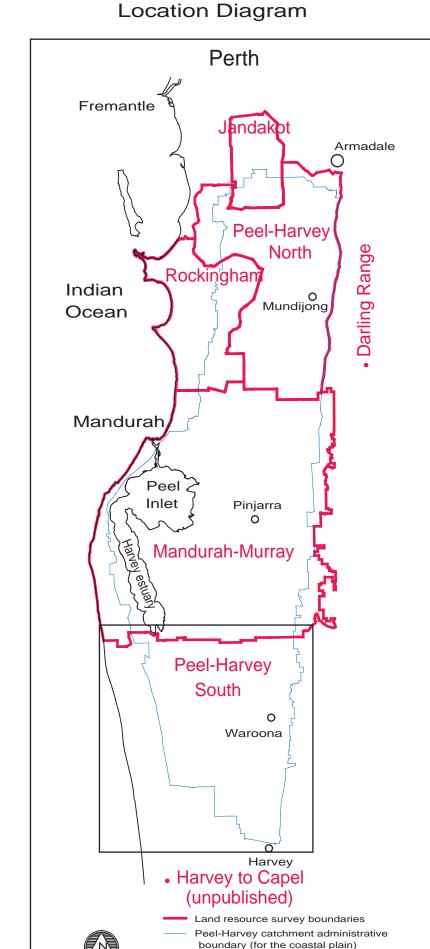
National Park boundary



Any reduction in the scale of the published map may result in inaccuracies

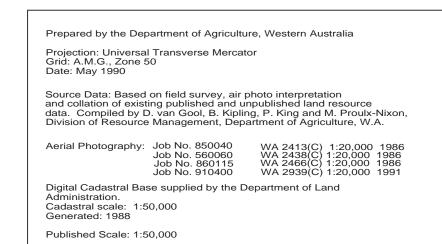
characteristics which are relevant to land use planning. They are also a base for land capability assessment. An example is the method described by Wells and King (1989).





Map sheet boundary

Other 1:50,000 mapping (not displayed - outside the catchment boundary)





Associated land resource studies and cited references Bettenay, E., McArthur, W.M. and Hingston, F.J. (1960). 'The soil associations of part of the Swan Coastal Plain, Western Australia'. C.S.I.R.O. Soils and Land Use Series No. 35. Churchward, H.M. and McArthur, W.M. (1979). Landforms and soils of the Darling Region of Western Australia. In 'Atlas of natural resources of the Darling Region of Western Australia'. Department of Conservation and Environment. (Government Printer: Perth). King P.D. and Wells, M.R. (1990). Darling Range rural land capability study, Department of Agriculture, Western Australia, Land Resources Series No. 3

Mc Arthur, W.M., and Bettenay, E. (1960). The development and distribution of the soils of the Swan Coastal Plain, Western Australia. C.S.I.R.O. Soil Publication No. 16. McDonald, R.C., Isbell, R.F., Speight, J.G., Walker, J. and Hopkins, M.S. (1984). 'Australian soil and land survey field handbook'. Inkata Press, Northcote, K.H. (1979). 'A factual key for the recognition of Australian soils'. Fourth Edition, Rellim Technical Publications, Glenside, South Australia. Oma, V.P.M., (1981). Coastal Land Resources Mapping. Unpublished mapping, Department of Agriculture, Western Australia van Gool, D. (1990). Land resources in the northern section of the Peel-Harvey catchment, Swan Coastal Plain, Western Australia. Department of Agriculture, Western Australia (Map and Land Capability table only)

Wells, M.R. and King, P.D. (1989). Land capability assessment methodology for rural-residential development and associated agricultural land uses. Department of Agriculture, Western Australia. Land Resources Series No. 1. Wells, M.R., Richards, N. and Clarke Al (1986). Jandakot groundwater scheme area - a study of land resources and planning considerations Department of Agriculture, Western Australia. Technical report 48 Wells, M.R., Oma V.P. and Richards, N. (1985). Shire of Rockingham - a study of land resources and planning considerations. Department of Agriculture, Western Australia. Technical report 44

Wells, M.R. (1989). Land capability study of the Shires of Mandurah and Murray. Department of Agriculture, Western Australia. Land Resources Series No. 2.