1 A SCOON 1 — c. 1·5 km E of Jumbo Well, E side of track where it goes down breakaway - at base of breakaway

2 A SCOON 2 — c. 7 km E on boundary fence line from junction with track from Cement Tank well. W side of clay pan c 50 m N of fence

3 C SCOON 1 — c. 7 km E on boundary fence line from junction with track from Cement Tank Well. W of clay pan on high ground N of fence

4 B SCOON 1 — c. 7 km E on boundary fence line from junction with track from Cement Tank Well, W side of clay pan at edge of rises c 50 m N of fence

5 A NANG 3 — 4·9 km W along road from homestead turnoff - to Charramunda Well - turn NW. At 3·4 km Comalgo Pool. Left through gate. At 3·7 thru gate at 6·2 rocky ridge. 200m further on - right fork along fenceline. At 7·5 km edge of gorge - on to T junction, turn right. At 10·8 km ?Gullamillyarra Well. at 14·4 old shearing quarters - at 20·2 W side of fence - c. 50 m trap strewn spinifex.

6 B NBULG 2 see 5 — This is 20·2 km from the road. c. 200 m W of fence

7 C NANG 2 see 5 — c 50 m from fence, north of no 5.

8 A NBULG 4 see 5 — 22·9 km NW of turn off from road. See 5 and 2·7 km further N from 5, 6 & 7 at base of granite rock.

9	B N BULG 3	see 8	on lower edge of granite
10	C N BULG 3	see 8	c 200 m W of track on upper part of granite rock.
11	B CORR 4	see 5	3·4 km from Charramunda Well W of track edge of pool
12	C S BULG 4	see 5	7·5 km from Charramunda Well edge of gorge, beyond yard, to
13	A S BULG 5	see 5	7·5 km from Charramunda Well base of gorge E of Yard
14	C Mard 5		NW from Charramunda Well 3·4 Cornalg Pool. 3·7 Well. N past Snake Well at c. 1·1 km N of well turned N ~~E~~ E quadrat on side of small pool on NW side of track.
15	B Mard 5	see 14	On top of breakaway
16	A Mard 6	see 14	base of breakaway
17	B York 6		W side of road 400 m N. of turnoff to homestead
18	A MARD 7		4km along road E of turnoff to homeste. N up track by Mardagullamarra Well. At 1·1 km N large pool on right quadrat on N side of ~~pool~~ pool
19	C MARD 6	see 18	quadrat N of 18 c 50 m E of track
20	B No 2 7		4km along road E of turnoff to homestead, N up track for c 6 km, and W at No 2 well

21 C no 27 see 20 - W side of well in Acacia scrub

22 A No 28 see 20 - 1km S of No 2 well - W side of track

23 A No 1 9 Out past shearing quarters E. Wombat enclosure at 700m. Left fork at 4.5. veered right after gate at White Bore well. Indistinct track across watercourse, south of main track. Quadrat in Pine Woodland at 12.4km S side of track.

24 B SAMP 8 E side of track c. 1km N of homestead S side of creekline

25 C DAWS 8 At site of trap lines at 450m SE of Dawsons Well S of pit traps on W side of track.

26 C DAWS 9 1.85 km S W of homestead gate, edge of Lake Ranger. slightly high area c.100m W of track c. 50 m S of 27

27 B MONG 9 see 26 c. 100 m W of track samphire flat c. 50 m N of 26

28 A DAWS 10 see 26 Sand dune c 200m W of track

A 11 E boundary at 1·6 km S of track from Coonthiago Bore - upper part of dune

B 10 " " " " " " " " mid dune slope

C 10 " " " " " " " " Close to track among mallees.

A 12 4·35 km S of Wadda Wadda Well - in creek line NE of track.

B 11 3 km SE of Wadda Wadda Well on E side of creek

C 11 3 km SE of Wadda Wadda Well on W side of track.

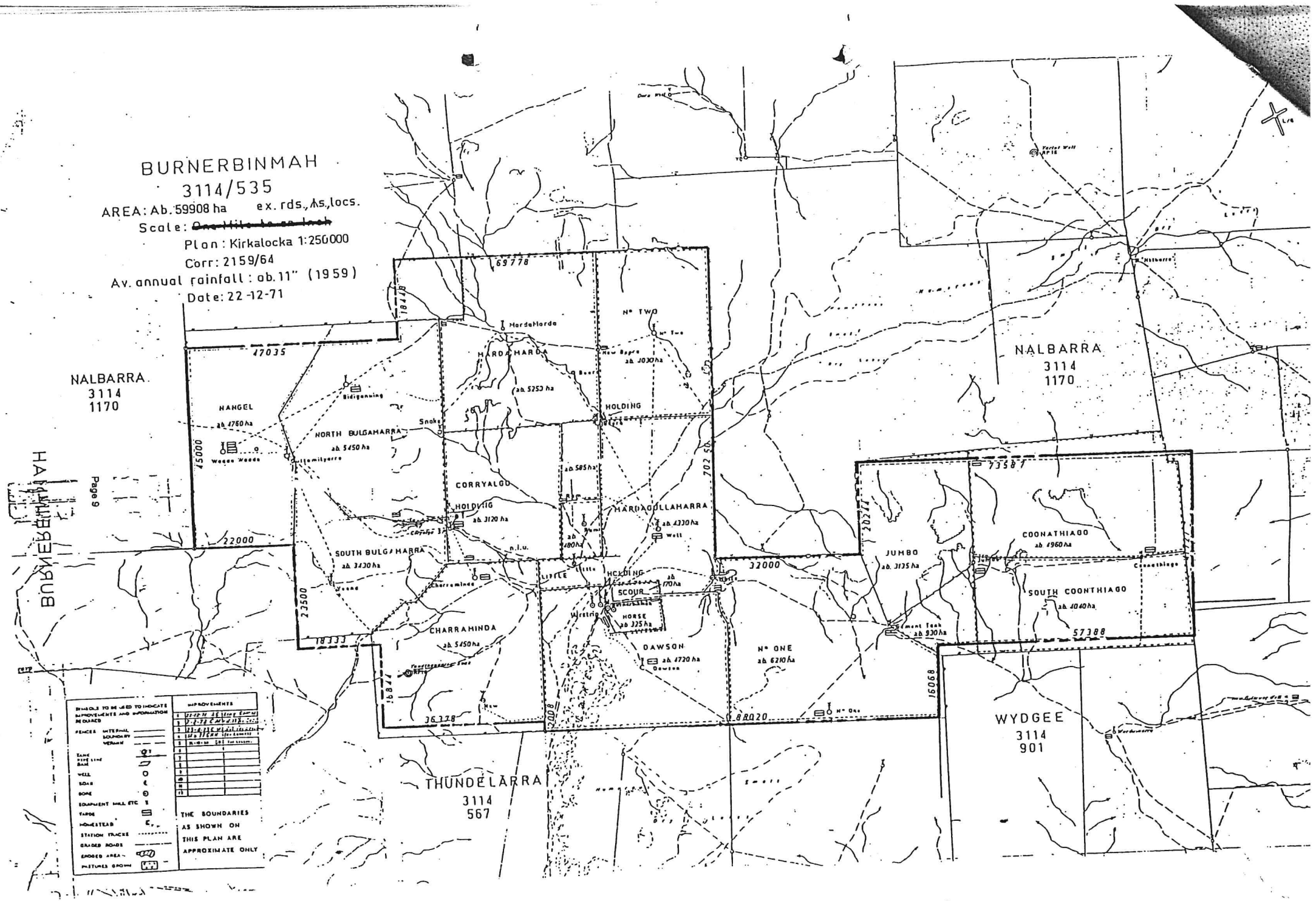


FIGURE 3: BURNERBINMAH STATION MAP

NALBARRA

3114
1170

1km

9mm=1km

NANGEL

NORTH BULGAMARRA

SOUTH BULGAMARRA

MARDAMARDA

No.TWO

HOLDING

CORRYALGO

MARDAGULLAMARRA

HOLDING

LITTLE SCOUR

HORSE

HOLDING

CHARRAMINDA

DAWSON

No.ONE

JUMBO

COONATHIAGO

SOUTH COONTHIAGO

THUNDELARRA

3114
567

WYDGEE

3114
901

Bibibernoo Waterhole
Beerbunna Well
Marda Soak
Marda Marda Bore
Well (Abd)
Number Two Well
New Beera Well
Beera Soak (PD)
Bidiganning Bore
Wadda Wadda Well
Snake Well
Beera Well (Abd)
Gullemilyaroo Pool
Gullamilyarra Well
Mardagullamarra Well
Weaner Well
Bulgamarra Spring
Corryalgo Pool
Ram Bore
Well (Ruin)
Slavins Well
COOTAMARRA HILL
Jumbo Well
Coonathiago Bore
Little Bore
Charraminda Well
White Bore
Yeena Bore
Burnerbinmah
Training Track
Bulliong Rockhole
Cement Tank Well
Yandangarra Soakage (PD)
New Bore
Dawson Well
Bookine Well
No One Well
Youlah Well
Yathagadaw Well (Niu)
Indagoodtharra Spring (PD)

PASTORAL LEASE : BURNERBINMAH
LEASE NUMBER : 3114 / 535
LAND DISTRICT AND LOCATIONS: NINGHAN 4257 WARRAMBOO 118

THIS PLAN WAS COMPILED BY D.O.L.A.
FROM INFORMATION GATHERED DURING

Land types and component land systems	**Quadrat**
Land Type 4	
Sherwood	A4 A5 A6 B3 B5 C3 C4 C5
Waguin	A1 C7
Land Type 6	
Challenge	No quadrats established
Land Type 12	
Kalli	A3 A9 A11 B2 B10 C2 C10
Land Type 13	
Hamilton	A12
Tindalarra	B11 C11
Woodline	A8 B7 C8
Land Type 14	
Yanganoo	No quadrats established
Land Type 17	
Ero	A7 B4 C6
Land Type 18	
Cunyu	A2 B1 C1
Mileura	B6 B8
Land Type 20	
Carnegie	A10 B9 C9

Land systems Burnerbinmah

4	Sherwood
	Waguin
6	Challenge
12	Kalli
13	Hamilton
	Tindalarra
	Woodline
14	Yanganoo
17	Ero
18	Cunyu
	Mileura
20	Carnegie

Xanthoparmelia norpraegnans

SHERWOOD LAND SYSTEM (3,458 km², 3.7% of survey area)

(after Mabbutt *et al.* 1963)

Granite breakaways and extensive stony plains with mulga shrublands and minor halophytic shrublands.

Land type: 4

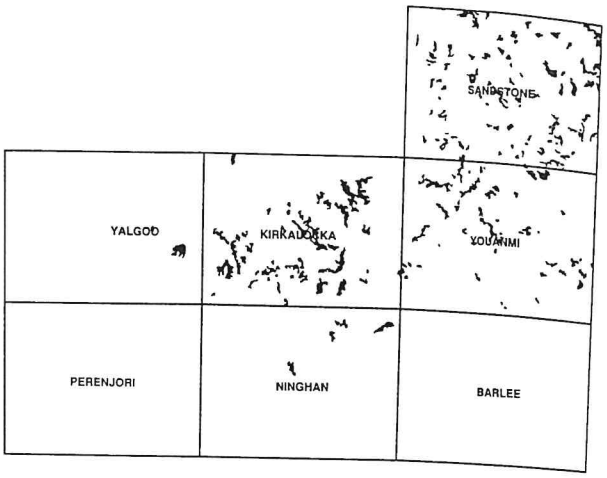
Geology: Archaean granite and gneiss. Tertiary laterite and silcrete, Quaternary colluvium and alluvium.

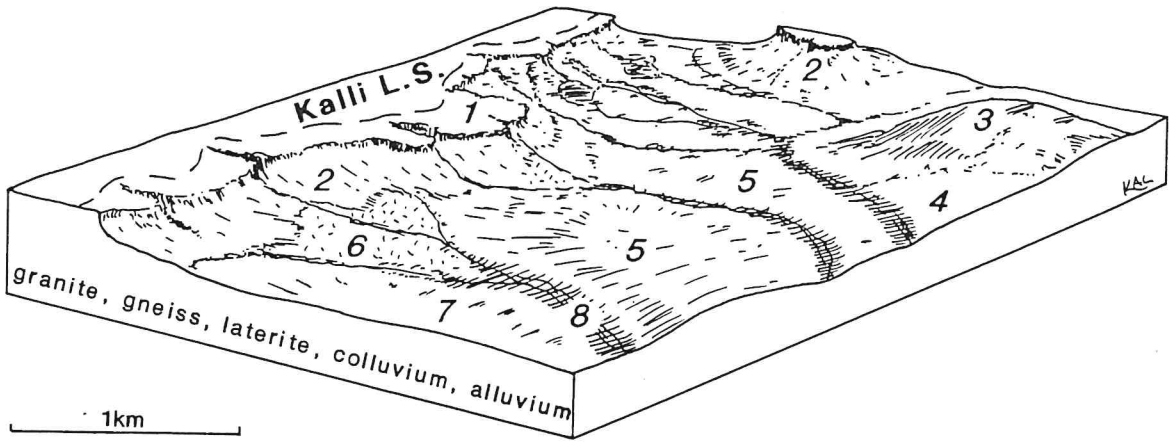
Geomorphology: Predominantly erosional surfaces; stripped plateaux edges and low breakaways (to 20 m relief) with very gently inclined depositional footslopes and plains derived from pallid zone materials; extensive, nearly level to gently undulating plains with mantles of quartz and granite pebbles, traversed by sparse, sub-parallel narrow drainage tracts becoming more dendritic and incised in upper sectors.

Land management: Lower footslopes (unit 2), alluvial plains (unit 6) and drainage tracts (unit 8) generally have fragile soils which are highly susceptible to water erosion. The vegetation on these units is preferentially grazed by introduced and native animals and is susceptible to overgrazing and consequent degradation. Unit 2 is particularly fragile and requires sensitive management to avoid irreversible land degradation.

Traverse condition summary (413 assessments):
Vegetation – good 42%; fair 31%; poor 21%; very poor 6%.
Soil erosion – nil 91%; slight 2%; minor 4%; moderate 3%.

Area mapped as sde: 13.2 km² (0.4% of land system's area).





No.	Unit name	Traverse recordings	Inventory sites
1	Breakaway/plateau	32	5
2	Lower footslope	45	3
3	Low rise	6	4
4	Gritty-surfaced plain	62	2
5	Stony plain/saline stony plain	118	8
6	Alluvial plain	27	5
7	Hardpan plain/loamy plain	71	–
8	Drainage tract	42	3
	Other	18	–
	Total	421 *	30

* 8 traverse points not assessed for condition.

Sherwood land system

Unit	area (%)	Landform	Soil	Vegetation
1.	8%	**Breakaways and plateaux** – low breakaways on granite (3-20 m relief), often with a siliceous duricrust; variably stripped plateaux with abundant lateritic gravel and indurated weathered granite outcrop, moderately inclined to steep escarpments and short pallid zone scree slopes with mantles of quartz and granite pebbles.	Rock outcrop, stony soils and shallow duplex on granite (1, 7a).	Very scattered (2.5-10% PFC) mixed low shrublands, common low shrubs include *Ptilotus obovatus* (cotton bush) and *Micromyrtus sulphurea*, with acacia tall shrubs (BRXS) on plateaux; very scattered (2.5-10% PFC) low shrublands on upper footslopes, with *Ptilotus obovatus* and *Frankenia* spp. (frankenia).
2.	10%	**Lower footslopes** – very gently inclined lower footslopes receiving run-on from unit 1, extending to 1 km, occasionally with a mantle of quartz and granite pebbles.	Shallow duplex on granite (7a).	Scattered (10-20% PFC) halophytic shrublands, common low shrubs include *Atriplex vesicaria* (bladder saltbush) and *Maireana glomerifolia* (ball-leaf bluebush) (BCLS, SBMS, FRAN).
3.	2%	**Low rises** – low rises, granite tors and low hills to 30 m relief with mantles of few to many granite and quartz pebbles and cobbles, and common granite outcrop.	Very shallow coarse red clayey sands on granite (2a).	Very scattered to scattered (2.5-20% PFC) *Acacia quadrimarginea* (granite wattle) tall shrublands (GRHS).
4.	15%	**Gritty-surfaced plains** – level to gently undulating plains with minor outcrop of granite, fringing unit 3.	Shallow coarse red clayey sands or red earths on granite (2a, 5c).	Very scattered to scattered (2.5-20% PFC) *Acacia aneura* (mulga) and *A. quadrimarginea* tall shrublands (SGRS) occasionally with wanderrie grasses.
5.	35%	**Stony plains/saline stony plains** – broad, level to gently undulating plains with mantles of few to abundant granite pebbles and cobbles, and minor granite outcrop.	Very shallow red clayey sand on granite, occasionally shallow duplex on granite (2a, 7a).	Scattered (10-20% PFC) acacia - eremophila shrublands (SAES) or scattered acacia shrublands (SGRS), occasionally very scattered to scattered (2.5-20% PFC) *Maireana* spp. (bluebush) low shrublands (SBMS).
6.	5%	**Alluvial plains** – very gently inclined plains receiving sheet flow from unit 2, occasional shallow channels.	Shallow duplex on granite or hardpan (7a, 7c).	Scattered (10-20% PFC) halophytic low shrublands often with *Maireana pyramidata* (sago bush) (PSAS) dominant; occasionally with *Atriplex vesicaria* (BLSS), *Atriplex bunburyana* (silver saltbush (SSAS).
7.	15%	**Hardpan plains/loamy plains** – level to very gently inclined plains, subject to sheet flow, occasionally with a mantle of fine ironstone gravel.	Shallow hardpan loams or red earths on hardpan (5d, 5c).	Scattered (10-20% PFC) tall *A. aneura* shrublands (HPMS, PLMS, MUBW).
8.	10%	**Drainage tracts** – channelled or unchannelled zones receiving concentrated flow, generally less than 500 m wide. Channels to 10 m wide and mostly <1 m deep.	Shallow duplex or red earths on granite (7a, 5c).	Moderately close (20-30% PFC) acacia tall shrublands (DRAS, HPCS). Dominant acacia species may be *A. aneura, A. acuminata* subsp. *burkittii* (fine-leaf jam) or *A. tetragonophylla* (curara).

WAGUIN LAND SYSTEM (1,249 km², 1.3% of the survey area)

(after Mabbutt *et al.* 1963)

Low breakaways with short stony and sandy plains, supporting acacia shrublands and minor halophytic shrublands.

Land type: 4

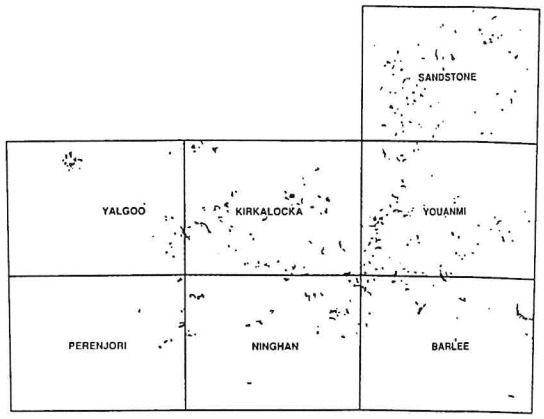
Geology: Deeply weathered Archaean granite and Quaternary colluvium and alluvium.

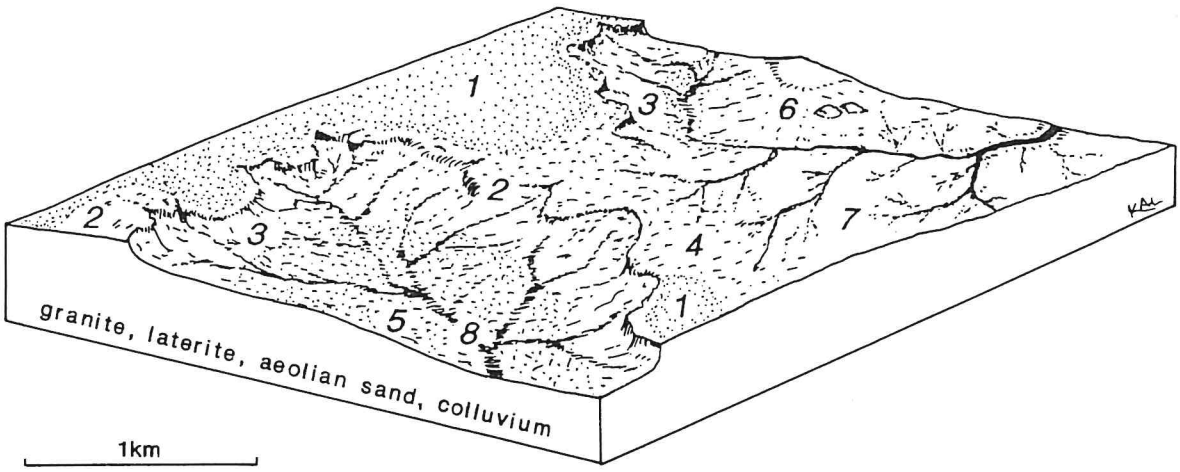
Geomorphology: Erosional surfaces; very low breakaways (relief usually <6 m) with short footslopes shedding water to stony plains and minor alluvial plains downslope. Minor patches of sandplain. This system usually occurs within large areas of sandplain, often occurring in parallel series in the north-east of the survey area.

Land management: Breakaway footslopes (unit 3) have fragile soils which are particularly susceptible to soil erosion if disturbed. Some of the vegetation types on this land system are preferentially grazed by introduced and native animals, especially as the system often occurs within large areas of spinifex vegetation which is unattractive to stock.

Traverse condition summary (123 assessments):
Vegetation – good 60%; fair 26%; poor 11%; very poor 3%.
Soil erosion – nil 99%; moderate 1%.

Area mapped as sde: Nil.





No.	Unit name	Traverse recordings	Inventory sites
1	Sandplain	10	1
2	Breakaway	17	6
3	Lower footslope	4	–
4	Stony plain	15	2
5	Saline stony plain	5	–
6	Gritty surfaced plain	16	–
7	Loamy sand/hardpan plain	43	–
8	Drainage floor	13	3
	Other	6	1
	Total	129 *	13

* 6 traverse points not assessed for condition.

Waguin land system

Unit	area (%)	Landform	Soil	Vegetation
1.	10%	**Sandplains** – very gently inclined remnant tracts of sand to 2 km in extent and elevated several metres above surrounding plains.	Deep red clayey sands (3a).	Moderately close (20-30% PFC) acacia tall shrublands with a wanderrie grass layer (SWGS). Grasses include *Monachather paradoxa* (broad-leaved wanderrie) and *Eragrostis eriopoda* (woolly butt)
2.	15%	**Breakaways** – low breakaways and plateaux on ferricrete, silcrete and granite, mostly up to 6 m relief; very gently inclined stripped surfaces with common weathered granite outcrop and many quartz, ironstone or silcrete cobbles and pebbles; moderately inclined to steep breakaway faces and short pallid zone scree slopes.	Pockets of stony soils on plateaux (1); shallow duplex on granite on footslopes (7a).	Scattered (10-20% PFC) low shrubland with *Acacia quadrimarginea* (granite wattle) mid to tall shrubs or scattered to moderately close (10-30% PFC) acacia tall shrubland (BRXS) on stripped surfaces and plateaux; very scattered (2.5-10% PFC) low shrublands on upper footslopes, with *Ptilotus obovatus* (cotton bush) and *Sida calyxhymenia* (tall sida); occasionally with moderately close (20-30% PFC) *Melaleuca uncinata* (broombush) tall shrubland near scarp faces (UFTH).
3.	10%	**Lower footslopes** – short very gently inclined slopes extending 100 to 500 m downslope from breakaways.	Shallow duplex on granite or hardpan (7a, 7c).	Scattered (10-20% PFC) halophytic low shrubland (BCLS), may be dominated by *Frankenia* spp.
4.	10%	**Stony plains** – gently undulating plains with variable mantles and minor to common outcrop of granite and quartz.	Very shallow coarse red clayey sands on granite (2a).	Scattered (10-20% PFC) acacia-eremophila tall shrublands (SAES).
5.	5%	**Saline stony plains** – level to gently undulating plains with quartz pebble mantles.	Shallow duplex with a stony mantle on granite (7a).	Very scattered to scattered (2.5-20% PFC) *Maireana* spp. (bluebush) low shrublands (SBMS).
6.	15%	**Gritty surfaced plains** – level to gently undulating plains with grit mantles and minor outcrop of granite.	Shallow coarse red clayey sands on granite (2a).	Very scattered (2.5-10% PFC) acacia shrublands, mostly *A. quadrimarginea* (SGRS).
7.	25%	**Loamy plains/hardpan plains** – level to gently undulating plains downslope from other units, receiving diffuse run-on.	Deep red clayey sands or deep red earths on hardpan (3a, 6a).	Scattered (10-20% PFC) *Acacia aneura* (mulga) and other acacia tall shrublands with patchy wanderrie grasses (PLMS, MUBW, HPMS).
8.	10%	**Drainage floors** – narrow drainage floors and alluvial plains with shallow channels or receiving sheet flow from units 2, 3 and 4, may be saline.	Shallow red duplex on hardpan or granite (7c, 7a).	Moderately close (20-30% PFC) acacia tall shrublands including *Acacia tetragonophylla* (curara) and *A. ramulosa* (bowgada) (DRAS). Scattered (10-20% PFC) halophytic low shrublands (SBMS, PXHS, SSAS) on saline soils.

CHALLENGE LAND SYSTEM (3,655 km², 3.9% of survey area)

(after Curry *et al.* 1994)

Gently undulating gritty-surfaced plains, occasional granite hills, tors and low breakaways, with acacia shrublands.

Land type: 6

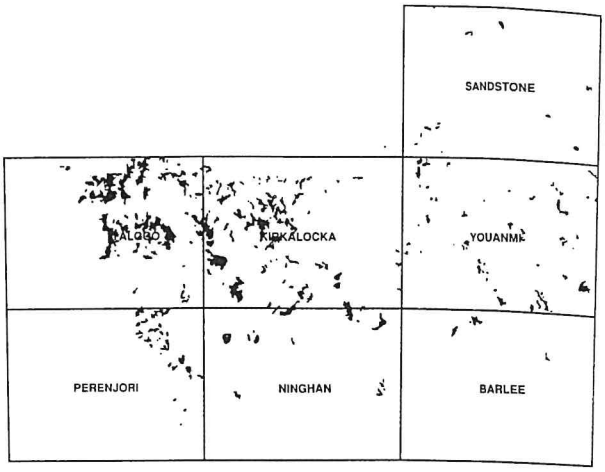
Geology: Archaean granite

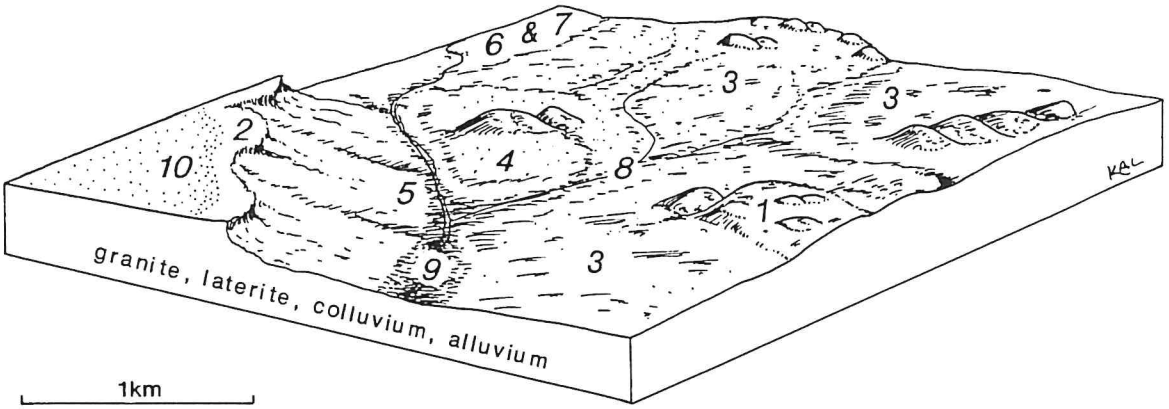
Geomorphology: Mainly erosional surfaces; very gently undulating gritty-surfaced plains with sandy drainage zones, minor plains with stone mantles and occasional hills, tors and low breakaways, generally with less than 10 m relief but occasionally up to 25 m.

Land management: Saline stony plains (unit 5) and alluvial plains (unit 9) are moderately susceptible to water erosion.

Traverse condition summary (448 assessments):
Vegetation – good 31%; fair 42%; poor 22%; very poor 5%.
Soil erosion – nil 96%; slight 2%; moderate 1%; severe 1%.

Area mapped as sde: Nil.





No.	Unit name	Traverse recordings	Inventory sites
1	Granite tor/dome	1	0
2	Breakaway	19	1
3	Gritty-surfaced plain	164	9
4	Stony plain	59	2
5	Saline stony plain	24	1
6	Loamy plains	37	–
7	Hardpan plain	79	3
8	Drainage line	35	2
9	Alluvial plain	21	3
10	Sand sheet	19	1
	Total	458 *	22

* 10 traverse points not assessed for condition.

Challenge land system

Unit	area (%)	Landform	Soil	Vegetation
1.	10%	**Granite tors and domes** – granite tors and domes generally <10 m relief with much bare rock.	Restricted pockets of shallow coarse red clayey sands (2a).	Very scattered to scattered (2.5-20% PFC) *Acacia quadrimarginea* (granite wattle) tall shrublands (GRHS).
2.	2%	**Breakaways** – low breakaways up to 25 m relief, with short saline footslopes.	Restricted pockets of shallow coarse red clayey sands (2a).	Scattered (10-20% PFC) mixed shrublands on breakaways and footslopes (BRXS, BCLS).
3.	38%	**Gritty-surfaced plains** – level to gently undulating plains with abundant fine quartz gravel and coarse sand, minor or common granite outcrop.	Shallow coarse red clayey sands on granite (2a).	Scattered (10-20% PFC) mixed shrublands with *Acacia aneura* (mulga) or *A. quadrimarginea* tall shrubs (SGRS, GABS).
4.	15%	**Stony plains** – gently undulating plains with few to common quartz and granite pebbles and cobbles on the surface and minor granite outcrop.	Shallow coarse red clayey sands with a stony mantle (2a), or shallow red clayey sands on granite (2d).	Scattered (10-20% PFC) acacia-eremophila shrublands. Dominant acacias include *A. quadrimarginea*, *A. acuminata* subsp. *burkittii* (fine-leaf jam) and *A. tetragonophylla* (curara) (SAES, SGRS).
5.	5%	**Stony saline plains** – level to gently undulating plains with many quartz pebbles and cobbles.	Shallow red earths on granite (5c).	Scattered (10-20% PFC) low shrublands commonly dominated by *Maireana pyramidata* (sago bush) (SBMS).
6.	5%	**Loamy plains** – level plains.	Red clayey sands (2d, 3a) or sandy red earths on hardpan at variable depth (4).	Scattered to moderately close (10-30% PFC) *A. aneura, A. ramulosa* (bowgada) tall shrublands with occasional wanderrie grasses (MUBW, PLMS).
7.	12%	**Hardpan plains** – level to gently undulating plains based on hardpan, may have a quartz pebble mantle.	Shallow red earths (5c) or shallow hardpan loams on hardpan, occasionally with a stony mantle (5d).	Scattered to moderately close (10-30% PFC) acacia tall shrublands (HPMS, HCAS). Dominant acacias include *A. ramulosa, A. acuminata* subsp. *burkittii* and *A. grasbyi* (miniritchie).
8.	5%	**Drainage lines** – narrow drainage floors with some channels.	Shallow red clayey sands (2d) or shallow duplex on granite (7a).	Moderately close (20-30% PFC) acacia tall shrublands (DRAS).
9.	5%	**Alluvial plains** – level plains receiving run-on from higher units.	Shallow duplex on granite (7a).	Scattered (10-20% PFC) halophytic low shrublands which may be dominated by *Maireana pyramidata* (PSAS). Also PXHS, ASWS.
10.	3%	**Sand sheets** – gently undulating sand sheet.	Shallow red clayey sands with ferruginous gravel on laterite (2b).	Moderately close (20-30% PFC) acacia tall shrublands (SACS).

KALLI LAND SYSTEM (4,954 km², 5.2% of the survey area)

(after Mabbutt *et al.* 1963)

Red sandplains supporting bowgada shrublands with wanderrie grasses.

Land type: 12

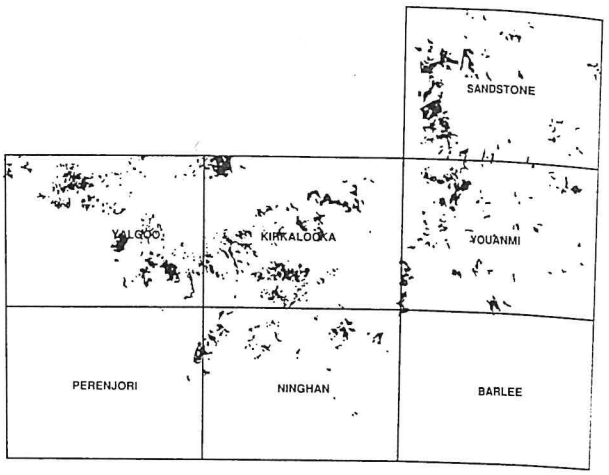
Geology: Quaternary aeolian sand derived from Archaean gneiss and granite, local Tertiary laterite.

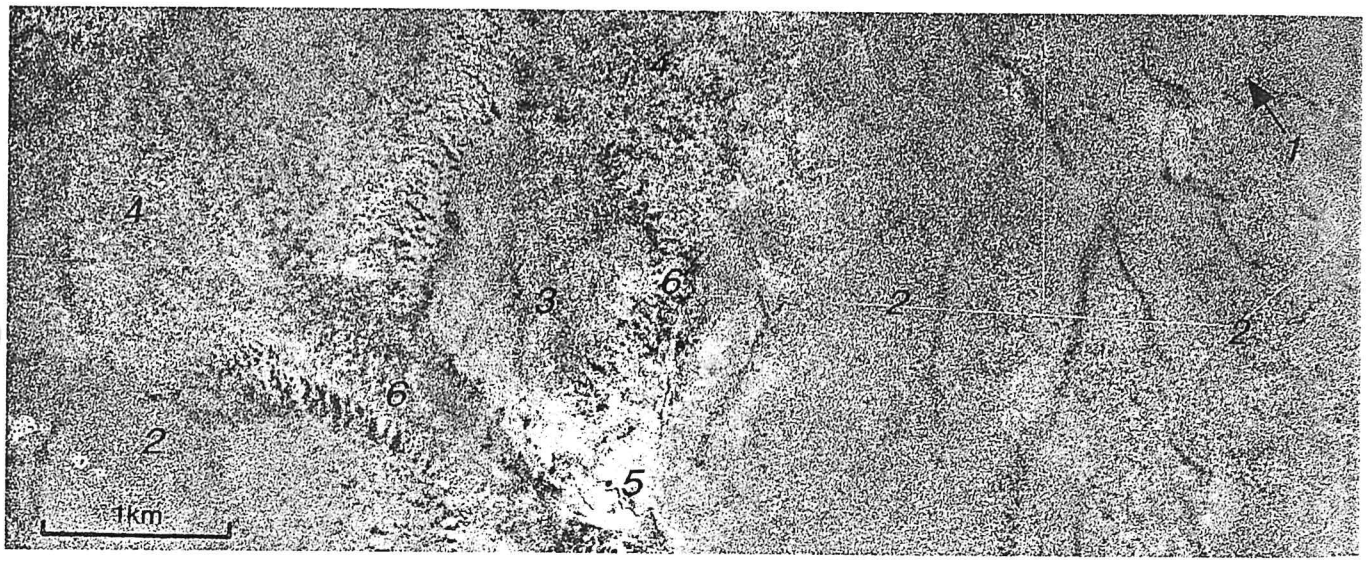
Geomorphology: Depositional surfaces; residual plateau surfaces with level to gently undulating sandplains high in the landscape, with occasional low linear dunes and exposed duricrust; infrequent drainage features, mostly diffuse and internal, but with some broad lightly stripped alluvial tracts with groved vegetation. Overall relief to about 20 m.

Land management: The system not normally susceptible to accelerated erosion, although vehicular tracks can cause local gullying on steeper gradients; dense vegetation protects the soil from wind erosion.

Traverse condition summary (435 assessments):
Vegetation – good 69%; fair 24%; poor 6%; very poor 1%.
Soil erosion – nil 100%.

Area mapped as sde: Nil.





No.	Unit name	Traverse recordings	Inventory sites
1	Sand dune	2	–
2	Sandplain	237	14
3	Gravelly sandplain	34	4
4	Loamy plain	130	–
5	Stripped surface	11	–
6	Alluvial tract	26	2
	Other	5	–
	Total	445 *	20

* 10 traverse points not assessed for condition.

Kalli land system

Unit area (%)	Landform	Soil	Vegetation
1. <1%	**Sand dunes** – linear dunes to about 6 m high and 1 km in length.	Deep red sands (3c).	Scattered to moderately close (10-30% PFC) acacia shrublands (SDSH).
2. 60%	**Sandplains** – level to gently undulating plains up to 5 or 6 km in extent with relief to 10 m.	Deep red clayey sands, occasionally overlying ferruginous gravels at <1 m (3a).	Moderately close to close (10-50% PFC) tall shrublands of *Acacia ramulosa* (bowgada) and *A. coolgardiensis* (sugar brother) with wanderrie grasses; occasional mallees and *Callitris glaucophylla* (native pine) (SWGS, SACS, MAAS, PINW).
3. 10%	**Gravelly sandplains** – very gently inclined plains, usually adjacent to stripped surfaces (unit 5), and occasional isolated gritty-surfaced tracts with granite outcrop.	Shallow red clayey sands over ferruginous gravels (2d).	Scattered to moderately close (10-30% PFC) mixed height shrublands of *Acacia* spp., myrtaceous low shrubs and *Amphipogon caricinus* (grey beard grass) (SWGS, SACS, LSHE).
4. 22%	**Loamy plains** – very gently inclined plains subject to diffuse run-on.	Sandy red earths and deep red clayey sands (4, 3a).	Moderately close to close (20-50% PFC) tall shrublands of *Acacia aneura* (mulga) and *A. ramulosa* with scattered wanderrie grasses (MUBW, PLMS, SWGS).
5. 3%	**Stripped surfaces** – very gently inclined plains with mantles of common to abundant ironstone and ferruginous gravel.	Shallow coarse clayey sands over laterite or deeply weathered granite (2a).	Very scattered to moderately close (2.5-30% PFC) often including acacias, eremophilas, and *Thryptomene decussata* and other myrtaceous shrubs (BRXS).
6. 5%	**Alluvial tracts** – very gently inclined broad fans and unchannelled drainage tracts, with areas of sheet flow; occasionally with gravelly mantles.	Shallow and deep red earths (5c, 6a).	Close (30-50% PFC) tall shrublands or woodlands of *A. aneura* and *A. ramulosa* (GRMU) in groves; elsewhere scattered to moderately close (10-30% PFC) acacia tall shrublands (HPMS, DRAS).

HAMILTON LAND SYSTEM (325 km², 0.3% of the survey area)

(after Pringle *et al.* 1994)

Hardpan plains and stony plains with mulga shrublands.

Land type: 13

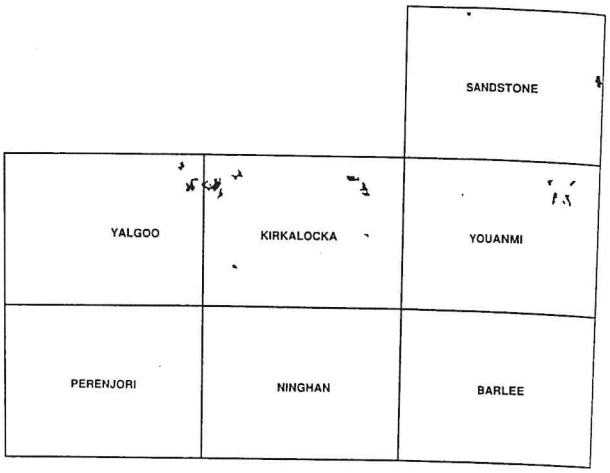
Geology: Partly cemented Quaternary alluvium and colluvium, minor Archaean granite.

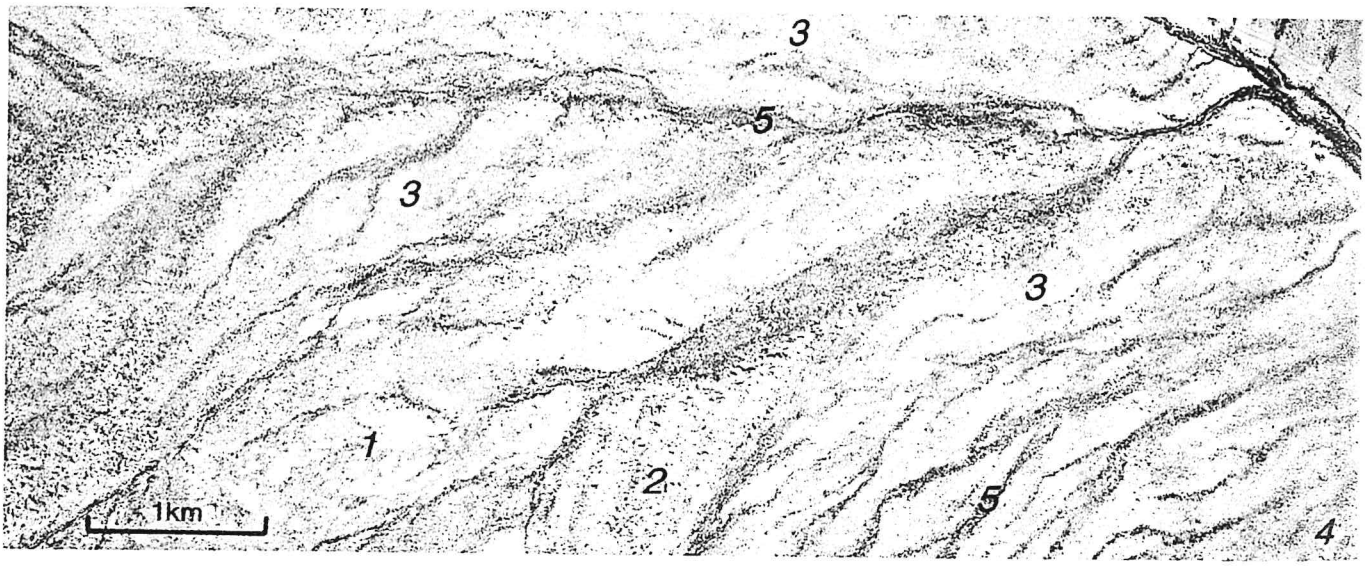
Geomorphology: Depositional surfaces; level to gently undulating plains with occasional irregular sandy banks upslope of drainage tracts with numerous narrow, often incised (to 5 m) channels which are dendritic in upper parts.

Land management: Hardpan plains (unit 1) and drainage lines (unit 5) are mildly susceptible to water erosion. Alteration of natural water flows can initiate erosion and cause water starvation and consequent loss of vigour in vegetation downslope.

Traverse condition summary (70 ratings):
Vegetation – good 21%; fair 49%; poor 26%; very poor 4%.
Soil erosion – nil 95%; slight 4%; moderate 1%.

Area mapped as sde: Nil.





No.	Unit name	Traverse recordings	Inventory sites
1	Stony plain	4	–
2	Stony hardpan plain	6	2
3	Hardpan plain	44	3
4	Sandy bank	5	–
5	Drainage line	7	2
	Other	5	–
	Total	71 *	7

* 1 traverse point not assessed for condition.

Hamilton land system

Unit area (%)	Landform	Soil	Vegetation
1. 10%	**Stony plains** – level to gently undulating plains and interfluves with quartz pebble mantles.	Shallow red earths or shallow duplex with a stony mantle, on granite (5c, 7a).	Scattered (10-20% PFC) acacia-eremophila shrublands (SAES) occasionally with halophytic low shrubs (USBS).
2. 15%	**Stony hardpan plains** – level to very gently inclined plains subject to sheet flow, with mantles of common quartz pebbles.	Shallow red earths with a stony mantle on hardpan over granite (5c).	Scattered to moderately close (10-30% PFC) *Acacia aneura* (mulga), *A. ramulosa* (bowgada) and *Eremophila* spp. tall shrublands (SAES, HPMS).
3. 60%	**Hardpan plains** – nearly level plains subject to sheet flow.	Shallow red earths (5c) or shallow red clayey sands on hardpan (2d).	Scattered to moderately close (10-30% PFC) *A. aneura* tall shrublands with *Eremophila* spp. low and mid shrubs (HPMS).
4. 5%	**Sandy banks** – slightly elevated irregular sandy banks on units 1 and 2.	Deep red clayey sands, or sandy red earths on hardpan (3a, 4).	Scattered (10-20% PFC) mixed shrublands with a wanderrie grass understorey (WABS).
5. 10%	**Drainage lines** – narrow flow zones with channels incised (to 5 m deep) into hardpan; dendritic in upper parts.	Shallow red clays on floors (9a); channel bedloads are large pebbles of granite and quartz (12), exposure of hardpan and granite along channels.	Scattered to moderately close (10-30% PFC) *A. aneura* tall shrublands (DRAS).

TINDALARRA LAND SYSTEM (4,349 km², 4.6% of survey area)

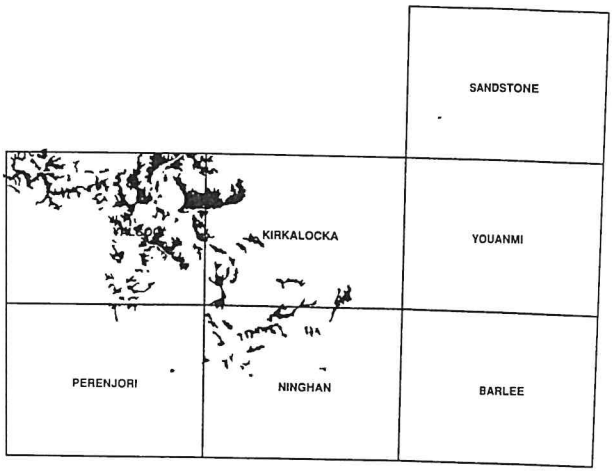
(after Curry *et al.* 1994)

Hardpan plains supporting acacia shrublands with sparse drainage channels and associated drainage floors supporting saltbush/bluebush shrubs under snakewood.

Land type: 13

Geology: Quaternary alluvium and hardpan.

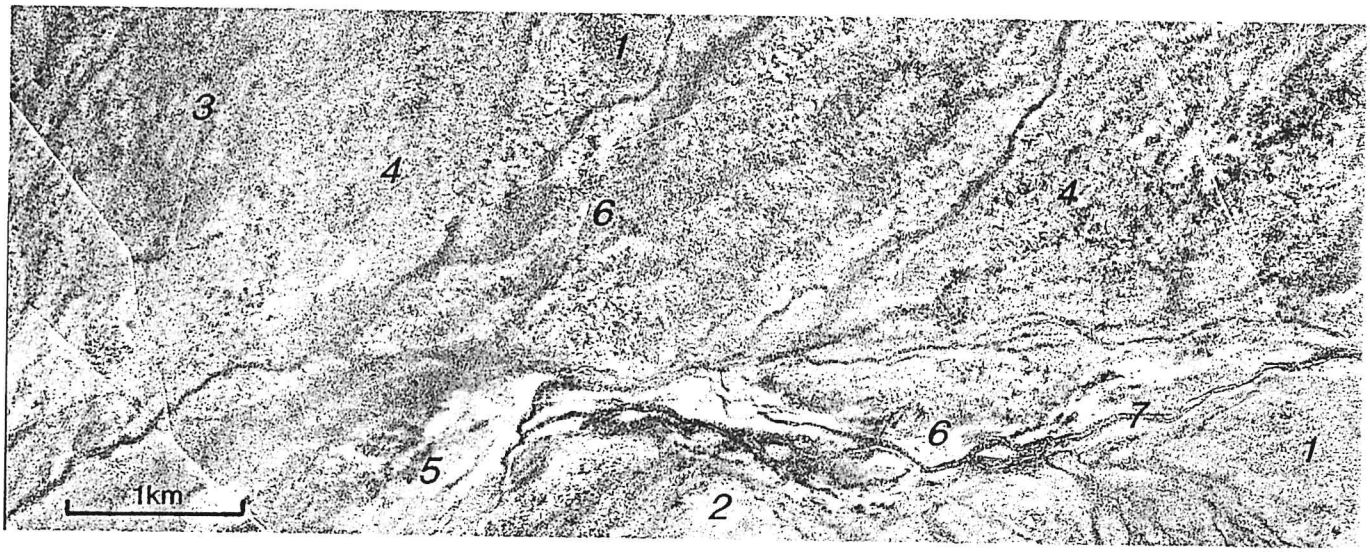
Geomorphology: Depositional surfaces; very restricted gently sloping upper plains on granite, broad nearly level plains up to 10 km or more in extent subject to diffuse sheet flow, occasional low wanderrie banks; narrow floodplains carrying more concentrated sheet flow and flanking concentrated drainage tracts with incised channels; relief mostly <5 m.



Land management: Impedance of sheet flows on units 3 & 4 can cause water starvation and consequent loss of vigour in vegetation downslope. Halophytic low shrublands on alluvial plains and drainage tracts (units 5 & 6) are often degraded due to preferential overgrazing and are moderately susceptible to accelerated erosion.

Traverse condition summary (710 assessments):
Vegetation – good 17%; fair 45%; poor 30%; very poor 8%.
Soil erosion – nil 89%; slight 3%; minor 4%; moderate 3%; severe 1%.

Area mapped as sde: 14 km² (0.3% of land system's area).



No.	Unit name	Traverse recordings	Inventory sites
1	Sandy bank/sand sheet	15	–
2	Gritty surfaced plain	15	3
3	Loamy plain	73	3
4	Hardpan plain	462	9
5	Alluvial plain	66	4
6	Drainage tract	80	5
7	Creekline/channel	2	2
	Other	3	–
	Total	716 *	24

* 6 traverse points not assessed for condition.

Tindalarra land system

Unit	area (%)	Landform	Soil	Vegetation
1.	3%	**Sandy banks/sand sheets** – isolated sandy banks and sandplain remnants to 1 km in extent.	Deep red clayey sands (3a).	Scattered (10-20% PFC) acacia tall shrublands with low shrubs such as *Eremophila forrestii* (Wilcox bush) and wanderrie grasses (WABS, SWGS).
2.	1%	**Gritty surfaced plains on granite** – restricted, very gently inclined plains with occasional granite outcrops	Shallow coarse red clayey sands on granite (2a).	Moderately close (20-30% PFC) shrublands of acacias and *Hakea recurva* (stand back) (SGRS).
3.	10%	**Loamy plains** – very gently inclined plains extending for up to 3 km, subject to diffuse sheet flow.	Mostly deep red clayey sands or red earths on hardpan (3a, 6a).	Moderately close (20-30% PFC) tall shrublands of *Acacia ramulosa* (bowgada) and other acacias with low shrubs such as *Eremophila forrestii* and sparse wanderrie grasses (MUBW, PLMS, HCAS).
4.	70%	**Hardpan plains** – very gently inclined broad plains extending for up to 8 km, occasionally with a mantle of few quartz or ironstone pebbles, subject to sheet flow.	Deep red earths or shallow hardpan loams on hardpan (6a, 5d).	Scattered to moderately close tall (10-30% PFC) shrublands co-dominated by *A. ramulosa*, *A. aneura* (mulga), *A. grasbyi* (miniritchie) and *A. acuminata* subsp. *burkittii* (fine-leaf jam) (HPMS, HCAS).
5.	5%	**Alluvial plains** – very gently inclined flood plains as inclusions (generally <2 km in extent) in unit 4 or associated with unit 6.	Shallow duplex soils and hardpan loams (7c, 5d) or red clayey sands (2d).	Very scattered to scattered (2.5-20% PFC) tall shrublands of *A. eremaea* (snakewood) with prominent undershrubs of frankenia and bluebush or low shrublands of frankenia and bluebush (ASWS, FRAN).
6.	10%	**Drainage tracts** – very gently inclined tributary flood plains, up to 1 km wide flanking creek channels.	Shallow hardpan loams, clays (5d, 7a) and red clayey sands on hardpan (2d).	Scattered (10-20% PFC) tall and low shrublands dominated by *A. eremaea,* frankenia and bluebush (ASWS) occasionally with *Eucalyptus loxophleba*, (York gum) trees. Also moderately close to close tall shrublands of *A. tetragonophylla* (curara) and other acacias (DRAS).
7.	1%	**Creeklines and channels** – Creeklines receiving flow from lower parts of unit 4 and becoming larger and more incised (up to 50 m wide and 2 m deep) as they pass through units 5 and 6. Also major channels to 100 m wide (e.g. Greenough River).	Juvenile deposits (12).	Moderately close (20-30% PFC) fringing woodlands or tall shrublands of acacias, *Casuarina obesa* (swamp oak), *Callistemon phoeniceus* (lesser bottlebrush) (CBKW, CBBS).

WOODLINE LAND SYSTEM (5,856 km², 6.2% of the survey area)

(after Curry *et al.* 1994)

Hardpan wash plains supporting acacia shrublands and woodlands.

Land type: 13

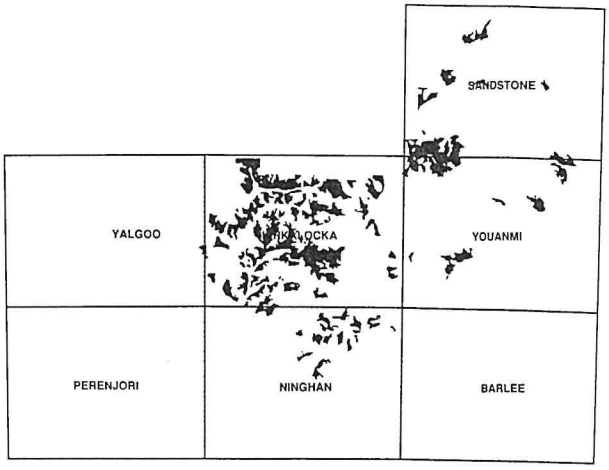
Geology: Quaternary cemented alluvium and minor aeolian sand.

Geomorphology: Depositional surfaces; broad, nearly level plains receiving sheet run-on from adjacent higher systems, more concentrated flow zones (rarely with channels) and minor tracts of sandplain.

Land management: The mulga woodlands on this system were formerly subject to extensive timber cutting for the mining industry but have now largely recovered. The system is generally not prone to accelerated soil erosion. However, impedance to overland flow (e.g. by roads and tracks diverting run-off) can cause water starvation effects on vegetation downslope.

Traverse condition summary (695 assessments):
Vegetation – good 27%; fair 41%; poor 27%; very poor 5%.
Soil erosion – nil 99%; slight 1%.

Area mapped as sde: 0.4 km² (0.01% of land system's area).



No.	Unit name	Traverse recordings	Inventory sites
1	Sand sheet	20	2
2	Hardpan plain/loamy plain	649	10
3	Drainage tract	48	7
	Other	16	–
	Total	733 *	19

* 38 traverse points not assessed for condition.

Woodline land system

Unit	area (%)	Landform	Soil	Vegetation
1.	5%	**Sand sheets** – level sandy tracts, to 2 km in extent and slightly elevated, above other units.	Deep red clayey sands, sandy red earths or red earths (3a, 4, 6a).	Scattered to moderately close (10-30% PFC) *Acacia ramulosa* (bowgada) tall shrublands with a *Monachather paradoxa* (broad-leaved wanderrie) grass layer (SWGS).
2.	85%	**Hardpan plains/loamy plains** – nearly level, loamy surfaced plains (usually 5-10 km wide), receiving sheet flow from granite uplands; indistinct arcuate, contour-aligned patterns of grove and intergrove.	Deep red earths on hardpan (6a).	Scattered to moderately close (10-30% PFC) acacia tall shrublands, dominated by *Acacia aneura* (mulga), *A. ramulosa* or *A. grasbyi* (miniritchie) (HPMS, HCAS), often with an *A. aneura* tree layer (MUBW, PLMS). Occasionally closed (>50% PFC) acacia woodlands (GRMU).
3.	10%	**Drainage tracts** – Mostly unincised drainage tracts generally 50-200 m wide, carrying more concentrated sheet flow; occasionally incised channels to 80 m wide and 2 m deep.	Deep red earths on hardpan or occasional shallow hardpan loams (6a, 5d).	Moderately close to close (20-50% PFC) *A. aneura* or *A. ramulosa* tall shrublands or *A. aneura* woodlands (DRAS).

YANGANOO LAND SYSTEM (3,276 km², 3.5% of survey area)

(after Mabbutt *et al.* 1963)

Hardpan plains and sandy tracts with groved mulga shrublands, hard spinifex and wanderrie grasses.

Land type: 14

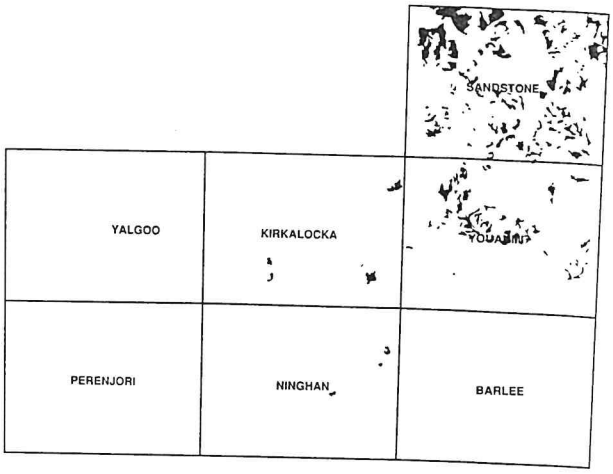
Geology: Quaternary cemented alluvium and sand.

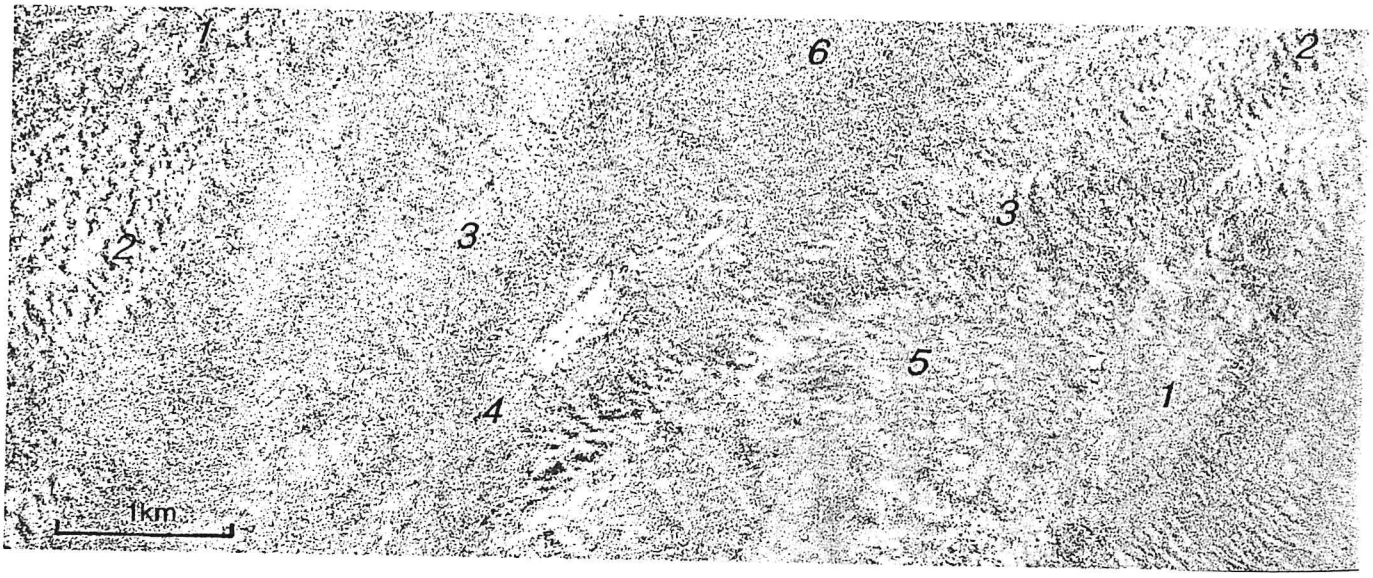
Geomorphology: Depositional surfaces; distributary alluvial plains commonly with central drainage tracts, receiving run-on from adjacent granite uplands; grading downslope and laterally into sandplain.

Land management: This system is generally not susceptible to soil erosion except for drainage tracts (unit 4) receiving concentrated run-on which are moderately susceptible to accelerated erosion if vegetation is degraded. Impedance to sheet flows on hardpan plains (unit 1) can cause water starvation and consequent loss of vigour in vegetation downslope.

Traverse condition summary (479 assessments):
Vegetation – good 29%; fair 28%; poor 37%; very poor 6%.
Soil erosion – nil 94%; slight 1%; minor 4%; moderate 1%.

Area mapped as sde: 3.9 km² (0.1% of land system's area).





No.	Unit name	Traverse recordings	Inventory sites
1	Hardpan plain	205	8
2	Grove	9	3
3	Loamy plain	193	4
4	Drainage tract	48	1
5	Sandy bank	15	–
6	Sand sheet	35	–
	Other	8	–
	Total	513 *	16

* 34 traverse points not assessed for condition.

Yanganoo land system

Unit	area (%)	Landform	Soil	Vegetation
1.	40%	**Hardpan plains** – level to gently inclined plains subject to sheet flow.	Shallow hardpan loams and deep red earths on hardpan (5d, 6a).	Scattered to moderately close (10-30% PFC) acacia tall shrublands including *Acacia aneura* (mulga), *A. ramulosa* (bowgada) and *A. tetragonophylla* (curara) (HPMS, HMCS).
2.	2%	**Groves** – arcuate, contour-aligned drainage foci (to 50 m wide and 200 m long) on unit 1, occasionally on unit 3.	Deep red earths (6a).	Close (30-50% PFC) *A. aneura* tall shrublands or woodlands (GRMU).
3.	40%	Loamy plains – level to very gently inclined plains subject to diffuse sheet flow.	Shallow hardpan loams and deep red earths (5d, 6a) or sandy red earths (4).	Scattered to moderately close (10-30% PFC) *A. aneura* tall shrublands with undershrubs such as *Eremophila forrestii* (Wilcox bush) and occasional wanderrie grasses (MUBW, PLMS).
4.	10%	**Drainage tracts** – broad (>500 m) alluvial tracts receiving concentrated run-on from adjacent granite uplands; occasionally with shallow channels incised into hardpan.	Deep red earths (6a).	Moderately close to close (20-50% PFC) *A. aneura* tall shrublands or woodlands with generally sparse understoreys (DRAS).
5.	3%	**Sandy banks** – reticulate sandy banks elevated to 1 m above surrounding plains (units 1 and 3), commonly transverse to slope.	Deep red clayey sands (3a).	Scattered to moderately close (10-30% PFC) acacia tall shrublands with low shrubs such as *E. forrestii* and wanderrie grasses (WABS).
6.	5%	**Sand sheets** – areas transitional to sandplain receiving very diffuse run-on.	Deep red clayey sands and sandy red earths (3a, 4).	Scattered (10-20% PFC) *A. ramulosa, A. aneura* tall shrublands with *Triodia basedowii* (hard spinifex) or wanderrie grass understoreys (SAMU, SWGS).

ERO LAND SYSTEM (531 km², 0.6% of the survey area)

(after Mabbutt *et al.* 1963)

Tributary floodplains supporting acacia tall shrublands and halophytic low shrublands.

Land type: 17

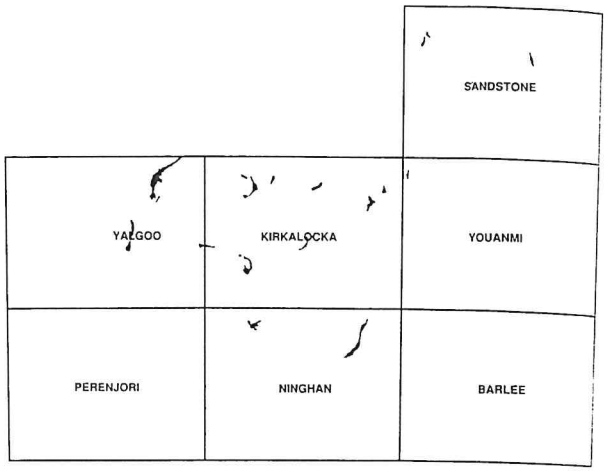
Geology: Quaternary alluvium, partly cemented.

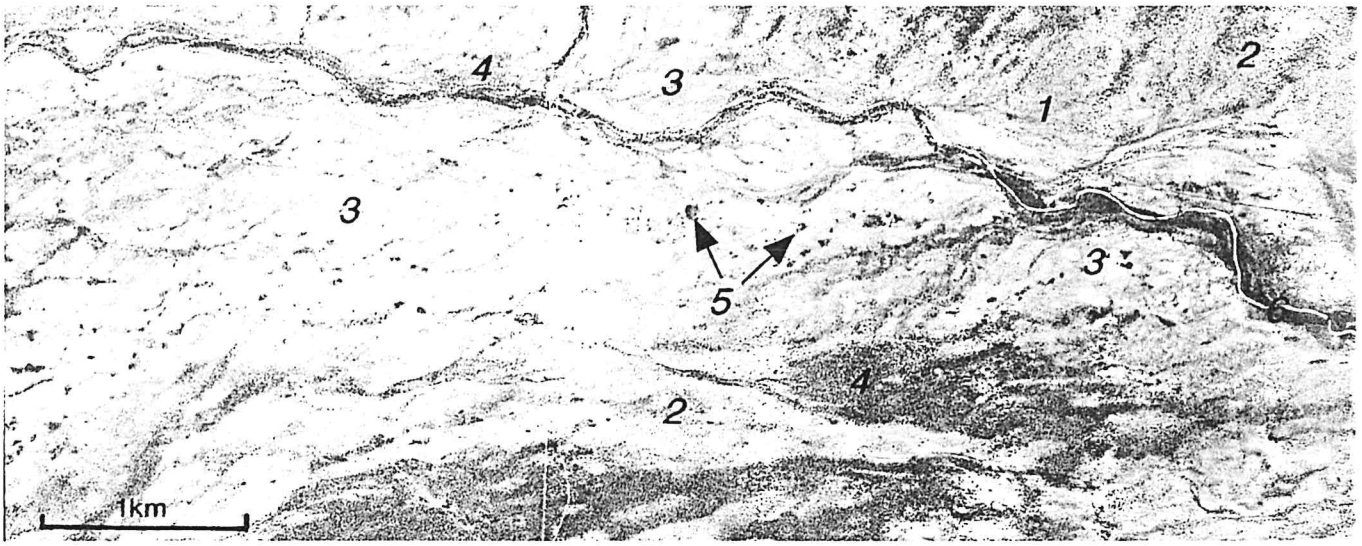
Geomorphology: Depositional surfaces; very gently inclined tributary plains with central concentrated drainage tracts with saline alluvium and minor anastomosing channels, flanked by plains with non-saline alluvium subject to sheet flow; occasional drainage foci.

Land management: The system supports vegetation which is attractive to stock and other animals and is liable to preferential overgrazing. Alluvial plains and drainage tracts (units 3 & 4) are highly susceptible to soil erosion if shrub cover is depleted and are subject to flooding.

Traverse condition summary (138 assessments): Vegetation – good 31%; fair 36%; poor 21%; very poor 12%. Soil erosion – nil 58%; slight 15%; minor 10%; moderate 12%; severe 4%; extreme 1%.

Area mapped as sde: 39.9 km² (7.5% of land system's area).





No.	Unit name	Traverse recordings	Inventory sites
1	Sandy bank	–	–
2	Hardpan plain	37	2
3	Alluvial plain	75	9
4	Drainage tract	21	4
5	Drainage focus	1	4
6	Channel	5	3
	Total	139	22

* 1 traverse point not assessed for condition.

Ero land system

Unit	area (%)	Landform	Soil	Vegetation
1.	5%	**Sandy banks** – to 300 m in extent and up to 1 m above adjacent unit 2.	Deep or shallow red clayey sands over hardpan (3a, 2d).	Very scattered to moderately close (2.5-30% PFC) acacia tall shrublands with *Eremophila* spp. low shrubs and wanderrie grasses (WABS).
2.	20%	**Hardpan plains** – level plains occasionally with a very sparse mantle of pebbles and cobbles, subject to sheet flow.	Shallow loams and red clayey sands over hardpan (5d, 2d). Some duplexes and red earths over hardpan (7c, 5c).	Scattered (10-20% PFC) tall shrublands dominated by *Acacia aneura* (mulga), *A. tetragonophylla* (curara), or *A. grasbyi* (miniritchie) (HPMS, HMCS).
3.	60%	**Alluvial plains** – level to very gently inclined saline plains to 4 km wide, subject to sheet flow and commonly with scalded and eroded surfaces.	Shallow duplex on hardpan (7c), shallow hardpan loams and deep duplex soils (5d, 8).	Very scattered to scattered (2.5-20% PFC) low halophytic shrublands, may be dominated by *Atriplex bunburyana* (silver saltbush) or *Maireana pyramidata* (sago bush) (SSAS, PSAS) occasionally with sparse acacia tall shrubs, commonly *A. eremaea* (snakewood) (ASWS).
4.	10%	**Drainage tracts** – level or gently inclined central tracts to 1 km wide through unit 3 and receiving more regular flooding than unit 3, occasional incised central channels.	Shallow clays, red earths (9a, 5c) or duplexes over hardpan at variable depth (7c, 8).	Scattered to close (10-50% PFC) tall shrublands of *A. tetragonophylla* and *A. aneura* with halophytic and non-halophytic undershrubs (DMCS, HMCS, DRAS).
5.	3%	**Drainage foci** – seasonally flooded claypans, swamps and rounded drainage foci to 400 m in diameter (usually smaller) occurring on units 3 & 4).	Shallow clays, red earths and duplex soils over hardpan or calcreted pans (9, 5c, 7c).	Moderately close to close (20-50% PFC) tall shrublands dominated by *A. tetragonophylla* or *Melaleuca uncinata,* occasionally with patchy grasses (ACGU, DRAS, MESS).
6.	<2%	**Channels** – anastomosing channels up to 25 m wide incised to 2 m deep with hardpan and calcrete exposures.	Channel bedloads of coarse sand, grit and hardpan fragments. Soils on banks are juvenile types of variable depth (12).	Variable fringing woodlands or tall shrublands with *Casuarina obesa* (swamp oak) or *Acacia* spp. and *Callistemon phoeniceus* (lesser bottlebrush) often with halophytic under shrubs (CBKW, CBBS).

CUNYU LAND SYSTEM (358 km², 0.4% of the survey area)

(after Mabbutt *et al.* 1963)

Calcrete platforms and intervening drainage floors and minor areas of alluvial plains, with acacia shrublands, casuarina woodlands and minor halophytic shrublands.

Land type: 18

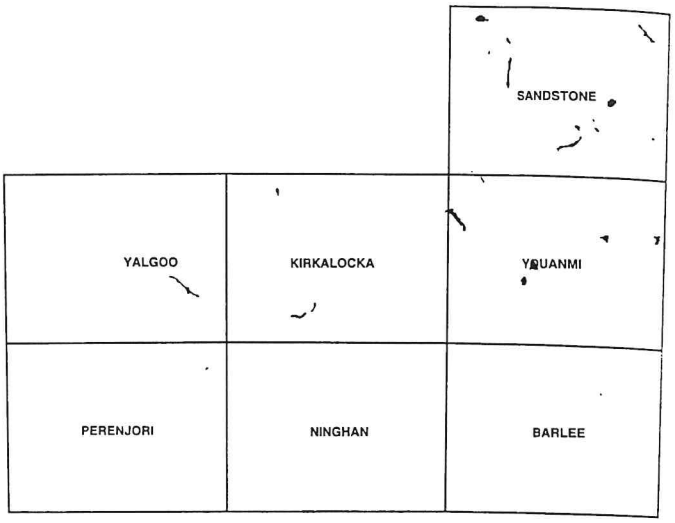
Geology: Tertiary calcrete and Quaternary alluvium.

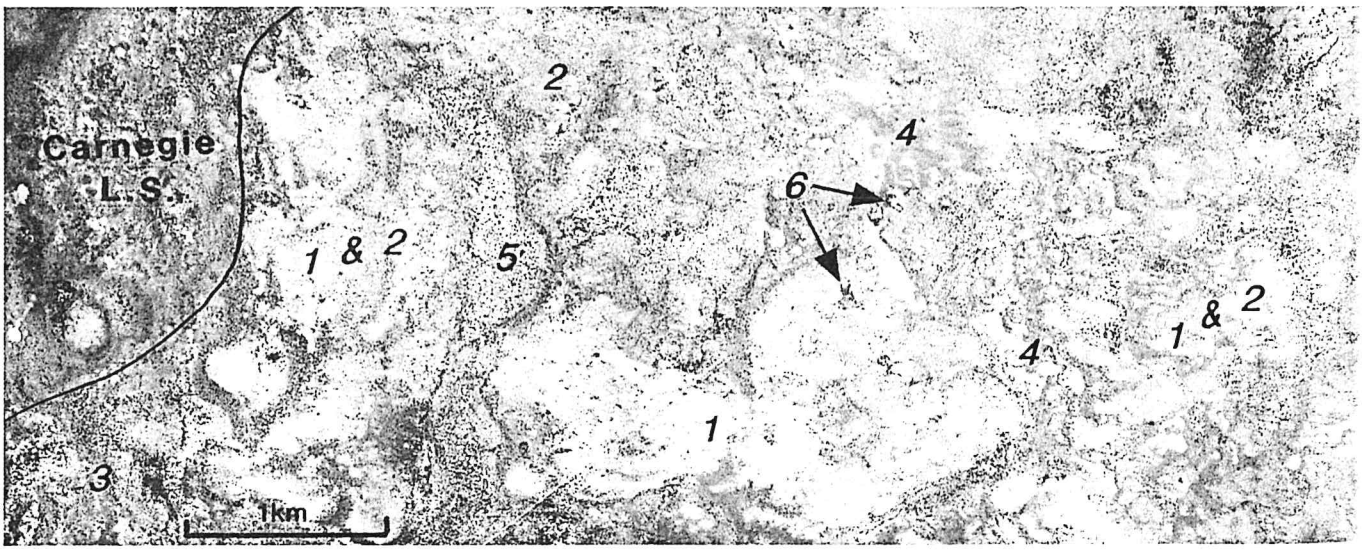
Geomorphology: Depositional surfaces, calcreted valley fill; calcrete platforms and intervening drainage floors and broader alluvial plains, also minor plains with mantles of calcrete rubble and occasional drainage foci.

Land management: Alluvial plains (unit 4) and drainage floors (unit 5) are moderately susceptible to water erosion if perennial shrub cover is substantially reduced or the soil surface is disturbed. Seasonal production of annual herbs and grasses is high in this land system. These plants are highly attractive to a wide range of herbivores and land managers should aim to control total grazing pressure in these preferred pastures.

Traverse condition summary (85 assessments):
Vegetation – good 13%; fair 17%; poor 42%; very poor 28%.
Soil erosion – nil 87%; slight 1%; minor 9%; moderate 1%; severe 1%; extreme 1%.

Area mapped as sde: 3.6 km² (1.0% of land system's area).





No.	Unit name	Traverse recordings	Inventory sites
1	Calcrete platform	42	7
2	Calcrete plain	16	–
3	Hardpan plain	7	2
4	Alluvial plain	11	–
5	Drainage floor	3	1
6	Drainage foci	11	4
	Other	6	–
	Total	96 *	14

* 11 traverse points not assessed for condition.

Cunyu land system

Unit area (%)	Landform	Soil	Vegetation
1. 48%	**Calcrete platforms** – very gently inclined platforms (to 4 m relief), with calcrete rubble and outcrop.	Shallow red clayey sands or shallow calcareous loams, on calcrete (2c, 5a).	Scattered (10-20% PFC) *Acacia acuminata* subsp. *burkittii* (fine-leaf jam) and other acacia grassy tall shrublands (JAMS) or very scattered (2.5-10% PFC) *Casuarina pauper* (black oak) woodlands with *Senna artemisioides* subsp. *petiolaris* (desert cassia) and *Ptilotus obovatus* (cotton bush) as common low shrubs (CAPW).
2. 25%	**Calcrete plains** – level plains with mantles of calcrete pebbles.	Shallow calcareous loams or shallow red clayey sands, on calcrete (5a, 2c).	Scattered to moderately close (10-30% PFC) *Acacia acuminata* subsp. *burkittii* tall shrublands (JAMS).
3. 10%	**Hardpan plains** – nearly level plains subject to weak sheet flow.	Shallow red clayey sands on hardpan or shallow hardpan loams (2d, 5c).	Moderately close (20-30% PFC) acacia tall shrublands (HCAS). Dominant acacias are *A. acuminata* subsp. *burkittii*, *A. grasbyi* (miniritchie), *A. tetragonophylla* (curara) and *A. aneura* (mulga).
4. 10%	**Alluvial plains** – nearly level plains marginally lower than units 1 and 2, subject to unchannelled through drainage.	Shallow duplex on hardpan and deep duplex (7c, 8).	Scattered to moderately close (10-30% PFC) halophytic low shrublands occasionally with *Acacia eremaea* (snakewood) tall shrubs (PXHS, ASWS).
5. 5%	**Drainage floors** – mostly unchannelled drainage tracts. (<250 m wide) between units 1 & 2.	Shallow red clays (9a), or shallow red earths on hardpan (5c).	Moderately close (20-30% PFC) acacia or acacia-melaleuca tall shrublands (DRAS).
6. 2%	**Drainage foci** – foci to 400 m in diameter but usually much less, collecting run-off from surrounding plains.	Shallow clays on calcrete or hardpan and deep clays (9a, 9b).	Scattered to moderately close (10-30% PFC) tall shrublands of *A. aneura* or *Melaleuca sheathiana* (boree) with a mixture of halophytic and non-halophytic mid and low shrubs and patchy perennial grasses (MESS, PDFT) or tussock grasslands of *Eragrostis setifolia* (neverfail) or *Eriachne flaccida* (claypan grass) with *Acacia tetragonophylla* tall shrubs (ACGU).

MILEURA LAND SYSTEM (708 km², 0.7% of the survey area)

(after Mabbutt *et al.* 1963)

Calcrete platforms and saline alluvial plains supporting halophytic shrublands.

Land type: 18

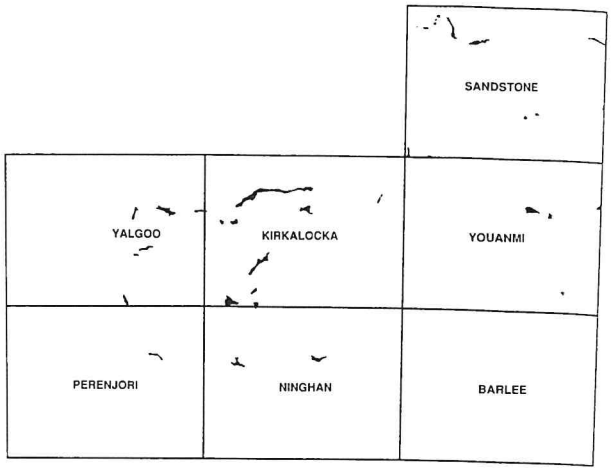
Geology: Tertiary calcrete and Quaternary alluvium.

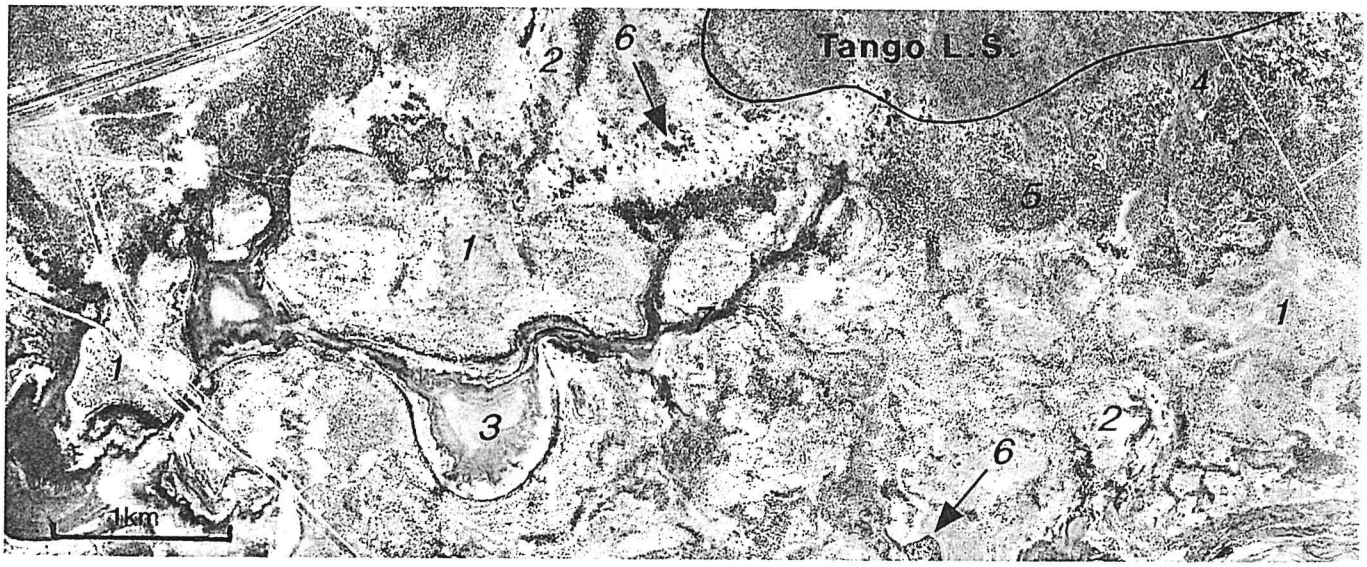
Geomorphology: Depositional surfaces; calcrete valley fills; a mosaic of calcrete platforms and alluvial plains, occasional sandy banks and usually unincised drainage tracts.

Land management: Alluvial plains (unit 2) are moderately susceptible to water erosion, particularly where perennial shrub cover has been substantially reduced or the soil surface is disturbed. The vegetation of this land system is highly preferred for grazing by introduced and native animals rendering it susceptible to overgrazing and consequent degradation. Overgrazing can be avoided by appropriate management, including control of total grazing pressure.

Traverse condition summary (199 assessments):
Vegetation – good 36%; fair 30%; poor 25%; very poor 9%.
Soil erosion – nil 86%; slight 3%; minor 7%; moderate 4%.

Area mapped as sde: 0.1 km² (0.02% of land system's area).





No.	Unit name	Traverse recordings	Inventory sites
1	Calcrete platform/calcrete plain	49	10
2	Alluvial plain	87	9
3	Saline plain	8	2
4	Hardpan plain	23	2
5	Sandy bank	9	1
6	Drainage focus	7	6
7	Drainage tract	9	3
	Other	2	–
	Total	194 *	33

* 5 traverse points not assessed for condition.

Mileura land system

	Unit area (%)	Landform	Soil	Vegetation
1.	30%	**Calcrete platforms and plains** – platforms (1-3 m relief) and plains to 3 or 4 km in extent, with mantles of calcrete rubble.	Shallow calcareous loams on calcrete (5a).	Variable: scattered to moderately close (10-30% PFC) eucalypt woodlands, (CAPW), scattered (10-20% PFC) *Acacia acuminata* subsp. *burkittii* (fine-leaf jam) tall shrublands (JAMS) or scattered (10-20% PFC) *Atriplex bunburyana* (silver saltbush) low shrublands (SSAS).
2.	40%	**Alluvial plains** – level to very gently inclined plains between platforms (unit 1) with occasional incised channels in lowest areas.	Variable depth duplex and clays (7c, 7d, 9a, 9b), with shallow hardpan loams and shallow red clayey sands on calcrete or hardpan (5d, 2c).	Scattered (10-20% PFC) halophytic low shrublands, (PXHS), occasionally with *Atriplex bunburyana* dominant (SSAS), also scattered *Acacia eremaea* (snakewood) tall shrubland with halophytic undershrubs (ASWS).
3.	10%	**Saline plains** – level plains slightly lower than units 2 & 4, subject to episodic inundation.	Deep and shallow clays on calcrete (9a, 9b).	Scattered to moderately close (10-30% PFC) *Halosarcia* spp. (samphire) low shrublands (SAMP).
4.	10%	**Hardpan plains** – nearly level plains subject to sheet flow.	Shallow hardpan loams (5d).	Scattered to moderately close (10-30% PFC) acacia tall shrublands with halophytic and non-halophytic low shrubs (HMCS, HPMS).
5.	3%	**Sandy banks** – low banks to 1 m relief, mostly on units 3 and 4.	Deep red clayey sands on calcrete or hardpan (3a).	Scattered to moderately close (10-30% PFC) tall and low shrublands with *Acacia aneura* (mulga) with halophytic and non-halophytic low shrubs and sparse wanderrie grass (SBLS, WABS).
6.	2%	**Drainage foci** – foci and swampy depressions up to 200 m in diameter.	Deep clays or red earths (9b, 6a) and shallow clays on calcrete (9a).	Scattered to closed (>10% PFC) variable shrublands or grassy shrublands dominated by *Melaleuca* spp. (paperbark), *A. aneura*, *A. tetragonophylla* (curara) or *Muehlenbeckia cunninghamii* (lignum) (MESS, ACGU, DMCS, LISW).
7.	5%	**Drainage tracts** – linear zones in unit 4 or passing through units 1 and 2 receiving more concentrated flow, rarely incised.	Shallow calcareous loams (5a), deep red earths and duplex soils on hardpan or calcrete (6a, 7c).	Scattered to close (10-50% PFC) acacia and melaleuca tall shrublands (DMCS, DRAS, MESS).

CARNEGIE LAND SYSTEM (8,649 km², including bare lake bed, 9.1% of survey area)

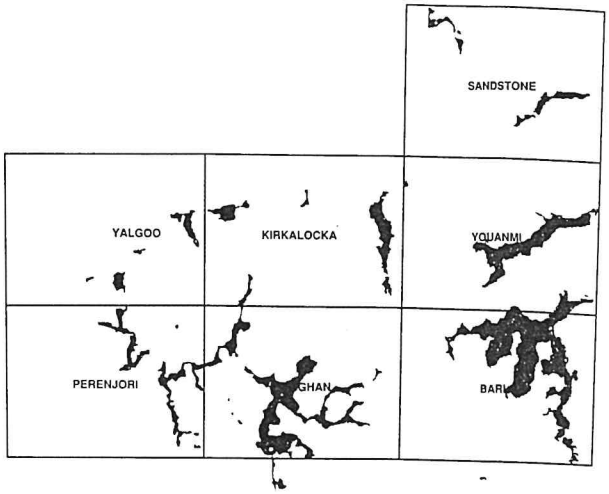
(after Mabbutt *et al.* 1963)

Salt lakes with fringing saline alluvial plains, kopi dunes and sandy banks, supporting halophytic shrublands.

Land type: 10

Geology: Quaternary lacustrine saline clay and sand, saline alluvium, aeolian sand and gypsum, minor Tertiary calcrete.

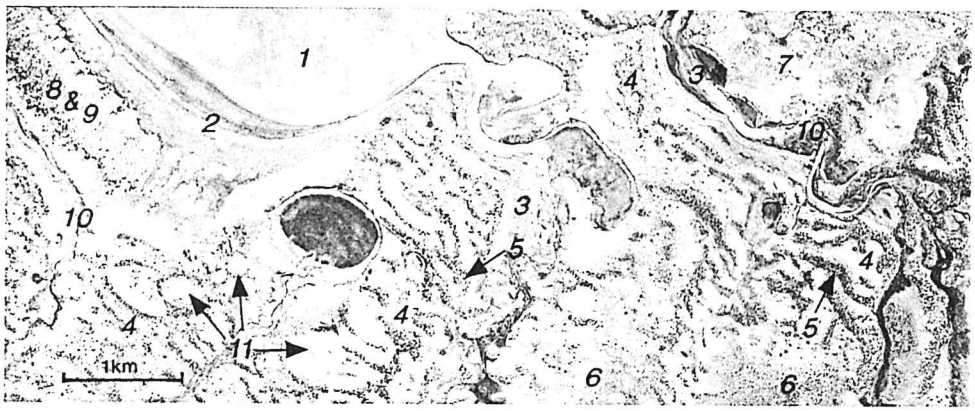
Geomorphology: Depositional surfaces; salt lakes and fringing level to very gently inclined plains with saline alluvium, low sandy banks and sand dunes on surrounding saline plains, undulating kopi dunes and gently undulating plains with calcrete rubble. Nearly level plains subject to sheet flow, with non-saline alluvium, on boundary of system; occasional drainage foci and narrow drainage lines.



Land management: Lack of slope renders most of this system not susceptible to water erosion. Minor areas receiving concentrated run-on in unit 4 are susceptible to rilling when shrub cover is substantially reduced or run-on is accelerated due to increased run-off from degraded areas upslope. Wind erosion of lake margins (unit 2) may be exacerbated by loss of stabilising perennial shrubs. The vegetation of this land system is highly preferred for grazing by introduced and native animals rendering it susceptible to overgrazing and consequent degradation. Overgrazing can be avoided by appropriate land management, including control of total grazing pressure.

Traverse condition summary (567 assessments):
Vegetation – good 62%; fair 27%; poor 9%; very poor 2%.
Soil erosion – nil 93%; slight 3%; minor 2%; moderate 1%; severe 1%.

Area mapped as sde: 3.7 km² (<0.1% of land system's area).



No.	Unit name	Traverse recordings	Inventory sites
1	Lake bed	2	–
2	Lake margin	20	2
3	Saline plain	66	3
4	Alluvial plain	231	18
5	Sandy bank	128	11
6	Hardpan plain	69	3
7	Calcrete plain	21	–
8	Kopi dune	15	3
9	Dune	–	–
10	Drainage line	6	1
11	Drainage foci	14	3
	Other	6	–
	Total	578 *	44

* 11 traverse points not assessed for condition.

Carnegie land system

	Unit area (%)	Landform	Soil	Vegetation
1.	30%	**Lake beds** – lake floors.	Highly saline (11).	Unvegetated.
2.	5%	**Lake margins** – hummocky plains marginal to unit 1.	Deep red clayey sands (3a) or gypsiferous sediments.	Scattered (10-20% PFC) *Atriplex vesicaria* (bladder saltbush) low shrublands (BLSS), or *Halosarcia* spp. (samphire) (SAMP).
3.	8%	**Saline plains** – level to gently undulating highly saline lower plains and drainage zones.	Deep clays (9b) or gypsiferous sediments.	Scattered to moderately close (10-30% PFC) low shrublands, usually *Halosarcia* spp. but also *Frankenia* spp. (frankenia) (SAMP, FRAN).
4.	30%	**Alluvial plains** – level to gently undulating saline plains, marginally higher than unit 3.	Shallow duplex on hardpan or occasionally calcrete (7c).	Scattered (10-20% PFC) halophytic low shrublands (PXHS), may be dominated by *Atriplex vesicaria* (bladder saltbush) (BLSS) or by *A. bunburyana* (silver saltbush) (SSAS); scattered (10-20% PFC) *Acacia masliniana* (spiny snakewood) with halophytic undershrubs (ASWS); occasionally scattered (10-20% PFC) *Eucalyptus loxophleba* (York gum) woodlands with halophytic undershrubs (PYCW).
5.	12%	**Sandy banks** – level to gently undulating low rises up to 4 m above the surrounding plains, and level sandy tracts.	Shallow red clayey sands on hardpan (2d) or deep red clayey sands (3a).	Scattered to moderately close (10-30% PFC) acacia tall shrublands. Dominant species include *Acacia ramulosa* (bowgada), *A. acuminata* subsp. *burkittii* (fine-leaf jam), *A. grasbyi* (miniritchie) and *A. masliniana* or low halophytic shrublands with acacia tall shrubs. Common low shrubs include *A. bunburyana* and *Gunniopsis quadrifida* (sweet samphire), occasionally with a spinifex hummock grass layer (SBLS).
6.	8%	**Hardpan plains** – nearly level plains on the margins of the system, receiving sheet flow.	Red clayey sands on hardpan at variable depth (2d, 3a).	Scattered (10-20% PFC) low shrublands with a mixture of halophytic and non-halophytic shrubs and *Acacia aneura* (mulga) tall shrubs (HMCS, HPMS).
7.	3%	**Calcrete plains** – gently undulating plains with calcrete rubble mantles.	Shallow calcareous loams on calcrete (5a).	Variable scattered (10-20% PFC) shrublands with *Acacia* spp. and halophytic and non-halophytic low shrubs.
8.	1%	**Kopi dunes** – low dunes with gently undulating crests to 1.5 km long and about 200 m wide; with 1-8 m relief, above unit 3 and in unit 1.	Encrusted gypsiferous sediments with shallow red sand in pockets (11).	Very scattered to scattered (2.5-20% PFC) *Eucalyptus striaticalyx* (kopi gum) woodlands with mixed shrub understorey or very scattered *Melaleuca sheathiana* (boree) tall shrublands (KOPI).
9.	1%	**Dunes** – generally linear, aeolian deposits to 10 m high fringing lake beds.	Deep red sands (3c).	Scattered (10-20% PFC) mixed shrublands occasionally with a eucalypt overstorey and dense spinifex grass layer.
10.	1%	**Drainage lines** – narrow drainage lines receiving concentrated flow, occasional small channels.	Deep red earths or deep clays (6a, 9b).	Moderately close (20-30% PFC) acacia tall shrublands occasionally with halophytic undershrubs (DACS). Halophytic low shrublands near lake beds (PXHS, SAMP).
11.	1%	**Drainage foci** – small circular depressions, swamps and claypans.	Deep red earths or deep clays (6a, 9).	Moderately close to close (20-50% PFC) tall shrubland (PDFT) in depressions; close (30-50% PFC) melaleuca shrublands (MESS) in swamps; claypans are unvegetated.