

Land

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INFORMATION ABOUT LAND SYSTEMS UNITS.(L. S. U.)

→ Refer to Fig 1.03 (+ other figs) in
STATIC Range Resources VOL. 1 Part 2

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(Refer to FIGURES in
VOL 1 PART 2 STATE Range LSU. 1
Resources)

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ECOLOGICAL CLASSIFICATION. N.W. LIMESTONE

TAXONOMIC FEATURES.

TREES.

Medium cover

Common Species.

Boscia minimifolia; Sesamothamnus sp.
Commiphora spp. Balanites sp. Delonix baccal
Acacia spp; Acacia tortilis. Boswellia
microphylla.

SHRUBS.

Dense cover.

Common Species.

Commiphora spp; Euphorbia cuneata.
Crewia sp. Iphiaea rotundifolia
Dalbergia commiphoroidea. Ipomoea donaldsonii
Cadaba glandulosa.

GRASSES & HERBS.

Sparse to very sparse cover.

Common Species.

Aristida sp. Pavonia spp. Indigofera ruspolii
Corchorus bricchetti.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Termitaria & associated stripes support densities of woody species giving a sparse "speckling" & "dashing" pattern.

Density & Canopy.

Medium density (60% canopy)
Commiphora shrubland with scattered low
Boscia, Commiphora & Acacia trees.

Termitaria.

Medium density of columnar & weathered columnar types.

Herbivore Tracks.

Very low density.

Cropping.

Nil

PHYSICAL CHARACTERS.

Altitude Range.

710 - 520.

Topography.

NW - SE sloping peneplain, very dissected with convex domes & ridges of 50 to 80m height 0.5 to 4km diameter. Land system unit 2 threads between the domes & dome clusters. Slopes from 0.13 at steepest part of slope.

DRAINAGE SYSTEM FEATURES.

Very few channels in LSU 1; LSU 2 is the drainage zone for LSU 1.

(Cont).

Water Sources.

None

Soils & Rocks.

Massive tertiary (middle-upper eocene) limestone covers 80-90% of surface. Medium orange to dark orange fine silty sands of mixed quartz & limestone cover the rest. Patches of silty sands associated with termitaria, and arcs, circular or elliptical (with very long axes in some cases) depending on position on slope.

Erosion & Soil Redist-
ribution.

Evidence of some sheet erosion on steeper slopes.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. W. ARCED SILTS.

TAXONOMIC FEATURES.

TREES.

Sparse to medium.

Common Species.

Acacia tortilis Delonix elata Boscia minimifolia

SHRUBS.

Medium to dense.

Common Species.

Acacia mellifera, A. nubica A. reficiens subsp. misera Commiphora sp. Boswellia sp. Dalbergia sp. Cadaba glandulosa, Grewia villosa.

GRASSES & HERBS.

Medium.

Common Species.

Sericocomopsis sp. Indigofera ruspolii
Asparagus sp. Sporobolus ruspolianus Latipes
senegalensis Cenchrus sp. Aerva sp. Sporobolus sp.
Barleria sp. Andropogon kelleria Triumfetta sp.
Chrysopogon aucheri.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Well defined arcs of vegetation of 10-30m width set in bare areas.

Density & Canopy.

Arced Acacia wooded Acacia Commiphora shrub herb grassland with areas of very low density short herb grassland and bare areas; overall cover 30%.

Termitaria.

Medium to high density columnar type.

Herbivore Tracks.

Medium to high density of tracks.

Cropping.

Low densities of cropping on areas of silt receiving run off water from adjacent limestone hills.

PHYSICAL CHARACTERS.

Altitude Range.

630 - 360.

Topography.

Gentle to medium slopes from NW to SE with some micro relief associated limestone bands close to the boundaries of LUS's 1 & 3.

Drainage System Features.

No development of surface drainage channels.

Water Sources.

Medium densities of ballehs & wells and medium to high densities of berkads.

Soils & Rocks.

Pale chestnut brown fine sandy clay loams with compacted surfaces. About 10% of the area has a mantle of limestone particles.

Erosion & Soil Redistribution.

Moderate sheet erosion associated with vegetation arcing.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. W. LIMESTONES.

TAXONOMIC FEATURES.

TREES.

Medium to sparse cover.

Common Species.

Boscia minimifolia; Sesamothamnus sp.
Commiphora spp. Balanites sp. Delonix baccal
Acacia spp; Acacia tortilis. Boswellia
microphylla.

SHRUBS.

Dense cover.

Common Species.

Commiphora spp; Euphorbia cuneata.
Crewia sp. Iphiaona rotundifolia
Dalbergia commiphoroides. Ipomoea donaldsonii
Cadaba glandulosa.

GRASS & HERBS.

Sparse to very sparse cover.

Common Species.

Aristida sp. Pavonia spp. Indigofera ruspolii
Corchorus bricchetti.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Termitaria & associated stripes support densities of woody species giving a sparse "speckling" & "dashing" pattern, but trees and larger bushes concentrate in younger drainage zones and at the edges of the more mature ones accentuating the "dashing" and adding a slight "striping" to the pattern.

Density & Canopy.

Medium density (60% canopy)
Commiphora shrubland with scattered low
Boscia, Commiphora & Acacia trees.

Termitaria.

Medium density of columnar & weathered columnar types.

Herbivore Tracks.

Very low to low density.

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

635.- 290

Topography.

NW-SE sloping peneplain less dissected than LSU. 1 with convex edged micro plateaux in NW and continuous undulating plateau on SE slopes. Steepest slopes 0.05 in NW. A few cliffs of 50-80m at the NW boundary.

LSU. 3 (Cont)

Drainage System Features.

No channels in the more dissected parts where LSU 2 forms drainage zone. Well developed S/SE flowing dry channels elsewhere with separations of about 10 Km for major sand filled beds and many smaller channels.

Water Sources.

Low densities of ballehs only.

Soils & Rocks.

Massive tertiary (middle - upper eocene) limestone covers 80-90% of surface. Medium orange to dark orange fine silty sands of mixed quartz & limestone cover the rest. Patches of silty sands associated with termitaria, and are circular or elliptical (with very long axes in some cases) depending on position on slope, but silty sands mostly medium orange toned and covering 20-40% of surface.

Erosion & Soil Redistribution.

Slight sheet erosion. Appreciable movement of silty sands down drainage channels in a SE direction.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

CULTIVATED STABILIZED SAND DUNES.

TAXONOMIC FEATURES.TREES.

Sparse.

Common Species.Delonix elata Acacia sp.SHRUBS.

Dense to medium.

Common Species.Acacia nilotica subsp. subalata Acacia reficiens subsp. miseria Acacia sp. aff. senegal Euphorbia cuneata, Ipomoea donaldsonii Sesamothamnus sp. Euphorbia longispina Acacia horrida subsp. benadirensis Commiphora spp. Dobera glabraGRASSES & HERBS.

Sparse.

Common Species.Indigofera sp. Indigofera ruspolii Aerva lanata Cenchrus sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

No pronounced pattern. Larger trees tend to be concentrated along the banks of the drainage channels.

Density & Canopy.Dense to medium Acacia Commiphora shrubland with scattered trees. Cover 60%.Termitaria.

Nil.

Herbivore Tracks.

High density of tracks.

Cropping.

Nil.

PHYSICAL CHARACTERS.Altitude Range.

120 - 80.

Topography.

Flat with slight slopes from SE to Nw on its eastern boundaries. The micro relief shows many shallow depressions & small hillocks, which are probably the result of wind erosion on an old stabilised dune field.

Drainage System Features.

Some gulleying of the fine silty sands in the eastern parts of the LSU.

Water Sources.

Very low densities of ballehs.

Soils & Rocks.

Exposures of limes & gypums each provide about 2% of the surface respectively. The rest is pale fine silty sand. These limestone exposures have the weathered nodular apperance typical of dune movements.

Erosion & Soil Redist-
ribution.

Wind movement of - surface sand is a very significant phenomen, and the surface can be considered to be under constant movement. Algal "fixation" in these circumstances is particularly relevant.

Dunes.

No mobile dunes in the LSU, but the whole area is an old stabilised dune field.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. W. LIMESTONE

TAXONOMIC FEATURES.

TREES.

Sparse to very sparse cover.

Common Species.

Boscia minimifolia; Sesamothamnus sp.
Commiphora spp. Balanites sp. Delonix baccal
Acacia spp; Acacia tortilis. Boswellia
microphylla.

SHRUBS.

Dense to medium cover.

Common Species.

Commiphora spp; Euphorbia cuneata
Crewia sp. Iphiaea rotundifolia
Dalbergia commiphoroides. Ipomoea donaldsonii
Cadaba glandulosa.

GRASSES & HERBS.

Sparse.

Common Species.

Aristida sp. Pavonia spp. Indigofera ruspolii
Corchorus bricchetti, Sporobolus sp. &
Latipes senegalensis.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Extensive limestone free areas as "speckles" and "dashes" above, but also larger patches of silty orange sand occurring between the separated limestone plates (which are approximately circular (or clusters of circles)).

Density & Canopy.

Medium to low density Commiphora shrubland with very scattered Acacia, Commiphora, Boscia trees. Cover 50%

Termitaria.

High density of wind eroded columnar type.

Herbivore Tracks.

Low density.

Cropping.

A few fields of beans & melons close to steeper limestone slopes where natural concentration of water run off occurs.

PHYSICAL CHARACTERS.

Altitude Range.

530 - 340

Topography.

NW-SE sloping gently undulating plain faulted below the level of LSU 3.

Drainage System Features.

Fairly well developed system of shallow channels.

Water Sources.

High densities of wells, a few barkads (wells probably associated with local gypsum).

Soils & Rocks.

Some massive limestone in "plate" configuration, areas of limestone fragments & stone mantles and limited surface exposures of gypsum/anhydrite mixed with limestone cover 50% of surface. The rest is medium orange silty sand.

Erosion & Soil Redistribution.

Slight sheet erosion.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.

TREES.

Sparse.

Common Species.

Acacia tortilis Boscia minimifolia Dobera glabra Balanites orbicularis.

SHRUBS.

Dense.

Common Species.

Acacia horrida subsp. benadirensis Commiphora spp. Euphorbia cuneata Balanites sp. Ipomea sp.

GRASSES & HERBS.

Sparse to very sparse.

Common Species.

Indigofera ruspolii Barleria sp. Abutilon sp. Heliotropium sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Dense woody vegetation & thickets along drainage lines & on limestone surfaces - less dense on the expanses of shallow pale orange sand.

Density & Canopy.

Medium to dense Commiphora dwarf shrubland with scattered Acacia Commiphora trees. cover 35%.

Termitaria.

Low densities of conical & short columnar termitaria.

Herbivore Tracks.

Low densities.

Cropping.

Very low densities except LSU 88 which has medium densities of abandoned crop fields.

PHYSICAL CHARACTERS.

Altitude Range.

390 - 60.

Topography.

Flat with gentle NW to SE slopes becoming steeper in the NW margins of the LSU. Each LSU has a characteristic micro relief related to the limestone structures underlying the sand sheet.

LSU. 6 (Cont).

LSU's 6, 7, 11, 13, 15 & 17 have a micro relief of gentle undulations associated with the wide narrow bands of limestone (wider in the N, narrower in the S) which are exposed. Other LSU's are more or less flat.

Drainage System Features.

Well developed sandy channels in the north (LSU 6 & 13) gradually petering out as they flow south eastwards. Few drainage channels in the southern LSU's.

Water Sources.

Very low densities in all LSU's except LSU 17 (which has gypseous exposures) & LSU 14.

Soils & Rocks.

All LSU's have a combination of limestones (pavements and fragmented surfaces) and pale orange sands. The fine sands become paler down the slope to the SE, and limestone exposures decrease from 50-60% (as isolated pavements arranged in "waves") in LSU 6 to 2% in LSU 38.

Erosion & Soil Redistribution.

Some sheet erosion and transport of sands down drainage channels in the northern LSU's only.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.

TREES.

Very sparse.

Common Species.

Balanites orbicularis Boscia minimifolia.

SHRUBS.

Dense to medium.

Common Species.

Acacia horrida subsp. benadirensis Commiphora spp.
Euphorbia cuneata Balanites sp. Ipomea sp.

GRASSES & HERBS.

Sparse to medium.

Common Species.

Indigofera ruspolii Barleria sp. Abutilon sp.
Heliotropium sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Dense woody vegetation & thickets along drainage lines & limestone surfaces - less dense on the expanses of shallow pale orange sand.

Density & Canopy.

Medium dwarf shrub Indigofera herbland. Cover 25%.

Termitaria.

Low densities of conical & short columnar termitaria.

Herbivore Tracks.

Low densities.

Cropping.

Very low densities except LSU 88 which has medium densities of abandoned crop fields.

PHYSICAL CHARACTERS.

Altitude Range.

390 - 60.

Topography.

Flat with gentle NW to SE slopes-slopes becoming steeper in the NW margins of the LSU. Each LSU has a characteristic micro relief related to the limestone structures underlying the sand sheet.

LSU. 7 (Cont).

LSU's 6, 7, 11, 13, 15 & 17 have a micro relief of gentle undulations associated with the wide narrow bands of limestone (wider in the N, narrower in the S) which are exposed. Other LSU's are more or less flat.

Drainage System Features.

Well developed sandy channels in the north (LSU 6 & 13) gradually petering out as they flow south eastwards. Few drainage channels in the southern LSU's.

Water Sources.

Very low densities in all LSU's except LSU 17 (which has gypseous exposures) & LSU 14.

Soils & Rocks.

All LSU's have a combination of limestones (pavements and fragmented surfaces) and pale orange sands. The fine sands become paler down the slope to the SE, and limestone exposures decrease from 50-60% (as isolated pavements arranged in "waves") in LSU 6 to 2% in LSU 38.

Erosion & Soil Redistribution.

Some sheet erosion and transport of sands down drainage channels in the northern LSU's only.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

CULTIVATED STABILIZED SAND DUNES.

TAXONOMIC FEATURES.

TREES.

Sparse.

Common Species.

Delonix elata Acacia sp.

SHRUBS.

Dense to medium.

Common Species.

Acacia nilotica subsp. subalata Acacia reficiens subsp. miseria Acacia sp. aff. senegal Euphorbia cuneata, Ipomoea donaldsonii Sesamothamnus sp. Euphorbia longispina Acacia horrida subsp. benadirensis Commiphora spp. Dobera glabra Jatropha sp. Psilotrichum sp. Cassia sp. Dalbergia sp. Dichrostachys sp.

GRASSES & HERBS.

Sparse.

Common Species.

Indigofera sp. Indigofera ruspolii Aerva lanata Cenchrus sp. Cyperus sp. Dactyloctenium scindicum Latipes senegalensis Solanum sp. Sida sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

No pronounced pattern. Larger trees tend to be concentrated along the banks of the drainage channels, old cropping patterns have imposed their own patterns.

Densiyt & Canopy.

Dense to medium Acacia Commiphora shrubland with scattered trees, much modified by cropping & the various stages of regeneration. Cover 50-60%.

Termitaria.

Nil.

Herbivore Tracks.

Very high densities of tracks.

Cropping.

High densities of cropping.

PHYSICAL CHARACTERS.

Altitude Range.

110 - 280.

LSU. 8 (Cont).

Topography.

Gentle slopes from SE to NW, which are more pronounced to the east of the LSU. The micro relief is typical evidence of a stabilised dune field.

Drainage System Features.

Well developed network of drainage channels with some gulleying particularly-in the east on the steeper slopes.

Water Sources.

Medium to low densities of wells & ballehs; some berkads & bore holes.

Soils & Rocks.

Exposures of weathered nodular limestones & gypsume/provide about 2% of the surface respectively. The rest is pale fine silty sand.

Erosion & Soil Redist-
ribution.

Wind movement of surface sand is a very significant phenomenon, and the surface can be considered to be under constant movement. Algal "fixation" in these circumstances is particularly relevant.

Dunes.

No mobile dunes in the LSU, but the whole area is an old stabilised dune field.

Field Notes.

LSU. 9

ECOLOGICAL CLASSIFICATION.

CENTRAL SANDS OVER LIMESTONE

TAXONOMIC FEATURES.TREES.

Nil.

Common Species.SHRUBS.

Sparse to medium.

Common Species.

Cadaba glandulosa; Commiphora spp. Dichrostachys sp.
Acacia edgeworthii Sesamothamnus sp. Jatropha sp.
Boscia coriacea, Euphorbia sp. Cissus sp.

GRASSES & HERBS.

Medium.

Common Species.

Pavonia spp. Indigofera spp. Iphiaea rotundifolia,
Aristida sp. Merremia sp., Melhania sp.

PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Very uniform patterns of distribution.

Density & Canopy.

Medium/low density dwarf shrub herbland.
 Cover 30%.

Termitaria.

Sparse densities of conical termitaria.

Herbivore Tracks.

Low densities.

Cropping.

Nil.

PHYSICAL CHARACTERS.Altitude Range.

330 - 100.

Topography.

Flat with very gentle W to E slopes in the western parts giving way to flat region in the east (an internal drainage system). The land starts to rise again at the far western border of these LSU's. Micro relief is less well developed than for LSU's 6-88, but there are some slight undulating patterns associated with limestone bands.

(Cont).

LSU. 9 (Cont).

Exposed gypsums occur throughout the region at the bottom of shallow depressions.

Drainage System Features.

Very little drainage development.

Water Sources.

Medium densities of wells and ballehs.

Soils & Rocks.

All LSU's comprise stony limestone surfaces (with very few massive pavements) (5-20%), red-orange toned sands (75-90%) and gypsums (5%). The sands in the W are medium reddish orange, but become paler in the E. Limestone virtually non existent in the E (LSU 63 & 85).

Erosion & Soil Redistribution.

Nil.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. W. LIMESTONE

TAXONOMIC FEATURES.TREES.

Sparse with some areas of medium density.

Common Species.Bosica minimifolia; Sesamothamnus sp.
Commiphora spp. Balanites sp. Acacia spp;
Acacia tortilis.SHRUBS.

Medium cover.

Common Species.Commiphora spp; Euphorbia cuneata
Crewia sp. Iphiona rotundifolia
Dalbergia Commiphoroides. Ipomoea donaldsonii
Cadaba glandulosa. Salvadora persica
Jatropha sp.GRASSES & HERBS.

Sparse to medium.

Common Species.Aristida sp. Pavonia spp. Indigofera ruspollii
Corchorus bricchetti. Abutilon sp. Pterodiscus sp.
Crotalaria spp. Barleria sp. Triumfetta sp.
Genchrus sp. Cyperus spp. Eragrostis sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Woody vegetation concentrated in slight depressions; no noticeable concentration on the narrow dark bands.

Density & Canopy.Medium density commiphora dwarf shrubland with zones of dwarf herb grassland. 40% cover.Termitaria.

Medium density of columnar eroding to conical type.

Herbivore & Tracks.

Low density.

Cropping.

A few fields of beans & melons close to steeper limestone slopes where natural concentration of water run off occurs.

PHYSICAL CHARACTERS.Altitude Range.

365 - 270.

Topography.

NW - SE very gentle slopes with some poorly developed shallow depressions in the northern part. Micro-ridges as a result of banding.

LSU. 10 (Cont)Drainage System Features.

Poorly developed system of shallow channels, but between these a fine pattern of loamy sand narrow bands probably serves as a drainage-system.

Water Sources.

Medium densities of wells, some ballehs & berkads.

Soils & Rocks.

Massive limestones in plate configurations, areas of limestone fragments and stone mantles with some gypsum/anhydrite exposures in shallow depressions cover 40% of surface. The rest is orange loamy sand, with appreciable secondary concretionary nodules of limestone. The limestones are patterned with narrow slightly way orange soil bands. Soil surface frequently has an algal skin.

Erosion & Soil Redist-
ribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.TREES.

Very sparse.

Common Species.Balanites orbicularis Boscia minimifolia.SHRUBS.

Medium.

Common Species.Acacia edgeworthii A. reficiens subsp. miser
A. horrida subsp. benadirensis Commiphora spp.
Jatropha dichter.GRASSES & HERBS.

Medium.

Common Species.Indigofera ruspolii Aristida sp. Latipes
senegalensis Aerva lanata Corchorus sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.Dense woody vegetation & thickets along drainage lines & on limestone surfaces - less dense on the expanses of shallow pale orange sand, also denser thickets of Acacia on very pale sands.Density & Canopy.Medium to dense Acacia Commiphora dwarf shrubland in a mosaic with dwarf shrub Indigofera herbland. Cover 30%.Termitaria.

Low densities of conical & short columnar termitaria.

Herbivore Tracks.

Low densities.

Cropping.

Very low densities except LSU 88 which has medium densities of abandoned crop fields.

PHYSICAL CHARACTERS.Altitude Range.

390 - 60.

Topography.

Flat with gentle NW to SE slopes- slopes becoming steeper in the NW margins of the LSU. Each LSU has a characteristic micro relief related to the limestone structures underlying the sand sheet.

LSU. 11 (Cont).

LSU's 6, 7, 11, 13, 15 & 17 have a micro relief of gentle undulations associated with the wide narrow bands of limestone (wider in the N, narrower in the S) which are exposed. Other LSU's are more or less flat.

Drainage System Features.

Well developed sandy channels in the north (LSU 6 & 13) gradually petering out as they flow south eastwards. Few drainage channels in the southern LSU's.

Water Sources.

Very low densities in all LSU's except LSU 17 (which has gypseous exposures) & LSU 14.

Soils & Rocks.

All LSU's have a combination of limestones (pavements and fragmented surfaces) and pale orange sands. The fine sands become paler down the slope to the SE, and limestone exposures decrease from 50-60% (as isolated pavements arranged in "waves") in LSU 6 to 2% in LSU 38.

Erosion & Soil Redistribution.

Some sheet erosion and transport of sands down drainage channels in the northern LSU's only.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. W. LIMESTONE.

TAXONOMIC FEATURES.TREES.

Sparse.

Common Species.

Boscia minimifolia; Sesamothamnus sp.
Commiphora spp. Balanites sp. Delonix baccal
Acacia spp; Acacia tortilis. Boswellia
microphylla.

SHRUBS.

Medium.

Common Species.

Commiphora spp; Euphorbia cuneata.
Crewia sp. Iphiona rotundifolia
Dalbergia Commiphoroides. Ipomoea donaldsonii
Cadaba glandulosa.

GRASSES & HERBS.

Sparse.

Common Species.

Aristida sp. Pavonia spp. Indigofera ruspolii
Corchorus bricchetti. Aerva lanata.

PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Woody vegetation concentrated in slight
 depressions; no noticeable concentration on the
 narrow dark bands.

Density & Canopy.

Medium density Commiphora shrubland mixed
 with Commiphora dwarf shrubland. Cover 40%.

Termitaria.

Low density of columnar type.

Herbivore Tracks.

Low density.

Cropping.

Nil.

PHYSICAL CHARACTERS.Altitude Range.

380 - 330

Topography.

Gently undulating without obvious axes;
 some small depressions & micro ridges well
 developed.

(Cont).

LSU. 12 (Cont)Drainage System Features.

Poorly developed system of shallow channels, but between these a fine pattern of loamy sand narrow bands probably serves as a drainage-system.

Water Sources.

Medium densities of wells, a few ballehs.

Soils & Rocks.

50% cover of limestone in plate configurations, as fragments, and stone mantles with some "banding" as described for LSU. 10. Some 50% of area is pale orange silty sand. Gypsum/anhydrite exposures are scattered throughout, particularly at border with LSU 28.

Erosion & Redistribution.

None.

Dunes.

None.

Field Notes.

LSU. 13.

ECOLOGICAL CLASSIFICATION.

N. SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.TREES.

Very sparse.

Common Species.Erythina sp. Acacia tortilis.SHRUBS.

Dense to medium.

Common Species.Acacia edgeworthii A. reficiens subsp. miseria
A. horrida subsp. benadirensis Commiphora spp.
Jatropha dichter. Acacia sp. Ziziphus hamur
Cissus sp.GRASSES & HERBS.

Sparse.

Common Species.Indigofera ruspolii Aristida sp. Latipes
senegalensis Aerva lanata Corchorus sp.
Jatropha sp. Tribulus terrestris Cassia sp.
Conchrus sp. Dactyloctenium scindicum.PHYSIOGNOMIC FEATURES.Vegetation Patterns.Dense woody vegetation & thickets along drainage lines & on limestone surfaces - less dense on the expanses of shallow pale orange sand, also denser thickets of Acacia on very pale sands.Density & Canopy.Medium dwarf shrub Indigofera herbland in mosaic with Commiphora dwarf shrubland. Cover 20-30%.Termitaria.

Low densities of conical & short columnar termitaria.

Herbivore Tracks.

Low densities.

Cropping.

Very low densities except LSU 83 which has medium densities of abandoned crop fields.

PHYSICAL CHARACTERS.Altitude Range.

390' - 60.

(Cont).

LSU. 13 (Cont)Topography.

Flat with gentle NW to SE slopes--slopes becoming steeper in the NW margins of the LSU. Each LSU has a characteristic micro relief related to the limestone structures underlying the sand sheet. LSU's 6, 7, 11, 13, 15 & 17 have a micro relief of gentle undulations associated with the wide narrow bands of limestone (wider in the N, narrower in the S) which are exposed. Other LSU's are more or less flat.

Drainage System Features.

Well developed sandy channels in the north (LSU 6 & 13) gradually petering out as they flow south eastwards. Few drainage channels in the southern LSU's.

Water Sources.

Very low densities in all LSU's except LSU 17 (which has gypseous exposures) & LSU 14.

Soils & Rocks.

All LSU's have a combination of limestones (pavements and fragmented surfaces) and pale orange sands. The fine sands become paler down the slope to the SE, and limestone exposures decrease from 50-60% (as isolated pavements arranged in "waves") in LSU 6 to 2% in LSU 38.

Erosion & Soil Redistribution.

Some sheet erosion and transport of sands down drainage channels in the northern LSU's only.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.TREES.

Extremely sparse.

Common Species.Balanites orbicularis Boscia minimifolia.SHRUBS.

Sparse to medium.

Common Species.Acacia edgeworthii A. reficiens subsp. miseria
A. horrida subsp. benadirensis Commiphora spp.
Jatropha dichter Cissus villosa Courtonia sp.GRASSES & HERBS.

Medium to dense.

Common Species.Indigofera ruspolii Aristida sp. Latipes
senegalensis Aerva lanata Corchorus sp.
Indigofera sp. Melhania sp. Tephrosia sp.
Corchorus sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.Dense woody vegetation & thickets along drainage lines & on limestone surfaces - less dense on the expanses of shallow pale orange sand, also denser thickets of Acacia on very pale sands, with very pronounced concentrations of shrubs on exposed limestones and very pale (ie shallow) sands.Density & Canopy.Medium to sparse dwarf shrub Indigofera herb-land in a mosaic with medium short herb grass-land. Cover 30%.Termitaria.

No information.

Herbivore Tracks.

No information.

Cropping.

No information.

PHYSICAL CHARACTERS.Altitude Range.

390 - 60.

(Cont).

LSU. 14 (Cont).Topography.

Flat with gentle NW to SE slopes-slopes becoming steeper in the NW margins of the LSU. Each LSU has a characteristic micro relief related to the limestone structures underlying the sand sheet. LSU's 6, 7, 11, 13, 15 & 17 have a micro relief of gentle undulations associated with the wide narrow bands of limestone (wider in the N, narrower in the S) which are exposed. Other LSU's are more or less flat.

Drainage System Features.

Well developed sandy channels in the north (LSU 6 & 13) gradually petering out as they flow south eastwards. Few drainage channels in the southern LSU's.

Water Sources.

Very low densities in all LSU's except LSU 17 (which has gypseous exposures) & LSU 14.

Soils & Rocks.

All LSU's have a combination of limestones (pavements and fragmented surfaces) and pale orange sands. The fine sands become paler down the slope to the SE, and limestone exposures decrease from 50-60% (as isolated pavements arranged in "waves") in LSU 6 to 2% in LSU 38.

Erosion & Soil Redistribution.

Some sheet erosion and transport of sands down drainage channels in the northern LSU's only.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.TREES.

Extremely sparse.

Common Species.Balanites orbicularis Boscia minimifoliaSHRUBS.

Medium.

Common Species.Acacia edgeworthii A. reficiens subsp. miseria
A. horrida subsp. benadirensis Commiphora spp.
Jatropha dichter. Cassus sp. Jatropha villosa
Courtonia sp.GRASSES & HERBS.

Medium.

Common Species.Indigofera ruspolii Aristida sp. Latipes
senegalensis Aerva lanata Corchorus sp.
Indigofera sp. Melhania sp. Tephrosia sp.
Corchorus sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Rather uniform distributions of woody & herbaceous vegetation.

Density & Canopy.Medium Commiphora dwarf shrub Indigofera herb-land in mosaic with medium Indigofera herbland. Cover 30-35%.Termitaria.Herbivore Tracks.Cropping.PHYSICAL CHARACTERS.Altitude Range.

390 - 60.

Topography.

Flat with gentle NW to SE slopes-slopes becoming steeper in the NW margins of the LSU. Each LSU has a characteristic micro relief related to the limestone structures underlying the sand sheet.

(Cont).

LSU. 15 (Cont).

LSU's 6, 7, 11, 13, 15 & 17 have a micro relief of gentle undulations associated with the wide narrow bands of limestone (wider in the N, narrower in the S) which are exposed. Other LSU's are more or less flat.

Drainage System Features.

Well developed sandy channels in the north (LSU 6 & 13) gradually petering out as they flow south eastwards. Few drainage channels in the southern LSU's.

Water Sources.

Very low densities in all LSU's except LSU 17 (which has gypseous exposures) & LSU 14.

Soils & Rocks.

All LSU's have a combination of limestones (pavements and fragmented surfaces) and pale orange sands. The fine sands become paler down slope to the SE, and limestone exposures decrease from 50-60% (as isolated pavements arranged in "waves") in LSU 6 to 2% in LSU 38.

Erosion & Soil Redistribution.

Some sheet erosion and transport of sands down drainage channels in the northern LSU's only.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

S. LIMESTONE

TAXONOMIC FEATURES.TREES.

Medium to sparse

Common Species.Acacia tortilis Commiphora spp. Delonix baccal
Acacia spp. Albizzia sp. Cordia spp.SHRUBS.

Medium to dense.

Common Species.Commiphora spp. Jatropha sp. Grewia sp.
Dalbergia sp. Solamm sp.GRASSES & HERBS.

Sparse to very sparse.

Common Species.Indigofera spp. Solamm sp. Aristida sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Rather uniform vegetation patterns, but trees tend to be concentrated in the bands of sands.

Density & Canopy.Medium to high density Commiphora shrubland with scattered Acacia spp. trees. Cover 35%.Termitaria.

High densities of short columnar type & pillar type.

Herbivore Tracks.

Medium.

Cropping.

Nil.

PHYSICAL CHARACTERS.Altitude Range.

330 - 230

Topography.

Gentle NW/SE slope, numerous small hills & depressions (5-10m) in the SE part forming a micro-relief.

Drainage System Features.

Narrow sandy bands form the drainage zones - channel development is poor.

(Cont).

Water Sources.

Very low densities of ballehs and wells.

Soils & Rocks.

About 60% of the surface is covered by limestones, some massive, some fragmented & mantled. The limestone is "speckled" with pale orange termitaria patches, and medium to narrow wavey bands of pale orange sand.

Erosion & Soil Redist-
ribution.

None

Dunes.

None

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.TREES.

Nil.

Common Species.SHRUBS.

Medium to sparse.

Common Species.Euphorbia sp. Jatropha villosa Loewia glutinosa,
Commiphora spp. Acacia spp. Balanites sp.GRASSES & HERBS.

Medium.

Common Species.Indigofera ruspolii Aristida sp. Latipes
senegalensis Aerva lanata Corchorus sp.
Chascanum sp. Pavonia spp. Melhania sp.
Kelleronia sp. Cassia sp. Launea sp. Monsonia sp.
Oxygonum sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

No obvious patterns.

Density & Canopy.Low density short dwarf shrub Indigofera herb-
land. Cover 15%.Termitaria.Herbivore Tracks.Cropping.PHYSICAL CHARACTERS.Altitude & Range.

390 - 60.

Topography.Flat with gentle NW to SE slopes-slopes becoming
steeper in the NW margins of the LSU. Each LSU
has a characteristic micro relief related to
the limestone structures underlying the sand
sheet.

(Cont).

LSU. 17 (Cont).

LSU's 6, 7, 11, 13, 15 & 17 have a micro relief of gentle undulations associated with the wide narrow bands of limestone (wider in the N, narrower in the S) which are exposed. Other LSU's are more or less flat.

Drainage System Features.

Well developed sandy channels in the north (LSU 6 & 13) gradually petering out as they flow south eastwards. Few drainage channels in the southern LSU's.

Water Sources.

Very low densities in all LSU's except LSU 17 (which has gypseous exposures) & LSU 14.

Soils & Rocks.

All LSU's have a combination of limestones (pavements and fragmented surfaces) and pale orange sands. The fine sands become paler down the slope to the SE, and limestone exposures decrease from 50-60% (as isolated pavements arranged in "waves") in LSU 6 to 2% in LSU 38.

Erosion & Soil Redistribution.

Some sheet erosion and transport of sands down drainage channels in the northern LSU's only.

Dunes.

Nil.

Field Notes.

LSU. 18, 19 & 23.

ECOLOGICAL CLASSIFICATION.

COASTAL GRASSLANDS ON STABILIZED SAND DUNES.

TAXONOMIC FEATURES.

TREES.

Extremely rare.

Common Species.

Acacia tortilis.

SHRUBS.

Sparse.

Common Species.

Acacia sp. aff. edgeworthii Commiphora sp.
(prostrate). Euphorbia Acacia leucospira
A. sarcophylla.

GRASSES & HERBS.

Medium.

Common Species.

Chrysopogon aucheri Var. Quinqueplumis
Aristida sp. Latipes senegalensis Cyperus sp.
Indigofera sp. Chloris sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Grasses & herbs on the consolidated sands;
woody species & succulents on limestone
pavements.

Density & Canopy.

Sparse to medium short herb grassland with
scattered dwarf shrubs in a mosaic with sparse
short herbland.

Termitaria.

Sparse densities of low conical types.

Herbivore Tracks.

Low to very low densities.

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

175 - 0.

Topography.

All LSU's slope NW to SE to the coast except
LSU 55 which slopes gently into a central
shallow depression.

(Cont).

LSU. 18, 19 & 23 (Cont).

Slopes in the north (LSU 18, 19) & south (LSU 60) are the steepest. The micro relief is fairly well developed, consisting of limestone terraces, fossil dune forms, shallow depressions in the limestone pavements, & consolidated "plates" of pale sand.

Drainage System Features.

No channel development in the north, but deep incised channels with gulleying characterises LSU 60, as run off from the coastal ridge spills onto the consolidated sands. Most of these channels peter out as sandy fans before reaching the sea. LSU 55 has a number of shallow winding drainage channels.

Water Sources.

All LSU's except 55 have very low densities of ballehs & even lower densities of wells. LSU 55, which is consolidated coastal pale sand over the stagnated evaporite internal basin, has medium to high densities of wells & ballehs.

Soils & Rocks.

Pink & brown toned coastal limestones (60% in LSU 18, 50% LSU 19, 60% LSU 23, 30% LSU 35, 40% LSU 41, 55, 5-10% LSU 60). Some white limestones (5% in LSU 18, 19, 23). Very rare gypsum exposures (2% in LSU 55), and the rest is pallid sands with some orange tone in the north, pinkish in the south.

Erosion & Soil Redistribution.

Some sheet erosion and movement of soil down the drainage channels on steeper slopes. The strong monsoonal winds (NxNE; SxSE) move the surface sands over the whole area, & dunes have been formed where local conditions so dictate. There is probably appreciable sheet movement of sands through wind influences, but the net annual effect will be relatively slight (see section 3).

Dunes.

Large mobile dunes have been separated out as LSU 51, 52, 53 & 54. Some small mobile dunes (notably at the shore line) remain in LSU's 18-60. Fossil dunes which have been stabilised for long periods constitute the major surface type.

Field Notes.

LSU. 20 & 21.

ECOLOGICAL CLASSIFICATION.

N.E. COASTAL LIMESTONES.

TAXONOMIC FEATURES.TREES.

Nil.

Common Species.SHRUBS.

Sparse.

Common Species.

Acacia sp. (very prostrate). Commiphora sp.
(very prostrate). Pavonia sp. Justicia flana
Psilotrichum sp. Capparis galeata Euphorbia sp.

GRASSES & HERBS.

Sparse to medium.

Common Species.

Oldenlandia saxifragoides Chenopodiaceae spp.
Limonium sp. Eragrostis sp. Cynodon dactylon
Dactyloctenium scindicum Aristida spp. Digitaria sp.
Cyperus spp. Heliotropium sp. Tephrosia sp.
Indigofera sp.

PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Grasses & herbs on the small plate like areas
of consolidated sandsheet; the fossil dunes
support mainly grasses; limestone pavements are
covered by a specialised community of prostrate
shrubs & succulents.

Density & Canopy.

A mosaic of medium density/very/short herb grass-
land with low densities of dwarf prostrate shrub-
land with specialised succulents on bare rock
surfaces.

Termitaria.

Sparse densities of conical & large columnar
types.

Herbivore Tracks.

Low densities.

Cropping.

Nil.

PHYSICAL CHARACTERS.Altitude Range.

110 - 0.

(Cont).

LSU. 20 & 21 (Cont).Topography.

Gentle slopes W to E with small cliffs near the sea, low ridges of stabilised sand dunes, and micro relief of limestone terraces and small shallow depressions in the limestone pavements.

Drainage System Features.

No drainage development.

Water Sources.

LSU 21 has high densities of wells close to the shore line. Both LSU's have medium to low densities of boreholes.

Soils & Rocks.

Both LSU's are chiefly bare pink/brown toned coastal limestone (70-90%) with patches of pale sand in the form of a consolidated mantle & fossil dunes. At the sea's edge a coastal dune is formed which is not entirely stabilised.

Erosion & Soil Redistribution.

Where the coastal cliff allow, sand is being forced up the shore by wave & wind actions.

Dunes.

The consolidated sheets & fossil dunes were both parts of an ancient dune system; mobile or recently mobile dunes have been separated out of LSU 20 as LSU 22.

Field Notes.

LSU. 22, 51, 52, 53, 54.

ECOLOGICAL CLASSIFICATION.

MOBILE OR RECENTLY STABILIZED SAND DUNES.

TAXONOMIC FEATURES.

TREES.

Very sparse.

Common Species.

Acacia sp.

SHRUBS.

Very sparse.

Common Species.

Melhanian sp. Oldenlandia sp. Grewia sp.

GRASSES & HERBS.

Very sparse.

Common Species.

Cyperus sp., Tephrosia sp. Sporobolus spicatus
Crotalaria spp. Ipomoea sp. Aristida sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Most of the dune areas are bare sand but the leading & receding edges have characteristic plants.

Density & Canopy.

Dense (less than 1%).

Termitaria.

Nil.

Herbivore Tracks.

Low densities of tracks.

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

430 - 20.

Topography.

A wide variety of dune formations including crescentic barchans short seifs, and a number of complex ripple system.

Drainage System Features.

None.

(Cont).

Water Sources.

Very low densities of wells and some ballehs on exposed rocks left by the moving sand.

Soils & Rocks.

Sands ranging from very pale to medium yellow/orange. Limestone pavements with a characteristic nodular weathering are exposed in dune areas, mainly at receding edge.

Erosion & Soil Redistribution.

Parts of these LSU's are very mobile, parts have recently become stabilised. There is obviously a complex movement along the two main wind axes, with a small net effect of movement.

Dunes.

These LSU's are the main areas of dune in the Central Rangeland: smaller isolated dunes are found in the other areas but are of negligible importance.

Field Notes.

LSU. 24.
(for LSU 23 see LSU 18)

ECOLOGICAL CLASSIFICATION. HAUD TYPE.

TAXONOMIC FEATURES.

TREES. Sparse to medium.

Common Species. Acacia tortilis Delonix elata Albizia anthelmintica Acacia bricchettiana.

SHRUBS. Medium to dense.

Common Species. Acacia edgeworthii, Cordia sp. Grewia sp. Commiphora spp. Cordyla somalensis, Cordeauxia edulis, Solanum sp.

GRASSES & HERBS. Medium.

Common Species. Indigofera spinosa, I. ruspolii Corchorus sp. Aerva persica Solanum sp. Aristida kelleri, Cassia spp. Blepharis sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns. More open grasslands dominate the N. part of the LSU. Burning of grass has created some patterning throughout the LSU.

Density & Canopy. Medium density medium height Acacia wooded Acacia Commiphora shrub herb grassland in mosaic with medium to dense Acacia Commiphora shrubland with scattered trees. Cover 55%.

Termitaria. Sparse conical pillar & columnar type termitaria.

Herbivore Tracks. Medium to low densities.

Cropping. Very low densities of abandoned cropping areas.

PHYSICAL CHARACTERS.

Altitude Range. 470 - 220.

(Cont).

LSU. 24 (Cont).Topography.

Gentle W to E slopes with no micro relief.

Drainage System Features.

No development of surface channels except for very few minor gulleys.

Water Sources.

Low densities of ballehs & wells, some berkads bore holes.

Soils & Rocks.

Limestone exposures (mostly at the western edge of the plateau) cover 1-2% of the LSU. The rest is red brown compacted (& locally cemented) loamy sand with lateritic (dark red) deposits over about 2%.

Erosion & Soil Redistribution.

Sheet erosion over compacted surface with negligible & minor gully formation where compaction of surface not complete.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

S. LIMESTONE

TAXONOMIC FEATURES.

TREES.

Medium to sparse.

Common Species.

Acacia tortilis Commiphora spp. Delonix baccal
Acacia spp. Albizia sp. Cordia sp.

SHRUBS.

Medium to dense.

Common Species.

Commiphora spp. Jatropha sp. Crewia sp.
Dalbergia sp. Solamm sp.

GRASSES & HERBS.

Sparse

Common Species.

Indigofera spp. Solamm sp. Aristida sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Very uniform without pronounced patterning.

Density & Canopy.

Medium to high density Commiphora shrubland with scattered Acacia spp. trees. Cover 60%.

Termitaria.

Very low conical turreted type; medium density & pillar type.

Herbivore Tracks.

Medium.

Cropping.

Medium densities of cropping.

PHYSICAL CHARACTERS.

Altitude Range.

270 - 140.

Topography.

Extremely gentle NW/SE slope. Some limited micro relief of small depressions & hills.

Drainage System Features.

No channels, sand bands are presumably drainage zones.

(Cont).

LSU. 25 (Cont).Water Sources.

Medium to low densities of ballehs & wells.

Soils & Rocks.

Massive limestones & fragmented stones cover 20 to 40% of the surface. The rest is orange toned sand and pale yellow sand (these latter mainly in the south). Limestone occurs in the segmented wide band pattern (of LSU 27).

Erosion & Soil Redist-
ribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

CENTRAL SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.TREES.

Very scattered.

Common Species.Acacia sp.SHRUBS.

Medium.

Common Species.

Cadaba glandulosa; Commiphora spp.
Dichrostachys sp. Acacia edgeworthii
Sesamothamnus sp. Jatropha sp. Boscia coriacea,
Euphorbia sp. Cissus sp. Cordia sp. Ipomoea
donaldsonii Euphorbia cuneata.

GRASSES & HERBS.

Medium to dense.

Common Species.

Pavonia spp.; Indigofera spp. Iphiona
rotundifolia, Aristida sp. Merremia sp.,
Melhania sp. Tribulus terrestris Cenchrus sp.,
Psilotrichum sp. Latipes senegalensis Cassia sp.

PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Very uniform patterns of distribution.

Density & Canopy.

Medium to dense Commiphora Euphorbia dwarf shrub
Indigofera Aristida herb grassland. Cover 50-70%.

Termitaria.Herbivore Tracks.

Low densities.

Cropping.

Medium densities of cropping.

PHYSICAL CHARACTERS.Altitude Range.

330 - 100.

(Cont).

LSU. 26 (Cont).

Topography.

Flat with very gentle W to E slopes in the western parts giving way to a flat region in the east (an internal drainage system). The land starts to rise again at the far western border of these LSU's. Micro relief is less well developed than for LSU's 6-88, but there are some slight undulating patterns associated with limestone bands. Exposed gypsums occur throughout the region at the bottom of shallow depressions.

Drainage System Features.

Very little drainage development.

Water Sources.

Medium densities of wells and ballehs.

Soils & Rocks.

All LSU's comprise stony limestone surfaces (with very few massive pavements) (5-20%), red-orange toned sands (75-90%) and gypsums (5%). The sands in the W are medium reddish orange, but become paler in the E. Limestones virtually non existent in the E (LSU 63 & 85).

Erosion & Soil Redistribution.

Nil.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

TRANSITIONAL N.W. LIMESTONE/CENTRAL SAND OVER LIMESTONE.

TAXONOMIC FEATURES.

TREES.

Very sparse

Common Species.

Acacia tortilis.

SHRUBS.

Sparse to medium

Common Species.

Commiphora spp. Balanites sp. Acacia edgeworthii Cadaba glandulosa Ipomoea donaldsonii.

GRASSES & HERBS.

Medium to dense.

Common Species.

Indigofera ruspolii Aristida sp. Chrysopogon aucheri Barleria sp. Aerva persica Eragrostis sp. Indigofera sp. Solanum sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Woody species tend to be concentrated on the limestone bands; herbs & grasses tend to concentrate on the shallow silty sands.

Density & Canopy.

Medium density degraded Chrysopogon dwarf herb grassland in a mosaic with Commiphora dwarf shrubland. Cover 40%.

Termitaria.

Sparse to medium columnar type on limestones; conical type at low density on sands.

Herbivore Tracks.

Medium to low density.

Cropping.

Very low densities of cropping.

PHYSICAL CHARACTERS.

Altitude Range.

345 - 280

Topography.

An extremely gentle NW - SE slope. Flat with scattered small depressions in the SW part.

LSU. 27 (Cont).Drainage System Features.

No channels developed.

Water Sources.

Low density of balleh only.

Soils & Rocks.

Limestones in wide parallel bands, separated by wide dark orange areas of sands (with some silt). Some of the limestone bands are further broken into isolated segments. Limestones cover 25% of surface in loose fragments & nodular concretionary forms.

Erosion & Soil Redistribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. GYPSUMS.

TAXONOMIC FEATURES.

TREES.

Sparse (in clumps)

Common Species.

Acacia tortilis Ficus sp.

SHRUBS.

Sparse.

Common Species.

Salvadora persica Solanum sp. Heliotropium sp.
Acacia edgeworthii Balanites sp. Commiphora spp.
Euphorbia sp. Dobera glabra.

GRASSES & HERBS.

Sparse to medium.

Common Species.

Zygophyllum sp. Pterodiscus ruspolii Senra
incana Aerva lanata Chrysopogon aucheri
Dactyloctenium scindicum Tribulus terrestris
Abutilon sp. Cleome brachycarpa Cassia sp.
Limonium distichum Cyperus spp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Pale pink gypseous sandy silts are in small depressions. Larger woody species concentrate in clumps in or near these. More halophytic species are found on the more stagnated parts of the drainage system.

Density & Canopy.

Medium density gypseous short dwarf shrub herb grassland with very scattered Acacia Ficus trees in a mosaic with low density saline very short herb grassland. Cover 20-30%.

Termitaria.

Nil.

Herbivore Tracks.

Medium to high.

Cropping.

Very small amount of cropping on silty fans and drainage zones.

PHYSICAL CHARACTERS.

Altitude Range.

380 - 210.

Topography.

Flat with very gentle NW/SE slope. Small shallow depressions and raised areas give a micro relief.

Drainage System Features.

An ancestral drainage zone with typical "shoe-string" form. Current drainage is not developed on surface, but some fossil channels & sink holes can be observed.

Water Sources.

Medium to high densities of wells and ballehs with some berkads & bore holes.

Soils & Rocks.

Gypsum/anhydrite exposures in massive plates, small secondary fragments, small stones etc. cover 70%. Pale pink gypseous fine sandy covers 20%. About 10% is limestone (concentrated at the LSU boundaries).

Erosion & Soil Redistribution.

None

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. GYPSUMS.

TAXONOMIC FEATURES.

TREES.

Sparse.

Common Species.

Acacia tortilis Ficus sp.

SHRUBS.

Sparse to medium sparse.

Common Species.

Salvadora persica Solanum sp. Heliotropium sp.
Acacia edgeworthii Balanites sp. Commiphora spp.
Euphorbia sp. Dobera glabra.

GRASSES & HERBS.

Medium.

Common Species.

Zygodium sp. Pterodiscus ruspolii Senra
incana Aerva lanata Chrysopogon aucheri
Dactyloctenium scindicum Tribulus terrestris
Abutilon sp. Cleome brachycarpa Cassia sp.
Limonium distichum Cyperus spp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Clumping of woody vegetation more pronounced.

Density & Canopy.

Medium density gypseous short dwarf shrub herb grassland with very scattered Acacia Ficus trees in a mosaic with low density saline very short herb grassland. Cover 25- 35%.

Termitaria.

Nil.

Herbivore Tracks.

Medium.

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

360 - 160.

Topography.

Flat with very gentle NW/SE slope. Small shallow depressions and raised areas give a micro relief.

(Cont).

LSU. 29 (Cont).Drainage System Features.

An ancestral drainage zone with typical "shoe-string" form. Current drainage is not developed on surface, but some fossil channels & sink holes can be observed. Some widely spaced incised drainage channels and wider gypsum expanses.

Water Sources.

Medium densities of wells.

Soils & Rocks.

Gypsum/anhydrite exposures in massive plates, small secondary fragments, small stones etc. cover 70%. Pale pink gypseous fine sandy silt covers 20%. About 10% is limestone (concentrated at the LSU boundraies). More gypsum/anhydrite plates & less limestone than LSU 28.

Erosion & Soil Redist-
ribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. GYPSUMS.

TAXONOMIC FEATURES.TREES.

Very sparse.

Common Species.Acacia tortilis only.SHRUBS.

Sparse.

Common Species.Acacia senegal Salvadora persica Suaeda sp.
Senada schimperi.GRASSES & HERBS.

Sparse.

Common Species.Limonium distichum Sporobolus ruspolianus
Dactyloctenium scindicum Urochondra setulosa
Zygophyllum sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

No obvious patterns.

Density & Canopy.Low density gypseous/saline very short herb
grassland. Cover 20-30%.Termitaria.

Nil.

Herbivore Tracks.

Medium to low.

Cropping.

Nil.

PHYSICAL CHARACTERS.Altitude Range.

Main body 40-25 subsidiary 80-50.

Topography.Very flat floored depressions, very slightly
deeper in its northern-most part - numerous
very shallow depressions provide a significant
micro relief.Drainage System Features.Ancestral drainages ended in this stagnated zone
against a faultline. At the edges of the present
basin some fans of pale orange & pink sands spill
on to the gypsum.

(Cont).

LSU. 30 (Cont).Water Sources.

Very high densities of wells & some ballehs.

Soils & Rocks.

See LSU 28 but more saline/paler soils & less limestones.

Erosion & Soil Redist-
ribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

S. GYPSUMS.

TAXONOMIC FEATURES.TREES.

Sparse.

Common Species.Acacia tortilis Ficus sp.SHRUBS.

Medium.

Common Species.Salvadora persica Solanum sp. Heliotropium sp.
Acacia edgeworthii Balanites sp. Commiphora spp.
Euphorbia sp. Dobera glabra.GRASSES & HERBS.

Medium.

Common Species.Zygophyllum sp. Pterodiscus ruspolii Senra
incana Aerva lanata Chrysopogon aucheri
Dactyloctenium scindicum Tribulus terrestris
Abutilon sp. Cleome brachycarpa Cassia sp.
Limonium distichum Cyperus spp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Clumps of woody species in slight depressions and denser woody stands on massive gypsums & limestones (at the zone boundaries). Wider expanses of sandy silts support medium herbaceous & grassy cover.

Density & Canopy.

Medium density gypseous dwarf shrubland in a mosaic with medium density gypseous short dwarf shrub herb grassland. Cover 45%.

Termitaria.

Low densities of small conical types.

Herbivore & Tracks.

High density.

Cropping.

Medium densities of cropping on colluvial silts.

PHYSICAL CHARACTERS.Altitude Range.

300 - 180.

(Cont).

Topography.

Flat with a gentle N to S slope. A section across the narrow "shoe-string" zone reveals a shallow channel with a floor about 10m below the surrounding limestone.

Drainage System Features.

An ancestral drainage zone with typical "shoe-string" form. Current drainage is not developed on surface, but some fossil channels & sink holes can be observed.

Water Sources.

Very high densities of wells & ballehs with same berkads & bore holes.

Soils & Rocks.

Gypsum/anhydrite exposures in massive plates, small secondary fragments, small stones etc. cover 70%. Pale pink gypseous fine sandy silt. Limestone and pale orange soils make up 15% of surfaces.

Erosion & soil Redist-ribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

S. GYPSUMS.

TAXONOMIC FEATURES.TREES.

Sparse.

Common Species.Boscia minimifolia Cadaba heterotricha
Sesamothamnus sp. Mearua sp.SHRUBS.

Medium to sparse.

Common Species.Salvadora sp. Commiphora spp. Euphorbia
Somalense Acacia sp. Euphorbia cuneata
Kelleronia sp.GRASSES & HERBS.

Medium.

Common Species.Zygophyllum sp. Pterodiscus ruspolii Senra
incana Aerva lanata Chrysopogon aucheri
Dactyloctenium scindicum Tribulus terrestris
Abutilon sp. Cleome brachycarpa Cassia sp.
Limonium distichum Cyperus spp. Sporobolus
ruspolianus Urochondra setulosa Suaeda sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Clumps of woody species in slight depressions and denser woody stands on massive gypseums & limestones (at the zone boundaries). Wider expanses of sandy silts support medium herbaceous & grassy cover.

Density & Canopy.

Medium density gypseous dwarf shrub herb grassland. Cover 30%.

Termitaria.

Low densities of pillar type & pillar/columnar type.

Herbivore Tracks.

High density.

Cropping.

Very low densities of cropping on colluvial silts.

PHYSICAL CHARACTERS.Altitude Range.

190 - 140.

(Cont).

LSU. 32 (Cont).

- Topography. Northern parts as for LSU 31. Southern part flat with micro relief of small ridges & some very shallow depressions.
- Drainage System Features. A stagnated terminal zone in the ancestral drainage. Contemporary drainage patterns incl. shallow channels & small silt filled lagoons.
- Water Sources. High densities of wells & ballehs. Some berkads.
- Soils & Rocks. Gypsums/anhydrites in massive plates and as stony fragments cover 40% of the surface. Very pale gypseous soils cover 55% and dark red brown silt 5%.
- Erosion & Soil Redistribution. None.
- Dunes. None.
- Field Notes.

ECOLOGICAL CLASSIFICATION.

SHEBELLI GYPSUMS.

TAXONOMIC FEATURES.TREES.

Sparse to medium.

Common Species.Delonix elata Acacia sp. Commiphora sp.SHRUBS.

Medium.

Common Species.Salvadora sp. Commiphora spp. Euphorbia
Somalense Acacia spp. Anisotes sp. Acacia
misera Cordia sp. Grewia tenax.GRASSES & HERBS.

Medium.

Common Species.Zygophyllum sp. Pterodiscus ruspolii Senra
incana Aerva lanata Chrysopogon aucheri
Dactyloctenium scindicum Tribulus terrestris
Abutilon sp. Cleome brachcarpa Cassia sp.
Limonium distichum Cyperus spp. Aristida sp.
Sporobolus ruspolianus. Indigofera spiniflora
Melhania sp. Leucas sp. Chrysopogon aucheri
Latipes sp. Enneapogon sp. Aristida sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.Gypseous exposures have medium woody cover.
Pale gypseous soils chiefly grass & herb cover.
Sandy clay loams support dense woody associations.Density & Canopy.A complex mosaic between gypseous dwarf shrub-
land, dense Commiphora shrubland, and gypseous
short shrub herb grassland. Cover 35%.Termitaria.

Medium densities of small conical termitaria.

Herbivore Tracks.

High density.

Cropping.Medium to high densities on the pale brown
alluviums.PHYSICAL CHARACTERS.Altitude Range.

270 - 160.

(Cont).

Topography.

Flat with gentle W to E slopes. A micro relief of small scarps surrounds the linear depressions in which the gypsums are exposed.

Drainage System Features.

A remnant of an ancestral drainage system. The contemporary drainage system is well developed as a wide channel 10-15m below the surrounding land.

Water Sources.

Medium densities of wells & ballehs.

Soils & Rocks.

Gypsum/anhydrites in plates and as stoney fragments exposed over 10-20% of the surface. Pale gypseous & pale chestnut brown clay loams cover the other 80-90%.

Erosion & soil Redist-
ribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. GYPSUMS.

TAXONOMIC FEATURES.

TREES.

Very sparse.

Common Species.

Acacia tortilis Salvadore persica Dobera glabra.

SHRUBS.

Sparse to medium.

Common Species.

Salvadore persica Solanum sp. Heliotropium sp.
Acacia edgeworthii Balanites sp. Commiphora spp.
Euphorbia sp. Dobera glabra.

GRASSES & HERBS.

Sparse.

Common Species.

Zygophyllum sp. Pterodiscus ruspolii Senra
incana Aerva lanata Chrysopogon aucheri
Dactyloctenium scindicum Tribulus terrestris
Abutilon sp. Cleome brachcarpa Limonium
distichum Cyperus spp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

No obvious patterns: denser woody vegetation on limestone & pale orange sands.

Density & Canopy.

Low density gypseous short dwarf shrub herb grassland in a mosaic with medium density dwarf shrubland. Cover 30%.

Termitaria.

Nil

Herbivore Tracks.

Medium to high.

Cropping.

Low to medium densities of cropping on deeper silts mixed with limestone derived sands.

PHYSICAL CHARACTERS.

Altitude Range.

290 - 50

Topography.

Very gently sloping sides of a shallow "shoe-string" evaporite running NW to SE. Small scarps formed at limestone evaporite boundary.

LSU. 34 (Cont).

Drainage System Features.

A shallow ancestral drainage line, with a contemporary drainage zone superimposed some narrow channel development.

Water Sources.

Very high densities of wells: a few ballehs.

Soils & Rocks.

Gypsum exposures in parts of the LSU. In other parts limestone & pale orange sands overlie or are mixed with the gypsums. Pale orange colluvial sands are mixed with gypseous soils throughout.

Erosion & Soil Redist-
ribution.

None.

Dunes.

None.

Field Notes.

LSU. 35 & 41.

ECOLOGICAL CLASSIFICATION.COASTAL GRASSLANDS ON STABILIZED SAND
DUNESTAXONOMIC FEATURES.TREES.

Nil.

Common Species.SHRUBS.

Sparse.

Common Species.Commiphora spp. Grewia sp. Acacia sp.
All prostrate forms.GRASSES & HERBS.

Medium.

Common Species.Aristida sp. Chloris sp. Heteropogon contorus,
Tetrapogon spataceus, Cenchrus sp. Latipes
senegalensis Cyperus spp. Indigofera spp.
Adenium sp., Crotalaria spp. Merremia sp.
Helichrysum sp. Jatropha sp. Blepharis sp.
Tephrosia sp. Rhynchosia sp. Cynodon dactylonPHYSIOGNOMIC FEATURES.Vegetation Patterns.Grasses & herbs on the small plate like areas
of consolidated sand sheet; the fossil dunes
support mainly grasses; limestone pavements are
covered by a specialised community of prostrate
shrubs & succulents.Density & Canopy.A mosaic of medium to low density short herb
grassland with low density dwarf prostrate shrub
herbland. Cover 25-30%.Termitaria.High densities of conical with some columnar
type.Herbivore Tracks.

Low densities.

Cropping.

Nil.

PHYSICAL CHARACTERS.Altitude Range.

175 - 0.

(Cont).

Topography.

All LSU's slope NW to SE to the coast except LSU 55 which slopes gently into a central shallow depression. Slopes in the north (LSU 18, 19) & south (LUS 60) are the steepest. The micro relief is fairly well developed, consisting of limestone terraces, fossil dune forms, shallow depressions in the limestone pavements, & consolidated "plates" of pale sand.

Drainage System Features.

No channels development in the north, but deep incised channels with gulleying characterises LSU 60, as run off from the coastal ridge spills onto the consolidated sands. Most of these channels peter out as sandy fans before reaching the sea. LSU 55 has a number of shallow winding dainager channels.

Water Sources.

All LSU's except 55 have very low densities of ballehs & even lower densities of wells. LSU 55, which is consolidated coastal pale sand over the stagnated evaporite internal basin, has medium to high densities of wells & ballehs.

Soils & Rocks.

Pink & brown toned coastal limestones (60% in LSU 18, 50% LSU 19, 60% LSU 23, 30% LSU 35, 40% LSU 41, 55, 5-10% LSU 60). Some white limestones (5% in LSU 18, 19, 23). Very rare gypsum exposures (2% in LSU 55), and the rest is pallid sands with some orange tone in the north, pinkish in the south.

Erosion & Soil Redist-
ribution.

Some sheet erosion and movement of soil down the drainage channels on steeper slopes. The strong monsoonal wiinds (NxNE; SxSW) move the surface sands over the whole area, & dunes have been formed where local conditions so dictate. There is probably appreciable sheet movement of sands through wind influences, but the net annual effect will be relatively slight (see section 3).

Dunes.

Large mobile dunes have been separated out as LSU 51, 52, 53 & 54. Some small mobile dunes (notably at the shore line) remain in LSU's 18-60. Fossil dunes which have been stabilised for long periods constitute the major surface type.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. W. LIMESTONE

TAXONOMIC FEATURES.

TREES.

Sparse.

Common Species.

Boscia minimifolia; Sesamothamnus sp.
Commiphora spp. Balanites sp. Delonix baccal
Acacia spp; Acacia tortilis. Boswellia
microphylla.

SHRUBS.

Medium dense.

Common Species.

Commiphora spp; Euphorbia cuneata.
Crewia sp. Iphiona rotundifolia
Dalbergia commiphoroides. Ipomoea donaldsonii.
Cadaba glandulosa.

GRASSES & HERBS.

Sparse.

Common Species.

Aristida sp. Pavonia spp. Indigofera ruspolii
very dominant. Corchorus bricchetti.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Woody vegetation concentrated in slight depressions; no noticeable concentration on the narrow dark bands, but with woody vegetation slight clumped, & Indigofera ruspolii dominating the inter-limestone sandy bands.

Density & Canopy.

Medium density Commiphora shrubland with scattered low Boscia Commiphora and Acacia trees. Cover 30%.

Termitaria.

High densities of conical & short columnar termitaria on limestone; none on silty sands.

Herbivore Tracks.

Density medium.

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

300 - 200

Topography.

Very gentle NW-SE slope & many shallow depressions: gradients decline to the SE. Some micro ridges.

Drainage System Features.

No development of channels but loamy sand narrow bands probably serves as a drainage system.

Water Sources.

None.

Soils & Rocks.

60% cover of limestone in plates, fragments & stone mantles showing banding. 40% is pale orange toned silty sand. No gypsums.

Erosion & Soil Redistribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.
=====

CENTRAL GYPSUMS.

TAXONOMIC FEATURES.
=====

TREES.

Very sparse.

Common Species.

Boscia minimifolia Cadaba heterotricha
Sesamothamnus sp.

SHRUBS.

Sparse.

Common Species.

Salvadore sp. Commiphora spp. Euphorbia somalensis
Acacia spp.

GRASSES & HERBS.

Medium to dense.

Common Species.

Zygophyllum sp. Pterodiscus ruspolii Senra
incana Aerva lanata Chrysopogon aucheri
Dactyloctenium scindicum Tribulus terrestris
Abutilon sp. Cleome brachcarpa Limonium
distichum Cyperus spp. Aristida sp. Sporobolus
ruspolianus.

PHYSIOGNOMIC FEATURES.
=====

Vegetation Patterns.

Wide pale silts support minimal woody cover:
lines & ridges of gypsums & limestones have a
concentration of woody species.

Density & Canopy.

Medium density gypseous short herb grassland.
Cover 35%.

Termitaria.

Low densities of conical termitaria.

Herbivore & Tracks.

Medium density.

Cropping.

Very low densities on "milder" colluvial silts.

PHYSICAL CHARACTERS.
=====

Altitude Range.

340 - 160.

Topography.

Very flat with very slight NW-SE slopes.
Micro relief of shallow channels and narrow
ridges and micro-scarps of both limestone &
gypsum.

Drainage System Features.

An ancestral drainage zone similar to that of LSU 28 but wider. A few shallow contemporary drainage channels.

Water Sources.

High densities of wells & ballehs; some berkads & bore holes.

Soils & Rocks.

Gypsum/anhydrite exposures in massive plates, with areas of small secondary fragments over 30%. Gypsecus sandy silt very white to pale pink, cover 60%. The other 10% is limestones and medium orange loamy sands.

Erosion & Soil Redistribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.

TREES.

Nil.

Common Species.

SHRUBS.

Sparse.

Common Species.

Acacia edgeworthii A. reficiens subsp. misera
A. horrida subsp. benadirensis Commiphora spp.
Jatropha dichter. Jatropha villosa, Euphorbia sp.

GRASSES & HERBS.

Medium.

Common Species.

Indigofera ruspolii Aristida sp. Latipes
senegalensis Aerva lanata Corchorus sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

No obvious patterns.

Density & Canopy.

Low density short Indigofera herbland.
Cover 10-15%.

Termitaria.

Herbivore Tracks.

Cropping.

PHYSICAL CHARACTERS.

Altitude Range.

390 - 60.

Topography.

Flat with gentle NW to SE slopes-slopes becoming steeper in the NW margins of the LSU. Each LSU has a characteristic micro relief related to the limestone structures underlying the sand sheet.

(Cont).

LSU's 6, 7, 11, 13, 15 & 17 have a micro relief of gentle undulations associated with the wide narrow bands of limestone (wider in the N, narrower in the S) which are exposed. Other LSU's are more or less flat.

Drainage System Features.

Well developed sandy channels in the north (LSU 6 & 13) gradually petering out as they flow south eastwards. Few drainage channels in the southern LSU's.

Water Sources.

Very low densities in all LSU's except LSU 17 (which has gypseous exposures) & LSU 14.

Soils & Rocks.

All LSU's have a combination of limestones (pavements and fragmented surfaces) and pale orange sands. The fine sands become paler down the slope to the SE, and limestone exposures decrease from 50-60% (as isolated pavements arranged in "waves") in LSU 6 to 2% in LSU 38.

Erosion & Soil Redist-
ribution.

Some sheet erosion and transport of sands down drainage channels in the northern LSU's only.

Dunes.

Nil.

Field Notes.

LSU. 42

(For LSU 41 See LSU 35)

ECOLOGICAL CLASSIFICATION.TRANSITIONAL N AND C. GYPSUMS. COASTAL
LIMESTONES.TAXONOMIC FEATURES.TREES.

Very sparse.

Common Species.Acacia tortilis Boscia minimifolia.SHRUBS.

Medium to dense.

Common Species.Acacia edgeworthii A. reficiens subsp. misera
Balanites sp. Commiphora spp. Salsola sp.
Jatropha villosa var glabra Grewia sp.GRASSES & HERBS.

Medium.

Common Species.Indigofera sp. Pavonia sp. Iphiaea rotundifolia
Rhynchosia sp. Aristida sp. Chrysopogon aucheri
Dactyloctenium scindicum Cyperus sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.Very complex & heterogeneous: woody vegetation
Concentrated along drainage lines and at the
top of small escarpments. Gypseous soils and
gypsums predominantly grassy & herbaceous cover.Density & Canopy.Low density short dwarf shrub herb land mixed
with herb grassland. Cover 20%.Termitaria.Low density of conical & short columnar
termitaria.Herbivore Tracks.

Low densities.

Cropping.

Nil.

PHYSICAL CHARACTERS.Altitude Range.

120 - 30.

(Cont).

LSU. 42 (Cont).Topography.

LS units 42 slope gently in from its edge towards shallow depressions (the stagnant sump of the ancestral drainage system). There is a well developed micro relief of scarps in the west, marking the transitional area between the sand covered limestone plateau and the gypseous depression. In the east a prominent escarpment marks the major fault line between the coastal limestone block & the earlier limestones of the interior.

Drainage System Features.

Very well developed system of surface channels with some incision & gulleying on the steeper slopes.

Water Sources.

Medium densities of wells & ballehs.

Soils & Rocks.

A transitional area between pink toned coastal limestones (30%) in massive pavements pale orange calcareous consolidated sands (30%), gypsums (10%) and pale gypseous sandy silts (30%).

Erosion & Soil Redistribution.

Sheet erosion down steeper slopes; some soil movement down drainage channels and onto the fans and slow movement of escarpment faces up slope.

Dunes.

None.

Field Notes.

LSU. 43.

ECOLOGICAL CLASSIFICATION.

CENTRAL SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.TREES.

Very scattered.

Common Species.Acacia sp.SHRUBS.

Medium to sparse.

Common Species.Commiphora sp. Cordia sp. Acacia benadirensis
A. edgeworthii Jatropha villosa Cassia sp.
Iphiaea rotundifolia.GRASSES & HERBS.

Medium.

Common Species.Indigofera ruspolii Tribulus Cistoides Aristida sp.
Cenchrus sp. Pleuroptera revoilii Heliotropium sp.
Cleome tenella Leucas minimifolia Blepharis sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

A discernable concentration of woody species in the paler soils and limestones.

Density & Canopy.

Medium density short dwarf shrub herb grassland in mosaic with medium density short herb grassland. Cover 30-50%.

Termitaria.

Sparse densities of columnar termitaria.

Herbivore Tracks.

Very low densities

Cropping.

High densities of cropping.

PHYSICAL CHARACTERS.Altitude Range.

330 - 100.

Topography.

Flat with very gentle W to E slopes in the western parts giving way to a flat region in the east (an internal drainage system).

(Cont).

LSU. 43 (Cont).

The land starts to rise again at the far western border of these LSU's. Micro relief is less well developed than for LSU's 6-88, but there are some slight undulating patterns associated with limestone bands. Exposed gypsums occur throughout the region at the bottom of shallow depressions.

Drainage System Features.

Very little drainage development.

Water Sources.

Medium densities of wells and ballehs.

Soils & Rocks.

All LSU's comprise stony limestone surfaces (with very few massive pavements) (5-20%), red-orange toned sands (75-90%) and gypsums (5%). The sands in the W are medium reddish orange, but become paler in the E. Limestones virtually non existent in the E (LSU 63 & 85).

Erosion & Soil Redistribution.

Nil.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

CENTRAL SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.TREES.

Nil.

Common Species.Acacia sp.SHRUBS.

Medium to sparse.

Common Species.Commiphora sp. Cordia sp. Acacia benadirensis
A. edgeworthii Jatropha villosa Cassia sp.
Iphiona rotundifolia.GRASSES & HERBS.

Medium.

Common Species.Indigofera ruspolii Tribulus Cistoides Aristida sp.
Cenchrus sp. Pleuroptera revoilii Heliotropium sp.
Cleome tenella Leucas minimifolia Blepharis sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

A discernable concentration of woody species in the paler soils and limestones.

Density & Canopy.

Medium density short dwarf shrub herb grassland in mosaic with medium density short herb grassland. Cover 30-50%.

Termitaria.

Sparse densities of columnar termitaria. Sparse to medium densities of conical termitaria.

Herbivore Tracks.

Low densities.

Cropping.

Nil.

PHYSICAL CHARACTERS.Altitude Range.

330 - 100.

Topography.

Flat with very gentle W to E slopes in the western parts giving way to a flat region in the east (an internal drainage system).

(Cont).

LSU. 44 (Cont).

The land starts to rise again at the far western border of these LSU's. Micro relief is less well developed than for LSU's 6-88, but there are some slight undulating patterns associated with limestone bands. Exposed gypsums occur throughout the region at the bottom of shallow depressions.

Drainage System Features.

Very little drainage development.

Water Sources.

Medium densities of wells and ballehs.

Soils & Rocks.

All LSU's comprise stony limestone surfaces (with very few massive pavements) (5-20%), red-orange toned sands (75-90%) and gypsums (5%). The sands in the W are medium reddish orange, but become paler in the E. Limestones virtually non existent in the E (LSU 63 & 85).

Erosion & Soil Redistribution.

Nil.

Dunes.

Nil.

Field Notes.

LSU. 45.

ECOLOGICAL CLASSIFICATION.

CENTRAL SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.TREES.

Nil.

Common Species.SHRUBS.

Sparse to medium.

Common Species.

Commiphora sp. Cordia sp. Acacia benadirensis
A. edgeworthii Jatropha villosa Cassia sp.
Iphiaena rotundifolia. Euphorbia cuneata
Ipomoea donaldsonii.

GRASSES & HERBS.

Medium to dense.

Common Species.

Indigofera ruspolii Tribulus distodes Aristida sp.
Cenchrus sp. Pleuroptera revollida Heliotropium sp.
Cleome tenella Leucas minimifolia Blepharis sp.
Latipes senegalensis Corchorus sp. Melhanina sp.

PHYSIOGNOMIC FEATURES.Vegetation Patterns.

A discernable concentration of woody species in the paler soils and limestones.

Density & Canopy.Medium density short Aristida herb grassland in mosaic with medium/sparse density low dwarf shrub Indigofera herbland. Cover 50-60%.Termitaria.

Sparse densities of conical termitaria.

Herbivore Tracks.

Low densities.

Cropping.

Low densities of cropping.

PHYSICAL CHARACTERS.Altitude Range.

330 - 100.

Topography.

Flat with very gentle W to E slopes in the western parts giving way to a flat region in the east (an internal drainage system). The land starts to rise again at the far western border of these LSU's.

(Cont).

LSU. 45(cont).

Micro relief is less well developed than for LSU's 6-88, but there are some slight undulating patterns associated with limestone bands. Exposed gypsums occur throughout the region at the bottom of shallow depressions.

Drainage System Features.

Very little drainage development.

Water Sources.

Medium densities of wells and ballehs.

Soils & Rocks.

All LSU's comprise stony limestone surfaces (with very few massive pavements) (5-20%), red-orange toned sands (75-90%) and gypsums (5%). The sands in the W are medium reddish orange, but become paler in the E. Limestones virtually non existent in the E (LSU 63 & 85).

Erosion & Soil Redist-
ribution.

Nil.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

TRANSITIONAL N.W. LIMESTONE. CENTRAL
SAND OVER LIMESTONE.

TAXONOMIC FEATURE.TREES.

Nil to very sparse.

Common Species.

Acacia tortilis.

SHRUBS.

Sparse to medium.

Common Species.

Commiphora spp. Balanites sp. Acacia edgeworthii Cadaba glandulosa Ipomoea donaldsonii.

GRASSES & HERBS.

Sparse to medium.

Common Species.

Indigofera ruspolii Aristida sp. Chrysopogon aucheri Barleria sp. Aerva persica Eragrostis sp. Indigofera sp. very dominant. Solanum sp.

PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Woody species tend to be concentrated on the limestone bands; herbs & grasses tend to concentrate on the shallow silty sands.

Density & Canopy.

Medium to low density degraded Chrysopogon dwarf shrub herb grassland. Cover 25%.

Termitaria.

Sparse to medium large columnar type.

Herbivore Tracks.

Medium.

Cropping.

Very low densities of cropping.

PHYSICAL CHARACTERS.Altitude Range.

300 - 230.

Topography.

Extremely gentle slopes NW to SE with scattered small depressions. The eastern most part of LSU 46 slightly indulating.

(Cont).

LSU. 46 (Cont).Drainage System Features.

Some narrow channels in the eastern part.

Water Sources.

Very low densities of ballehs and wells.

Soils & Rocks.

Limestones in wide parallel bands, separated by wide dark orange areas of sands (with some silt). Some of the limestone bands are further broken into isolated segments. Limestones cover only 15-20% of the area.

Erosion & Soil Redistribution.

None.

Dunes.

None.

Field Notes.

LSU. 47

ECOLOGICAL CLASSIFICATION.

S. LIMESTONE

TAXONOMIC FEATURES.TREES.

Sparse.

Common Species.Acacia tortilis Commiphora spp. Delonix baccal
Acacia spp. Albizzia sp. Cordia sp.SHRUBS.

Medium.

Common Species.Commiphora spp. Jatropha sp. Crewia sp.
Dalberiga sp. Solamm sp. Ipomoea donaldsonii
Euphorbia cuneata Acacia spp.GRASSES & HERBS.

Sparse.

Common Species.Indigofera spp. Solamm sp. Aristida sp. Latipes
senegalensis Cyperus sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Rather uniform but herbaceous & grassy plants concentrated on the sandy areas, with woody plants on limestone.

Density & Canopy.Medium density Commiphora shrubland. Cover 30%.Termitaria.

Low densities of columnar type: medium density of pillar type.

Herbivore Tracks.

Medium.

Cropping.

Low densities of cropping.

PHYSICAL CHARACTERS.Altitude Range.

290 - 230.

Topography.

Gentle NW/SE slope; ancient peneplain in the south of the LSU with numerous small depressions. Well developed micro relief associated with wavy bands.

(Cont).

LSU. 47 (Cont).

- Drainage System Features. A few drainage channels, but generally sandy bands acting as drainage zones.
- Water Sources. Low densities of ballehs and wells.
- Soils & Rocks. Parallel wavy wide bands of limestone (mostly fragmented stones on surface) and orange toned sands. Sands cover 40% of the area. A few gypsum exposures in small depressions.
- Erosion & Soil Redistribution. None.
- Dunes. None.
- Field Notes.

ECOLOGICAL CLASSIFICATION.

TRANSITIONAL N.W. LIMESTONE/CENTRAL GYPSUMS.

TAXONOMIC FEATURES.

LIMESTONE & PALE ORANGE SOILS.

TREES.

Very sparse.

Common Species.

Boscia minimifolia; Sesamthamnus sp.
Commiphora spp; Balanites sp. Acacia spp;
Acacia tortilis.

SHRUBS.

Medium dense.

Common Species.

Commiphora spp; Euphorbia cuneata
Crewia sp. Iphiaona rotundifolia
Dalbergia commiphoroides. Ipomoea donaldsonii
Cadaba glandulosa. Solamm sp. & Jatropha sp.

GRASSES & HERBS.

Sparse.

Common Species.

Aristida sp. Pavonia spp. Indigofera ruspolii
very dominant. Corchorus bricchetti.

GYPSUMS/Anhydrites.

TREES.

Very sparse.

Common Species.

Acacia sp.

SHRUBS.

Very sparse.

Common Species.

Euphorbia cuneata. Commiphora spp.
Salvadora persica.

GRASSES & HERBS.

Medium.

Common Species.

Sporobolus ruspoliamus xylocalyx sp.
Zygophyllum simplex Dactyloctenium scindicum
Aristida sp. Ipomoea sp.

Gypseous Soils.

TREES.

Sparse to very sparse.

Common Species.

Cadaba heterotricha Dobera glabra.

(Cont).

SHRUBS.

Sparse to medium.

Common Species.

Commiphora spp. Salvadora persica.
Ipomoea donaldsonii.

GRASSES & HERBS.

Medium to sparse.

Common Species.

Sporobolus ruspolianus xylocalyx hispida
Aristida sp. Indigofera sp.

PHYSIOGNOMIC FEATURES.

Limestone and Pale Orange Soils.

Vegetation Patterns.

A slight concentration of woody vegetation on the sandy bands and at their margins.

Density & Canopy.

Medium density Commiphora dwarf shrubland. Cover 25%.

Termitaria.

Medium densities of columnar termitaria on orange soils & limestones.

Herbivore Tracks.

Medium to high density of tracks.

Cropping.

Low densities of cropping on pale silts of mixed gypseous limestone origin.

Gypsums/Anhydrites.

Vegetation Patterns.

Woody vegetation in isolated clumps-herbs & grasses uniformly distributed.

Density & Canopy.

Medium density, short Sporobolus Xylocalyx dwarf shrub herb grassland. Cover 35%.

Termitaria.

Nil on pale soil & gypsums.

Gypseous Soils.

Vegetation Pattern.

Woody vegetation tending to concentrate in wide wavy bands.

Density & Canopy.

Medium density short dwarf shrub herb grassland mixed with Commiphora dwarf shrubland. Cover 30%.

PHYSICAL CHARACTERS.Altitude Range.

240 - 120.

Topography.

An extremely gentle NW - SE slope, obscured in many places by local relief, which includes depressions & low escarpments associated with gypsums and fairly steep slopes between limestones & evaporites.

Drainage System Features.

Channels development on the steep slopes (very narrow bands). Many depressions, and much stag-nation in the drainages towards the SE.

Water Sources.

Medium densities of wells and a few hallehs (all on gypsums).

Soils & Rocks.

A transitional area between limestones and evaporites with complex interfaces throughout. Cover is approximately 30% fragmented limestone & limestone stone mantles, set in 20% medium/pale orange silty sands, and 15% gypsums/anhydrites associated with 35% pale gypsecus silts. Overall patterns very intricate & complex, particularly in the gypseous parts.

Erosion & Soil Redistribution.

Sheet erosion down the steep slopes and movement of cliff faces as the steep edges erode.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. W. LIMESTONE

TAXONOMIC FEATURES.TREES.

Very sparse.

Common Species.Boscia minimifolia; Sesamothamnus sp.
Commiphora spp; Balanites sp. Acacia spp;
Acacia tortilis.SHRUBS.Commiphora spp; Euphorbia cuneata.
Crewia sp. Iphiaea rotundifolia
Dalbergia commiphoroides. Ipomoea donaldsonii
Cadaba glandulosa. Salvadora persica
Jatropha sp.GRASSES & HERBS.

Sparse.

Common Species.Aristida sp. Pavonia spp. Indigofera ruspolii
very dominant. Corchorus bricchetti.PHYSIOGNOMIC FEATURES.Vegetation Patterns.A slight concentration of woody vegetation
on the sandy bands and at their margins.Density & Canopy.Medium density Commiphora dwarf shrubland.
Cover 25%.Termitaria.

Low density of columnar termitaria.

Herbivore & Tracks.

Medium density.

Cropping.

Nil.

PHYSICAL CHARACTERS.Altitude Range.

190- 140

Topography.Extremely slight NW - SE slopes, flat with
micro relief associated with wide banding.

(Cont).

LSU. 49 (Cont)Drainage System Features.

No development of drainage channels.

Water Sources.

None.

Soils & Rocks.

Mostly fragmented limestones and smaller pavements cover 30% - 40% of surface. 60-70% is pale orange toned silty sand. Some gypsums but only at boundary with LSU 37. Sands occur between limestone areas in wide wavy parallel bands.

Erosion & Soil Redistribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

TRANSITIONAL N AND C. GYPSUMS. COASTAL LIMESTONES.

TAXONOMIC FEATURES.

TREES.

Very sparse.

Common Species.

Acacia tortilis Boscia minimifolia.

SHRUBS.

Medium to dense.

Common Species.

Acacia edgeworthii A. reficiens subsp. miseria
Balanites sp. Commiphora spp. Salsola sp.
Jatropha villosa var glabra Grewia sp.

GRASSES & HERBS.

Medium.

Common Species.

Indigofera sp. Pavonia sp. Iphiona rotundifolia
Rhynchosia sp. Aristida sp. Chrysopogon aucheri
Dactyloctenium scindicum Cyperus sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Very complex & heterogeneous: woody vegetation concentrated along drainage lines and at the top of small escarpments. Gypseous soils and gypsums predominantly grassy & herbaceous cover.

Density & Canopy.

Low density short dwarf shrub herb land mixed with herb grassland. Cover 20%.

Termitaria.

Low density of conical & short columnar termitaria.

Herbivore Tracks.

Low densities.

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

130 - 70.

(Cont).

LSU. 50 (Cont).Topography.

LS units 50 slope gently in from is edge towards shallow depressions (the stagnant sump of the ancestral drainage system). There is a well developed micro relief of scarps in the west, marking the transitional area between the sand covered limestone plateau and the gypseous depression. In the east a prominent escarpment marks the major fault line between the coastal limestone block & the earlier limestones of the interior.

Drainage System Features.

Very well developed system of surface channels with some incision & gulleying on the steeper slopes.

Water Sources.

Medium densities of wells & ballehs.

Soils & Rocks.

A transitional area between pink toned coastal limestones (30%) in massive pavements pale orange calcareous concolidated sands (30%), gypsums (10%) and pale gypseous sandy silts (30%).

Erosion & Soil Redistribution.

Sheet erosion down steeper slopes; some soil movement down drainage channels and onto the fans and slow movement of escarpment faces up slope.

Dunes.

None.

Field Notes.

(For LSU 51, 52, 53, 54 see LSU 22)

LSU. 55

ECOLOGICAL CLASSIFICATION.

COASTAL GRASSLANDS ON STABILIZED SAND DUNES

TAXONOMIC FEATURES.

TREES.

Nil.

Common Species.

SHRUBS.

Medium & locally dense.

Common Species.

Balanites sp. Sesamothamnus sp. Acacia sp.
(prostrate) Euphorbia cuneata Ormocarpum sp.
Commiphora sp.

GRASSES & HERBS.

Medium to sparse.

Common Species.

Chrysopogon aucheri Tetrapogon spataceus
Dactyloctenium scindicum Cassia sp. Alde sp.
Indigofera raspolii, Chascanum sp. Barleria sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Concentrations of woody plants along shallow drainage channels & on limestones. Pale sands & gypseous types support mostly herbs & grasses.

Density & Canopy.

Medium density short dwarf shrub grassland mixed with medium density short grass herb-land. Cover 45%.

Termitaria.

Medium densities of conical type.

Herbivore Tracks.

Low densities:

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

175 - 0.

(Cont).

LSU. 55 (Cont).Topography.

All LSU's slope NW to SE to the coast except LSU 55 which slopes gently into a central shallow depression. Slopes in the north (LSU 18, 19) & south (LSU 60) are the steepest. The micro relief is fairly well developed, consisting of limestone terraces, fossil dune forms, shallow depressions in the limestone pavements, & consolidated "plates" of pale sand.

Drainage System Features

No channel development in the north, but deep incised channels with gulleying characterises LSU 60, as run off from the coastal ridge spills on to the consolidated sands. Most of these channels peter out as sandy fans before reaching the sea. LSU 55 has a number of shallow winding drainage channels.

Water Sources.

All LSU's except 55 have very low densities of ballehs & even lower densities of wells. LSU 55, which is consolidated coastal pale sand over the stagnated evaporite internal basin, has medium to high densities of wells & ballehs.

Soils & Rocks.

Pink & brown toned coastal limestones (60% in LSU 18, 50% LSU 19, 60% LSU 23, 30% LSU 35, 40% LSU 41, 55, 5-10% LSU 60). Some white limestones (5% in LSU 18, 19, 23). Very rare gypsum exposures (2% in LSU 55), and the rest is pallid sands with some orange tone in the north, pinkish in the south.

Erosion & Soil Redistribution.

Some sheet erosion and movement of soil down the drainage channels on steeper slopes. The strong monsoonal winds (NxNE; SxSW) move the surface sands over the whole area, & dunes have been formed where local conditions so dictate. There is probably appreciable sheet movement of sands through wind influences, but the net annual effect will be relatively slight (see section 3).

Dunes.

Large mobile dunes have been separated out as LSU 51, 52, 53, & 54. Some small mobile dunes (notably at the shore line) remain in LSU's 18-60. Fossil dunes which have been stabilised for long periods constitute the major surface type.

Field Notes.

ECOLOGICAL CLASSIFICATION.

COASTAL WOODY ASSOCIATIONS.

TAXONOMIC FEATURES.

TREES.

Medium.

Common Species.

Terminalia kelleri Acacia tortilis.

SHRUBS.

Medium to dense.

Common Species.

Commiphora spp. Loewia glutinosa, Iphiaona rotundifolia, Jatropha sp. Acacia mellifera, Dichrostachys sp. Cadaba spp.

GRASSES & HERBS.

Medium to sparse.

Common Species.

Aristida sp. Tetropogon spattaceus Heteropogon contortus Cyperus sp. Sporobolus sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

No obvious patterns.

Density & Canopy.

Medium to dense short Acacia terminalia wooded Commiphora shrub grassland. Cover 70%.

Termitaria.

Nil.

Herbivore Tracks.

High density of tracks.

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

140 - 75.

Topography.

Gentle to medium slopes NW to SL & SE to NW the LSU having a ridge section. Micro relief of undulations typical of a stabilised dune form.

Drainage System Features.

No development of the surface drainage system.

(Cont).

LSU. 56 (Cont).Water Sources.

Very low densities of wells.

Soils & Rocks.

Pale sands; some with pale pink hue cover the whole LSU.

Erosion & Soil Redist-
ribution.

Wind movement of sand with both removal & deposition taking place.

Dunes.

The whole LSU is a stabilised dune area and retains the micro relief of the dune bases.

Field Notes.

ECOLOGICAL CLASSIFICATION.

CENTRAL GYPSUMS.

TAXONOMIC FEATURES.TREES.

Very sparse.

Common Species.Boscia minimifolia Cadaba heterotricha
Sesamothamnus sp. Mearua sp.SHRUBS.

Medium to sparse.

Common Species.Salvadora sp. Commiphora spp. Euphorbia
Somalense Acacia sp.GRASSES & HERBS.

Sparse to medium.

Common Species.Zygophyllum sp. Pterodiscus ruspolii Senra
incana Aerva lanata Chrysopogon aucheri
Dactyloctenium scindicum Tribulus terrestris
Abutilon sp. Cleome brancarpa Limonium
distichum Cyperus spp. Sporobolus ruspolianus
Urochondra setulosa Suaeda sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Medium densities of woody species in the upper parts of the drainage area (on exposed gypsum & limestones). Sparse woody vegetation & medium herbaceous & grassy cover on the lower parts on silts & colluvial sandy silts.

Density & Canopy.

Medium density, gypseous dwarf shrubland in a mosaic with low density gypseous/saline short herb grassland. Cover 25%.

Termitaria.

Low densities of small conical & low columnar types.

Herbivore Tracks.

Medium density.

Cropping.

Nil.

PHYSICAL CHARACTERS.Altitude Range.

160 - 100.

(Cont).

LSU. 57 (Cont).Topography.

Western parts of the LSU show very slight NW/SE gradients, with a micro relief of small limestone & gypsum terraces marking different ancient levels in the ancestral drainage system. Eastern part is similar to LSU 30 - a flat floored depression.

Drainage System Features.

A stagnated terminal zone in the ancestral drainage about 60 - 80m above the final drainage sump of LSU 30. Contemporary drainage patterns include shallow channels and saline lagoons.

Water Sources.

Medium densities of wells; low densities of ballehs.

Soils & Rocks.

Gypsum/anhydrites on surface cover 30%; limestone 10%; and pale saline gypseous silts 60%.

Erosion & Soil Redistribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

SHEBELLE LIMESTONE.

TAXONOMIC FEATURES.

TREES.

Medium to sparse.

Common Species.

Boswellia sp. Commiphora spp. Boscia
minimifolia Dobera glabra Acacia sp.

SHRUBS.

Medium to dense.

Common Species.

Acacia seyal Euphorbia spp. Acacia misera
Crewia sp. Maerua sp. Commiphora spp.

GRASSES & HERBS.

Sparse.

Common Species.

Polygala sp. Chloris sp. Pavonia spp.
Sporobolus sp. Seddera sp. Enneapogon sp.
Cassia sp. Aristida kelleri Latipes sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Steeper slopes have less soil but higher densities of woody vegetation.

Density & Canopy.

High density Acacia Commiphora shrubland with scattered trees. Cover 65%.

Termitaria.

Nil.

Herbivore Tracks.

High densities.

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

340 - 160

Topography.

Very steep (0.26) convex slopes at edges of the northern plateau remnants of LSU 58. Further south slopes are less extreme and the landform is more plateau-like.

Drainage System Features.

Short incised drainages on the steeper slopes.

(Cont).

LSU. 58 (Cont)

- Water Sources. None.
- Soils & Rocks. Massive pale pink, pale grey & pale yellow limestones & stony hillslopes cover 95% of the area. Very small areas of pink toned soils (5%) is washed down slopes in sheet erosion action. Weathering blocks of yellowish laterite widespread.
- Erosion & Soil Redistribution. Some sheet erosion on steep slopes, and appreciable soil movement down the drainage channels.
- Dunes. None.
- Field Notes.

LSU. 59 (Cont).Topography.

Gentle to medium slopes from W to E. Micro relief associated with limestone bands which occur sporadically in the LSU.

Drainage System Features.

Near the fringing limestone hills (LSU 58) some gulleys have formed under the influence of hill slope run-off. Otherwise no development of surface channels.

Water Sources.

Very low densities of ballehs & wells.

Soils & Rocks.

Pale orange toned silty clay surfaces with compaction. 15-20% of the area is covered by stone mantles & stony limestone banding.

Erosion & Soil Redistribution.

Moderate sheet erosion associated with vegetation arcing.

Dunes.

Nil.

Field Notes.

LSU. 59.

ECOLOGICAL CLASSIFICATION.

S. W. ARCED SILTS.

TAXONOMIC FEATURES.TREES.

Sparse to medium.

Common Species.Delonix elata Euphorbia sp. Boscia sp.
minimifolia.SHRUBS.

Medium to dense.

Common Species.Acacia sp. aff. senegal Cordia sp. Anisotes sp.
Commiphora spp. Cadaba glandulosa Jatropha sp.
Lanea triphylla.GRASSES & HERBS.

Sparse to medium.

Common Species.Euphorbia bifida, Tribulus terrestris,
Caralluma sp. Dactyloctenium scindicum
Sporobolus sp. Andropogon sp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Poorly defined arcs of 10-15m width is sparsely covered areas; some fairly uniform distributions.

Density & Canopy.Arced Acacia Commiphora shrubland with scattered trees in a mosaic with medium to low density Acacia Commiphora shrubland & shrub herb grassland.Termitaria.

Low densities of conical & columnar termitaria.

Herbivore Tracks.

Medium to high densities of tracks.

Cropping.

Low densities of cropping.

PHYSICAL CHARACTERS.Altitude Range.

300 - 170.

(Cont).

ECOLOGICAL CLASSIFICATION.

COASTAL GRASSLANDS ON STABILIZED SAND DUNES.

TAXONOMIC FEATURES.

TREES.

Nil (below 200m).

Common Species.

SHRUBS.

Very sparse.

Common Species.

Dichrostachys sp. Euphorbia cuneata Grewia sp.
(prostrate form).

GRASSES & HERBS.

Medium.

Common Species.

Aristida sp. Chloris sp. Heteropogon contortus,
Tetrapogon spattaceus, Cenchrus sp. Latipes
senegalensis Cyperus spp. Indigofera spp.
Adenium sp. Crotalaria spp. Merremia sp.
Helichrysum sp. Jatropha sp. Elepharis sp.
Tephrosia sp. Rhynchosia sp. Cynodon dactylon,
Panicum sp. Sporobolus sp. Leucas sp.
Digitaria sp. Justicia sp. Chascanum sp.
Abutilon sp. Hildebrandtia sp. Crotalaria sp.
Sida sp. Oldenlandia sp. Solanum sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

No patterns - very uniform vegetation.

Density & Canopy.

Medium density very short herb grassland, and bare rock surfaces. Cover 40-50%.

Termitaria.

Low densities of columnar type.

Herbivore Tracks.

High densities of tracks.

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

175 - 0.

LSU. 60 (Cont).

Topography.

All LSU's slopes NW to Se to the coast except LSU 55 which slopes gently into a central shallow depression. Slopes in the north (LSU 18, 19) & south (LSU 60) are the steepest. The micro relief is fairly well developed, consisting of limestone terraces, fossil dune forms, shallow depressions in the limestone pavements, & consolidated "plates" of pale sand.

Drainage System Features.

No channels development in the north, but deep incised channels with gulleying characterises LSU 60, as run off from the coastal ridge spills onto the consolidated sands. Most of these channels peter out as sandy fans before reaching the sea. LSU 55 has a number of shallow winding drainage channels.

Water Sources.

All LSU's except 55 have very low densities of ballehs & even lower densities of wells. LSU 55, which is consolidated coastal pale sand over the stagnated evaporite internal basin, has medium to high densities of wells & ballehs.

Soils & Rocks.

Pink & brown toned coastal limestones (60% in LSU 18, 50% LSU 19, 60% LSU 23, 30% LSU 35, 40% LSU 41, 55, 5-10% LSU 60). Some white limestones (5% in LSU 18, 19, 23). Very rare gypsum exposures (2% in LSU 55), and the rest is pallid sands with some orange tone in the north, pinkish in the south.

Erosion & Soil Redistribution.

Some sheet erosion and movement of soil down the drainage channels on steeper slopes. The strong monsoonal winds (NxNE; SxSW) move the surface sands over the whole area, & dunes have been formed where local conditions so dictate. There is probably appreciable sheet movement of sands through wind influences, but the net annual effect will be relatively slight (see section 3).

Dunes.

Large mobile dunes have been separated out as LSU 51, 52, 53, 54. Some small mobile dunes (notably at the shore line) remain in LSU's 18-60. Fossil dunes which have been stabilised for long periods constitute the major surface type.

Field Notes.

PHYSICAL CHARACTERS.

Altitude Range.

400 - 130.

Topography.

Fairly steep NW to SE slopes and, to the west of the watershed in the S of the LSU, some SE to NW slopes. A micro relief of undulations as for LSU 56.

Drainage System Features.

A deeply incised & dense network of drainage channels with much gulleying on steeper slopes.

Water Sources.

Medium densities of wells.

Soils & Rocks.

5% of the surface is weathered white limestone exposed by sand movement, gulleying or dune passage. The other 95% is orange/red loamy sand.

Erosion & Soil Redist.
ribution.

Wind movement of sand with both removal & deposition taking place, appreciable sheet erosion down slopes & movement down drainage channels.

Dunes.

The whole LSU is a stabilised dune area and retains the micro relief of the dune bases. Some small mobile dunes seen in the area & not separated out into LSU 22-54.

Field Notes.

ECOLOGICAL CLASSIFICATION.

COASTAL WOODY ASSOCIATIONS.

TAXONOMIC FEATURES.

TREES.

Medium to dense.

Common Species.

Terminalia kelleri Acacia tortilis Acacia sp.,
Delonix elata; Dobera glabra.

SHRUBS.

Medium to dense.

Common Species.

Commiphora spp. Loewia glutinosa, Iphiaea
rotundifolia, Jatropha sp. Acacia mellifera,
Dichrostachys sp. Cadaba spp. Commiphora spp.
Acacia benadirensis Dalbergia microphylla;
Dichrostachys sp. Erythrochlamys spectabilis;
Cadaba heterotricha, Cadaba sp. Euphorbia
cuneata, Hildebrandtia sp. Boswellia sp.,
Commiphora rostrata Kleinia sp., Euphorbia spp.

GRASSES & HERBS.

Medium.

Common Species.

Aristida sp., Tetropogon spatteus Heteropogon
contortus Cyperus sp. Sporobolus sp. Sarcostemma sp.
Kelleronia sp. Adenia sp. Caralluma sp.
Abutilon sp. Indigofera ruspolii, Jatropha sp.
Solanum sp. Crotalaria sp. Sansevieria sp.,
Euphorbia sp. Vernonia sp. Ipomoea sp. Latipes
senegalensis, Panicum sp. Eragrostis sp.
Cynodon dactylon.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

No obvious patterns except for the different regenerative stages on old cropping areas.

Density & Canopy.

Dense Acacia Terminalia wooded Commiphora shrub-land. Cover 85-90% With areas of short sub-coastal plateau grassland. Cover 60-70%.

Termitaria.

Nil.

Herbivore Tracks.

Very high density of tracks.

Cropping.

Medium density of cropping on flatter parts of LSU.

ECOLOGICAL CLASSIFICATION.

CULTIVATED STABILISED SAND DUNES.

TAXONOMIC FEATURES.

TREES.

Sparse.

Common Species.

Delonix elata Acacia tortilis Acacia mellifera

SHRUBS.

Dense to medium.

Common Species.

Acacia nilotica subsp. subalata Acacia reficiens subsp. misera Acacia sp. aff. senegal Euphorbia cuneata, Ipomoea donaldsonii Sesamothamnus sp. Euphorbia longispina Acacia horrida subsp. benadirensis Commiphora spp. Dobera glabra Jatropha sp. Psilotrichum sp. Cassia sp. Dalbergia sp. Dichrostachys sp. Gaesalpineae sp. Kleinia sp. Hartogea aquifolia; Hildebrandtia sp.

GRASSES & HERBS.

Sparse.

Common Species.

Indigofera sp. Indigofera ruspolii Aerva lanata Cenchrus sp. Cyperus sp. Dactyloctenium scindicum Latipes senegalensis Solanum sp. Sida sp. Notonia sp. Ipomoea sp. Allophylus sp. Vernonia sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

No pronounced pattern. Larger trees tend to be concentrated along the banks of the drainage channels, old cropping patterns have imposed their own patterns.

Density & Canopy.

Dense to medium Acacia Commiphora shrubland with scattered trees, much modified by cropping & the various stages of regeneration. Cover 60%.

Termitaria.

Low densities of conical termitaria.

Herbivore Tracks.

Very high densities.

Cropping.

Medium to high densities of cropping.

PHYSIOGNOMIC FEATURES.

Altitude Range.

120 - 260.

LSU. 62 (Cont).

Topography.

Gentle slopes from SE to NW, which are more pronounced to the east of the LSU. The micro relief is typical evidence of a stabilised dune field.

Drainage System Features.

Well developed network of drainage channels with some gulleying particularly-in the east on the steeper slopes.

Water Sources.

Very low densities of wells & ballehs.

Soils & Rocks.

Exposures of weathered nodular limestones cover 2-5%. Very pale sands cover the remaining 95-98%.

Erosion & Soil Redist-
ribution.

Wind movement of surface sand us a very significant phenomen, and the surface can be considered to be under constant movement. Algal "fixation" in these circumstances is particularly relevant.

Dunes.

No mobile dunes in the LSU, but the whole area is an old stabilised dune field.

Field Notes.

LSU. 63.

ECOLOGICAL CLASSIFICATION.

CENTRAL SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.

TREES.

Sparse.

Common Species.

Acacia sp.

SHRUBS.

Dense.

Common Species.

Cadaba glandulosa; Commiphora sp. Dichrostachys spp.
Acacia edgeworthii Sesamothamnus sp. Jatropha sp.
Boscia coriacea, Euphorbia sp. Cissus sp. Acacia
benadirensis.

GRASSES & HERBS.

Medium to sparse.

Common Species.

Pavonia spp.; Indigofera spp. Iphiona rotundifolia
Aristida sp. Merremia sp. Melhania sp. Indigofera
ruspolii.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

No obvious patterns.

Density & Canopy.

Medium to dense Acacia Commiphora dwarf shrub-
land in mosaic with medium density short Acacia
Commiphora dwarf shrub Indigofera herbland.
Cover 60%.

Termitaria.

Nil.

Herbivore Tracks.

Low densities.

Cropping.

Medium to low densities of cropping on pale sands.

PHYSICAL CHARACTERS.

Altitude Range.

330 - 100.

Topography.

Flat with very gentle W to E slopes in the
western parts giving way to a flat region in
the east (an internal drainage system).

LSU. 63 (Cont).

The land starts to rise again at the far western border of these LSU's. Micro relief is less well developed than for LSU's 6-88, but there are some slight undulating patterns associated with limestone bands. Exposed gypsums occur throughout the region at the bottom of shallow depressions.

Drainage System Features.

Very little drainage development.

Water Sources.

Medium densities of wells and ballehs.

Soils & Rocks.

All LSU's comprise stony limestone surfaces (with very few massive pavements) (5-20%), red-orange toned sands (75-90%) and gypsums (5%). The sands in the W are medium reddish orange, but become paler in the E. Limestones virtually non existent in the E (LSU 63 & 85).

Erosion & Soil Redistribution.

Nil.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION. TRANSITIONAL S. LIMESTONE. S. GYPSUMS.

TAXONOMIC FEATURES.

Limestones & pale orange sands.

- TREES. Sparse.
 - Common Species. Acacia tortilis Commiphora spp.
 - SHRUBS. Medium.
 - Common Species. Commiphora spp. Dalbergia sp. Euphorbia sp. Merremia sp. Cassia sp. Acacia edgeworthii Jatropha sp.
 - GRASSES & HERBS. Sparse.
 - Common Species. Indigofera sp. Barleria sp. Eragrostis sp. Aristida sp.
-

Gypsums & pale gypseous soils.

- TREES. Sparse.
 - Common Species. Boscia minimifolia Salvadora persica Commiphora sp. Acacia tortilis Sesamothamnus sp.
 - SHRUBS. Sparse to medium.
 - Common Species. Commiphora sp. Commicarpus reniformis Salvadora persica; Jatropha sp. Euphorbia sp. Ipomoea donaldsonii Cleome sp. Dobera glabra
 - GRASSES & HERBS. Medium.
 - Common Species. Chrysopogon aucheri Triumfetta sp. Xylocalyx hispida Indigofera sp. Dactyloctenium scindicum Aristida sp.
-

PHYSIOGNOMIC FEATURES.

- (Limestones & pale orange sands).
- Vegetation Patterns. Rather uniform with a concentration of woody plants on the limestones.
- Density & Canopy. Medium density Commiphora shrubland. Cover 40-50%.

LSU. 64 (Cont)

Termitaria. Medium densities short conical termitaria.

Herbivore Tracks. Low to medium.

Cropping. Nil.

Gypsums & pale gypseous soils.

Vegetation Patterns. Clumps of woody vegetation in small depressions: gypseous soils are covered mainly by herbaceous & grass cover & gypsum exposures by low densities of short herbs.

Density & Canopy. Medium density dwarf shrub herb grassland with isolated clumps of low Commiphora shrubs and trees.

Termitaria. Medium densities of pillar type.

Herbivore Tracks. Medium to high.

Cropping. Nil.

PHYSICAL CHARACTERS.

Altitude Range. 250 - 170.

Topography. Very gentle NW/SE slope numerous shallow depressions, associated with gypsum exposures, and some micro relief at boundaries between limestones & gypsums.

Drainage System Features. No channel development.

Water Sources. Medium to high densities of ballehs, medium densities of wells.

Soils & Rocks. A transitional area between limestones & evaporites with complex interfaces throughout. Cover is approx. 30% limestone (mostly fragmented surfaces) 30% pale orange sands, 20% gypsums & 20% pale gypseous soils. Patterns are complex between these type.

Erosion & Soil Redistribution. None.

Dunes. None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

COASTAL WOODY ASSOCIATIONS.

TAXONOMIC FEATURES.

TREES.

Dense to medium.

Common Species.

Terminalia kelleri Acacia tortilis Acacia sp.,
Delonix elata; Dobera glabra Sterculia sp.
Entada sp.

SHRUBS.

Dense.

Common Species.

Commiphora spp. Loewia glutinosa, Iphiona rotundifolia, Jatropha sp. Acacia mellifera, Dichrostachys sp. Cadaba spp. Commiphora spp. Acacia benadirensis Dalbergia microphylla; Dichrostachys sp. Erythrochlamys spectabilis; Cadaba heterotracha, Cadaba sp. Euphorbia cuneata, Hildebrandtia sp. Boswellia sp. Commiphora rostrata Kleinia sp. Euphorbia spp. Gardenia sp. Acacia reficiens subsp. miseria, Buxus hildebrandtii, Jatropha sp. Ghiakaea speciosa Anisotes sp. Triumfetta sp. Omnocarpum sp. Acacia spp.

GRASSES & HERBS.

Sparse.

Common Species.

Barleria sp. Indigofera sp. Heteropogon contortus Cenchrus sp. Latipes senegalensis Tephrosia sp. Hartogea aquifolia.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Very dense woody vegetation & thickets in valleys and on valley sides (cliffs & gorge sides); some patterning as a result of regeneration on old cropping areas.

Density & Canopy.

Dense wooded Acacia shrubland with dense woodland and thicket woodland associated with drainage system.

Termitaria.

Nil.

Herbivore Tracks.

Very high density of tracks.

Cropping.

Medium density of cropping on flatter parts of LSU.

PHYSICAL CHARACTERS.

Altitude Range. 220 - 90.

Topography. Steep NW to SE slopes dissected by numerous deep channels, with cliffs, and gorges developing.

Drainage System Features. A very deeply incised network of drainage channels which have out through the limestone, creating deep gorges, with cliffs.

Water Sources. Nil.

Soils & Rocks. Upper slopes and drainage channels show limestone surfaces (60-70%). The rest is covered by fine pale sand (30-40%).

Erosion & Soil Redistribution. Wind movement of sand with both removal & deposition taking place, appreciable sheet erosion down slopes & movement down drainage channels.

Dunes. The lower slopes are covered by stabilised sand dunes; upper slopes have little sand cover.

Field Note.

ECOLOGICAL CLASSIFICATION.

COASTAL WOODY ASSOCIATIONS.

TAXONOMIC FEATURES.TREES.

Dense to medium.

Common Species.

Terminalia kelleri Boswellia sp. Albizzia sp.
Sesamothamnus sp. Acacia tortilis Erythrochlamys sp.
Dobera glabra.

SHRUBS.

Dense.

Common Species.

Commiphora spp. Dalbergia sp. Premna resinosa,
Grewia sp. Hildebrandtia sp. Allophylus sp.
Acacia nilotica, Acacia sp. aff. benadirensis,
Acacia sp. aff. edgeworthii, Kleinia sp.
Croton sp.

GRASSES & HERBS.

Sparse to medium.

Common Species.

Aloe sp., Rhynchosia sp. Kelleronia sp. Cissus sp.
Euphorbia sp. Abutilon sp. Sansevieria sp.
Cenchrus sp. Dactyloctenium scindicum Eragrostis sp.
Cyperus spp. Latipes senegalensis.

PHYSIOGNOMIC FEATURES.Vegetation Patterns.

No obvious patterns except for the different stages of regeneration on old cropping areas.

Density & Canopy.Dense Terminalia Acacia wooded Acacia Commiphora shrubland. Cover 85%.Termitaria.

Nil.

Herbivore Tracks.

High densities of tracks.

Cropping.

Medium to high densities of cropping.

PHYSICAL CHARATERS.Altitude Range.

370 -160.

LSU. 66 (Cont).

Topography.

Medium to gentle SE to NW slopes with undulations characteristic of consolidated dunes.

Drainage System Features.

Well developed widely spaced drainage channels without gulleying.

Water Sources.

Very low densities of ballehs & berkads.

Soils & Rocks.

Pale to pale orange sand no limestones.

Erosion & Soil Redistribution.

Some movement of sand down the drainage channels. Appreciable movement of surface sands under wind influence.

Dunes.

The whole LSU is a stabilised dune area and retains the micro relief of the dune bases, some small mobile dunes seen in the area & not separated out into LSU 22-54.

Field Notes.

ECOLOGICAL CLASSIFICATION.

SHEBELLI MIXED LIMESTONES AND HARD ESCARPMENT

TAXONOMIC FEATURES.

TREES.

Sparse to medium

Common Species.

Acacia tortilis Dobera glabra Delonix elata

SHRUBS.

Medium to dense.

Common Species.

Sesamothamnus sp. Grewia sp. Euphorbia
cuneata vel. aff. Acacia edgeworthii Jatropha
dichtar Acacia spp.

GRASSES & HERBS.

Sparse but locally medium to dense.

Common Species.

Indigofera ruspolii Euphorbia sp. Corchorus sp.
Aristida kelleri Enneapogon sp. Chrysopogon sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Trees concentrated along drainage channels; shrubby growth concentrated on limestone & grasses & herbs densest on colluvial slopes & fans.

Density & Canopy.

Medium to dense Commiphora shrubland with scattered Dobra glabra interspread with short annual Aristida Indigofera Chrysopogon shrub herb grassland. Cover 60%.

Termitaria.

Low densities of medium conical types.

Herbivore Tracks.

High densities.

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

450 - 250.

Topography.

Very broken edges of the Haud plateau escarpment facing westwards, with steep (0.25) slopes & less steep secondary colluvial terraces.

(Cont).

Drainage System Features.

Very well developed deeply incised dendritic drainage on steeper limestones, with colluvial fans and wider sandy bedded dry channels on the gentler colluvial slopes.

Water Sources.

One berkad onlynegligible water source densities.

Soils & Rocks.

The upper valley terrace of the Webi Shabeelle: a complex mixture of broken limestone escarpment yellow & red lateritic surfaces, and orange & pale colluvial loamy sands. A series of erosional & despositional cycles is responsible for this mixture. No simple patterns explains todays distribution of materials.

Erosion & Soil Redist-
ribution.

Sheet erosion down steep slopes and appreciable soil movement down the drainage channels and onto alluvial fans.

Dunes.

Small area of wind blown sand close to the main road.

Field Notes.

ECOLOGICAL CLASSIFICATION.

SHEBELLI LIMESTONE.

TAXONOMIC FEATURES.

TREES.

Medium to sparse.

Common Species.

Boswellia sp. Commiphora spp. Boscia
minimifolia Dobera glabra Acacia sp.
Cordia sp. Terminalia sp.

SHRUBS.

Medium to dense.

Common Species.

Acacia seyal Euphorbia spp. Acacia misera
Crewia sp. Maerua sp. Commiphora spp

GRASSES & HERBS.

Sparse.

Common Species.

Polygala sp. Chloris sp. Pavonia spp.
Sporobolus sp. Seddera sp. Enneapogon sp.
Cassia sp. Aristida Kelleri Latipes sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Steeper slopes have less soil but higher densities of woody vegetation. More extensive colluvial areas have low densities of woody species & medium herbaceous/grass cover.

Density & Canopy.

High density Acacia Commiphora shrubland with scattered trees. Cover 70%.

Termitaria.

Nil.

Herbivore Tracks.

Medium to high densities.

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

350 - 180.

Topography.

Very steeply (0.25) sloping edges to residual limestone paleaux, with secondary scarps. Some less broken country of colluvial soils.

Drainage System Features.

Narrow deeply incised dendritic drainage system feeding into wider sandy bedded dry channels.

(Cont).

Water Sources.

Very low densities of wells & ballehs.

Soils & Rocks.

Massive grey & pink toned limestones and fragmented limestone surfaces cover 90% of surface. Weathered blocks of yellowish laterite widespread on limestone surfaces. Small patches of pale orange colluvial soils in the limestone hills, and more extensive alluvial areas on secondary terraces.

Erosion & Soil Redistribution.

Sheet erosion down the steep; much movement down the drainage channels.

Dunes.

Field Notes.

ECOLOGICAL CLASSIFICATION.

SHEBELLI PALE ALLUVIUMS.

TAXONOMIC FEATURES.

TREES.

Very sparse.

Common Species.

Acacia tortilis Boscia minimifolia.

SHRUBS.

Sparse.

Common Species.

Commiphora spp. Acacia seyal, Acacia nubica,
A. stuhlmanii, A. benadiensis, A. reficiens
subsp. miseria Grewia sp. Cissus quadrangularis,
Cassia sp. Ziziphus hamur Anisotes sp.
Salvadora persica, Geralluma sp. Aloe sp.

GRASSES & HERBS.

Sparse to medium.

Common Species.

Dactyloctenium scindicum Cyperus sp. Latipes
senegalensis Pavonia spp. Cleome brachycarpa
Indigofera sp. Solanum sp. Heliotropium sp.
Tribulus sp. Crotalaria sp. Elepharis sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Almos all the LSU has been cropped & the
vegetation pattern reflects only the present
patternd & recent history of cropping.

Density & Canopy.

Under the influences of cropping the vegetation
is a low density regenerating short herb grass-
land with scattered trees, shrubs and small
shrub thickets in a mosaic with crop fields
& fallows fields. Cover 40%.

Termitaria.

Nil.

Herbivore Tracks.

Very high densities.

Cropping.

Very high densities of cropping.

PHYSICAL CHARACTERS.

Altitude Range.

190 - 120.

LSU. 69, 70, 83 (Cont).

Topography.

Very gentle sloping beds of alluvial deposits with negligible micro relief.

Drainage System Features.

The Webi Shabeelle flows from N to S through LSU's 69 & 70 in a natural valley incised about 10-15m below the first valley terrace. Colluvial fans and a few wide dry channels enter the terrace (chiefly from the eastern side) at widely spaced intervals representing a relatively undeveloped tributary system.

Water Sources.

The river is the principal source of water in the area. Densities of wells & ballehs are very low & there are no berkads or bore holes.

Soils & Rocks.

Stony mantled limestone fragments, gravels & coarser particles cover 5% of the surface. The rest is a mixture of pale grey, pale orange & chestnut brown (mostly LSU 83) alluvial and colluvial deposits.

Erosion & Soil Redistribution.

Colluvial fans sweep soils from the surrounding limestones into the Shabeelle valley. The river itself carries heavy silt loads.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

CULTIVATED STABILIZED SAND DUNES.

TAXONOMIC FEATURES.

TREES.

Sparse.

Common Species.

Delonix elata Acacia tortilis Acacia mellifera

SHRUBS.

Medium.

Common Species.

Acacia nilotica subsp. subalata Acacia reficiens subsp. miseria Acacia sp. aff. senegal Euphorbia cuneata, Ipomoea donaldsonii Sesamothamnus sp. Euphorbia longispina Acacia horrida subsp. benadirensis Commiphora spp. Dobera glabra Grewia tenax, Balanites sp. Cissus, Salvadora perscia Acacia edgeworthii.

GRASSES & HERBS.

Sparse to medium.

Common Species.

Indigofera sp. Indigofera ruspolii Aerva lanata Cenchrus sp. Cyperus sp. Dactyloctenium scindicum Latipes senegalensis Solanum sp. Sida sp. Barleria sp. Pavonia spp. Vernonia sp. Aristida sp. Enneapogon sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Old crop areas dominate the patterning of vegetation with a mosaic of regenerating patches at different phases.

Density & Canopy.

Medium density Acacic Commiphora shrubland with scattered trees. Cover 60-65%.

Termitaria.

Nil.

Herbivore Tracks.

Very high densities of tracks.

Cropping.

High densities of cropping.

PHYSICAL CHARACTERS.

Altitude Range.

90 - 280.

LSU. 71 (Cont).

Topography.

A flat saucer shaped depression with very gentle slopes in from the E & W. A distinct micro-relief of dune remnants is evident.

Drainage System Features.

No surface drainage development except in the extreme east, where steeper slopes bring rain water run-off from the coastal ridge.

Water Sources.

Very low densities of ballehs berkads & bore holes.

Soils & Rocks.

Exposed weathered nodular limestones cover less than 1% of the area - the rest of the surface is very pale orange sand, with strips of paler sand.

Erosion & Soil Redistribution.

Wind movement of surface sand is a very significant phenomenon, and the surface can be considered to be under constant movement. Algal "fixation" in these circumstances is particularly relevant.

Dunes.

A few small mobile dunes are seen in this LSU. Otherwise the area is an old stabilised dune field.

Field Notes.

ECOLOGICAL CLASSIFICATION.

COASTAL GRASSLANDS ON STABILIZED SAND DUNES.

TAXONOMIC FEATURES.

TREES.

Sparse to medium (above 200m).

Common Sparse.

Terminalia kelleri Commiphora spp. Acacia sp.

SHRUBS.

Sparse to medium.

Common Species.

Kleinia spp. Commiphora spp. Acacia sp. aff. senegal Premna resinosa.

GRASSES & HERBS.

Medium.

Common Species.

Cenchrus sp. Aristida sp. Heteropogon contortus
Lauraea sp. Commeluna sp. Anilema sp. Indigofera sp.
Helichrysum sp. Grewia sp. Evolvulus sp.
Pentanisia sp. Melhania sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Clumps of trees & bushes in micro thickets. Also woody vegetation concentrated in drainage lines.

Density & Canopy.

A mosaic of medium density short herb grassland (sub-coastal plateau grassland type) and medium density short Terminalia scattered tree Acacia Commiphora shrub thicket grassland. Cover 50-60%.

Termitaria.

Nil.

Herbivore Tracks.

High densities of tracks.

Cropping.

Nil.

PHYSICAL CHARACTERS.

Altitude Range.

380 - 0.

(Cont).

LSU. 72 (Cont)Topography.

Fairly steep NW to Se slopes from the limestone ridge down to the coastline. An undulating micro relief associated with an ancient dune landscape is apparent. A secondary limestone ridge lies between the primary ridge & the sea.

Drainage System Features.

A deeply incised and dense network of drainage channels, with much gulleying on steeper slopes. Most of the channels do not reach the coast, but peter out as sandy fans.

Water Sources.

Medium to high densities of well & ballehs.

Soils & Rocks.

Pink coastal limestone (as eroded pavements) cover 10%. The rest is very pale white sand & very pale pink sand.

Erosion & Soil Redistribution.

Some sheet erosion and movement of soil down the drainage channels on steeper slopes. The strong monsoonal winds (NxNE; SxSW) move the surface sands over the whole area, & dunes have been formed where local conditions so dictate. There is probably appreciable sheet movement of sands through wind influences, but the net annual effect will be relatively slight (see section 3).

Dunes.

Large mobile dunes have been separated out as LSU 51, 52, 53 & 54. Some small mobile dunes (notably at the shore line) remain in LSU's 18-60. Fossil dunes which have been stabilised for long periods constitute the major surface type.

Field Notes.

ECOLOGICAL CLASSIFICATION.

COASTAL WOODY ASSOCIATIONS.

TAXONOMIC FEATURES.

TREES.

Medium to sparse.

Common Species.

Terminalia kelleri Boswellia sp.
Erythrochlamys sp. Albizzia sp.

SHRUBS.

Dense.

Common Species.

Commiphora spp. Dalbergia sp. Premna resinosa,
Grewia sp. Hildebrandtia sp. Allophylus sp.
Acacia nilotica, Acacia sp. aff. benadriensis,
Acacia sp. aff. edgeworthii, Kleinia sp.,
Croton sp. Solanum sp. Gardenia sp. Maerua sp.
Indigofera sp.

GRASSES & HERBS.

Sparse.

Common Species.

Aloe sp. Rhynchosia sp. Kelleronia sp. Cissus sp.
Euphorbia sp. Abutilon sp. Sansevieria sp.
Cenchrus sp. Dactyloctenium scindicum Eragrostis sp.
Cyperus spp. Latipes senegalensis Aristida sp.
& Cyperus sp. of the grass edges.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

No obvious patterns rather uniform distributions except for old cropping areas.

Density & Canopy.

Dense Acacia Commiphora shrubland with scattered trees. Cover 85%.

Termitaria.

Nil.

Herbivore Tracks.

High densities of tracks.

Cropping.

Low to medium densities of cropping. but ancient cropping scars very widespread & abundant.

PHYSICAL CHARACTERS.

Altitude Range.

380 - 160.

LSU. 73 (Cont).

Topography.

Medium to gentle slopes on both axes, since this LSU is positioned on the coastal ridge watershed. Undulations.

Drainage System Features.

A very widely spaced distribution of drainage channels with some minor gulleying.

Water Sources.

Very low densities of wells & berkads.

Soils & Rocks.

Pale orange to medium orange sands - no limestones.

Erosions & Soil Redistribution.

Some movement of sand down the drainage channels. Appreciable movement of surface sands under wind influence.

Dunes.

The whole LSU is a stabilised area and retains the micro relief of the dune bases.

Field Notes.

ECOLOGICAL CLASSIFICATION.

HAUD TYPE.

TAXONOMIC FEATURES.

TREES.

Sparse to medium.

Common Species.

Acacia tortilis Delonix elatata Albizia anthelmintica Acacia bricchettiana.

SHRUBS.

Dense.

Common Species.

Acacia edgeworthii Cordia sp. Grewia sp. Commiphora spp. Cordyla somalensis cordeauxia edulis Solanum sp. Acacia benadirensis, Dichrostachys benadirensis Erthrochlamys spectabilis Acacia nilotica, A. nubica, Acacia sp. Solanum spp. Sesamothamnus sp. Euphorbia sp. aff. cuneata, Boswellia sp. Dalbergia microphylla Gardenia florii.

GRASSES & HERBS.

Sparse to medium.

Common Species.

Indigofera spinosa, I. ruspolii Corchorus sp. Aerva persica Solanum sp. Aristida kelleri, Cassia spp. Blepharis sp. Tephrosia obbiadensis Jatrophia sp. Melhania sp. Iphiaona sp. Abutilon spp. Ipomoea sp. Pavonia sp. Cenchrus sp. Latipes senegalensis, Aristida sp. Cromcarpum sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Very uniform distribution of vegetation, but old burnt patches evident as low densities of all cover types.

Density & Canopy.

Dense Acacia Commiphora shrubland with scattered trees. Cover 70%.

Termitaria.

Nil.

Herbivore Tracks.

Medium to low density of tracks.

Cropping.

Very low densities of cropping.

PHYSICAL CHARACTERS.

Altitude Range. 380 - 150.

Topography. In the north gentle W to E slopes; in the south gentle SW to NE slopes.

Drainage System Features. No development of surface channels.

Water Sources. Very low densities of ballehs & wells.

Soils & Rocks. No limestone exposures; the surface is orange to pale orange silty sand compacted & slightly cemented in the north, less compacted & not cemented in the south.

Erosion & Soil Redistribution. Some wind movement, particularly in the south where compaction of surface is less widespread.

Dunes. Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

SHEBELLI MIXED LIMESTONES AND HARD ESCARPMENT

TAXONOMIC FEATURES.

TREES.

Sparse.

Common Species.

Acacia tortilis Dobera glabra Delonix elata

SHRUBS.

Medium to dense.

Common Species.

Sesamothamnus sp. Grewia sp Euphorbia
cuneata vel. aff. Acacia edgeworthii Jatropha
dichtar Acacia spp. Cordyla somalensis

GRASSES & HERBS.

Medium.

Common Species.

Indigofera ruspolii Euphorbia sp. Corchorus s
Aristida kelleri Enneapogon sp. Chrysopogon s
Aerva sp. Melhanian sp. Pavonia spp. Iphia
rotundifolia.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Trees concentrated along drainage channels; shrubby growth concentrated on limestone & grasses & herbs densest on colluvial slopes & fans.

Density & Canopy.

Medium to dense Commiphora shrubland with scattered Dobra glabra interspread with short annual Aristida Indigofera Chrysopogon shrub herb grassland. Cover 60%.

Termitaria.

Low densities of small conical types.

Herbivore Tracks.

High densities.

Cropping.

Appreciable amounts of cropping on gentle colluvial slopes and fans.

PHYSICAL CHARACTERS.

Altitude Range.

350 - 160.

Topography.

Very broken edges of the Haud plateau escarpment facing westwards. Secondary collu valleys.

Drainage System Features.

Very well developed deeply incised dendritic drainage on steeper limestones, with colluvial fans and wider sandy bedded dry channels on the gentler colluvial slopes.

Water Sources.

Low densiteis of wells only.

Soils & Rocks.

The Upper valley terrace of the Webi Shabeelle: a complex mixture of broken limestone escarpment, yellow & red lateritic surfaces, and orange & pale colluvial loamy sands. A series of erosional & despositional cycles is responsible for this mixture. No simple pattern explains todays distribution of materials. High proportion of colluviums and lateritic surfaces.

Erosion & Soil Redist-
ribution.

Sheet erosion down steep slopes and appreciable soil movement down the drainage channels and onto alluvial fans.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

SHEBELLI LIMESTONE

TAXONOMIC FEATURES.

TREES.

Medium to sparse.

Common Species.

Boswellia sp. Commiphora spp. Boscia
minimifolia Dobera glabra Acacia sp.
Acacia tortilis.

SHRUBS.

Dense.

Common Species.

Acacia seyal Euphorbia spp. Acacia misera
Crewia sp. Maerua sp. Commiphora spp.

GRASSES & HERBS.

Sparse.

Common Species.

Polygala sp. Chloris sp. Pavonia spp.
Sporobolus sp. Seddera sp. Enneapogon sp.
Cassia sp. Aristida Kelleri Latipes sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Steeper slopes have less soil but higher densities of woody vegetation. More extensive colluvial areas have low densities of woody species & medium herbaceous/grass cover.

Density & Canopy.

High density Acacia Commiphora shrubland with scattered trees & isolated shrub thickets. Cover 80%.

Termitaria.

Low densities of conical termitaria.

Herbivore Tracks.

Medium to low densities.

Cropping.

Very low densities of cropping on colluvial terraces.

PHYSICAL CHARACTERS.

Atitude Range.

320 - 160.

Topography.

Less steeply sloping, edges to residual limestone plateaux, with secondary scarps. Some less broken country of colluvial soils.

(Cont).

LSU. 76 (Cont).Drainage System Features.

Narrow deeply incised dendritic drainage system feeding into wider sandy bedded dry channels.

Water Sources.

Very low densities of wells & ballehs.

Soils & Rocks.

Massive grey, pink & yellow toned limestones & fragmented limestones over 80% of the area. Orange colluvial soils, yellow lateritic boulders, and red lateritic pavements make up the other 20%.

Erosion & Soil Reist-
ribution.

Sheet erosion down the steep slopes; much movement down the drainage channels.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

SHEBELLI GYPSEOUS ALLUVIUMS

TAXONOMIC FEATURES.TREES.

Medium to sparse.

Common Species.Acacia tortilis Albizia anthelmintica
Euphorbia sp. Cordia sp.SHRUBS.

Dense to medium.

Common Species.Commiphora spp. Acacia mellifera Acacia spp.
Caesalpinia sp. Adenia spp. Salvadora persica
Euphorbia spp. Suaeda micromeris.GRASSES & HERBS.

Medium to sparse.

Common Species.Limonium axillare Urochondra setulosa Asparagus sp.
Senra incana Barleria sp. Crotalaria sp.
Abutilon sp. Heliotropium sp. Dactyloctenium
scindicum Chloris sp. Cyperus spp.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Most complex with saline grassy herbaceous zones, in which there are clumps of trees & bushes mozaiced with denser woody vegetation in which bush thickets occur.

Density & Canopy.Low density saline gypseous short herb grassland with small Acacia Commiphora Euphorbia thickets; dense Commiphora shrubland with scattered shrub/tree thickets. Cover 50%.Termitaria.

Medium density of conical turrered termitaria.

Herbivore Tracks.

High densities.

Cropping.

Low densities of cropping in dark orange alluviums.

PHYSICAL CHARACTERS.Altitude Range.

290' - 120.

LSU. 77 (Cont).

Topography.

Flat with gentle W to E slope - micro relief of ridges, small stony hills & flat shallow depressions.

Drainage System Features.

No well developed drainage system, but depressions in the east of the LSU indicate a stagnating drainage zone.

Water Sources.

Low densities of wells, some berkads & one bore hole.

Soils & Rocks.

A complex combination of exposed gypsums/ anhydrites (10%), pale brown gypseous clays (20%) limestone wide stony ridges & small hills (20-30%) & dark orange alluvial clays (40-50%).

Erosion & Soil Redistribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

SHEBELLI DARK ALLUVIUMS.

TAXONOMIC FEATURES.

TREES.

Very sparse.

Common Species.

Acacia tortilis Boscia minimifolia Terminalia obicularis.

SHRUBS.

Sparse to medium.

Common Species.

Acacia mellifera, Acacia seyal, Cordia sp.
Acacia misera, Commiphora spp. Salvadora persica
Cissus sp. Cadaba glandulosa Caucanthus sp.
Grewia sp. Anisotes sp. Adenia sp.

GRASSES & HERBS.

Sparse to medium.

Common Species.

Senra incana, Blepharis sp. Glossypium Somalense, Sericocomopsis sp. Caralluma sp.
Dactyloctenium scindicum Sporobolus sp.
Indigofera sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Almost all the LSU has been cropped & the vegetation pattern reflects only the present pattern & recent history of cropping.

Density & Canopy.

Medium density regenerating Acacia Commiphora shrubland in mosaic with low density regenerating short herb grassland. Both these types have very scattered trees & shrubs or small shrub thickets. Crop fields & fallow fields make up part of the mosaic. Cover 50-60%.

Termitaria.

Low densities of dark brown conical termitaria.

Herbivore Tracks.

Medium to high densities.

Cropping.

Very high densities of cropping.

PHYSICAL CHARACTERS.

Altitude Range. 240 - 130.

Topography. Very flat with gentle W to E slopes. No micro relief.

Drainage System Features. Some surface channels, shallowly incised, occur at the boundaries of the LSU close to small limestone hills. Otherwise there is no development of surface drainage.

Water Sources. Very low densities of ballehs & wells.

Soils & Rocks. Very dark chestnut brown clays cover 95% of the LSU. Fragmented limestone surfaces cover the other 5%. Some of the clays have a fine manteling of small limestone particles.

Erosion & Soil Redistribution. None.

Dunes. Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

SHEBELLI LIMESTONE

TAXONOMIC FEATURES.

TREES.

Sparse.

Common Species.

Acaica tortilis Cordia sp. Boscia minimifolia
Commiphora spp. Ziziphus hamur.

SHRUBS.

Medium to dense.

Common Species.

Anisotes sp. Grewia sp. Lanea greenwayii
Commiphora spp.

GRASSES & HERBS.

Sparse.

Common Species.

Aerva sp.; Aristida sp. Sida ovata Indigofera
spinosa Glossypium somalense Aristida Kelleri
Sporobolus sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Woody vegetation concentrated on limestones,
more herbs & grasses on the orange loams.

Density & Canopy.

Medium Density Acacia Commiphora shrubland.
Cover 50%.

Termitaria.

Medium densities of conical termitaria.

Herbivore Tracks.

Medium densities.

Cropping.

Very low densities of cropping on colluvial
terraces.

PHYSICAL CHARACTERS.

Atitude Range.

230 - 130

Topography.

Steeply sloping edges to residual limestone
plateaux, with secondary scarps. Some less
broken country of colluvial soils.

Drainage System Features.

Poorly developed drainages.

(Cont).

LSU. 79 (Cont)Water Sources.

Very low densities of wells & ballehs.

Soil & Rocks.

Fragmented limestone surfaces cover 60% of of the surface: the rest is orange toned sandy clay loam with many stones on the surface.

Erosion & Soil Redist-
ribution.

Small areas of sheet erosion.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

TRANSITIONAL S. LIMESTONES. CULTIVATED
STABILIZED SAND DUNES.

TAXONOMIC FEATURES.

Pale yellow sands & old dune tracks.

TREES.

Sparse.

Common Speices.

Acacia tortilis.

SHRUBS.

Sparse to medium.

Common Species.

Acacia sp. Aff senegal Commiphora spp.
Dalbergia sp. Boswellia sp. Ipomoea donaldsonii
Sesamothamnus sp. Grewia sp. Solanum sp.
Cordyla sp.

GRASSES & HERBS.

Dense.

Common Species.

Indigofera ruspolii Tephrosia subtrifolia
Commelina sp. Notonia sp. Iphiona sp. Pavonia sp.
Aristida sp. Cenchrus sp. Tetrapogon sp.

Limestones/orange silty sands.

TREES.

Sparse.

Common Species.

Terminalia orbicularis.

SHRUBS.

Dense.

Common Species.

Anisotes sp. Sesamothamnus sp. Commiphora (7 spp.)
Lanea greenwayii Euphorbia spp. Grewia spp.
Dobera glabra.

GRASSES & HERBS.

Sparse.

Common Species.

Indigofera ruspolii Triumfetta sp. Pavonia spp.
Corchorus sp. Aerva sp.

PHYSIOGNOMIC FEATURES.

Pale yellow sands & old dune tracks.

Vegetation Patterns.

Patterns dominated by disposition of old dune tracks, cropping scars and position of limestone "plates".

Density & Canopy.

Medium density Acacia Commiphora shrubland.
(Cover 40%).

Termitaria.

On orange soils low densities of conical termitaria medium densities of pillar type on pale and orange soils.

(Cont).

Herbivore Tracks. Medium to high densities.

Cropping. Appreciable amount of cropping concentrated on the paler sands.

Limestones/orange silty sands.

Vegetation Patterns. Densest woody vegetation on limestones, densest grass/herbaceous cover on pale sands.

Density & Canopy. High density Commiphora shrubland. Cover 60%.

Termitaria. On orange soils low densities of conical termitaria medium densities of pillar type on pale and orange soils.

Herbivore Tracks. Medium to high densities.

Cropping. Appreciable amount of cropping, concentrated on the paler sands.

PHYSICAL CHARACTERS.

Altitude Range. 160 - 115.

Topography. Gentle W to E slopes with micro relief of shallow depressions & ridges of limestone. Pale sands still show the relics of an old dune field relief.

Drainage System Features. No channel development.

Water Sources. Medium to high densities of ballehs & wells.

Soils & Rocks. A transitional area between limestones, with orange silty sands, pale ancestral dune sands, with occasional exposures of underlying gypsums/anhydrites. Some ancient dune movements have left "tracks" which are still distinguishable as predominately pale sands over weathered lime-cobbled pavements & these constitute LSU 80.

Erosion & Soil Redistribution. None.

Dunes. None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

CULTIVATED STABILIZED SAND DUNES.

TAXONOMIC FEATURES.

TREES.

Sparse to very sparse.

Common Species.

Delonix elata Acacia tortilis Acacia mellifera
Boscia minimifolia.

SHRUBS.

Medium.

Common Species.

Acacia nilotica subsp. subalata Acacia reficiens
subsp. misera Acacia sp. aff. senegal Euphorbia
cuneata, Ipomoea donaldsonii Sesamothamnus sp.
Euphorbia longispina Acacia horrida subsp.
benadirensis Commiphora spp. Dobera glabra
Grewia tenax, Balanites sp. Cissus, Salvadora
persica Acacia edgeworthii Anisotes sp.
Arthrocarpum sp. Hildebrandtia sp.

GRASSES & HERBS.

Medium.

Common Species.

Indigofera sp. Indigofera ruspolii Aerva lanata
Cenchrus sp. Cyperus sp. Dactyloctenium scindicum
Latipes senegalensis Solanum sp. Sida sp.
Barleria sp. Pavonia spp. Vernonia sp. Aristida sp.
Enneapogon sp. Tephrosia sp. Orthosiphon sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Old crop areas dominate the patterning of vegetation with a mosaic of regeneration patches at different phases.

Density & Canopy.

A mosaic of medium density Acacia Commiphora shrubland with medium density Acacia Commiphora shrub herb grassland. Cover 65%.

Termitaria.

Low densities of pillar type.

Herbivore Tracks.

Very high densities of tracks.

Cropping.

High densities of cropping.

PHYSICAL CHARACTES.

Altitude Range.

110 - 280.

Topography.

Very gentle slopes from S to N with a distinct undulating micro-relief characteristic of a stabilised dune field.

Drainage System Features.

No surface drainage development.

Water Sources.

Low densities of ballehs, wells berkads & bore holes.

Soils & Rocks.

Exposed weathered nodular limestones cover less than 1% of the area - the rest of the surface is very pale orange sand, with strips of paler sand.

Erosion & Soil Redist-
ribution.

Wind movement of surface sand is a very significant phenomen, and the surface can be considered to be under constant movement. Algal "fixation" in these circumstances is particularly relevant.

Dunes.

No mobile dunes, although this LSU is an old stabilised dune field.

Field Notes.

Drainage System Features.

No surface drainage.

Water Sources.

Very low densities of ballehs.

Soils & Rocks.

Medium to dark orange sands cover the whole LSU.

Erosion & Soil Redistribution.

Nil.

Dunes.

This LSU is a stabilised dune field. Several small mobile dunes occur just S of the project area.

Field Notes.

ECOLOGICAL CLASSIFICATION.

UNCULTIVATED STABILIZED SAND DUNES.

TAXONOMIC FEATURES.TREES.

Medium to sparse.

Common Species.Boscia minimifolia Delonix elator Acacia tortilis.SHRUBS.

Dense.

Common Species.Commiphora spp. Acacia edgeworthii Acacia benadirensis, Acacia sp. aff. sengal, Dalbergia sp. Kleinia sp. Arthrocarpum sp. Grewia sp. Euphorbia sp. Anisotes sp. Hildebrandtia sp. Sesamothamnus sp.GRASSES & HERBS.

Sparse.

Common Species.Aristida sp. Kelleronia sp. Euphorbia sp. Barleria sp. Aerva sp. Pavonia spp. Melhania sp. Sansevieria sp. Dactyloctenium scindicum.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

Uniformly dense throughout, except where old cropping areas support less dense bush.

Density & Canopy.Dense Acacia Commiphora shrubland with scattered trees. Cover 80%.Termitaria.

Nil.

Herbivore Tracks.

Medium to low densities of tracks.

Cropping.

Very low densities of cropping.

PHYSICAL CHARACTERS.Altitude Range.

240 - 130.

Topography.

Typical stabilised dune undulations - the general slope from E-W is gentle & obscured by the micro-relief.

ECOLOGICAL CLASSIFICATION.

CENTRAL SANDS OVER LIMESTONE

TAXONOMIC FEATURES.

TREES.

Nil.

Common Species.

SHRUBS.

Medium to dense.

Common Species.

Cadaba glandulosa; Commiphora spp.
Dichrostachys sp., Acacia edgeworthii
Sesamothamnus sp. Jatropha sp. Boscia coriacea,
Euphorbia sp. Cissus sp. Cordia sp., Ipomea
donaldsonii Euphorbia cuneata Acacia benadirensis

GRASSES & HERBS.

Medium to sparse.

Common Species.

Pavonia spp.; Indigofera spp. Iphiaea rotundifolia,
Aristida sp. Merremia sp. Melhania sp. Tribulus
terrestris Cenchrus sp., Psilotrichum sp. Latipes
senegalensis Cassia sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

A discernable concentration of woody species in the paler soils and limestones.

Density & Canopy.

Medium Acacia Commiphora dwarf shrubland in mosaic with medium density short dwarf shrub herbland.

Termitaria.

Sparse densities of small conical type.

Herbivore Tracks.

Low densities.

Cropping.

Medium to low densities of cropping on pale sands.

PHYSICAL CHARACTERS.

Altitude Range.

330 - 100.

Topography.

Flat with very gentle W to E slopes in the western parts giving way to a flat region in the east (an internal drainage system).

(Cont).

The land starts to rise again at the far western border of these LSU's. Micro relief is less well developed than for LSU's 6-88, but there are some slight undulating patterns associated with limestone bands. Exposed gypsums occur throughout the region at the bottom of shallow depressions.

Drainage System Features.

Very little drainage development.

Water Sources.

Medium densities of wells and ballehs.

Soils & Rocks.

All LSU's comprise stony limestone surfaces (with very few massive pavements) (5-20%), red-orange toned sands (75-90%) and gypsums (5%). The sands in the W are medium reddish orange, but become paler in the E. Limestones virtually non existent in the E (LUS 63 & 85).

Erosion & Soils Redistribution.

Nil.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

COASTAL PLATEAU GRASSLAND.

TAXONOMIC FEATURES.TREES.

Very sparse.

Common Species.Terminalia kelleri.SHRUBS.

Very sparse.

Common Species.Dobera glabra.GRASSES & HERBS.

Medium to dense.

Common Species.Heteropogon contortus.PHYSIOGNOMIC FEATURES.Vegetation Patterns.

No obvious patterns.

Density & Canopy.Medium density short Heteropogon herb grassland.Termitaria.

Nil.

Herbivore Tracks.

Medium densities of tracks.

Cropping.

Very low densities of cropping.

PHYSICAL CHARACTERS.Altitude Range.

390 - 100.

Topography.

Gentle slopes from the water sheds of the coastal ridge.

Drainage System Features.

A few widely spaced shallow channels.

Water Sources.

Low densities of ballehs and berkads.

(Cont).

LSU. 86 (Cont).

Soils & Rocks.

Pale sands cover 98% of the surface. Limestone exposures over 2% only.

Erosion & Soil Redistribution.

Some sheet erosion on steeper parts of the slopes; the fine silty sands are readily moved by the strong prevailing coastal winds, & small dunes, not isolated as LSU 51 or 53, have formed over small parts of the grassland.

Dunes.

A few small dune areas.

Field Notes.

ECOLOGICAL CLASSIFICATION.

COASTAL WOODY ASSOCIATIONS.

TAXONOMIC FEATURES.

TREES.

Medium.

Common Species.

Terminalia kelleri Acacia tortilis Acacia sp.
Delonix elata; Dobera glabra.

SHRUBS.

Dense.

Common Species.

Commiphora spp. Loewia glutinosa, Iphiona rotundifolia, Jatropha sp. Acacia mellifera, Dichrostachys sp. Cadaba spp. Commiphora spp. Acacia benadirensis Dalbergia microphylla; Dichrostachys sp. Erythrochlamys spectabilis; Cadaba heterotricha, Cadaba sp. Euphorbia cuneata, Hildebrandtia sp. Boswellia sp. Commiphora rostrata Kleinia sp. Euphorbia spp. Salvadora persica, Anisotes sp. Lyceum europeum, Hartogea aquifolia Boscia sp. aff. coriacea, Grewia tenax, Gardenia fiorii Salsola sp., Hildebrandtia sp.

GRASSES & HERBS.

Medium to sparse.

Common Species.

Leucas sp. Anilema sp. Aerva lanata, Crotalaria sp. Asparagus sp. Cenchrus sp. Sporobolus ruspolii Dactyloctenium Scindicum

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Woody vegetation denser along drainage lines and the broken gully sides.

Density & Canopy.

Dense Acacia Commiphora wooded shrubland. Cover 70-80%.

Termitaria.

Nil.

Herbivore Tracks.

High density of tracks.

Cropping.

Very low densities of cropping.

PHYSICAL CHARACTERS.

Altitude Range.

380 - 130.

Topography.

Steep slopes SE to NW, with undulations typical of consolidated dunes. These undulations are virtually obscured by the dense network of deeply incised & gulleyed drainage channels.

Drainage System Features.

A dense network of deeply incised & gulleyed drainage channels flowing to the NW & N.

Water Sources.

Very low densities of ballehs.

Soils & Rocks.

White limestones are exposed by sand removal over 5% of the area. The rest is medium to pale orange sands.

Erosion & Soil Redist-
ribution.

Much sand movement down the drainage lines; some wind movement of surface sand.

Dunes.

The whole LSU is a stabilised dune area and retains the micro relief of the dune bases.

Field Notes.

ECOLOGICAL CLASSIFICATION.

N. SANDS OVER LIMESTONE.

TAXONOMIC FEATURES.

TREES.

Sparse.

Common Species.

Boscia minifolia Acacia sp.

SHRUBS.

Medium.

Common Species.

Acacia edgeworthii A. reficiens subsp. misera
A. horrida subsp. benadirensis Commiphora spp.
Jatropha dichter. Jatropha villosa, Ipomoea
donaldsonii Sesamothamnus.

GRASSES & HERBS.

Medium.

Common Species.

Indigofera ruspolii Aristida sp. Latipes
senegalensis Aerva lanata. Corchorus sp.
Phyllanthus sp. Kelleronia sp. Crotalaria sp.
Cassia sp. Tephrosia sp. Merremia sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Dense woody vegetation & thickets along drainage lines & on limestone surfaces - less dense on the expanses of shallow pale orange sand, but also denser thickets of Acacia on very pale sands.

Density & Canopy.

Medium Jatropha Commiphora dwarf shrubland in a mosaic with medium density dwarf shrub herb-land. Cover 25%.

Termitaria.

Herbivore Tracks.

Cropping.

PHYSICAL CHARACTERS.

Altitude Range.

390 - 60.

(Cont).

Topography.

Flat with gentle NW to SE slopes--slopes becoming steeper in the NW margins of the LSU. Each LSU has a characteristic micro relief related to the limestone structures underlying the sand sheet. LSU's 6, 7, 11, 13, 15 & 17 have a micro relief of gentle undulations associated with the wide narrow bands of limestone (wider in the N, narrower in the S) which are exposed. Other LSU's are more or less flat.

Drainage System Features.

Well developed sandy channels in the north (LSU 6 & 13) gradually petering out as they flow south eastwards. Few drainage channels in the southern LSU's.

Water Sources.

Very low densities in all LSU's except LSU 17 (which has gypseous exposures) & LSU 14.

Soils & Rocks.

All LSU's have a combination of limestones (pavements and fragmented surfaces) and pale orange sands. The fine sands become paler down the slope to the SE, and limestone exposures decrease from 50-60% (as isolated pavements arranged in "waves") in LSU 6 to 2% in LSU 38.

Erosion & Soil Redistribution.

Some sheet erosion and transport of sands down drainage channels in the northern LSU's only.

Dunes.

Nil.

Field Notes.

ECOLOGICAL CLASSIFICATION.

S. LIMESTONE

TAXONOMIC FEATURES.TREES.

Very sparse.

Common Species.Acacia tortilis Commiphora spp. Delonix baccal
Acacia spp. Albizzia sp. Cordia sp.SHRUBS.

Medium.

Common Species.Commiphora spp. Jatropha sp. Crewia sp.
Dalbergia sp. Solamm sp.GRASSES & HERBS.

Sparse.

Common Species.Indigofera spp. Solamm sp. Aristida sp.PYSIOGONOMIC FEATURES.Vegetation Patterns.

Rather uniform, but herbaceous & grassy plants concentrated on the sandy areas, with woody plants on limestone.

Density & Canopy.Medium density Commiphora shrubland. Cover 30%.Termitaria.

Medium densities of conical turreted termitaria and columnar termitaria on orange soils & pillar termitaria on gypseous soils.

Herbivore Tracks.

Medium to low.

Cropping.

Dense cropping.

PHYSICAL CHARACTERS.Altitude Range.

230 - 150.

Topography.

Inperceptible NW/SE slope - numerous shallow depressions and a well developed micro relief associated with wide banding patterns.

(Cont).

Drainage System Features.

Very few drainage channels, and sandy bands (slightly below the limestones) act as drainage zones.

Water Sources.

Medium densities of ballehs and wells.

Soils & Rocks.

Parallel wavy wide bands of limestone (mostly fragmented stones on surface) and orange toned sands. Sands cover 40% of the area. A few gypsum exposures in small depressions, with gypsum more wide spread on the eastern boundary of the LSU, with 1-2% of gypseous soils. Also soils pale orange than LSU. 47.

Erosion & Soil Redist-
ribution.

None.

Dunes.

None.

Field Notes.

ECOLOGICAL CLASSIFICATION.

ELEVATED CULTIVATED COASTAL STABILIZED SAND DUNES.

TAXONOMIC FEATURES.

TREES.

Sparse to medium.

Common Species.

Terminalia kelleri Boswellia sp.
Erythrochlamys sp. Albizia sp.

SHRUBS.

Dense.

Common Species.

Commiphora spp. Dalbergia sp. Premna resinosa,
Grewia sp. Hildebrandtia sp. Allophylus sp.
Acacia nilotica, Acacia sp. aff. benadirensis,
Acacia sp. aff. edgeworthii Kleinia sp. Croton sp.
Solanum sp. Gardenia sp. Maerua sp. Indigofera sp.

GRASSES & HERBS.

Medium.

Common Species.

Aloe sp. Rhynchosia sp. Kelleronia sp. Cissus sp.
Euphorbia sp., Abutilon sp. Sansevieria sp.
Cenchrus sp. Dactyloctenium scindicum Eragrostis sp.
Cyperus spp. Latipes senegalensis Aristida sp.
& Cyperus sp. of the grass edges.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Most of the LSU has been cropping in the recent past & the vegetation in consequence is a mosaic of small patches at various stages of regeneration. Fallow & recently abandoned fields have good grass/herb cover. (Cover of "undisturbed" vegetation 85%; cover on old fields 20-70%).

Density & Canopy.

Dense Acacia Commiphora shrubland with scattered trees, much modified by cropping.

Termitaria.

Nil.

Herbivore Tracks.

High densities of tracks.

Cropping.

Very high densities of cropping.

(Cont).

PHYSICAL CHARACTERS.

Altitude Range.

400 - 220.

Topography.

Medium to gentle slopes SE to NW, with undulations characteristic of consolidated dunes.

Drainage System Features.

Well developed but widely spaced distribution of drainage channels with some gulleying.

Water Sources.

Very low densities of berkads.

Soils & Rocks.

Pale to medium orange sands cover most of the LSU. Limestone exposures only cover 2% of the area.

Erosion & Soil Redistribution.

Some movement of sand down the drainage channels. Appreciable movement of surface sands under wind influence.

Dunes.

The whole LSU is a stabilised dune area and retains the micro relief of the dune bases.

Field Notes.

ECOLOGICAL CLASSIFICATION.

CULTIVATED STABILIZED SAND DUNES.

TAXONOMIC FEATURES.

TREES.

Sparse to very sparse.

Common Species.

Delonix elatata Acacia tortilis Acacia mellifera

SHRUBS.

Medium.

Common Species.

Acacia nilotica subsp. subalata Acacia reficiens
subsp. miserata Acacia sp. aff. senegal Euphrobia
cuneata, Ipomoea donaldsonii Sesamothamnus sp.
Euphorbia longispina Acacia horrida subsp.
benadirensis Commiphora spp. Dobera glabra
Grewia tenax, Balanites sp. Cissus Salvadora
persica Acacia edgeworthii.

GRASSES & HERBS.

Medium.

Common Species.

Indigofera sp. Indigofera ruspolii Aerva lanata
Cenchrus sp. Cyperus sp. Dactyloctenium scindicum
Latipes senegalensis Solanum sp. Sida sp.
Barleria sp. Pavonia spp. Vernonia sp. Aristida sp.
Enneapogon sp.

PHYSIOGNOMIC FEATURES.

Vegetation Patterns.

Old crop areas dominate the patterning of vegetation with a mosaic of regeneration patches at different phases.

Density & Canopy.

A mosaic of medium density Acacia Commiphora shrubland with medium density Acacia Commiphora shrub herb grassland. Cover 50-60%.

Termitaria.

Nil.

Herbivore Tracks.

Cropping.

Medium to high densities of cropping.

(Cont).

PHYSICAL CHARACTERS.

Altitude Range.

10 - 280.

Topography.

A gentle NW to SE slope; micro relief as for LSU 81.

Drainage System Features.

A few incised drainages on steeper slopes with gulleys.

Water Sources.

Low densities of ballehs, wells & bore holes.

Soils & Rocks.

Exposed weathered nodular limestones cover less than 1% of the area the rest of the surface is very pale orange sand, with strips of paler sand.

Erosion & Soil Redistribution.

Wind movement of surface sand is a very significant phenomenon, and the surface can be considered to be under constant movement. Algal "fixation" in these circumstances is particularly relevant. In addition, there is some sheet erosion down steeper slopes, and minor movement of sand down the drainage channels.

Dunes.

A few small mobile dunes are found in this LSU, which is an old stabilised dune field.

Field Notes.