

Oxbow Swamp

Lakefield National Park



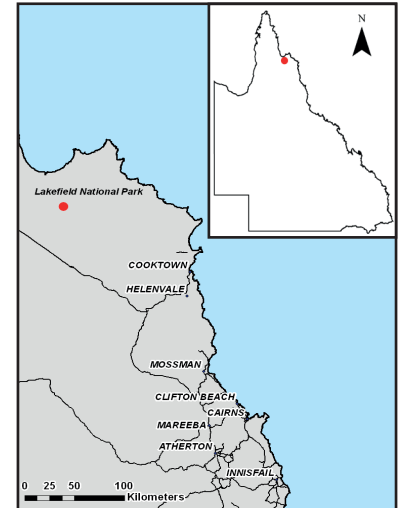
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Study Area

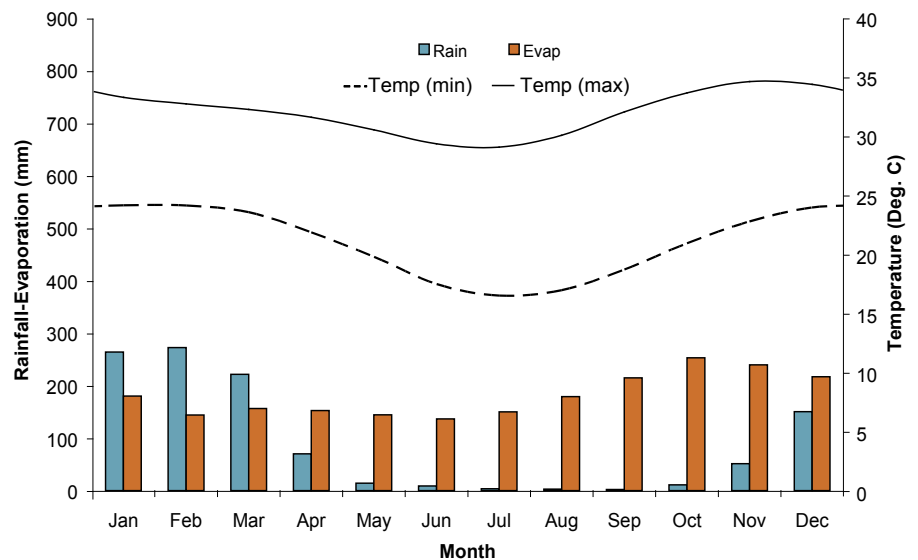
Lakefield National Park is the second largest national park in Queensland. Its centre is approximately 160 km north-west of Cooktown, Northern Queensland.

The area is predominantly alluvial plains, old stream channels, infilled prior stream channels and shallow lagoons which are seasonally inundated¹.

This study area is an example of a coastal and sub-coastal floodplain grass, sedge, herb swamp within the Cape York Peninsula Bioregion.



Climate²



The study area is situated in a tropical/equatorial climatic region with a distinct wet and dry season. Evaporation exceeds rainfall in the majority of months. The average annual rainfall for the area is 1070 mm.

Landform and Inundation	Oxbow drainage depression on alluvium Freshwater seasonally inundated areas from overland flow
Soils³	Hydrosols and Kandosols
Vegetation⁴	<i>Corymbia clarksoniana</i> with or without <i>Corymbia papuana</i> woodland on alluvial plains (RE 3.3.18)
Geology⁵	Quaternary alluvium
Disturbance	No effective disturbance except grazing by hoofed animals



Australian Government

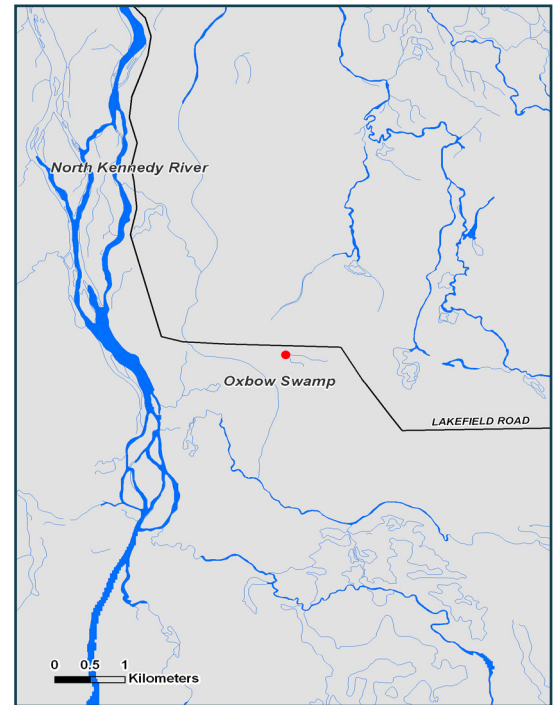


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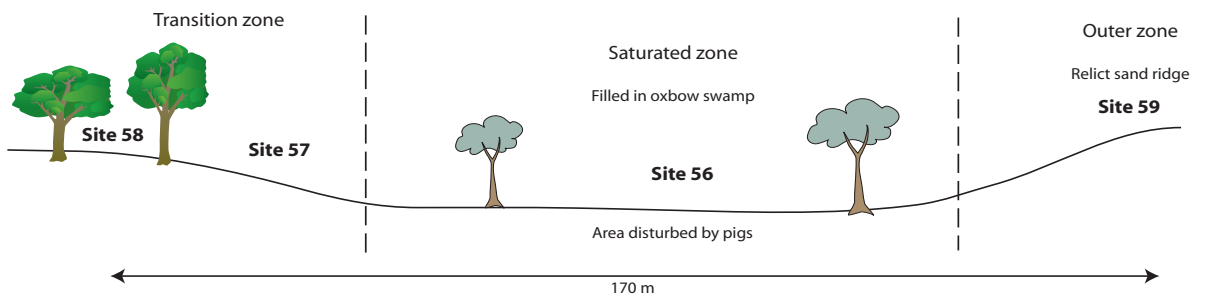
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Location

GDA94 • MGA Coordinates : 188696 E, 8358929 N, Zone 55 • Lat/Long : -14.82580 S, 144.10775 E

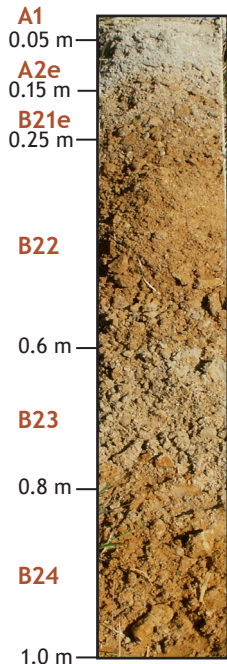


Landscape Diagram



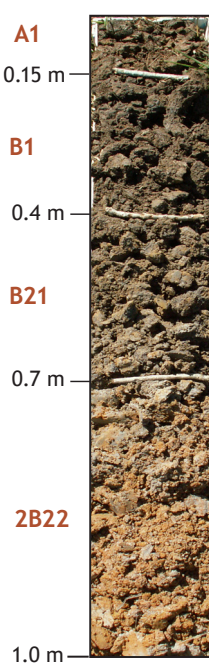
Soil Profiles

Site 57



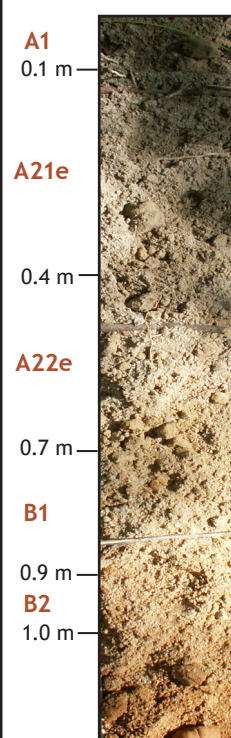
Mottling and ferruginous root channel linings suggest water fluctuation throughout profile

Site 56



Higher organic carbon content, mottling and ferruginous root channel linings indicate a seasonally inundated area

Site 59



Few wetland soil indicators observed
Lack of indicators implies this area does not become saturated or inundated
Faint mottling most likely due to the local hydro-pedological environment

Soil Indicators Present (within 0.3 m of surface)

Indicator ⁶	Site 56	Site 57
Organic materials and organic carbon (OC)*	No organic materials OC: 1.77%	No organic materials OC: 0.98%
Matrix colour	Greyish brown	Grey to brown
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.3 m)
Mottles and Segregations	Common <5 mm distinct orange mottles	Few <5 mm prominent orange mottles Many <5 mm distinct pale mottles
Depth to groundwater	Not present	Not present
Ferruginous root channel and pore linings	Present	Present
pH* ⁷	Very strongly acid	Very strongly acid
Texture	Silty light clay to silty light medium clay	Silty clay loam to silty light medium clay
Acid sulfate material	Not present	Not present
Electrical Conductivity (EC) ⁷	Non saline	Non saline
Indicator ⁶	Site 58	Site 59
Organic materials and organic carbon (OC)*	No organic materials OC: 0.97%	No organic materials OC: 0.92
Matrix colour	Grey to brown	Greyish brown to brownish grey
Chroma (thickness of layer)**	Present (0.15 m)	Present (0.3 m)
Mottles and Segregations	Few <2 mm ferromanganiferous nodules Few <5 mm faint orange mottles	Few <5 mm faint yellow mottles
Depth to groundwater	Not present	Not present
Ferruginous root channel and pore linings	Present	Not present
pH* ⁷	Very strongly acid	Strongly acid
Texture	Silty loam to silty light clay	Loamy sand
Acid sulfate materials	Not present	Not present
Electrical Conductivity (EC) ⁷	Non saline	Non saline

*Organic carbon % (Dumas method) and pH taken from surface (0-0.1 m)

**Chroma value is less than or equal to 2

Summary of Field Observations

- Mottling observed within surface 0.3 m and at depth indicates water fluctuation throughout profiles
- Ferromanganiferous segregations and ferruginous root channel linings indicative of seasonally inundated areas in the saturated and transition zone
- Higher organic carbon levels in the saturated zone indicate waterlogged conditions and is the most compelling indicator of a wetland soil at this location
- Scattered *melaleuca* spp. reflect intermittent inundation
- Low chroma and faint mottling in outer zone reflect the regional hydrogeological environment, as the landscape is seasonally saturated this may lead to low chroma values and mottling in soils outside the wetland environment



Soil Morphology

Site 56			Classification				Australian Soil Classification				Vertic, Dermosolic, Redoxic Hydrosol								
			Landform Element				Landform Element				Swamp								
			Morphological Type				Morphological Type				Flat								
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence	Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence
A1	0 to .15	clear to	silty light clay	dark greyish brown (10YR42)	many (20-50%) fine (<5 mm) distinct orange mottles	none	moderate 5-10 mm subangular blocky	none	firm moderately moist	B1	.15 to .4	gradual to	silty light medium clay	dark greyish brown (10YR42)	common (10-20%) fine (<5 mm) distinct orange mottles, few (2-10%) fine (<5 mm) distinct grey mottles	none	moderate 5-10 mm angular blocky	none	very firm moderately moist
B21	.4 to .7	diffuse to	light medium clay	dark grey (10YR41)	many (20-50%) medium (5-15 mm) distinct orange mottles, common (10-20%) medium (5-15 mm) distinct orange mottles	none	moderate 5-10 mm angular blocky	none	very firm moderately moist	2B22	.7 to 1	-	sandy light medium clay	grey (10YR61)	many (20-50%) medium (5-15 mm) distinct red mottles, common (10-20%) medium (5-15 mm) distinct orange mottles	none	weak 5-10 mm angular blocky	none	firm moist
Site 57			Classification				Australian Soil Classification				Bleached-Acidic, Kandosolic, Redoxic Hydrosol								
			Landform Element				Landform Element				Swamp								
			Morphological Type				Morphological Type				Midslope								
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence	Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence
A1	0 to .05	clear to	silty clay loam	very dark grey (10YR31)	none	none	massive	none	weak moderately moist	A2e	.05 to .15	clear to	silty light clay	grey (10YR61)	none	none	massive	none	weak moderately moist
B21e	.15 to .25	clear to	silty light medium clay	light grey (10YR71)	few (2-10%) fine (<5 mm) prominent orange mottles	none	massive	none	weak moderately moist	B22	.25 to .6	clear to	silty light clay	strong brown (7.5YR56)	many (20-50%) fine (<5 mm) distinct pale mottles	none	weak 2-5 mm angular blocky	none	firm moderately moist
B23	.6 to .8	clear to	sandy light clay	light brownish grey (10YR62)	few (2-10%) medium (5-15 mm) distinct orange mottles	none	massive	none	weak moderately moist	B24	.8 to 1	-	sandy loam	light brownish grey (10YR62)	many (20-50%) medium (5-15 mm) prominent orange mottles	none	massive	none	weak moderately moist

Site 58		Classification			Australian Soil Classification				Haplic, Mesotrophic, Yellow Kandosol		
		Landform Element			Plain				Upper slope		
		Morphological Type									
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
A1	0 to .05	-	silty loam	very dark grey (10YR31)	none	none	moderate 2-5 mm cast	none	-		
AZj	.05 to .15	-	silty clay loam	grey (10YR61)	few (2-10%) fine (<5 mm) faint orange mottles	none	massive	few (2-10%) fine (<2 mm) ferromanganiferous nodules	-		
B21	.15 to .35	-	silty light clay	light yellowish brown (2.5Y64)	none	none	weak 2-5 mm angular blocky	very few (<2%) medium (2-6 mm) ferromanganiferous nodules	-		
B22	.35 to .5	-	fine sandy light clay	olive yellow (2.5Y65)	few (2-10%) fine (<5 mm) faint orange mottles	none	weak 2-5 mm angular blocky	none	-		

Site 59		Classification			Australian Soil Classification				Bleached-Mottled, Dystrophic, Grey Kandosol		
		Landform Element			Plain				Flat		
		Morphological Type									
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
A1	0 to .1	gradual to	loamy sand	dark greyish brown (10YR42)	none	none	single grain	none	very weak moderately moist		
A21e	.1 to .4	gradual to	loamy sand	light brownish grey (10YR62)	few (2-10%) fine (<5 mm) faint yellow mottles	none	single grain	none	very weak moist		
A22e	.4 to .7	gradual to	sandy loam	very pale brown (10YR74)	common (10-20%) fine (<5 mm) distinct orange mottles, few (2-10%) fine (<5 mm) distinct red mottles	none	massive	none	weak moist		
B1	.7 to .9	gradual to	sandy clay loam	very pale brown (10YR73)	many (20-50%) fine (<5 mm) distinct yellow mottles, common (10-20%) fine (<5 mm) distinct red mottles	none	massive	none	firm moderately moist		
B2	.9 to 1.3	-	sandy light clay	very pale brown (10YR83)	many (20-50%) coarse (15-30 mm) prominent red mottles, many (20-50%) medium (5-15 mm) distinct yellow mottles	none	massive	none	firm moderately moist		

Soil Chemistry

Site	Depth (m)	pH*	EC (dS/m)	Cl (mg/kg)	NO ₃ -N (mg/kg)	TC%**	TN%**
56	0.00-0.10	4.5	0.03	21	9	1.77	0.18
	0.20-0.30	5.3	0.01	35	3	0.78	0.09
	0.40-0.50	5.7	0.02	24	4	0.58	0.08
57	0.00-0.10	4.7	0.02	<20	8	0.98	0.1
	0.20-0.30	4.9	0.01	<20	4	0.54	0.07
	0.40-0.50	5.1	0.01	<20	2	0.38	0.05
58	0.00-0.10	4.9	0.03	24	15	0.97	0.07
	0.20-0.30	5.3	0.02	26	1	0.46	0.04
	0.40-0.50	6.5	0.02	<20	1	0.24	<0.03
59	0.00-0.10	5.2	0.03	27	7	0.92	0.07
	0.20-0.30	5	0.01	<20	1	0.2	<0.03
	0.40-0.50	5.1	0.01	<20	<1	0.17	<0.03

*Aqueous 1:5

**Total carbon and total nitrogen

References

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