

# Cape Flattery

## Dune Lake



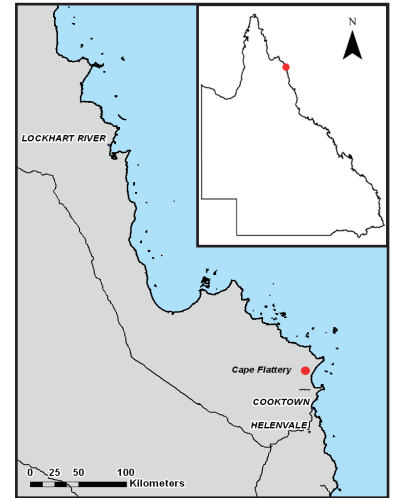
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### Study Area

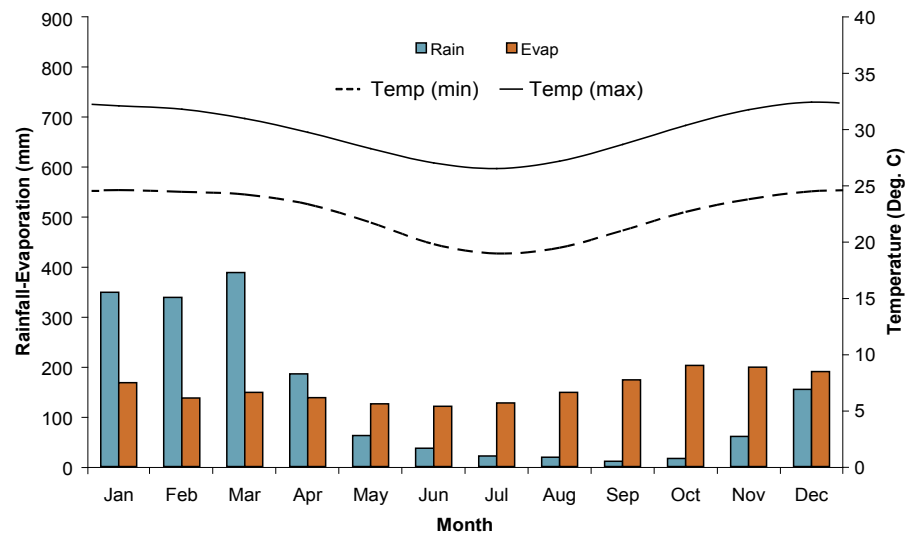
Cape Flattery Dune Lakes are located approximately 55 km north of Cooktown, Northern Queensland.

The wetlands in this area comprise of a number of lakes and palustrine wetlands within dune swales. It is the largest dune field on the east coast of Australia north of Fraser Island and has some of the best examples of dune lakes in Australia<sup>1</sup>.

The study area is an example of a coastal and sub-coastal non-floodplain sand lake (window) in the Cape York Peninsula Bioregion.



### Climate<sup>2</sup>



The study area is situated within 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 1643 mm.

<b>Landform and Inundation</b>	Coastal dune lake Freshwater permanently inundated areas from groundwater and overland flow
<b>Soils<sup>3</sup></b>	Hydrosols and Tenosols
<b>Vegetation<sup>4</sup></b>	Perennial lakes with sedgeland on margins. Lakes in east coast dunefields (RE 3.2.27)
<b>Geology<sup>5</sup></b>	Quaternary younger dune sand
<b>Disturbance</b>	No effective disturbance



Australian Government

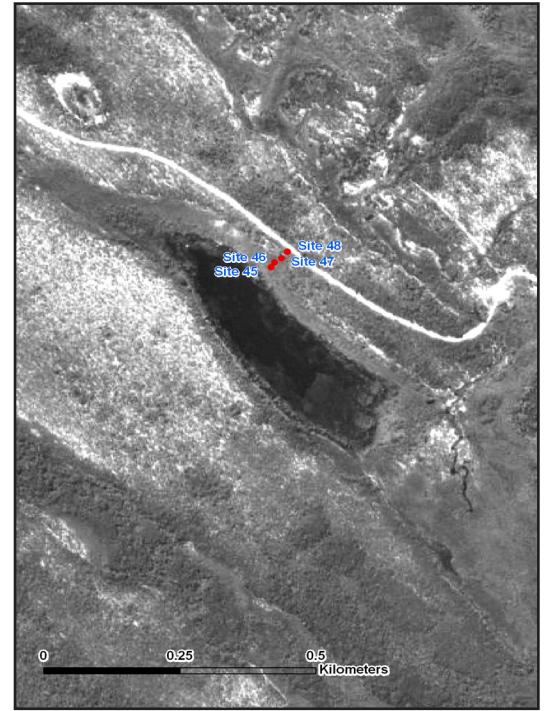


Queensland Government

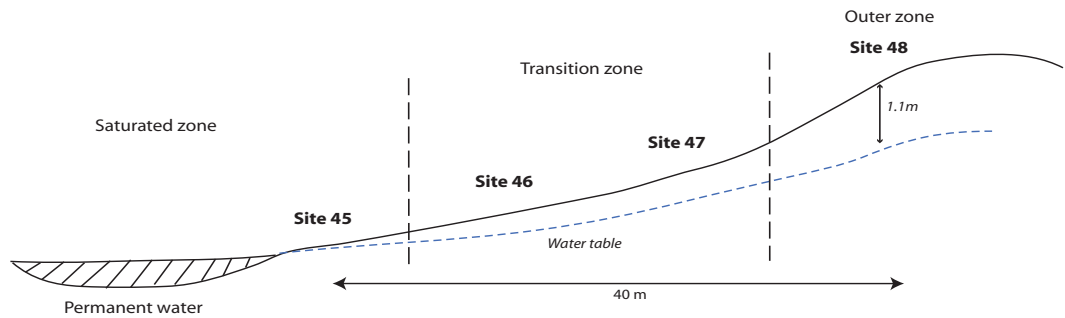
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## Location

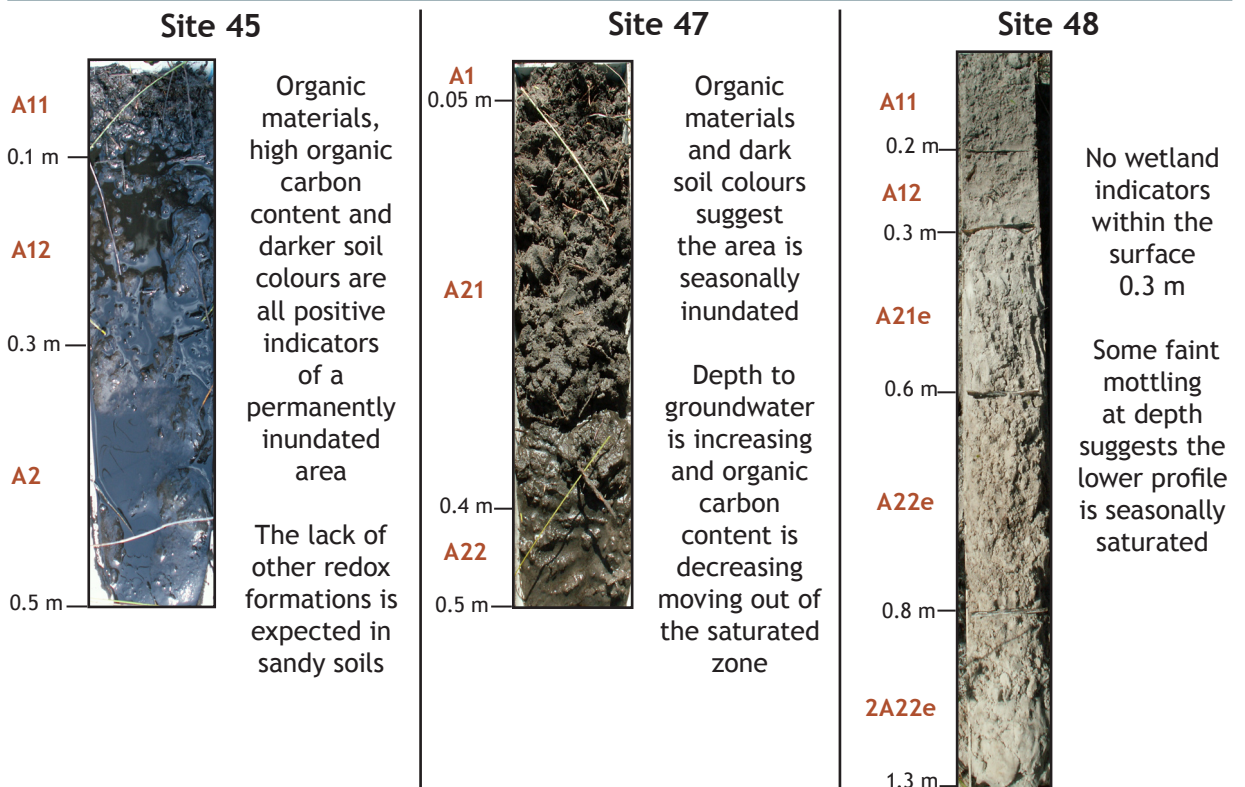
GDA94 • MGA Coordinates : 304687 E, 8331878 N, Zone 55 • Lat/Long : -15.08127 S, 145.18283 E



## Landscape Diagram



## Soil Profiles



## Soil Indicators Present (within 0.3 m of surface)

Indicator <sup>6</sup>	Site 45	Site 46
Organic materials and organic carbon (OC)*	Organic materials layer 0.1 m thick starting within 0.3 m OC: 3.13%	Organic materials layer 0.25 m thick starting with 0.3 m OC: 1.53%
Matrix colour	Black to dark grey	Black to greenish grey
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.3 m)
Mottles and Segregations	Not present	Not present
Depth to groundwater	0.25 m	0.15 m
Ferruginous root channel and pore linings	Not present	Not present
pH* <sup>7</sup>	Very strongly acid	Very strongly acid
Texture	Loamy sand to sandy loam	Sand to sandy loam
Acid sulfate material	Not present	Not present
Electrical Conductivity (EC) <sup>7</sup>	Non saline	Non saline
Indicator <sup>6</sup>	Site 47	Site 48
Organic materials and organic carbon (OC)*	Organic materials layer 0.05 m thick starting within 0.3 m OC: 0.4%	No organic materials OC: 0.78%
Matrix colour	Dark grey	Dark grey
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.3 m)
Mottles and Segregations	Many <5 mm faint gley mottles	Not present
Depth to groundwater	0.4 m	1.1 m
Ferruginous root channel and pore linings	Not present	Not present
pH* <sup>7</sup>	Very strongly acid	Very strongly acid
Texture	Loamy sand to sandy loam	Sand to loamy sand
Acid sulfate material	Not present	Not present
Electrical Conductivity (EC) <sup>7</sup>	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

- Organic materials indicate a waterlogged environment
- Dark soil colours indicative of a saturated environment where there is organic accumulation
- High water tables and poor external drainage predispose area to saturation
- High organic carbon levels in wetland indicative of a saturated environment
- Presence of hydrophytic vegetation corresponds to where the permanent dry season water table is at <0.5 m from the soil surface

## References

1. DEWHA (2008). Australian Wetlands Database. [online]. Available at <http://www.environment.gov.au/water/publications/environmental/wetlands/database/> [accessed 21/08/08]
2. Queensland Department of Natural Resources and Water (2008). SILO [online]. Available at <http://www.longpaddock.qld.gov.au/silo/> [accessed 5/11/2007].
3. Isbell RF (2002). *The Australian Soil Classification*. CSIRO Publishing, Collingwood, Victoria, revised edition.
4. EPA (2008) Regional Ecosystems. [online]. Available at [http://www.epa.qld.gov.au/nature\\_conservation/biodiversity/regional\\_ecosystems/](http://www.epa.qld.gov.au/nature_conservation/biodiversity/regional_ecosystems/) [accessed 28/06/08].
5. Bureau of Mineral Resources (1966). *Cooktown: Australia 1:250,000 Geological Series*, Bureau of Mineral Resources, Canberra.
6. Bryant KB, Wilson PR, Biggs AJW, Brough DM and Burgess JW (2008). *Soil Indicators of Queensland Wetlands: State-wide assessment and methodology*. Queensland Department of Natural Resources and Water. Brisbane.
7. Hazelton P and Murphy B (2007). *Interpreting Soil Test Results: What do all the numbers mean?. [2nd ed]*. CSIRO publishing. Collingwood Victoria

## Soil Morphology

Site 45		Classification		Australian Soil Classification			Bleached, Tenosolic, Oxyaquic Hydrosol		
		Landform Element		Swale					
		Morphological Type		Lower slope					
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence
A11	0 to .1	-	fibric sandy loam	black (N2.5/0)	none	none	single grain	none	weak wet
A12	.1 to .3	-	loamy sand	very dark grey (N30)	none	none	single grain	none	very weak wet
A2	.3 to .5	-	sand	dark grey (N40)	none	none	single grain	none	very weak wet
Site 46		Classification		Australian Soil Classification			Acidic, Tenosolic, Oxyaquic Hydrosol		
		Landform Element		Swale					
		Morphological Type		Midslope					
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence
A11	0 to .12	-	sapric sandy loam	black (N2.5/0)	none	none	single grain	none	very weak wet
A12	.12 to .25	-	sapric loamy sand	very dark grey (N30)	none	none	single grain	none	very weak wet
A2	.25 to .5	-	sand	dark greenish grey (10Y31)	none	none	single grain	none	very weak wet
Site 47		Classification		Australian Soil Classification			Acidic, Tenosolic, Oxyaquic Hydrosol		
		Landform Element		Footslope					
		Morphological Type		Midslope					
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence
A1	0 to .05	clear to	fibric sandy loam	very dark grey (10YR31)	none	none	single grain	none	-
A21	.05 to .4	clear to	loamy sand	very dark grey (10YR31)	none	none	single grain	none	-
A22	.4 to .5	-	loamy sand	grey (10YR51)	none	none	single grain	none	-

Site 48		Classification			Australian Soil Classification					Basic, Arenic, Bleached-Orthic Tenosol		
					Landform Element					Hillslope		
		Horizon	Depth (m)	Boundary	Texture	Morphological Type					Upper slope	
Colour	Mottles					Coarse Fragments	Structure	Segregations	Consistence			
A11	0 to .2	gradual to	loamy sand	very dark grey (10YR31)	none	none	single grain	none		very weak dry		
A12	.2 to .3	clear to	sand	dark grey (10YR41)	none	none	single grain	none		very weak dry		
A21e	.3 to .6	gradual to	sand	grey (10YR61)	none	none	single grain	none		very weak moderately moist		
A22e	.6 to .8	gradual to	sand	light brownish grey (10YR62)	common (10-20%) coarse (15-30 mm) distinct brown mottles	none	single grain	none		very weak moist		
2A23e	.8 to 1.3	-	sand	white (5Y81)	none	none	single grain	none		very weak wet		

## Soil Chemistry

Site	Depth (m)	pH*	EC (dS/m)	Cl (mg/kg)	NO3-N (mg/kg)	TC%**	TN%**
45	0.00-0.10	3.7	0.04	35	<1	3.13	0.12
	0.20-0.30	3.9	0.01	24	1	0.62	<0.03
	0.40-0.50	3.9	0.01	24	1	0.29	<0.03
46	0.00-0.10	3.8	0.04	<20	<1	1.53	0.07
	0.20-0.30	3.7	0.02	<20	1	0.92	<0.03
	0.40-0.50	3.8	0.01	<20	3	0.4	<0.03
47	0.00-0.10	3.8	0.02	<20	<1	0.4	<0.03
	0.20-0.30	3.7	0.03	28	1	1.23	<0.03
	0.40-0.50	3.9	0.01	22	1	0.38	<0.03
48	0.00-0.10	4.3	0.01	<20	2	0.78	<0.03
	0.20-0.30	4	0.01	<20	1	0.4	<0.03
	0.40-0.50	4	0.01	<20	1	0.19	<0.03

\*Aqueous 1:5

\*\*Total carbon and total nitrogen