

Cape Flattery Swamp

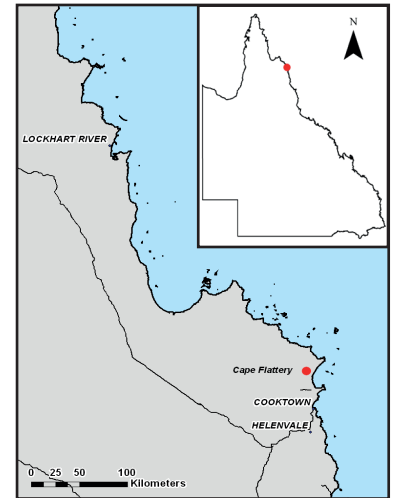


Study Area

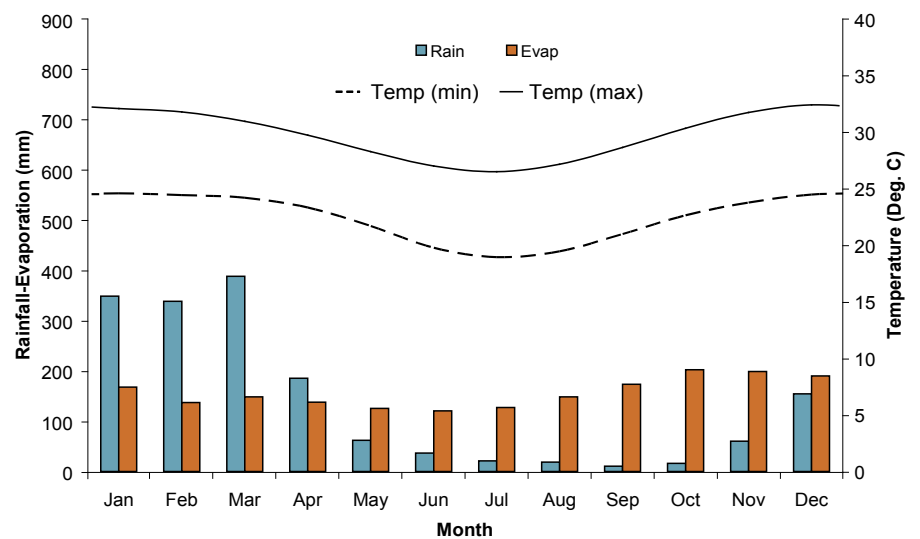
Cape Flattery Dune Lakes are located approximately 55 km north of Cooktown, Northern Queensland.

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 Australia¹.

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



Climate²



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.

Landform and Inundation	Coastal dune swamp Freshwater periodically inundated areas from groundwater and overland flow
Soils³	Hydrosols and Tenosols
Vegetation⁴	Perennial lakes with sedgelands on margins. Lakes in east coast dunefields (RE 3.2.27)
Geology⁵	Quaternary younger dune sand
Disturbance	No effective disturbance



Australian Government

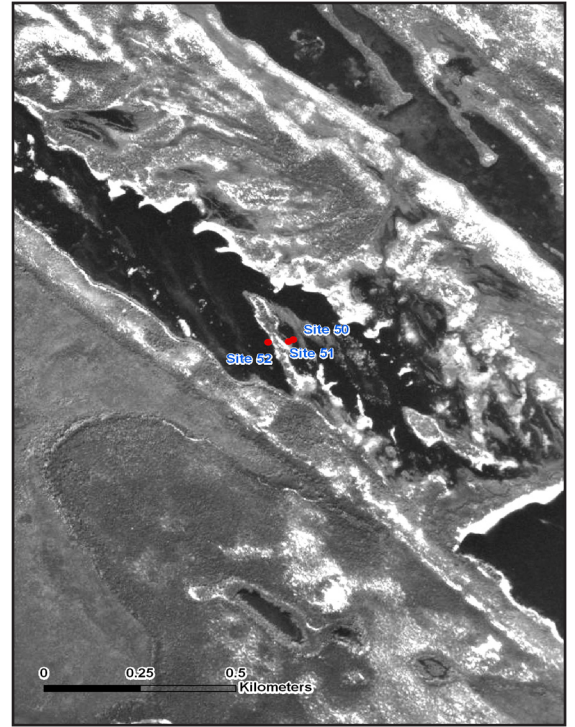


Queensland Government

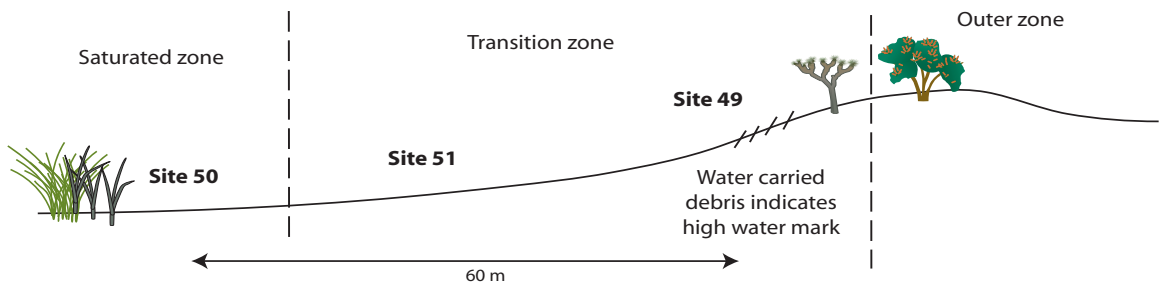
Queensland Wetlands Program

Location

GDA94 • MGA Coordinates : 303501 E, 8334545 N, Zone 55 • Lat/Long : -15.05709 S, 145.17201 E



Landscape Diagram



Soil Profiles

Site 50

0.1 m

Streaked organic materials, higher organic carbon content and dry season water table depth (0.1 m) indicates this area remains permanently saturated

Site 51

A1
0.05 m

A21e
0.3 m

A22e
0.6 m

Presence of mottling and a high dry season water table depth (0.5 m) suggests this area is seasonally inundated

Site 49

A1
0.15 m

A12
0.4 m

A21e
0.7 m

A22e
1.0 m

No wetland indicators present other than faint mottling at depth

Water carried debris at site suggests that the area has been inundated at some stage

Soil Indicators Present (within 0.3 m of surface)

Indicator ⁶	Site 49	Site 50	Site 51
Organic materials and organic carbon (OC)*	No organic materials OC: 0.64%	Organic materials layer 0.05 m thick within 0.3 m of the soil surface OC: 3.2%	No organic materials OC: 0.22%
Matrix colour	Grey	Black to grey	Grey
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.3 m)	Present (0.3 m)
Mottles and Segregations	Not present	Not present	Not present
Depth to groundwater	Not present	0.1 m	0.5 m
Ferruginous root channel and pore linings	Not present	Not present	Not present
pH* ⁷	Very strongly acid	Very strongly acid	Very strongly acid
Texture	Sand to loamy sand	Sand to sandy clay loam	Sand to loamy sand
Acid sulfate material	Not present	Not present	Not present
Electrical Conductivity (EC) ⁷	Non saline	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

- Streaked organic materials and high organic carbon content in the saturated zone are indicative of a reduced environment
- Dark soil surface colours are present in the saturated zone where there is organic accumulation
- Flood carried debris in the outer zone indicate that water reaches this site, the area however may not be inundated for a sufficient time to become reduced
- Faint mottling present at depth in the transition zone indicates water fluctuation throughout the profile
- Sandier soils may have inadequate amounts/quantities of iron to present significant redox features regardless of saturation, therefore there is a reliance on identifying organic accumulations to identify a wetland soil

Soil Chemistry

Site	Depth (m)	pH*	EC (dS/m)	Cl (mg/kg)	NO ₃ -N (mg/kg)	TC%**	TN%**
49	0.00-0.10	4.1	0.01	<20	3	0.64	<0.03
	0.20-0.30	4.2	0.01	<20	2	0.24	<0.03
	0.40-0.50	4.3	0.01	<20	2	0.08	<0.03
50	0.00-0.10	4.2	0.02	<20	2	3.2	0.09
	0.20-0.30	4	0.01	<20	4	0.17	<0.03
	0.40-0.50	4.2	0.01	<20	2	0.05	<0.03
51	0.00-0.10	4.4	0.02	23	2	0.22	<0.03
	0.20-0.30	4.5	0.01	<20	2	0.06	<0.03
	0.40-0.50	4.6	<0.01	<20	<1	<0.05	<0.03

*Aqueous 1:5

**Total carbon and total nitrogen

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/ [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 49		Classification		Australian Soil Classification			Basic, Arenic, Bleached-Orthic Tenosol		
				Landform Element			Swale		
				Morphological Type			Upper Slope		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence
A11	0 to .15	gradual to	loamy sand	grey (10YR5/1)	none	none	single grain	none	very weak dry
A12	.15 to .4	clear to	sand	grey (10YR6/1)	none	none	single grain	none	very weak moderately moist
A21e	.4 to .7	gradual to	sand	light grey (5Y7/1)	none	none	single grain	none	very weak moist
A22e	.7 to 1	-	sand	white (5Y8/1)	few (2-10%) fine (<5 mm) faint brown mottles, very few (<2%) coarse (15-30 mm) faint dark mottles	None	single grain	none	very weak moist
Site 50		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
A1	0 to .05	-	sandy clay loam	black (10YR2/1)	none	none	single grain	none	-
A21e	.05 to .15	-	sand	grey (10YR5/1)	none	none	single grain	none	-
A22e	.15 to .5	-	sand	grey (10YR6/1)	none	none	single grain	none	-
Site 51		Classification		Australian Soil Classification			Bleached, Tenosolic, Oxyaquic Hydrosol		
				Landform Element			Swale		
				Morphological Type			Mid-slope		
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence
A1	0 to .05	-	-	grey (5Y5/1)	none	none	single grain	none	very weak moist
A21e	.05 to .3	-	sand	light grey (5Y7/1)	none	none	single grain	none	very weak moist
A22e	.3 to .6	-	sand	white (5Y8/1)	very few (<2%) fine (<5 mm) faint brown mottles	none	single grain	none	very weak wet