

Lake Munya

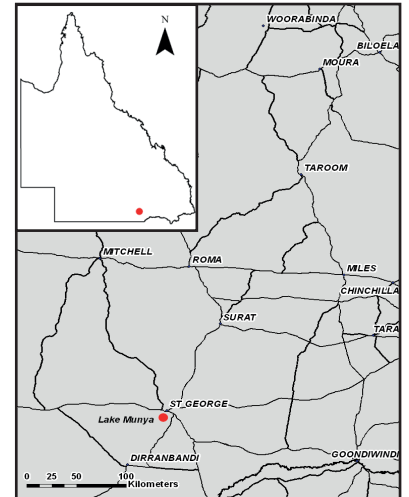


Study Area

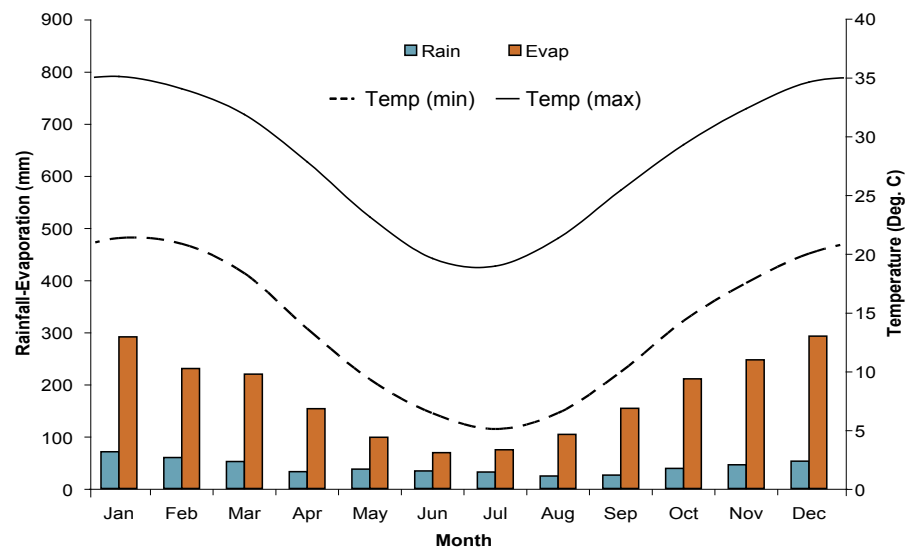
This transect is an oxbow located on the Balonne River floodplain, St George South-West Queensland.

The area is a complex of billabongs, swamps, oxbow lakes and anastomosing stream channels on an active floodplain.

This study area is an example of a semi-arid floodplain lake on an active floodplain in the Darling Riverine Plains Bioregion.



Climate¹



The study area is situated within a semi-arid climatic region with no distinct wet and dry season. Evaporation exceeds rainfall in every month. The average annual rainfall for the area is 501 mm.

Landform and Inundation	Oxbow lake on plains associated with both functional and non functional drainage lines Freshwater intermittent inundation from overland flow
Soils²	Vertosols and Dermosols
Vegetation	Coolibah (<i>Eucalyptus microtheca</i>) fringing the wetland
Geology³	Quaternary alluvium
Disturbance	Little to no disturbance except grazing by hoofed animals



Australian Government



Queensland Government

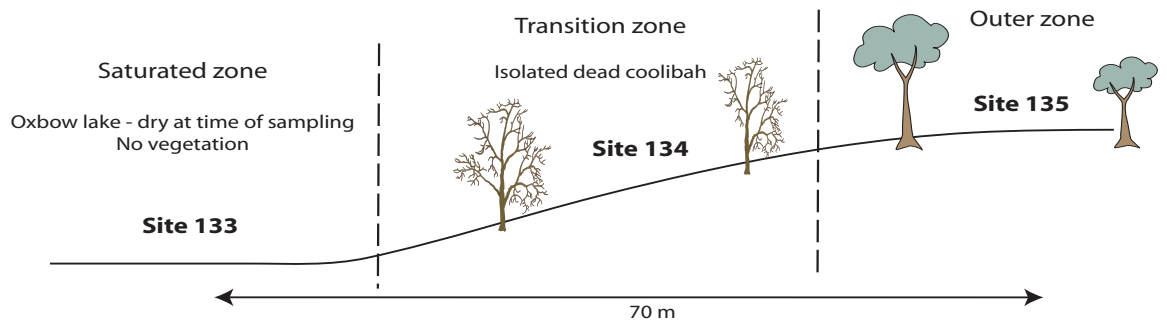
Queensland
Wetlands Program

Location

GDA94 • MGA Coordinates : 652302 E, 6890133 N, Zone 55 • Lat/Long : -28.10556 S, 148.55041 E



Landscape Diagram



Soil Profiles

Site 133



Low chroma values and mottling suggest inundation and water fluctuation throughout profile

Site 134



Low chroma values and mottling suggest inundation and water fluctuation throughout profile

Site 135



Presence of mottling and ferruginous root channel linings indicate this area has been inundated at some time

Soil Indicators Present (within 0.3 m of surface)

Indicator ⁴	Site 133	Site 134	Site 135
Organic materials and organic carbon (OC)*	No organic materials OC: 0.98%	No organic materials OC: 1.2%	No organic materials OC: 1.3%
Matrix colour	Greyish brown to dark grey	Grey	Brown
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.3 m)	Present (0.05 m)
Mottles and Segregations	Many <5 mm distinct orange mottles Common <5 mm distinct brown mottles	Common 5-15 mm distinct red mottles	Very few <5 mm distinct orange mottles Very few 6-20 mm calcareous concretions
Depth to groundwater	Not present	Not present	Not present
Ferruginous root channel and pore linings	Not present	Not present	Present
pH ⁵	Slightly acid	Slightly acid	Neutral
Texture	Medium heavy clay to heavy clay	Medium clay to heavy clay	Fine sandy light clay to medium clay
Acid sulfate material	Not present	Not present	Not present
Electrical Conductivity (EC) ⁵	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

- Faint and distinct mottling in surface and at depth, suggest water fluctuation throughout all soil profiles (Figure 1)
- Grey surface colours and low chroma values within the saturated and transition zones suggest reducing conditions and a periodically inundated environment
- Ferruginous root channel linings are observed where vegetation is present along the transect, linings in the outer zone indicate that the area has been inundated at some time
- Vertosol soils (Site 133 and 134) appear to define the boundary of the wetland
- There are higher organic carbon levels in this wetland compared to others in the semiarid region, the fact that this wetland is on an active floodplain may contribute to the input of organic materials

Figure 1. Distinct mottling.

Soil mottling or the presence of more than one soil colour is usually an indication of poor drainage or water fluctuation throughout a soil profile



References

1. Queensland Department of Natural Resources and Water (2008). SILO [online]. Available at <http://www.longpaddock.qld.gov.au/silo/> [accessed 5/11/2007].
2. Isbell RF (2002). *The Australian Soil Classification*. CSIRO Publishing, Collingwood, Victoria, revised edition.
3. Bureau of Mineral Resources (1971). *Saint George: Australia 1:250,000 Geological Series*, Bureau of Mineral Resources, Canberra.
4. 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.
5. 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 133		Classification			Australian Soil Classification				Epihypersodic, Self-Mulching, Grey Vertosol		
		Landform Element			Swamp						
		Morphological Type			Flat						
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
A1	0 to .02	-	medium heavy clay	dark greyish brown (10YR42)	none	none	strong <2 mm granular	none	weak dry		
B21	.02 to .15	-	heavy clay	dark greyish brown (2.5Y42)	many (20-50%) fine (<5 mm) distinct orange mottles	none	strong 2-5 mm subangular blocky	none	very firm dry		
B22	.15 to .3	-	heavy clay	dark grey (5Y41)	common (10-20%) fine (<5 mm) distinct brown mottles	none	moderate 5-10 mm lenticular	none	very strong dry		
B23	.3 to .8	-	heavy clay	dark grey (2.5Y41)	common (10-20%) fine (<5 mm) faint brown mottles	none	moderate 5-10 mm lenticular	none	strong moderately moist		
B24	.8 to 1	-	heavy clay	grey (5Y51)	common (10-20%) fine (<5 mm) faint brown mottles	none	moderate 5-10 mm lenticular	none	very firm moderately moist		
Site 134		Classification			Australian Soil Classification				Mottled, Epipedal, Grey Vertosol		
		Landform Element			Hillslope						
		Morphological Type			Lower slope						
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
A1	0 to .08	-	medium clay	very dark grey (10YR31)	none	none	strong <2 mm polyhedral	none	very firm dry		
B21	.08 to .3	-	heavy clay	grey (10YR51)	common (10-20%) medium (5-15 mm) distinct red mottles	none	moderate 5-10 mm angular blocky	none	firm moderately moist		
B22	.3 to .45	-	heavy clay	dark grey (10YR41)	few (2-10%) medium (5-15 mm) distinct red mottles	none	moderate 10-20 mm lenticular	few (2-10%) medium (2-6 mm) ferruginous root linings	very firm dry		
B23	.45 to .85	-	medium heavy clay	dark grey (10YR41)	few (2-10%) medium (5-15 mm) faint brown mottles	very few (<2%) shell medium pebbles (6-20 mm)	moderate 50-100 mm lenticular	none	very firm dry		

Site 135		Classification				Australian Soil Classification				Mottled-Sodic, Eutrophic, Brown Dermosol	
		Landform Element				Hillslope					
		Morphological Type				Midslope					
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
A1	0 to .05	abrupt to	light medium clay	very dark greyish brown (10YR32)	none	none	strong 5-10 mm subangular blocky	-	-		
B2	.05 to .2	abrupt to	medium clay fine sandy	brown (10YR43)	very few (<2%) fine (<5 mm) distinct orange mottles	none	strong 5-10 mm angular blocky	few (2-10%) fine (<2 mm) ferruginous root linings	-		
2Db	.2 to .3	abrupt to	fine sandy light clay	brown (10YR43)	none	none	weak 10-20 mm prismatic	very few (<2%) coarse (6-20 mm) calcareous concretions	-		
3D1b	.3 to .6	gradual to	fine sandy clay loam	brown (10YR53)	common (10-20%) fine (<5 mm) distinct orange mottles	none	weak 10-20 mm prismatic, moderate 5-10 mm angular blocky	few (2-10%) fine (<2 mm) ferruginous root linings	-		
3D2b	.6 to 1	-	medium clay	dark greyish brown (10YR42)	many (20-50%) fine (<5 mm) distinct orange mottles	none	weak 10-20 mm prismatic, weak 5-10 mm angular blocky	few (2-10%) fine (<2 mm) ferruginous root linings, few (2-10%) fine (<2 mm) calcareous soft segregations	-		

Soil Chemistry

Site	Depth (m)	pH*	EC (dS/m)	Cl (mg/kg)	NO3-N (mg/kg)	TC%**	TN%**
133	0.00-0.10	6.1	0.13	40	33	0.98	0.1
	0.20-0.30	7	0.08	32	7	0.57	0.06
	0.40-0.50	7.2	0.09	29	7	0.58	0.06
134	0.00-0.10	6.2	0.18	34	62	1.2	0.11
	0.20-0.30	6.9	0.08	29	26	0.66	0.06
	0.40-0.50	7.8	0.08	31	14	0.66	0.06
135	0.00-0.10	7.2	0.22	52	16	1.3	0.1
	0.20-0.30	8	0.1	22	<1	0.33	<0.03
	0.40-0.50	8.6	0.11	23	2	0.48	0.04

*Aqueous 1:5

**Total carbon and total nitrogen



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