

# Bribie Island

## Lower Swamp Crossing



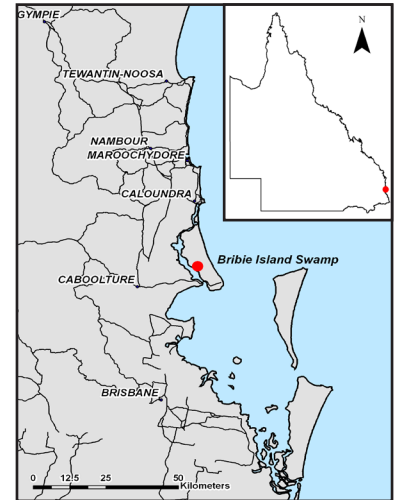
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### Study Area

Bribie Island is located approximately 60 km north of Brisbane, South-East Queensland.

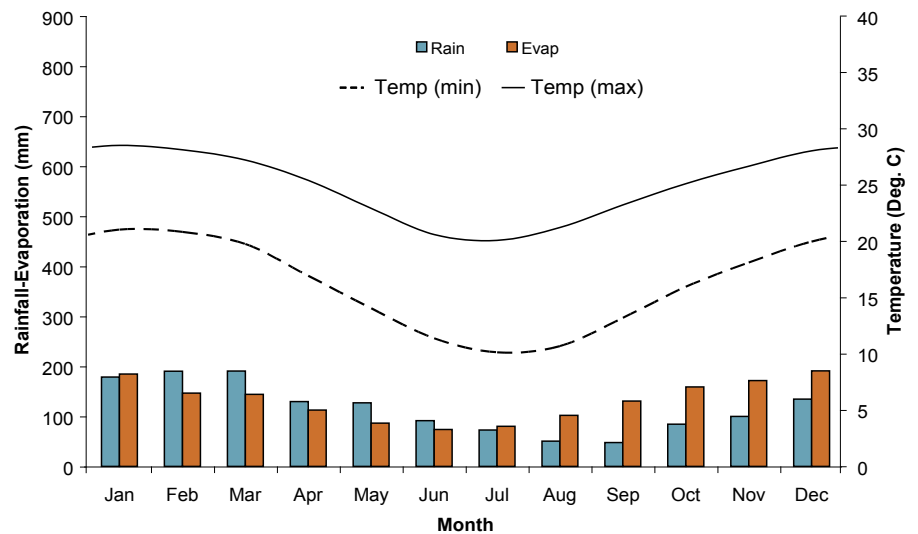
The majority of Bribie Island is national park, forest reserve and private plantations. It is a low sand island with a wide variety of wetland aggregations such as creeks, lagoons, swamps and tidal flats<sup>1</sup>.

The study area is situated at the southern end of the central swamp, which spans approximately 15 km in a north-south direction in the middle of the island.



It is an example of a coastal and sub-coastal non-floodplain tree swamp (melaleuca and eucalyptus spp.) in the South-East Queensland Bioregion.

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



The study area is situated within a subtropical climatic region with a wet and dry season. Evaporation exceeds rainfall in the majority of months. The average annual rainfall for the area is 1397 mm.

<b>Landform and Inundation</b>	Low lying coastal plain consisting of swampland Freshwater seasonally inundated areas from both overland flow and groundwater influence
<b>Soils<sup>3</sup></b>	Hydrosols and Tenosols
<b>Vegetation<sup>4</sup></b>	<i>Melaleuca quinquenervia</i> open forest on coastal alluvium (RE 12.3.5)
<b>Geology<sup>5</sup></b>	Quaternary estuarine, floodplain and tidal delta deposits
<b>Disturbance</b>	Disturbed by pine plantation at edge of swamp. Depositional materials present on fringes of wetland.



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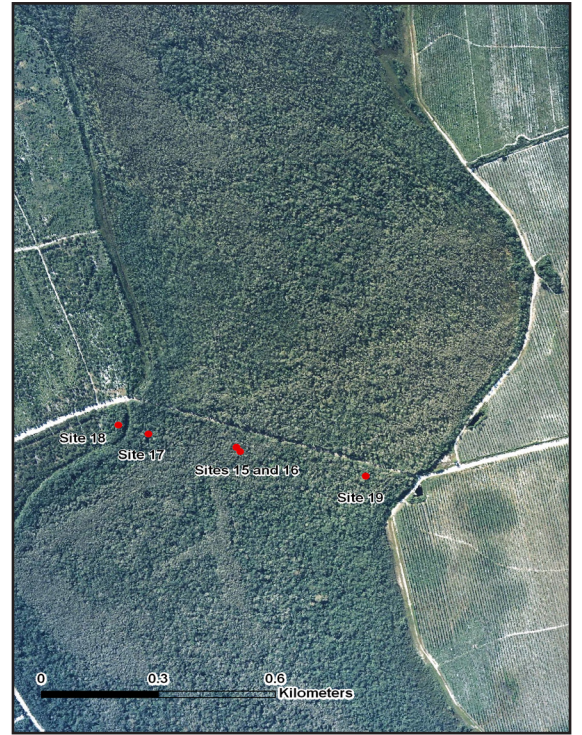


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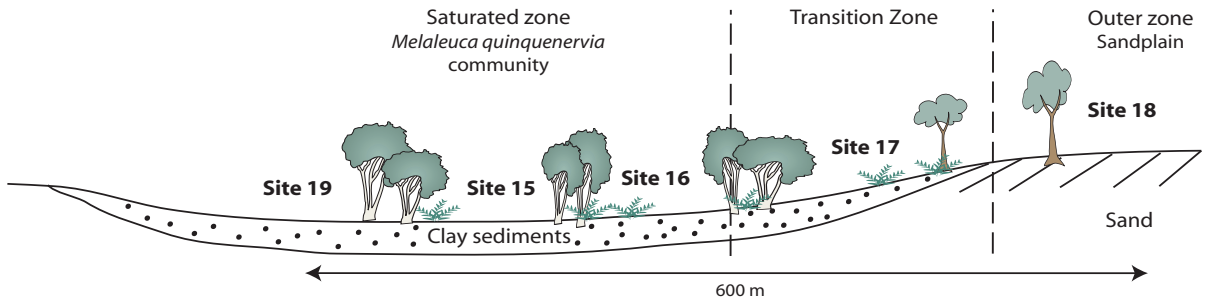
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## Location

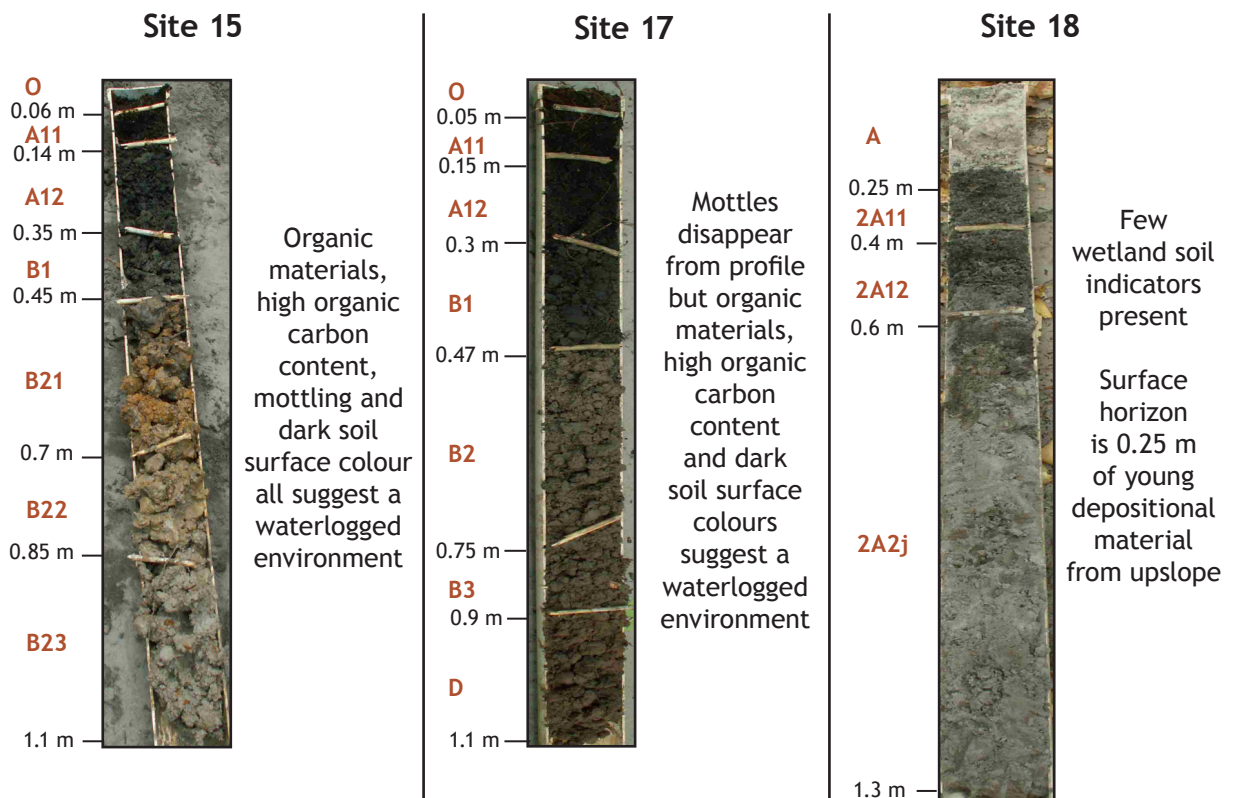
GDA94 • MGA Coordinates : 512707 E, 7011849 N, Zone 56 • Lat/Long : -27.01543 S, 153.12809 E



## Landscape Diagram



## Soil Profiles



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

Indicator <sup>6</sup>	Site 15	Site 16	Site 17
Organic materials and organic carbon (OC)*	Organic materials to 0.3 m OC: 28.8%	Organic materials to 0.3 m OC: 11.3%	Organic materials to 0.3 m OC: 16.5%
Matrix colour	Dark brown to dark grey	Black to dark grey	Black
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.3 m)	Present (0.3 m)
Mottles and Segregations	Very few <5 mm faint grey mottles	Not present	Not present
Depth to groundwater	0.7 m	1.1 m	1.0 m
Ferruginous root channel and pore linings	Not present	Not present	Not present
pH* <sup>7</sup>	Very strongly acid	Very strongly acid	Very strongly acid
Texture	Loam	Loam to clay loam	Loam to clay loam
Acid sulfate material	Not present	Not present	Not present
Electrical Conductivity (EC) <sup>7</sup>	Non saline	Non saline	Non saline
Indicator <sup>6</sup>	Site 18	Site 19	
Organic materials and organic carbon (OC)*	Organic materials layer 0.15 m thick starting within 0.3 m OC: 3.17% (sample taken at 0.3 m)	Organic materials layer 0.2 m thick starting within 0.3 m OC: 7.77%	
Matrix colour	Grey	Black	
Chroma (thickness of layer)**	Present (0.3 m)	Present (0.3 m)	
Mottles and Segregations	Not present	Very few <5 mm distinct orange mottles Common <2 mm ferruginous soft segregations	
Depth to groundwater	Not present	1.2 m	
Ferruginous root channel and pore linings	Not present	Present	
pH* <sup>7</sup>	Very strongly acid	Very strongly acid	
Texture	Sand to loamy sand	Loam to light clay	
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

- Faint and distinct mottling present is indicative of water fluctuation throughout the profiles in the saturated zone (Figure 1), mottling disappears from profiles in the transition zone
- Ferruginous soft segregations and ferruginous root channel linings within 0.3 m of the soil surface imply periodic waterlogging in the saturated zone
- Dark soil surface colours in the saturated and transition zone suggest reducing conditions and a seasonally saturated environment
- Organic materials and high organic carbon contents indicate a reduced environment
- The presence of swamp hummock microrelief suggests a saturated environment



Figure 1.  
Mottling observed  
in saturated zone of  
wetland

Soil Chemistry

Site	Depth (m)	pH*	EC dS/m	Cl mg/kg	NO3-N mg/kg	P mg/kg	S mg/kg	TC** %	TN** %	Ca meq/100g	Mg meq/100g	Na meq/100g	K meq/100g	Na corr meq/100g	Cu mg/kg	Zn mg/kg	Mn mg/kg	Fe mg/kg
15	0.00-0.10	4.5	0.33	61	14	55	260	28.8	1.44	4.57	5.29	1.17	0.944	0.999	-	-	-	-
	0.20-0.30	5	0.14	51	7	39	187	7.71	0.64	0.919	2.09	0.854	0.681	0.71	0.4	0.3	0.3	90
	0.50-0.60	4.7	0.08	48	<1	<1	87	1.4	0.09	1.54	5.86	0.858	0.504	0.723	0.2	0.2	0.4	109
16	0.00-0.10	4.6	0.13	49	17	23	51	11.3	0.84	0.922	2.77	0.765	0.744	0.627	0.2	0.3	1.5	57.7
	0.25-0.30	4.7	0.06	26	4	10	43	5.75	0.41	0.459	2.38	0.554	0.425	0.48	0.2	0.5	0.5	184
	0.40-0.50	4.7	0.1	42	5	6	79	4.02	0.31	0.522	3.43	0.806	0.432	0.687	0.2	0.1	0.2	70.5
17	0.00-0.10	4.4	0.45	553	<1	23	70	16.5	0.86	3.46	3.93	2.11	0.465	0.546	0.1	0.4	0.8	237
	0.20-0.30	4.5	0.13	141	<1	5	37	3.8	0.2	0.318	0.475	0.534	0.16	0.136	0.1	0.2	0.1	51.8
	0.40-0.50	4.6	0.06	43	<1	2	33	2.18	0.12	0.081	0.454	0.351	0.081	0.23	0.3	0.1	<0.1	42
18	0.30-0.40	4	0.03	<20	<1	10	2	3.17	0.13	0.759	1.11	0.161	0.038	0.161	<0.1	0.2	<0.1	66
	0.50-0.60	3.9	0.03	<20	<1	4	2	1.14	<0.03	0.362	0.356	0.098	<0.018	0.098	<0.1	0.1	<0.1	32.3
	0.70-0.80	4.3	0.01	<20	<1	<1	<1	0.26	<0.03	0.14	0.096	0.02	<0.018	0.02	<0.1	0.1	<0.1	7.8
19	0.00-0.10	5	0.11	79	1	14	28	7.77	0.46	2.49	4.66	0.992	0.77	0.769	0.1	0.4	0.2	258
	0.20-0.30	4.9	0.07	42	<1	8	25	3.68	0.24	0.957	3.88	0.645	0.528	0.526	0.2	0.2	<0.1	229
	0.40-0.50	4.7	0.1	71	1	2	34	3.33	0.19	1.06	4.82	0.672	0.622	0.472	0.2	0.2	<0.1	208

\*Aqueous 1:5

\*\*Total carbon and total nitrogen

Soil Morphology

Horizon	Depth (m)	Classification				Australian Soil Classification			Humose-Acidic, Dermosolic, Redoxic Hydrosol		
		Boundary	Texture	Colour	Mottles	Lanform Element		Swamp			
						Morphological Type			Structure	Segregations	Consistence
O1	0 to .06	clear to	fibric loam	very dark brown (10YR22)	none	none	Coarse Fragments	Structure	Segregations	Consistence	
A11	.06 to .14	gradual to	fibric loam	very dark brown (10YR22)	none	none	none	weak 2-5 mm subangular blocky	none	very weak moist	
A12	.14 to .35	clear to	sapric loam	very dark grey (10YR31)	very few (<2%) fine (<5 mm) faint grey mottles	none	none	weak 2-5 mm subangular blocky	none	very weak moist	
B1	.35 to .45	abrupt to	sapric clay loam	dark greyish brown (10YR42)	very few (<2%) fine (<5 mm) faint orange mottles, common (10-20%) fine (<5 mm) faint grey mottles	none	none	massive	none	weak moist	
B21	.45 to .7	clear to	light clay	grey (10YR61)	many (20-50%) medium (5-15 mm) prominent orange mottles	none	none	weak 5-10 mm angular blocky	none	very firm moist	
B22	.7 to .85	gradual to	light clay	light brownish grey (10YR62)	common (10-20%) coarse (15-30 mm) prominent orange mottles	none	none	weak 5-10 mm angular blocky	none	weak wet	
B23	.85 to 1.1	-	light medium clay	grey (5Y51)	few (2-10%) coarse (15-30 mm) prominent orange mottles	none	none	massive	none	weak wet	

Site 16		Classification			Australian Soil Classification				Humose-Acidic, Kurosolic, Redoxic Hydrosol		
		Landform Element			Swamp				Swamp		
		Morphological Type			Flat						
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
O1	0 to .05	clear to	fibric loam	black (10YR21)	none	none	weak 2-5 mm subangular blocky	none	very weak moist		
A11	.05 to .25	gradual to	fibric loam	black (10YR21)	none	none	weak 2-5 mm subangular blocky	none	very weak moist		
A12	.25 to .55	clear to	sapric clay loam	very dark grey (10YR31)	none	none	massive	none	weak moist		
B21	.55 to .85	gradual to	light medium clay	grey (2.5Y51)	many (20-50%) medium (5-15 mm) prominent orange mottles	none	weak 5-10 mm angular blocky	none	firm moist		
B22	.85 to 1.1	-	light medium clay	grey (2.5Y51)	common (10-20%) medium (5-15 mm) distinct orange mottles	none	weak 5-10 mm angular blocky	none	firm moist		
Site 17		Classification			Australian Soil Classification				Humose-Acidic, Kandosolic, Oxyaquic Hydrosol		
		Landform Element			Swamp						
		Morphological Type			Simple slope						
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
O1	0 to .05	clear to	fibric loam	black (10YR21)	none	none	weak 2-5 mm subangular blocky	none	very weak moist		
A11	.05 to .15	gradual to	sapric loam	black (10YR21)	none	none	weak 2-5 mm subangular blocky	none	very weak moist		
A12	.15 to .3	clear to	sapric sandy clay loam	black (10YR21)	none	none	massive	none	very weak moist		
B1	.3 to .47	clear to	clay loam, sandy	very dark grey (10YR31)	common (10-20%) fine (<5 mm) faint grey mechanical mixing mottles	none	weak 5-10 mm subangular blocky	none	weak moist		
B2	.47 to .75	gradual to	sandy light clay	dark greyish brown (10YR42)	very few (<2%) fine (<5 mm) faint brown mottles	none	5-10 mm angular blocky weak	none	firm moist		
B3	.75 to .9	clear to	clay loam, sandy	dark greyish brown (10YR42)	few (2-10%) fine (<5 mm) faint brown mottles	none	massive	none	firm wet		
D	.9 to 1.1	-	sandy loam	brown (10YR43)	common (10-20%) medium (5-15 mm) distinct brown mottles	none	massive	none	very weak wet		

Site 18		Classification			Australian Soil Classification				Humose-Acidic, Ferric-Petroferric, Bleached-Orthic Tenosol		
		Landform Element			Plain						
		Morphological Type			Simple slope						
Horizon	Depth	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
A	0 to .25	-	sand	grey (2.5Y51)	none	none	single grain	none	very weak moderately moist		
2A11	.25 to .4	-	sapric loamy sand	very dark grey (10YR31)	none	none	massive	none	very weak moderately moist		
2A12	.4 to .6	-	sapric loamy sand	very dark grey (10YR31)	none	none	massive	none	very weak moist		
2A2j	.6 to 1.3	-	loamy sand	dark grey (2.5Y41)	none	none	single grain	none	very weak moist		
Site 19		Classification			Australian Soil Classification				Humose-Acidic, Kurosollic, Redoxic Hydrosol		
		Landform Element			Swamp						
		Morphological Type			Simple slope						
Horizon	Depth (m)	Boundary	Texture	Colour	Mottles	Coarse Fragments	Structure	Segregations	Consistence		
O	0 to .05	clear to	fibric loam	black (10YR21)	none	none	weak 2-5 mm subangular blocky	none	very weak moist		
A11	.05 to .2	gradual to	sapric clay loam	black (10YR21)	none	none	moderate 2-5 mm subangular blocky	none	weak moist		
A12	.2 to .5	abrupt to	light clay	black (10YR21)	very few (<2%) fine (<5 mm) distinct orange mottles	none	weak 2-5 mm subangular blocky	common (10-20%) fine (<2 mm) ferruginous soft segregations	firm moist		
B21	.5 to .8	gradual to	medium clay	dark grey (2.5Y41)	many (20-50%) coarse (15-30 mm) prominent orange mottles, common (10-20%) medium (5-15 mm) distinct brown mottles	none	moderate 5-10 mm angular blocky	none	firm moist		
B22	.8 to 1.05	gradual to	heavy light medium clay	dark grey (2.5Y41)	common (10-20%) medium (5-15 mm) distinct orange mottles, common (10-20%) medium (5-15 mm) distinct brown mottles	none	weak 5-10 mm angular blocky	none	firm moist		
B3	1.05 to 1.2	diffuse to	sandy light clay	grey (2.5Y51)	few (2-10%) fine (<5 mm) faint orange mottles	none	massive	none	weak wet		
D	1.2 to 1.3	-	sandy loam	grey (2.5Y51)	few (2-10%) fine (<5 mm) faint orange mottles	none	massive	none	very weak wet		

## References

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