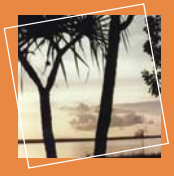
PHYSICAL PROFILE

Physical Profile



Climate

"***Kumunupunari*** is the dry season, when there is little or no rainfall. The first part of the dry season is called ***wurringawuni***, when the first dry winds blow in from the south-east and flatten the tall grass and dry up a lot of surface water. The period some time later when the dry grass is burnt is called ***kimirrakinari***. The wind later in the dry season that causes your skin to become dry and flaky is called ***pumutingari***.

The colder weather in the middle of the dry season is referred to as ***yirriwini*** and ***mirniputi***. This cold weather only lasts for a week or two and is signalled by the flowering of ***wurritjinga*** (*Eucalyptus confertiflora*).

Tiyari is the season of hot weather with high humidity and little rain. ***Wurrijingarri*** is the period when many trees flower; it is also the time of ***milikornari*** when the ground is very hot and the soles of your feet become hot when you walk. Later in tiyari there are often cloudy skies, ***rakungumpara***, and even black clouds, ***turniyuwa***, and thunder, ***pumwanyinga***, but very little rain.

The thunder and lightning is telling you that the wet season is not far away. ***Tiyari*** is a season of hardship with water levels low and not many bush foods available.

Jamutakari is the wet season, when rain, ***pakitiringa***, falls consistently every day and the swamps, creeks and rivers are full. ***Wunijaka***, the north-west wind blows and brings rain. There is much lightning [***pumurali***] and thunder with the rain."

(Puruntatameri *et al.* 2001)

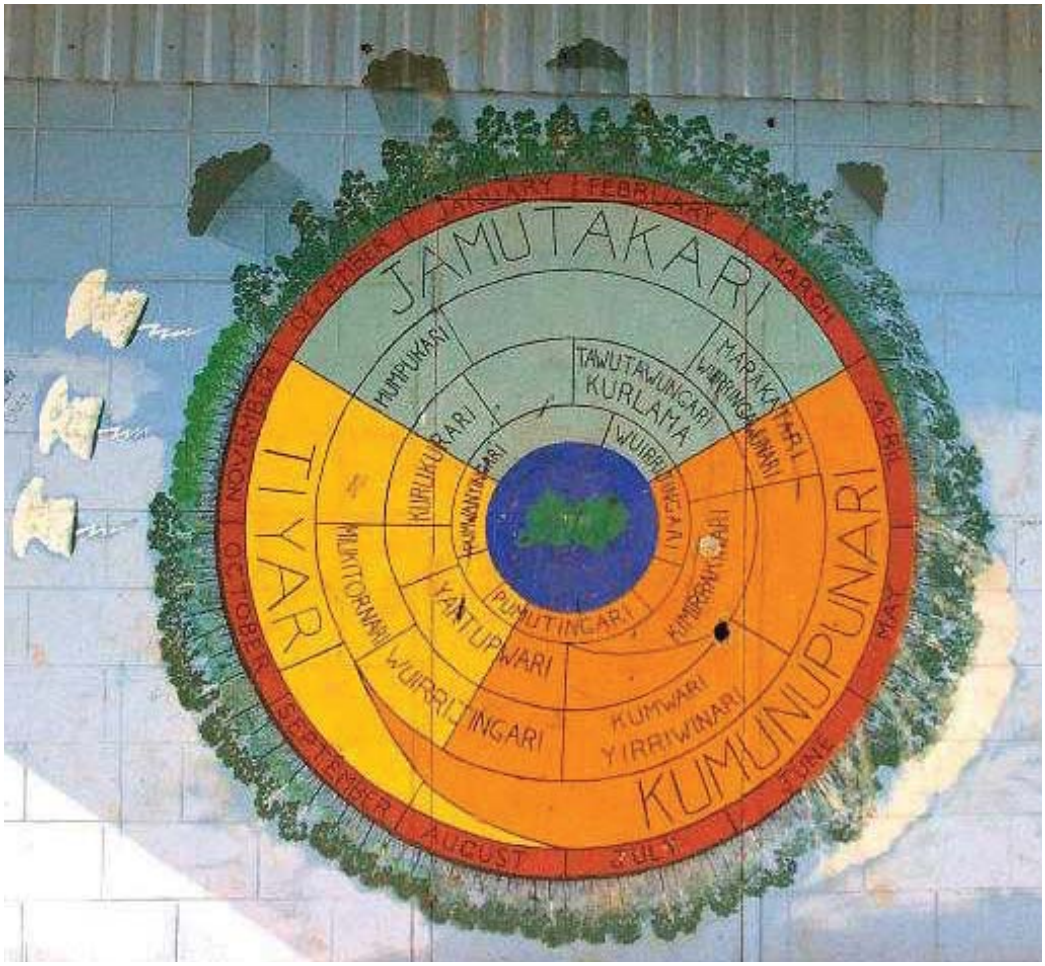


Figure 2: Tiwi Seasons

The climate of the Tiwi Islands is tropical monsoonal, characterised by a hot and humid 'summer' (wet season) and a hot and dry 'winter' (dry season). These two distinct periods of annual drought and highly predictable annual rainfall are typical throughout the Top End.

The timing of the transition between the two seasons is variable, with the dry season commencing any time between late March and late May. The length of the seasons, however, is relatively constant. Winds are predominantly north-westerly in the wet season, and south-easterly in the dry season.

Average temperatures range from 25 to 36°C in October and 19 to 29°C in July. During the colder dry season months of June and July, inland temperatures can reach as low as 12°C overnight (Plumb 1977 & Puruntatameri *et al.* 2001). The variation in daylight length is small at around 1.5 hours.

In terms of total rainfall, the Tiwi Islands have the highest rainfall in the Northern Territory, with around 90% falling between November and April. Mean annual averages range from 1200mm to 1400mm in eastern Melville Island, and up to 2000mm in northern Bathurst Island and north-western Melville Island (Hollingsworth 2003). The variability of rainfall between months is high, with monsoonal storms typically occurring in January and February. The months either side are characterised by high intensity convectional storms and storms associated with the monsoon trough.

'Hector' is a local storm cell that forms over the Islands in the late afternoons prior to and during the wet season. It is responsible for bringing significant early rainfall to the Islands, resulting in a slightly longer wet season than that of the mainland. Hector has also been the subject of international study under the maritime continental thunderstorms experiment.

Cyclones are regular events on the Tiwi Islands, and have at times caused great damage and loss of life. Below is a random selection of the many cyclones that have affected the Islands:

April 1827
Category 3 — Destroyed fences, gardens, wharf and buildings at Fort Dundas settlement, Melville Island.

February 1915
Category 4 — 250mm of rain in 8 hours at Bathurst Island. Trees uprooted and building damage at Bathurst and Melville Islands.

March 1919
Category 4 — Nguiu destroyed. Storm surge washed away the wreckage and one baby drowned.

November 1948
Category 3 — Severe damage on Bathurst and Melville Islands. Most of the huts at Nguiu demolished. Lugger *La Grange* wrecked with 10 lives lost.

December 1998
Category 5 — Cyclone Thelma. Maximum wind gusts to 320 km/hr north of Bathurst Island. Major disruptions to communications and power supplies. Many large trees blown down and minor building damage at Pirlangimpi. Extensive tree damage around north Bathurst Island and north-west Melville Island. Waves to 6m and swells to 8m reported at Cape Fourcroy.

(Northern Territory Government 2000).

Geology Landform and Soils

"Long ago there were no people on the earth and darkness covered the land. There were no rivers or billabongs, there was no water in the streams, no hills or valleys. There were no animals living in the sea, no fish, turtles or crocodiles.

One day Murtankala dug her way from a cave underground and arrived on earth. When she knelt to rest, her children cried because they were hungry. Murtankala had no milk so she looked around for food for her children, and for soft ground where she could lay them, but she could find nothing. There was no grass, no water nor any bushland where they could look for food.

So then she began to crawl at that place where she had arrived on the earth. When she crawled along she made a large hole behind her and the seawater began to rush in behind her back. She was facing towards where the sun now rises and her face was turned to that eastern side. She crawled along and after a long time returned to where she first started. And so she created these two Islands."

(Kerinaiua 1989)

Detailed information on the geology of the Tiwi Islands is provided by Hughes, who compiled the 1:250,000 scale Geological Series *Bathurst Island and Melville Island, Northern Territory*.

Bathurst and Melville Islands consist of a thin, gently north westerly dipping sheet of Mesozoic and Cainozoic sediments deposited on a stable sheet known as the Bathurst Terrace. The main units are shown in Figure 3.

The Wangarlu Member is comprised mostly of mudstone and siltstone, and underlies the Islands from approximately sea level to a depth of about 500m. It is seen in drill cuttings as sticky to firm grey clay, and can be seen exposed at low tide on the south eastern coast of Bathurst Island (Haig *et al.* 2003). It was accumulated during a time when open marine conditions occurred across the platform (Hughes 1976).

Sand, silt and mud were deposited as the sea withdrew, creating the overlying Moonkinu Member. This is described as fine to very fine sandstone interbedded with grey carbonaceous mudstone and siltstone (Hughes 1976). A highly weathered hard, dark brown section of this unit can be seen along the beach at Milikapiti (Haig *et al.* 2003).

A period of chemical weathering followed, which resulted in an extensive cover of laterite. In the subsequent Tertiary period, earth movements resulted in slight tilting to the north west. Much of the area remained above sea level, and subsequent erosion and deposition resulted in the laying down of the Van Diemen sandstone. This consists of friable, white to yellow, medium to coarse grained quartzose sandstone with lenses of siltstone (Hughes 1976). This formation covers most of Melville and Bathurst Islands, and varies in thickness from 20m in gently undulating terrain, to over 60m on the higher ridges (Haig *et al.* 2003).

AGE	Era	Period	Formation
	Cainozoic	Quaternary	Alluvial sediments
		Tertiary	Van Diemen Sandstone
	Mesozoic	Cretaceous	Moonkinu Member
			Wangarlu Member

Figure 3: Geological Units (Hughes 1976)

Thin alluvial sediments of silt, sand and gravel were laid down during the Quaternary period, and are widespread over the Islands. Red sandy soils developed on the Van Diemen Sandstone, and grey to yellow sandy soils developed on the Moonkinu Member (Hughes 1976).

The Tiwi Islands are of low relief and topographically simple. Lateritic rises and dissected plateaux drain mostly northwards across inland sand plains and out into coastal plains.

The areas of higher relief to the south (up to120m on Bathurst Island, and 160m on Melville Island) are remnants of the Van Diemen Sandstone laid down in the Tertiary period. Inland sand plains formed northwards as a result of the erosion and deposition of the Tertiary surface, while poorly drained open plains around Maxwell Creek on Melville Island and central Bathurst Island are a result of exposure of the earlier Moonkinu Member (Hughes 1976).

The coastal plains are made up of mangrove-lined tidal flats extending inland along river channels, and deposits of beach and littoral sand that have accumulated on the western and northern coasts. Sand dunes occupy a 20km coastal strip on southern Bathurst Island, where they rise to more than 20m above sea level, and extend inland up to 1.5km (Hughes 1976).

Bauxite is present in northern Melville Island, but has been assessed as uneconomical. Similarly, occurrences of phosphate along the south coast of Bathurst Island are not considered to be of commercial value. Several areas of significant concentrations of mineral sands have been identified on the north coast of Melville Island and west coast of Bathurst Island (Hughes 1976).

Detailed soil descriptions are provided in Hollingsworth (2003), who described eighteen soil types from surveys of 385 sites. The main soil types reflect the parent material, with red and yellow sandy soils occurring on the residual plateaux surrounded by well drained sandy profiles. Recent alluvium deposited along creeks forms localised clay terraces, while the low lying coastal plains are primarily saline clays. The coastal dune systems are primarily siliceous sands with some calcareous sands in places (Forsci 1998).

The surface soils of the Islands are typically highly leached and nutritionally poor, common with most soils in the Top End of the Northern Territory (Hollingsworth 2003). More detailed analyses of soil fertility are provided in Forsci (1998).

Hollingsworth (2003) mapped and described thirty discrete land units at 1:100,000 scale, and provided capability assessments for a range of key land use objectives:

Land Unit	Land-form	Area (ha)	Opportunities/limitations
Laq086	Plateau, summit surface	9,463	Opportunities for forestry, agriculture, horticulture, building and construction, roads, septic tanks.
Gaq086	Plateau, summit surface	25,428	Opportunities for forestry, agriculture, building and construction, roads, septic tanks.
Uec088	Rises, fan	72,690	Opportunities for building and construction, roads.
Gec090	Rises, footslopes	3,366	Opportunities for building and construction, roads.
Gfc085	Plain, slopes	15,155	Opportunities for roads. Erosion risk limitations.
Lfo095	Plain	5,270	Opportunities for gravel extraction; severe drainage limitations.
Lfo109	Plain	4,680	Opportunities for gravel extraction; drainage limitations.
Gfo109	Plain	29,780	Opportunities for construction, road material, gravel extraction; drainage limitation.
Lrm099	Estuary, tidal flat	115,140	Drainage and flooding limitations.
Usj098	Chernier plain, beach ridge	1,190	Opportunities for building and construction, roads, sand extraction. Moderate drainage and flooding limitations.
Ueo107	Low hills, hill slopes and crests	19,490	Opportunities for gravel extraction; slope, drainage and surface rock limitations.
Uef085	Plain, slopes	44	Opportunities for roads; erosion risk limitation.
Lfl098	Rises, slopes	4,660	Drainage limitations.
Laq105	Plateau, summit surface	110,910	Opportunities for building and construction, roads.
Gaq085	Plateau, undulating rises, hill crests & plateau edges	9,376	Opportunities for roads; erosion risk limitation.
Uaf100 Lef100 Laf100 Rdf100	Plateau, hill slopes and plateau edges	2,050	Opportunities for gravel extraction; surface rock and erosion risk limitations.
Gec088	Sandplain, fan	13,080	Opportunities for building and construction, roads.
Lgl101	Plain	342	Drainage limitations.
Gec091	Sandplain, slope and flat	59,827	Opportunities for building and roads; drainage limitations.

Lfc093	Plateau, plain	102,810	Opportunities for building and construction, septic tanks.
Udf085	Plain, slopes	103,510	Opportunities for roads; erosion risk limitation.
Lfc087	Plateau, summit surface	2,810	Opportunities for forestry, agriculture, horticulture, building and construction, septic tanks.
Gec084	Plain, footslopes	532	Surface rock and drainage limitations.
Gfo095	Plain	9,413	Opportunities for gravel; drainage and flooding limitations.
Lrm110	Estuary, supra-tidal flat	5,590	Severe drainage and flooding limitations.
Lff112	Plain	7,700	Opportunity for gravel extraction; soil depth and surface rock limitations.
Lsj113	Sand plain, swamps	3,560	Opportunity for sand extraction; drainage and flooding limitations.
Lfc114 Lef114	Plain, swamps and drainage depressions	2,840	Drainage and flooding limitations
Lfc116	Estuary, supra-tidal flat	392	Drainage limitations.
Gel117	Rises, stream channels	Approx 200	High conservation value and not suitable for development.

Table 7: Land Units (Hollingsworth 2003)

Hydrology

> "The old woman continued her journey overland and once again the moulded earth filled with the flow of water."
>
> (Kerinaiua 1989)

The water resources of the Tiwi Islands were mapped, described and evaluated by Haig *et al.* in 2003, and are summarised below. Assessments were carried out on groundwater and surface water, the interactions between the two, and water resource management issues.

Groundwater

Haig *et al.* (2003) identified two regional aquifer systems on the Tiwi Islands: a shallow, unconfined aquifer; and a deep, confined aquifer.

The shallow aquifer occurs within the Van Diemen Sandstone and overlying laterite and alluvium. It covers the majority of both Islands, and is the most readily used for bore water supplies on the Islands.

Production potential is dependent on the thickness of the aquifer. In areas where the sandstone is greater than 60m thick, yields of up to 10 litres/second are likely. Areas of less than 20m thickness are likely to only produce up to 0.5 litres/second, while the likelihood of shallow water supplies is low where there is no underlying Van Diemen Sandstone, or less than 10m thickness.

The shallow aquifer is made up of sandstone with layers of silt and clay. As these materials do not readily react with water, the stored water largely retains the properties of the annual rainfall recharge. Subsequently, the quality of water from the aquifer has been assessed as very high. pH is typically low (between 4 and 6), however is within acceptable limits for drinking water. Hardness and salinity are also low, with the exception of areas near the coast where salt water may intrude into the groundwater.

Recharge occurs each wet season through direct infiltration of localised rainfall. A series of rainfall events is required before there is sufficient recharge to affect the aquifer water table, although once a certain level of saturation is reached the response time reduces. During the dry season, water drains from the shallow portion of the aquifer, with shallow bores fluctuating up to 5 metres between seasons. In contrast, the deeper bores show seasonal fluctuations of between only 1 and 3 metres. This shows the 'buffering' effect of the greater thickness of the sandstone, and the greater length of time required for the recharge water to penetrate into the deeper portion.

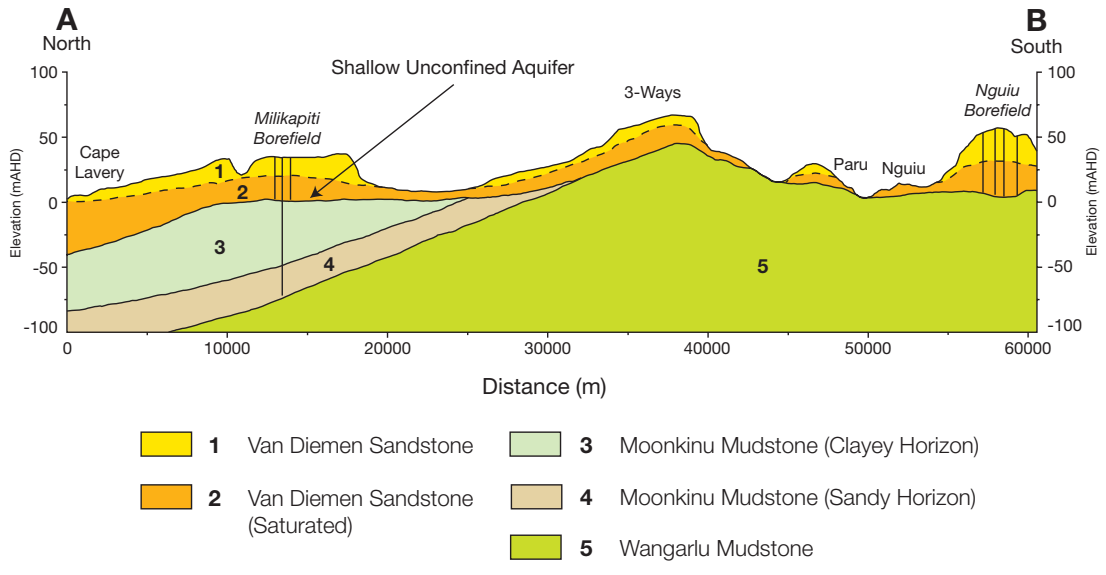


Figure 4: Geological Cross Section of the Shallow Unconfined Aquifer (Haig *et al.* 2003)

The deep, confined regional aquifer occurs within the Moonkinu Member, and is separated from the shallow aquifer by a relatively impermeable layer of claystone and siltstone. It is approximately 30 to 60 metres thick, and dips gently to the north west. The top of this aquifer is located at about sea level in central Bathurst and Melville Islands, and at about 110m depth in the north of Melville Island.

The aquifer has been identified in three locations on the Tiwi Islands, with bore yields ranging from 0.5 litres/second to 4 litres/second. As with the shallow aquifer, water quality has been assessed as very high, with the presence of carbonate in the aquifer material resulting in higher pH values.

Recharge to the deep aquifer occurred more than 7,000 years ago when the sea level was approximately 130 metres lower than present. Rainfall in the centre of the Island recharged the aquifer where it is close to the land surface, and then slowly flowed down gradient to the north west. Over a long period of time the deeper portion was fully recharged. Recharge no longer occurs, as the water levels in the aquifer are now at sea level.

Surface Water

The areas of higher relief in the south of the Tiwi Islands drain mostly northwards through creek and river systems. Major catchment areas for the Islands are:

Main drainage feature	Catchment area km²
Bathurst Island	
Dudwell Creek	333
Gullala Creek	165
Fuingatingerrany & Kulaka-Iniarimu Creeks	250
Tunganapu Creek	209
Munanampi & Maand Creeks	241
Euro Creek	195
Tipabina Creek	89
Southern Bathurst	161
Melville Island	
Kilu-Impini Creek	536
Mirikau-yunga & Maxwell Creeks	386
Tjipripu River	726
Andranangoo Creek	554
Jessie (Aliu) River	492
Johnston River	890
Dongau Creek	552
Takamprimili Creek	610
Southern Melville	980

Table 8: Major Catchments

Flows in rivers and creeks are highest during the wet season. Soils become saturated and rainfall converts to runoff, which becomes the dominant flow component. At the end of the wet season and into the dry season when rainfall reduces, the dominant flow is sourced from springs or drainage of the shallow aquifer along the course of the waterway. This is known as base flow.

Base flow occurs through drainage of the Van Diemen Sandstone. Where the sandstone is thicker, the volume and duration of flow is greater. This results in some of the smaller rivers and creeks in the northern half of Melville Island flowing all year round, while many areas

on the southern side where the sandstone is very thin (<20m) tend to be dry by the end of the dry season. Similarly, spring fed creeks at higher elevations tend to dry up earlier than those at lower elevations, reflecting the drainage behaviour of the aquifer.

The surface water quality from 29 sites on both Bathurst and Melville Islands has been assessed as high, with chemistry similar to that of groundwater from the shallow aquifer. A study of Takamprimili Creek in south west Melville Island in 1994-1996 found that the creek was in good health, with a macro-invertebrate population comparable to that of other Top End creeks. This was despite the area being subject to major forestry operations in the past (Haig *et al.* 2003; Suggit and Edwards 1997).

Localised increases in turbidity and nutrients have been reported in some areas of the Islands, and attributed to feral buffalo activity on Melville Island and feral pig activity on Bathurst Island. Another potential impact on turbidity and sediment load has been identified as the introduction of suspended solids from road works and clearing operations.

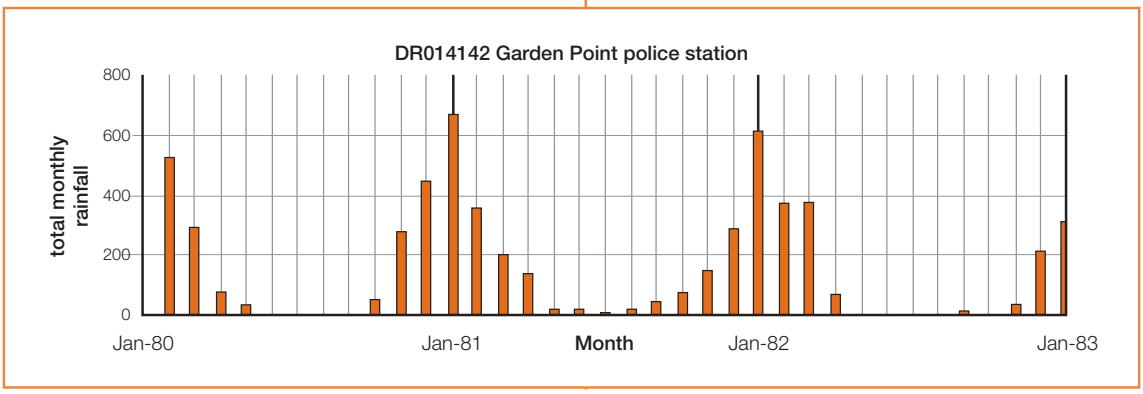


Figure 5: Rainfall data from Garden Point Police Station (Haig *et al.* 2003)

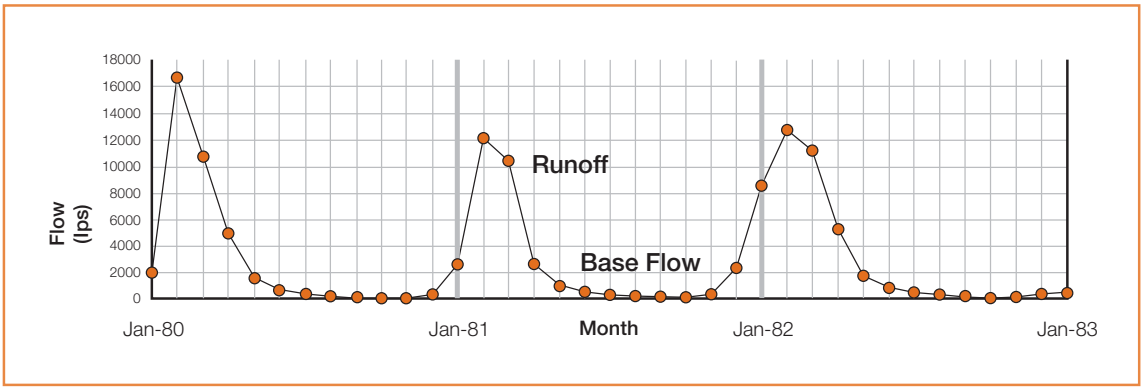


Figure 6: Flow Volumes in Blue Water Creek (Haig *et al.* 2003)

Flora and Fauna

> Before she left, Murtankala covered the islands she had created with plants and filled the land and sea with living creatures. Finally the land was prepared for her children and for the generation of Tiwi who followed.
>
> (Kerinaiua 1989)

Up until 2000, European knowledge of the biodiversity of the Tiwi Islands was sparse and fragmented, and impending plantation forestry development led the Tiwi Land Council to initiate a number of biodiversity studies from 2000 onwards. Carried out by the Parks and Wildlife Service of the NT, the most recent study will provide a three-part report on environments and plants, fauna, and management. Specialist consultants were also engaged to consider implications for individual species.

Although the Tiwi Islands support a distinctive biota, many of the species and environments also occur on the mainland, particularly Coburg Peninsula. 'Tiwi-Coburg' is a nationally recognised bioregion that comprises the Tiwi Islands, Croker Island and Coburg Peninsula.

Vegetation

Traditional Tiwi knowledge recognises ten different vegetation classifications:

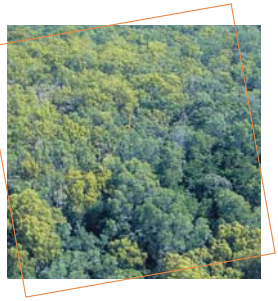
Class/name	Description
Rapatinga	Sand dune areas with little or no vegetation.
Kurlimipiti	Sand dune covered with grass.
Mirriparinga, Pamparinga	Mangrove areas.
Yawurlama	Monsoon vine forest, jungle.
Yirringarni	Billabong, swamp, waterhole.
Turringiya	Open plains, grassy areas.
Turrungini	Open area with no plants.
Warta	Eucalypt forest and woodland.
Tingata	Beach areas
Murinyini	Shrubby vegetation to about 2-3m high.

Table 9: Tiwi Vegetation Types (Puruntatameri *et al.* 2001)

Woinarski *et al.* (2003a) recorded 1082 native plant species, and identified twelve native vegetation types on the Islands from interpretation of LANDSAT imagery and intensive field sampling. Their classification illustrates the dominance of eucalypt forests and woodlands, which comprise 5,725km^2 or 76% of the total area. It also highlights the low level of disturbance, with at least 98% of the Islands' native vegetation relatively intact.

Class	Description	Area (km2)		
		Bathurst	Melville	Total
wet rainforest	Floristically diverse tall closed forests around springs and some sheltered watercourses.	4.4	21.7	26.1
dry rainforest	Coastal thickets and dry slopes of broken plateau edge	29.7	102.8	132.5
mangroves	Tall dense forests to low open woodlands in tidally inundated coastal areas, with a range of dominant species including *Sonneratia alba, Rhizophora stylosa, Bruguiera parviflora, Xylocarpus mekongensis* and *Ceriops tagal*.	275.6	515.8	791.4
sand & salt flats	Typically saline coastal areas intermixed with mangals, and supporting no vegetation, coastal dune fields, or grasslands dominated by *Sporobolus virginicus*.	14.8	115.5	130.3
sedgelands & grasslands	Mostly seasonally inundated areas, typically dominated by *Eleocharis dulcis* and *Scirpus litoralis*.	13.2	159.7	172.9
Melaleuca open forests	Forests dominated by a range of *Melaleuca* spp. (typically including *M. leucadendra* and *M. viridiflora*) in riparian areas and swamplands.	13.7	47.1	60.8
Melaleuca low woodlands	Low woodlands or shrublands typically on poorly drained sites, dominated by *M. nervosa* and/or *M. viridiflora*.	3.8	12.5	16.3
treeless plains	Low open woodlands typically dominated by *Acacia* spp., *Grevillea pteridifolia* and *Banksia dentata*.	22.1	160.7	182.8
eucalypt forest (dense)	Tall forest dominated by *Eucalyptus miniata, E. tetrodonta* and/or *E. nesophila* (often with ironwood *Erythrophleum chlorostachys* subdominant), typically with dense tall understory (variably including *Acacia* spp., *Gronophyllum, Livistona*); also including smaller areas of *Lophostemon lactifluus* and *Eucalyptus ptychocarpa* in drainage lines.	610.0	1384.5	1994.5
eucalypt forest (mid-open)	Tall forest dominated by *Eucalyptus miniata, E. tetrodonta* and/or *E. nesophila*, typically with grassy understory.	477.7	2130.9	2608.6
eucalypt forest (open)	Forest typically dominated by *Eucalyptus bleeseri* with open grassy understory.	152.6	873.5	1026.1
eucalypt woodland	Woodland dominated by *Eucalyptus oligantha* or *E. latifolia* or *E. alba* with grass understory	0	94.8	94.8
Plantations		2.2	78.9	81.1
built-up area		19.5	6.2	25.7

Table 10: Western Scientific Vegetation Types (Woinarski *et al.* 2003a)



Information on the weed status of the Tiwi Islands is documented in Fensham and Cowie (1997). This was compiled using data from five vegetation surveys of the Tiwi Islands from 1986 to 1992. 95 exotic species were identified, including declared noxious weeds, introduced pasture plants, forestry species and garden ornamentals. Ten naturalised species were identified, and twelve declared weeds. Most occurrences are currently restricted to communities and disturbed areas, with the vast majority of native vegetation in the Islands weed free. The proportion of naturalised species in undisturbed areas is also relatively low compared to other areas in the NT and Australia as a whole (Woinarski *et al.* 2003).

Species name	Common Name
Naturalised species	
Alysicarpus vaginalis	Buffalo clover
Cyperus rotundus	Nutgrass
Dactyloctenium aegyptium	Button grass
Echinochloa colona	Barnyard grass
Hyptis suaveolens	Hyptis
Lantana camara	Common Lantana
Malachra fasciata	Malachra
Passiflora foetida	Wild passionfruit
Stylosanthes humilis	Stylo
Triumfetta rhomboidea	Jute
Declared species	
Cenchrus echinatus	Mossman River grass
Cryptostegia madagascariensis	Ornamental rubber vine
Hyptis suaveolens	Hyptis
Lantana camara	Common Lantana
Mimosa pigra	Mimosa, giant sensitive plant
Pennisetum polystachion	Mission grass
Senna obtusifolia	Sicklepod
Senna occidentalis	Coffee senna
Sida acuta	Spinyhead sida
Sida cordifolia	Flannel weed
Sida rhombifolia	Paddy's lucerne
Stachytarpheta cayennensis	Snake weed

Table 11: Naturalised and Declared Weeds (Fensham and Cowie, 1997)

Fauna

While recording traditional Tiwi knowledge during 1994-1996, Puruntatameri *et al.* (2001) recorded 171 animal taxa. The majority were bird species, representing one third of the total listing. The next most recorded groups were reptiles, fish, insects, mammals, shellfish and molluscs, and crustaceans.

Grouping	No of species recorded	Total species recorded
Birds		
bush fowl, ducks, geese, turkey	7	
carnivores, insectivores	10	
cockatoos, lorikeets and parrots	5	
granivores, frugivores	6	
owls and nightjars	5	
raptors	7	
waterbirds	16	**56**
Fish	**24**	**24**
Mammals		
bandicoots, gliders, possums	3	
bats	3	
wallaby	1	
feral mammals	3	
marine mammals	3	
rats	3	
others	2	**19**
Reptiles		
crocodiles	1	
lizards, skinks, goannas	9	
snakes	12	
turtles	5	**27**
Shellfish/molluscs	**9**	**9**
Crustaceans	**5**	**5**
Insects	**23**	**23**
Other	**8**	**8**

Table 12: Tiwi Fauna Groups (Puruntatameri *et al.* 2001)

Woinarski *et al.* (2003b) collated historical information on the fauna of the Islands, and described detailed results from studies undertaken in 2000-2001. Limited information is available for fish, freshwater systems, marine systems and invertebrates, with most emphasis placed on terrestrial vertebrate fauna. Woinarski *et al.* (2003b) did, however, systematically inventory ants, and identified 151 species during 2000-2001, also noting that the tally was likely to be very incomplete.

Results from historical collations and recent studies are broadly summarised on the following page:

Grouping	No of species recorded	Total species recorded	Comments
Birds	216	**216**	4 may need confirmation
Fish	49	**49**	includes many estuarine species
Mammals			
dasyurids	4		
bandicoots	1		
macropods	1		
possums	2		
bats	16		1 may need confirmation
rodents	10		2 may need confirmation
dingoes	1		
dugongs	1	**36**	
exotic	6	**6**	Exotic
Reptiles			
crocodiles	1		
marine turtles	5		
freshwater turtles	2		
geckoes	5		1 is exotic
legless lizards	3		
dragons	6		2 may need confirmation
goannas	6		1 may need confirmation
skinks	21		1 may need confirmation
blind snakes	3		1 is exotic
pythons	4		
file snakes	2		1 may need confirmation
colubrid snakes	6		
elapid snakes	11		
sea snakes	6	**81**	
Frogs	17	**17**	
Ants	151	**151**	6 are exotic

Table 13: Western Scientific Fauna Groups (Woinarski *et al.* 2003b)

Six exotic mammal species were identified during the study; black rat, water buffalo, cattle, pig, horse and cat. Water buffalo and horses occur exclusively on Melville Island, with the exception of one resident stallion at Nguiu known locally as Charlie. A survey by Saalfield in 1997 estimated 4107 ± 2009 buffalo concentrated mostly in the eastern half of Melville Island, and 1397 ± 1234 horses predominantly in the southern half. The survey methodology suggests that these estimates are likely to be significantly low (Saalfield 2003).

Until recently, feral pigs were thought to occur exclusively on Bathurst Island. Sporadic but unconfirmed reports of pigs on Melville Island led the Tiwi Land Council to initiate a localised survey in 2003, which confirmed their presence. Although numbers are not known, it is believed that their occurrence is restricted to one area in the north west of the Island. Pigs have been present on Bathurst Island since Mission settlement, and while their numbers are also not known, they have caused significant local impact in many areas of the Island.

Cats have largely been restricted to the communities on both Islands, however reports of bush sightings are increasing.

Of the six introduced ant species recorded, five are considered to be relatively innocuous. The sixth, *Pheidole megacephala*, or big-headed ant, is known as one of the world's most invasive ant species and a threat to biodiversity values. At this stage, the ant is known only from communities, and did not appear in recent Tiwi fauna surveys (Andersen *et al.* 2003).