Plant Group

The Plant Group is currently focussing on three projects: Leaf Longevity Experiments, Leaf Litter Trapping and the production of a Saltmarsh/Mangrove Herbarium. Other projects have been completed including a transect at the 10 Terminal Regiment area, Townsville.

1. Leaf Longevity Experiments

There is little information available concerning the vegetative growth or fruiting/flowering behaviour of the mangrove forests of North Eastern Australia. Information such as this is important for gaining an understanding of mangrove production, ecology, and feeding relationships. Rate of primary production for a given mangrove ecosystem is used as a key indicator of the health of that system.

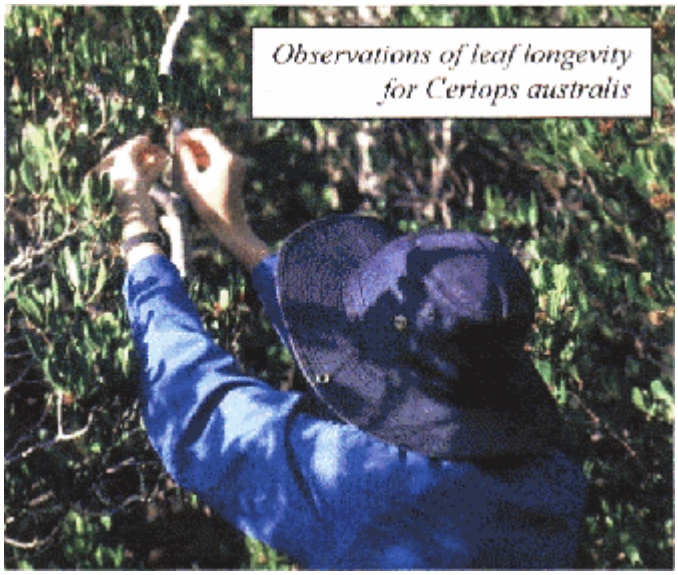
Previous studies have shown that the majority of organic nutrient input into a system comes in the form of leaves followed by reproductive parts from mangrove species falling into mud/water and being broken down by sesarmid crabs and macro-gastropods among other organisms. As such, studies concerning vegetative and reproductive phenology are seen as standard ways of establishing baseline data on the health of an estuarine ecosystem. Previous studies have shown that the number of leaves per branch is fairly consistent, and as such, it has been selected as a measure of canopy status and dynamics. This has allowed for estimates of leaf longevity to be made directly through observing leaf production and loss on branches.

The aims of this project are to make observations of leaf longevity for *Ceriops australis* at a number of locations over a 3-year period, to gain an insight into the total productivity and health of this environment.

Methods

The first site studied was adjacent to the 10 Terminal Regiment and Army Maritime School Ross Island, Townsville. Trees from the first study site were measured from June, 1997 to January, 1999. In order to provide a representative sample of trees, three sites were selected (map PG-01) with each site containing six trees, spaced no more than eight metres apart. The second study site was on the banks of the Bohle River adjacent to the boat ramp and was measured from November, 1997 to August, 1998 (No map available).

Eight branches were chosen on each tree, four in the upper whorl and four in the lower whorl, to represent the overall tree habit. Leaves on each of these branches were monitored over time to ascertain their growth and longevity. Pairs of leaves at each node are given a number beginning at one. This number was etched into the leaf using a ballpoint pen. Consecutive pairs of leaves at each node was then numbered in the same manner In one sampling interval, the number of leaves, branching shoots, buds, flowers, fruits, and hypocotyls per node is recorded in a data sheet, using a key (Fig. PG-02) to establish the stage of development.



This is repeated for all tagged branches at each of the three sites in every sampling interval.

Data analysis

Leaf loss and leaf production rates were calculated for each branch. To gain a net annual leaf production value for the entire site, leaf loss and leaf production rates for upper and lower whorls were summed for the entire study period and standardised for annual production. A summation of lower and upper whorls data gives a net annual leaf production.

Results and Discussion

Experiments focussing on leaf longevity generally involve a monthly sampling interval. Due to time and human resource constraints, however, it was decided that a six monthly sampling interval be undertaken which enabled the gathering of annual leaf production values but doesn't allow graphing of seasonal trends.

There appeared to be no significant difference in leaf production between the upper and lower whorls. However, in general, there appeared to be a higher production rate of flowering and fruiting bodies in the upper whorl as compared to the lower whorl.

The process from flower bud formation to the mature hypocotyl persisted throughout the year. It should be noted though that flower buds typically formed over the summer months while fruit and hypocotyl development persisted into the winter months.

The annual leaf production at the **10 Regiment Terminal** was less than the annual leaf shedding rate, with the **net annual leaf production** being **-3.15.** This may be due to any number of factors. There are vast amounts of seedling recruitment in the area suggesting that the area is still productive. It may also by undergoing a change in species composition whereby the Ceriops stands are being replaced with other mangrove species. This is a common occurrence amongst mangrove systems.

In contrast, the site at the **Bohle River** indicated a more productive system over the same time period, with the net annual leaf production being **5.8.**

In summary, this study demonstrates some basic techniques that can be carried out by the average person in order to gain insight into the heath of a mangrove ecosystem. The results presented here indicate that the site adjacent to the 10 Terminal Regiment is in a non-productive state while the site at the Bohle appears to be relative healthy.

Due to the amount of time that it takes to perform such experiments(it may not be the ideal method of choice for such a community group. For this reason it has been suggested that leaf litter trapping techniques be used in the future to analyse mangrove productivity as they involve less contact hours yet provide results similar to that obtained by research institutions.

2. Vegetation Transects at South Townsville Mangroves, adjacent to the 10 Terminal Regiment and Army Maritime School, Ross Island, Townsville.

A series of transect-based vegetation surveys were undertaken from May-June 1998 in order to provide a basic description of the vegetation communities present on the site. Three major transects (A, B and C) were undertaken with smaller transects emanating from each of these major transects. For all transects, the plants within im either side were counted, thus each transect was 2m wide. Distances were measured with a 50m transect tape and directional bearings were estimated using a compass.

TRANSECT LINE A (17 May 1998)

From the 10 Terminal side of the bridge over Goondi Creek, a distance of 15m was measured. The main transect was then taken from this point at a compass angle of 245 degrees (approx. WSW). At 20m intervals along this transect, 5 shorter transects, at an angle of 90 degrees to the main transect were undertaken. These were of varying length, with all ending at the creek (Goondi Creek) edge.

Main Transect

- 0.0 – 6.5m	rock-filled bank of road
- 6.5 – 14.5m	*Avicennia marina* to 5m high dominant with a few *Ceriops australis* to 1.2m high and *Rhizophora stylosa* to 1.9m high
- 14.5 – 15.7m	bare mud, part of natural drainage line to Goondi Creek
- 15.7 – 19.7m	mix of *Sueada australis* and *Sporobolus virginicus*
- 19.7 – 20.8m	*Sueada australis*
- 20.8 – 23.6m	medium density *Halosarcia indica*
- 23.6 – 73.2m	open area of bare mud
- 73.2 – 86.9m	sparse coverage of *Halosarcia indica*
- 86.9 – 89.7m	medium density *Halosarcia indica*
- 89.7 – 93.9m	mix of *Sueada australis* and *Halosarcia indica*
- 93.9 – 95.4m	mix of *Sueada australis* and *Sporobolus virginicus*
- 95.4 – 104.3m	*Sporobolus virginicus* with one *Ceriops australis* 1.2m high, one *Excoecaria agallocha* 2.4m high and one *Avicennia marina* 2.5m high
- 104.3 – 105.5m	mix of *Sueada australis* and *Sporobolus virginicus*
- 105.5 – 111.6m	*Ceriops australis* to 4m high and *Avicennia marina* to 4m high with a few *Aegialitis annulata* to 2.5m high
- 111.6 – 114.9m	*Rhizophora stylosa* to 2.5m high, *Aegialitis annulata* to 2.5m high and *Avicennia marina* to 5m high

ends at Goondi Creek

Transect A.1

- 0 - 15m	mix of *Sueada australis* and *Sporobolus virginicus*
- 15 - 18.2m	*Sporobolus virginicus*
- 18.2 - 25.0m	*Ceriops australis* dominant averaging 4.5m high, one *Bruguiera* at 22.4m
- 25.0 - 25.2m	*Avicennia marina* at edge of Goondi Creek

Transect A.2

- 0 - 8.9m	bare mud
- 8.9 – 14.7m	scattered *Halosarcia indica* among mud
- 14.7 – 15.8m	mix of *Sueada australis* and *Sporobolus virginicus*
- 15.8 – 17.3m	*Sporobolus virginicus*
- 17.3 – 25.1m	*Ceriops australis* to 4m high dominant with one *Avicennia marina* and one *Aegialitis annulata*
- 25.1 – 28.5m	mixture of *Ceriops australis* and *Avicennia marina* to 5m high
- 28.5 – 29.3m	*Rhizophora stylosa* at edge of Goondi Creek

Transect A.3

- 0 - 6.9m	bare mud
- 6.9 - 17.4m	scattered *Halosarcia indica* among mud
- 17.4 - 18.4m	*Sueada australis* dominant with some *Sporobolus virginicus*
- 18.4 - 21.6m	*Sporobolus virginicus* dominant with six small *Avicennia marina* to 1.9m and one *Ceriops australis* to 0.9m high
- 21.6 - 26.0m	*Sporobolus virginicus*
- 26.0 - 38.0m	*Ceriops australis* to 4m high dominant with some *Avicennia marina* to 5m high

- 38.0 - 44.0m *Ceriops australis* to 4m high and some *Avicennia marina* to 5m high
- 44.0 - 46.5m *Rhizophòra stylosa* to 5m high hanging in water and several *Aegiceras corniculatum* to 2.5m high

Transect A.4

- 0 – 10.9m scattered *Halosarcia indica* among mud
- 10.9 – 12.5m mix of *Sueada australis* and *Halosarcia indica*
- 12.5 – 13.2m mix of *Sueada australis* and *Sporobolus virginicus*
- 13.2 – 17.1m *Sporobolus virginicus*
- 17.1 – 19.4m *Sporobolus virginicus* with several *Avicennia marina* to 4m high
- 19.4 – 29.6m *Sporobolus virginicus*
- 29.6 – 30.6m mix of *Sueada australis* and *Sporobolus virginicus*
- 30.6 – 31.6m *Ceriops australis* and *Aegialitis annulata*
- 31.6 – 37.4m *Ceriops australis* to 3.5m high, *Aegialitis annulata* to 1.5m high, *Rhizophora stylosa* to 3m high and *Avicennia marina* to 5m high
- 37.4 – 39.2m *Avicennia marina* to 5m high and *Aegialitis annulata* to 1.5m high and one *Rhizophora stylosa* to 1.2m high

Transect A.5

- 0 – 4.2m *Sporobolus virginicus*
- 4.2 – 7.0m mix of *Sueada australis* and *Sporobolus virginicus*
- 7.0 – 8.0m mix of *Sueada australis* and *Sporobolus virginicus* and *Aegialitis annulata* to 1.5m high
- 8.0 – 15.0m *Ceriops australis* to 3m high and *Avicennia marina* to 5.5m high
- 15.0 – 16.0m *Aegialitis annulata* to 1.5m high and *Rhizophora stylosa* to 3m high

TRANSECT B (31 May 1998)

From the 10 Terminal side of the bridge over Goondi Creek, a distance of 17m was measured. The main transect was taken from this point at a compass angle of 70 degrees (approx. ENE). At 20m intervals along the transect, 4 shorter transects, at an angle of 350 degrees (Transect 1, 2 and 4) or 10 degrees (Transect 3) to the main transect were undertaken. These were of varying length, with all ending at the Goondi Creek edge.

Main Transect

- 0 – 5.6m rock-filled bank of road
- 5.6 – 9.1m sparse *Aegialitis annulata* and *Ceriops australis* to 1m high with a couple of *Avicennia marina* to 3m high
- 9.1 – 20.0m open area of bare mud
- 20.0 – 37.3m open area of bare mud
- 37.3 – 40.0m patch of low *Ceriops australis* to 1m high
- 40.0 – 52.3m mostly bare mud with a few spindly *Avicennia marina* to 3m high
- 52.3 – 56.9m sparse *Aegialitis annulata* to 1.5m high with *Avicennia marina* to 4m high
- 56.9 – 60.0m one *Avicennia marina* to 2.5m high and one *Ceriops australis* to 1.5m high
- 60.0 – 64.0m open mud area with numerous *Avicennia marina* pneumatophores from adjacent trees
- 64.0 – 71.8m open mud area with numerous *Avicennia marina* pneumatophores and 3 trees to 4m high
- 71.8 – 80.0m patch of *Aegialitis annulata* of 1-1.5m high with *Avicennia marina* to 4m high

Transect B.1

- 0.0 - 10.0m open area of bare mud
- 10.0 – 21.0m *Ceriops australis* to 2m high and *Avicennia marina* to 3.5m high with a single *Bruguiera* at 19.8m
- 21.0 – 28.1m patch of *Sporobolus virginicus* with some *Sueada australis*

- 28.1 – 29.1m *Ceriops australis* to 2.5m with one *Rhizophora stylosa* to 3m high

Transect B.2

- 0.0 – 2.0m transect is along the edge of a patch of low *Ceriops australis* to 1m high
- 2.0 – 11.1m open area of bare mud
- 11.1 – 22.3m *Ceriops australis* to 2.5m, *Avicennia marina* to 4m and occasional *Sueada australis* and one or two *Halosarcia indica*
- 22.3 – 24.2m *Avicennia marina* to 4m high
- 24.2 – 30.0m patch of *Sporobolus virginicus* with a few *Sueada australis* and numerous *Ceriops australis* seedlings at 30.0m
- 30.0 – 33.0m *Ceriops australis* to 3.5m high
- 33.0 – 33.5m *Avicennia marina* to 4m high

Transect B.3

- 0.0 – 3.2m mostly bare mud with a few *Avicennia marina* to 4m high and individual *Ceriops australis* and *Aegialitis annulata* to 1m high
- 3.2 – 10.1m right side of transect is a patch of *Aegialitis annulata* to 1.5m high and left side is bare mud with numerous *Avicennia marina* pneumatophores
- 10.1 – 15.5m mostly bare mud with two *Avicennia marina* to 7m high and dense ground-coverage of *A. marina* pneumatophores
- 15.5 – 26.5m *Aegialitis annulata* to 1.5m and a few *Avicennia marina* to 3.5m
- 26.5 – 30.2m a few each of *Ceriops australis* to 3m, *Rhizophora stylosa* to 3m and *Avicennia marina* to 4m high
- 30.2 – 37.1m *Sporobolus* patch on mud mound raised about 25cm above surrounding mud areas
- 37.1 – 46.1m mostly *Ceriops australis* to 4m with some *Avicennia marina* to 5m, one *Bruguiera* to 3m and one *Aegialitis annulata* to 2m high
- 46.1 – 48.6m *Rhizophora stylosa* to 5m and *Avicennia marina* leaning over creek

Transect B.4

- 0.0 – 16.8m mixture of *Avicennia marina* to 4m, *Ceriops australis* to 1.5-2.0m, *Aegialitis annulata* to 1.5m and a couple of *Rhizophora stylosa* to 1.5m high
- 16.8 – 22.8m patch of *Aegialitis annulata* to 1m high
- 22.8 – 32.5m patches of bare mud with patches of *Ceriops australis* to 1.5m and a couple of *Avicennia marina* to 4m high
- -32.5 – 36.5m patch of bare mud
- 36.5 – 50.8m dense patch of *Ceriops australis* to 3m and a couple of *Avicennia marina* to 6-7m high
- 50.8 – 54.7m *Avicennia marina* to 7m hanging over creek with understorey of *Aegialitis annulata* to 2m and some *Rhizophora stylosa* to 5m high

TRANSECT C (14 June 1998)

Six transects done from various points emanating from the fencelike surrounding the 10 Terminal regiment compound. Each began at a corner or fence pole where the fence changed direction, never along a straight stretch of fence. The first few metres of each transect consists of the sand embankment upon which the compound is built and has been revegetated as part of the construction so its vegetation should change with time as these become established.

Transect C.1

Begins at the first corner post encountered from the car park at an angle of 280 degrees toward Bumphead Creek.

- 0.0 – 3.5m bare soil to bottom of raised embankment on which the site is built.
- 3.5 – 11.5m mostly bare sand with a few *Avicennia marina* to 3m with vigorous healthy growth.

- 11.5 – 16.8m mud area with quite a few *Sueada arbusculoides* and a few small mangrove seedlings
- 16.8 – 30.0m mostly *Aegialitis annulata* to 2.2m high with quite a few emergent *Avicennia marina* to 6m high with a couple of *Rhizophora* and *Ceriops australis* to 1.5m high.
- 30.0 – 38.3m mostly *Aegialitis annulata* to 2.2m high with quite a few emergent *Avicennia marina* to 6m high with a couple of *Rhizophora* and many *Ceriops australis* to 3.0m high
- 38.3 – 39.8m *Rhizophora stylosa* to 3m high

Transect C.2

Begins at the first corner post encountered from the car park at an angle of 190 degrees toward Bumphead Creek.

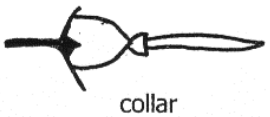
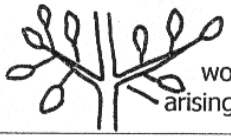
- 0.0 – 5.4m top of embankment thick with *Ipomoea pes-caprae* and with some Melinis repens (red natal) and *Chloris* sp.
- 5.4 – 6.7m embankment slope with dense *Sporobolus virginicus*
- 6.7 – 9.3m bare mud with abundant *Avicennia marina* seedlings and *Sueada arbusculoides*. Also one *Avicennia marina* to 3.5m high and one *Ceriops australis* to 2.0m high.
- 9.3 – 12.8m one side of transect sandy and bare, the other muddy with lots of *Halosarcia indica* and a little *Sueada arbusculoides*
- 12.8 – 15.5m sand soil with scattered *Sueada arbusculoides*
- 15.5 – 20.8m muddy area with lots of *Sueada arbusculoides*, lots of *Aegialitis annulata* seedlings to 30cm high and a few *Avicennia marina* and *Ceriops australis*
- 20.8 – 31.3m dense patch of *Aegialitis annulata* increasing in height along the transect from 1m high to 2.5m high.
- 31.3 – 36.3m predominantly *Aegialitis annulata* to 2.5m high with occasional *Avicennia marina* to 6m high, *Rhizophora stylosa* to 4m high and *Ceriops australis* to 3m high
- 36.3 – 37.0m *Rhizophora stylosa* tree zone.

Transect C.3

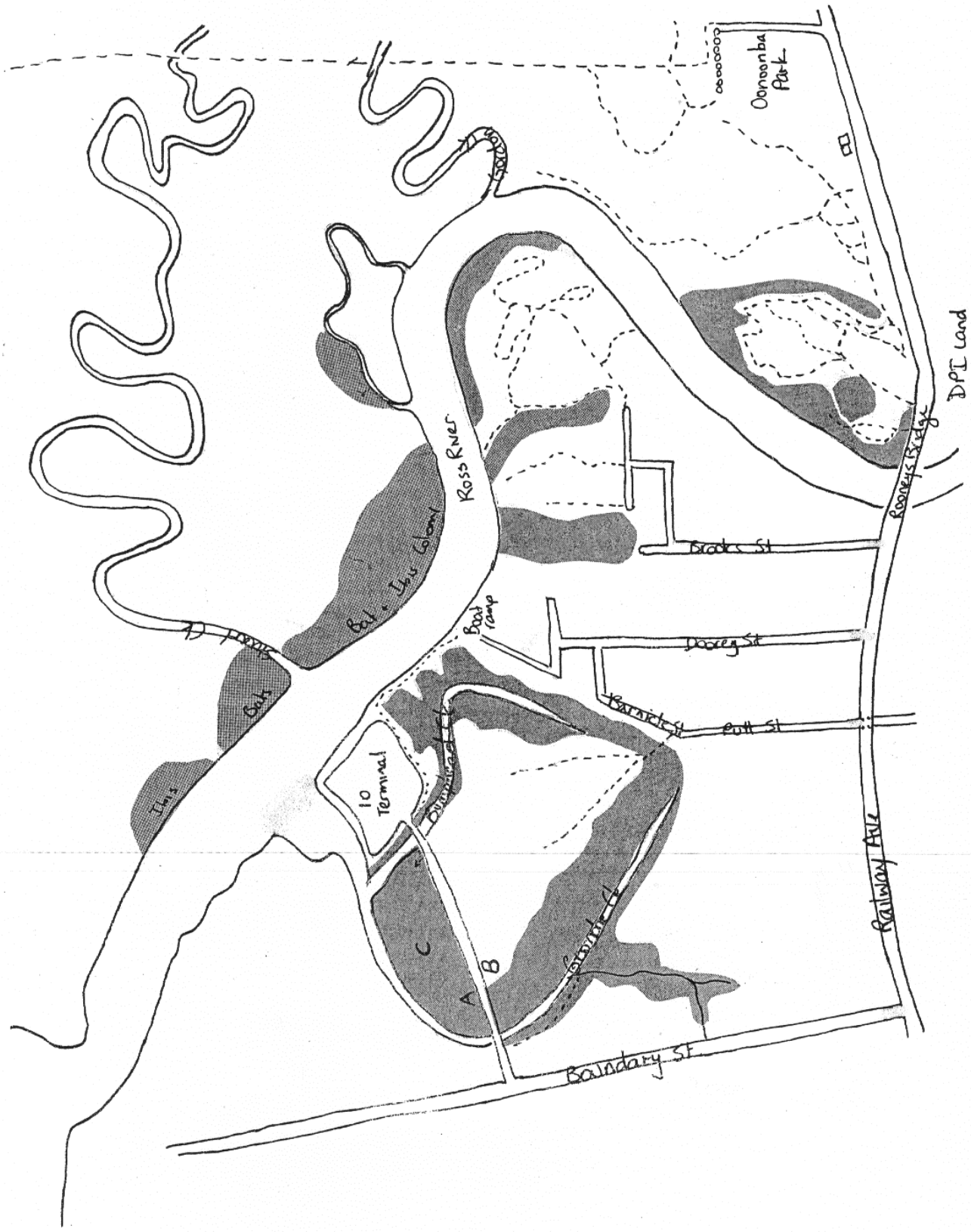
- 0.0 – 4.0m top of embankment with some *Ipomoea pes-caprae* and lots of *Chloris* sp. grass
- 4.0 – 7.0m dense *Sporobolus* on face of slope and area just below
- 7.0 – 8.8m muddy ground with sparse *Sporobolus*
- 8.8 – 11.8m scattered *Sueada arbusculoides* and several *Avicennia marina* seedlings
- 11.8 – 18.3m *Sueada australis* with scattered *Ceriops australis* to 2m high and some *Sesuvium portulacastrum*
- 18.3 – 20.8m several *Avicennia marina* to 5m high and *Aegialitis annulata* to 2.5m high on creek edge

Transect C.4

- 0.0 – 4.1m top of embankment with some *Ipomoea pes-caprae* and lots of *Chloris* sp. grass
- 4.1 – 6.3m embankment slope with some *Ipomoea pes-caprae*, but mostly *Sporobolus*
- 6.3 – 7.5m *Sueada australis* patch
- 7.5 – 17.1m muddy patch with lots of *Sueada arbusculoides* and several *Avicennia marina* seedlings
- 17.1 – 18.6m small group of small Ceriops *australis* to 1.5m high and an understorey of *Sueada arbusculoides*
- 18.6 – 21.2m mostly *Sueada arbusculoides* with several *Sueada australis* also
- *21.2 – 29.7m mixture of mangroves, mostly* Aegialitis annulata *to 2.5m high with several* Ceriops *australis and with emergent* Avicennia marina *to 6m high*
- 29.7 – 44.2m mostly *Ceriops australis* to 2.5m high with a couple of *Aegialitis annulata* to 2.5m high, one *Bruguiera* to 2.5m high (at 43.2m) and several emergent *Avicennia marina* to 7-8m high.
- 44.2 – 49.8m open mud bank sloping down to creek edge. The whole area is covered by

Character Code	Plant part Developmental Stage	Diagram
Bp	Bud primoridia	 Green in colour
Ba	Bud immature	 Green in colour
Bb	Bud mature	 Yellow in colour
I	Flower	
Fa	Fruit immature	
Fb	Fruit mature	
Ha	Hypocotyl immature	
Hb	Hypocotyl mature	 collar
Fex	Fruit expended	
NL	New Leaves	 thin, slightly waxy leaves
LS	Leaf Shoot	 small, pointy leaf shoots
Bs	Branching shoot	 woody branch arising from stem

Map PG-01: **Mangrove areas around the 10 Terminal Regiment, Ross Island, and the sites used for the leaf longevity study (A, B & C)**



Avicennia marina pneumatophores. A few *Avicennia marina* trees to 8m high and *Rhizophora stylosa* to 1.5m high are present at the creek edge.

Transect C.5

- 0.0 – 4.1m top of embankment and beginning of embankment slope has mostly *Chloris* sp. grass with some *Ipomoea pes-caprae*
- 4.1 – 6.2m dense *Sporobolus virginicus* with some *Ipomoea pes-caprae*
- 6.2 – 13.8m muddy substrate with sparse *Sueada arbusculoides*, *Rhizophora stylosa* and *Avicennia marina* seedlings and regrowth *Avicennia marina* trees to 4-7m high
- 13. 8 – 19.2m mixed mangroves of *Rhizophora stylosa* to 4m high, *Avicennia marina* to 7m high and *Aegialitis annulata* to 2.5m high
- 19.2 – 23.7m *Rhizophora stylosa* to 4m high and a couple of *Avicennia marina*

Transect ends at small tidal drain that drains into Bumphead Creek about 20m away.

Transect C.6

- 0.0 – 2.7m top of embankment with *Chloris* sp. grass, one *Ipomoea pes-caprae* plant and several *Canavalia* sp.
- 2.7 – 4.2m embankment slope with *Ipomoea pes-caprae*, *Canavalia* sp. and *Sesbania* sp.
- 4.2 – 5.3m bottom of embankment slope with *Fimbristylis ferruginia*
- 5.3 – 8.3m open sandy patch with *Ipomoea pes-caprae*, *Canavalia* sp. and *Sesuvium* sp.
- 8.3 – 12.8m *Halosarcia halecnemoides* and two *Sueada australis*
- 12.8 – 16.4m open mud area with several *Sueada arbusculoides* and *Avicennia marina* seedlings
- 16.4 – 36.0m mostly *Aegialitis annulata* seedlings to 2.5-3.0m high with some *Avicennia marina* to 5m high and *Rhizophora stylosa* and *Ceriops australis*
- 36.0 – 50.0m mostly *Ceriops australis* to 2.5m high with occasional emergent *Avicennia marina* to 6m high and some *Aegialitis annulata* to 1.5m high

3. Litter trapping at Gordon Creek, Townsville

Mangrove systems are among the most productive ecosystems in the world. Mangrove leaf litter has significant importance in maintaining the food web in mangrove ecosystems as the litter provides the primary input of food. Measurement of the productivity of mangrove systems allows a greater understanding of these

habitats and provides indications of mangrove health. Litter trapping experiments have been well established as a method for determining the productivity of these and other environments. The Plant Group uses methods analogous to research institutions in order to gain insight into the productivity of mangrove systems surrounding Gordon Creek, Townsville.

Site details

Gordon Creek is a tributary of Ross River and lies at the back of Oonoonba, Townsville. The site consists mainly of *Avicennia marina, Rhizophora stylosa* and *Ceriops australis.* Other mangrove species noted at the site are *Excoecaria agallocha, Bruguiera exaristata, Lumnitzera racemosa, Osbornia octodonta Xylocarpus mekongensis and Aegialltis annula~.* The mangrove areas are typically bounded by saltmarsh zones which are constantly inundated with vehicle traffic and in a visually poor state. Saltmarsh species noted include *Halosarcia halecnemoides, Halosairia indica indica, Halosarcia' indicajulacea, Suaeda arbusculoides, Suaeda australis, Sesuvium poftulacastrum, Fimbristylis* spp., *Sporobolus virginicus* and *Limonium solandri.*

Methods

Litter traps were constructed using irrigation polypipe and netting available from local suppliers. Traps measured one metre square and were tapered to allow easy collection. The traps were located in stands of *Avicennia' marina* and *Rhizophora stylosa* with each species site having four replicate traps. Traps were suspended above the high tide mark with builder's line so as to avoid the effects of decomposition and were emptied approximately every month from November 1998.

Data represent here is the summary so far. This experiment is on-going and members of the Plant Group continue to make monthly collections from the site indicated.

Results and discussion

Figure PG-03 and PG-04 show the litter fall data from *A vicennia marina* and *Rhizophora stylosa* respectively collected until date of writing.

By far the major component of litter was leaves, both from *Avicennia marina* and *Rhizophora stylosa,* followed by reproductive material and wood. Leaves accounted for 58% and 71% of total litter collected from *Avicennia marina* and *Rhizophora stylosa* respectively.

The production of leaf litter peaked after the reproductive cycle of *Rhizophora stylosa* while leaf production peaked before the reproductive cycle in *Avicennia' marina.* The main reproductive phase for both species was during February and March.

Figure PG-03: **Litter Fall Data for the Grey Mangrove, *Avicennia marina* from sites at Gordon Creek, Townsville** (Nov 98 - Aug 99)

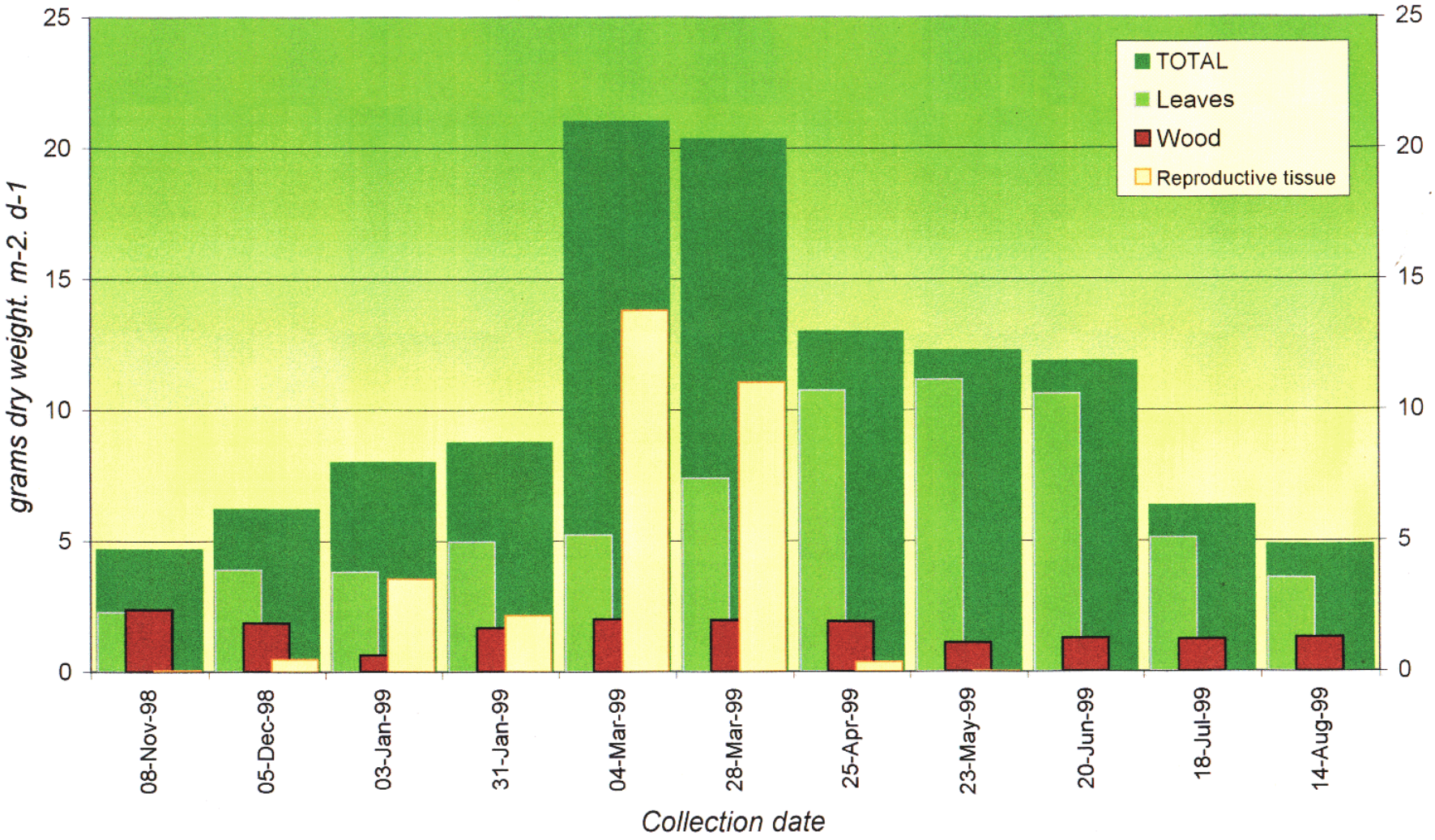
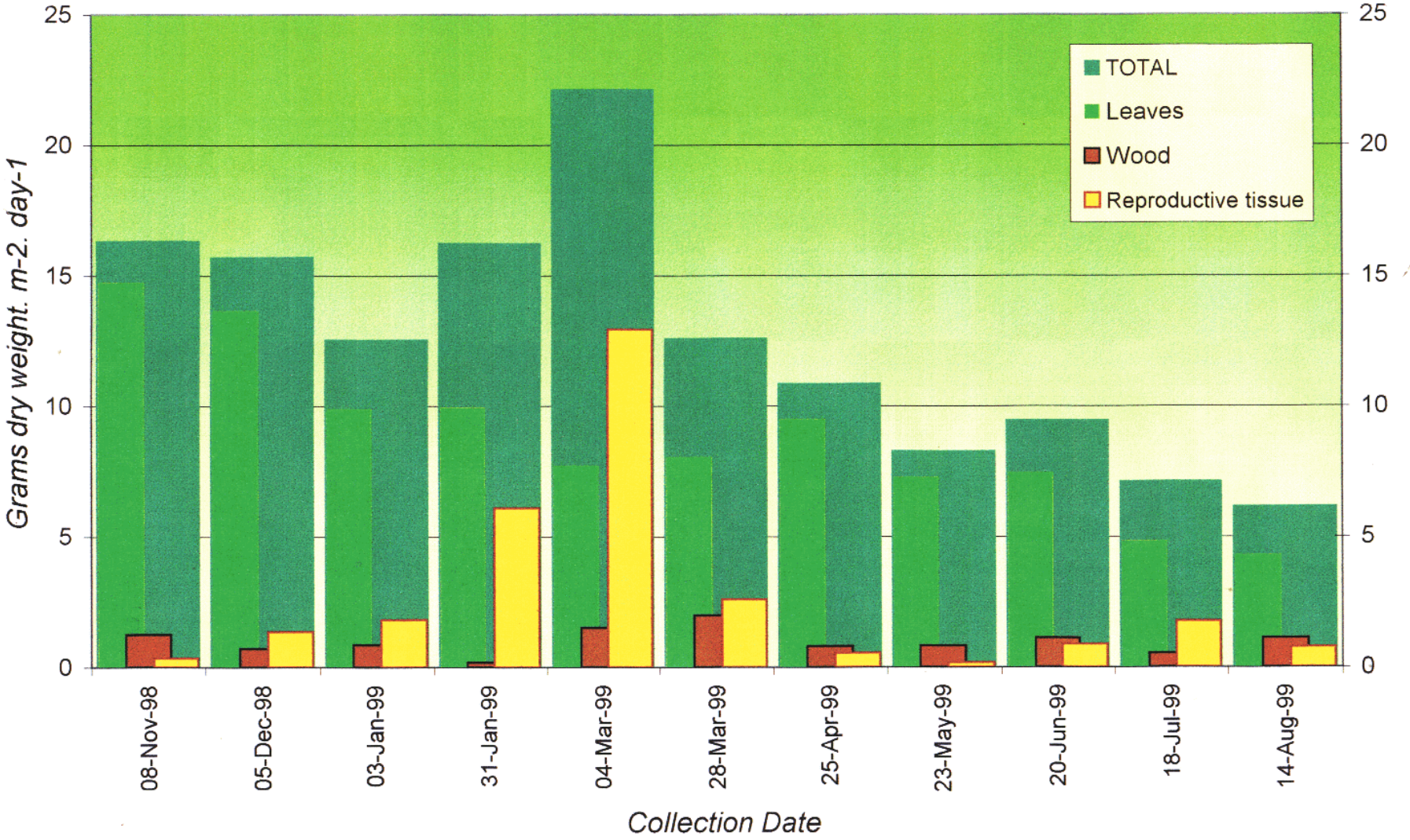


Figure PG-04: **Litter Fall Data of the Red Mangrove, *Rhizophora stylosa* from sites at Gordon Creek, Townsville** (Nov 98 - Aug 99)



Based on this data the annual litter fall for *AviCennia madna* and *Rhizophora stylosa* were 0.42 and 0.49 g dry weight. m^{-2} day^{-1}. This translates to 1.53 and 1.79 tonnes dry weight. Ha^{-1}. $Year^{-1}$, a figure which is well below that of the productivity of a number of areas around the world. Reasons for this low productivity rate are not known but may vary from contaminated sea water to reduced amounts of fresh water input due to their locality in the Dry Tropics.

Typically these experiments are carried out over the course of three or more years. The Plant Group will continue to monitor these sites, as a greater understanding of the productivity will be attained with time.

4. Mangrove and Saltmarsh Herbarium

A collection of the Mangroves and Saltmarshes of the Townsville Coastal Plains was initiated by the Plant Group in 1998. At present, no collection exists as a separate entity and at best, comprises parts of existing Herbarium collections. To date, the commonly encountered mangrove species have been collected and where possible, flowering and fruiting bodies are added to each specimen as they are not usually found on any one collection trip. Methods for preserving succulent saltmarshes are being explored as normal pressed specimens do not display the typical habits of such plants. The collection is a minor but important part of the Plant Group as it will also provide an education aid for the community and identification tool for persons interested in these plants.

Identifying saltmarsh plants with help of Russell Cumming

5. Saltmarsh Field Guide

A field guide to the common saltmarshes of the Townsville Coastal Plains is a minor project of the Plant Group and aims to provide the broader community with a tool to help identify commonly encountered saltmarshes of this area. The main emphasis is to provide a document that is void of botanical jargon and relies on overall appearance and characteristics of the plants in question. The production of this field guide is based on drafts being produced and tested in the field. Changes are made and a new draft is produced and tested. Support has been gathered from local botanists interested in sampling such a

field guide as a lot of saltmarsh plants appear identical on first glance. The field guide is currently approaching draft three and is gathering more interest as time progresses.

Current Members

- Peter Brock
- Damien Burrows
- Karyn Lawrence
- Jill Grevatt
- Jason Doyle
- Mike Fulloon

Past Members

- Marion Gaemers
- Kathy Salter
- Diana Zelayandia

Irregular Visitors and Helpers

- Tanya Korn
- Bonita Pilling
- Ralph Zulman
- Amanda Smith

Expertise within:

Damien W. Burrows, Research Officer, Australian Centre for Tropical Freshwater Research, James Cook University, Townsville

Experts called upon:

Dr Norman C Duke (formerly working at the Australian Institute for Marine Science), Mangrove Ecosystem Research, Botany Department, The University of Queensland, St Lucia, QLD.

Russell Cumming, Senior Botanist, Environmental Protection Agency, Northern Regional Centre, Pallarenda Townsville

JoAnn Resing, Rural Information Specialist, North Queensland, Department of Primary Industries, Oonoonba District Office, Townsville

Highest Group Achievement

Using scientific literature the Plant Group has designed an experiment to monitor leaf litter at a number of sites at Gordon Creek. Data gathered from these experiments will provide seasonal variations in the aerial (above ground) primary productivity of the mangrove system at this site.

Highest Personal Achievements

Being out in the field with friendly, interesting people has been the highlight of the Plant Group. And let's not forget the ability to identify with confidence a large proportion of the mangrove species in the Townsville region.

Funny stuff!!!!

Without doubt, it has to be the ability of Mike Fulloon to get us lost in the *Rhizophora* stand by his so called 'short cuts' when searching out the leaf litter traps.