Top End Native Plant Society

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~ APRIL 2006 NEWSLETTER ~

MEETINGS AND FIELD TRIPS

We meet on the third Thursday of the month at 7:30 pm. General meetings conclude by 8.15pm and are followed by a guest speaker beginning at 8:30 pm. There is time for a cuppa between the meeting and the guest speaker. The venue for the meeting is Marrara Christian School Library, on the corner of Amy Johnson and McMillan Drives.
All welcome. Bring plants to swap, sell or have identified.

~ NEXT MEETING THURSDAY 20th APRIL ~
MARJ KING

"Plants of Patagonia (and a little further north)"

An irresistible part of South America. Come and have a tour of Patagonia through Marj's photos and experiences without having to leave Darwin!

~ OTHER UPCOMING EVENTS ~

There will be no April Field Trip as our field trip was Willie's Open Garden.

~ MEETING THURSDAY 18TH MAY~
TBA
"Aquatic Plants"

"Wetland Wander"
9.30am on Saturday 20th May
Spencely Road, Humpty Doo

With the receding water many small plants are in flower, including carnivorous plants like Drosera, Bybis and Utricularias. A series of lagoons will also give us an opportunity to see aquatic plants.

Be prepared to walk in wet sedgelands; bring plenty of water, sunblock and mozzie repellent. Please contact Sally on 8988 5654 to confirm attendance. Meet at the end of Spencely Road Humpty Doo. (Turn right off Arnhem Hwy just before Humpty Doo shops. Go past the rubbish tip and cross over Strangways Road).

THANKS FOR A SUCCESSFUL OPEN GARDEN

On the 8th and 9th April TENPS members Willie and Mai Burgess conducted a very successful Open Garden. The event was well attended and things ran smoothly over the weekend. Thanks to Willie and Mai for their efforts and hospitality. Thanks also to all the TENPS members who contributed in many ways, ranging from growing plants for sale and preparing labels prior to the weekend, through to coming along and helping over the two days. Once again we had support from NT Carers. Saint Johns Cadets provided a food stall and assisted on the gate with Red Cross. Thanks to all for a successful weekend.

Dave Liddle

ARNHEM LAND PLATEAU VEGETATION

Jeremy Russell-Smith gave us a drama packed night last Meeting. Commencing with a innocent, vulnerable landscape, threatening that landscape with debilitating, unstoppable fires and rounding up with tricky politics, multinational companies as heroes and some sound land management from local stake holders.

The Arnhem plateau has the highest diversity of plants in the NT. The plant diversity is similar to Cape York Peninsula. The Heath Land of the upper sandstone country, is home to plants such as the Jacksonia, some Hibbertias, Pityrodia and other heath type plants, many of them endemic species. Micriara, a type of spinifex that grows on top of rock is an interesting member of this community.
Shrubs such as Calytrix decusrata, Grevillia formosea, Petraeomyrtus punicea (formerly Regelia) are all obligate seeders, only regenerating from seed.
Other obligate seeders are Cypress Pine (Callitris intratropica) and Myrtella sp (small woody shrub with beautiful white and pink flowers) which can occur together in groves where no destructive fires have been for many years. The Callitris grows 11 cms in three years, 30 cms in 6 years and 2 metres in 10 years! The Petraeomyrtus punicea formerly Regelia (small shrub with tiny scale-like leaves and showy red flowers) needs 6 years to mature and seed.

Fire has always played a part in this country, but in the past local aboriginal people burn't the landscape as they travelled along trade routes. These were trickle fires, small cool patchwork fires. Fire management of this country ceased in recent history, setting the scene for large unchecked fires burning huge areas for days.
In areas like Kakadu where there is 16 years of plant data, we are able to document the rapid depletion of plant diversity by fires! In 2004 75% of the Arnhem Land Escarpment was taken out in one fire! **The Heath Country of Arnhem Land has been nominated as an endangered community under the Biodiversity Act.**

Fire management from the Bush Fire Council using local Aboriginal people, would again bring good fire management back to the Western Arnhem Land Plateau. But good fire management needs funding. Savannah burning of the NT contributes to 48% of greenhouse gases which is 3% of national emissions. Late dry season fires contribute twice (nearly 3 times) the amount of greenhouse gases than the earlier cool fires. Early dry season fire management (fires lit by people) is recognized as reducing greenhouse gases in the Kyoto Protocol. So this landscape recognized as endangered and the fire management regime recognized as reducing greenhouse gases sets the scene for a

multinational company to use the Arnhem Land Plateau and the Bush Fire Council fire management regime as a Greenhouse Emissions Abatement project.

Conoco Phillips Darwin Harbour gas refinery will emit 1% of the nation's total greenhouse gases. To offset these gases, Conoco Phillips will contribute 1.1 million dollars in the next twenty years to the Bushfire Council to set up an employment program to local Aboriginal people to mange fire on the Western Arnhem Land Plateau. The Bush Fire Council will also receive extra funding from the NT government for this project.

This environmental and community service will give Conoco Phillips a huge PR boost which has spurred BHP and Rio Tinto, (other multinational companies who are also big polluters) to seek similar projects. Such as aiding fire abatement towards the east of Arnhem Land and around the Gulf Country.

An extraordinary outcome!

Grace Matarazzo

THE MAGNIFICENT ARAUCARIA OF NEW CALEDONIA

Araucaria are conifers that are native to Australia, South America, New Guinea, New Caledonia and Norfolk Island. There are about 19 species, including three in Australia; *A. bidwillii* (Bunya pine, SE Qld), *A. cunninghamii* (hoop pine, Qld and NSW) and *A. heterophylla* (Norfolk Island pine, endemic to Norfolk Island). The bunya tree is typical of the Australian species. This tall tree grows 30-45 metres in height, has a straight trunk and a dome-shaped, symmetrical crown. The glossy green leaves are lance-shaped with pungent points. The large, female fruiting cones are about 30 cm long and each contains from 50 to 100 large seeds. Traditionally, local Aboriginals would gather and feast on the nuts when they fruited.

Araucaria were once common up til the Cretaceous – fossils of many extinct species have been found across the globe. However, now these majestic trees tend to occur as relic species with restricted distributions.

An exception is on New Caledonia, where *Araucaria* has undergone relatively recent and rapid adaptive speciation. It has diversified into 13 endemic species (*A. bernieri, A. biramulata, A. columnaris, A. humboldtensis, A. laubenfelsii, A. luxurians, A. montana, A. muelleri, A. nemorosa, A. rulei, A. scopulorum, A. schmidii* and *A. subulata*). Ten of these *Araucaria* are currently on the IUCN Red List of threatened species.

The tall *A. columnaris* dominates the coastal vegetation of the smaller islands and Captain Cook named the southern Island of Pines (Ile de Pins) after this tree. Its ability to grow to a massive tree on limestone just metres above sea level and metres from the sea is incredible.

However it is on soils formed from the ultramafic rocks of New Caledonia that the other 12 species are found. These are a particularly hostile medium for plant growth, characterized by a dominance of magnesium over calcium and containing high and sometimes toxic levels of heavy metals chrome and nickel. Yet the *Araucaria* have thrived both as shrubs and trees on these ultramafic substrates as these act as refuge areas where interspecific competition is less fierce. Another advantage is that high levels of chrome and nickel are also toxic to animals and so native mammalian herbivores are absent. Thus the New Caledonian species of *Araucaria* tend to have soft flexible leaves in contrast to the tough and sharp-tipped leaves of the Australian species.

New Caledonia's flora has a very strong link to the Australian flora, sharing not just the *Araucaria* but also many families that dominate Australian vegetation. Grande Terre, the 800 km long main island, originated from a splinter of the Australian

continent that separated sometime between the Triassic and the end of the Jurassic. New Caledonia is well worth visiting to see this familiar but very unique flora – as well as the French wine and desserts!

Sean Bellairs

Below: Araucaria dominating the vegetation – Ille des Pins

Above: Araucaria columnaris has an amazing ability to grow into a tall tree on the skeletal limestone soils, just metres from the ocean.

Contrasting leaves of two of the New Caledonia's Araucaria species

PRELIMINARY RESULTS FROM THE 2005 AND 2006 ASSESSMENTS OF NERVILIA PELTATA AT CHARLES DARWIN NATIONAL PARK

Three series of study plots were established by members of the Top End Native Plant Society in Charles Darwin National Park in the late wet season 2003/2004. In each series, five 0.5m x 0.5m plots were randomly located to sample *Nervilia peltata* populations. The *Nervilia* populations occur on cycad study sites and each series is located in a different fire treatment. The fire treatments are "annual" burning, "triennial" burning and an "infrequently" burnt site. At the time of establishment, the infrequently burnt site had last been burnt in 1997. This relatively long-unburnt site was subject to a wildfire in the late dry season 2005. The fire was a "hot" fire, scorching most of the Eucalypt overstory to the top of the canopy. Between 2005 and 2006 the annual burn site was subject to a relatively cool early dry season fire and the *Nervilia* population on the triennial site remained unburnt.

Preliminary results from the recent *Nervilia* leaf assessment in March 2006 reveal some interesting trends. The results presented below summarise two categories of data; 1) counts of all living leaves evident in the quadrats and 2) diameter measurements for all leaves with a sufficiently complete leaf blade to allow a measurement of leaf diameter.

In summary the count data reveal:
- stability with total leaf numbers in annual and triennial fire treatments and what appears to be a decline in the infrequent fire treatment (Table 1 and Figure 1).

Table 1: Counts of *Nervilia peltata* leaves in five 0.5m x 0.5m quadrats in each of three fire treatments in March 2005 and March 2006 at Charles Darwin National Park

Fire Treatment (fire event 2005 to 2006)	Year	Total leaf count across 5 quadrats	Mean number of leaves per quadrat	Standard error of the mean	Min count in a quadrat	Max count in a quadrat	% change in total count 2005 to 2006
Annual Fire (cool burn 2005)	2005	204	40.8	19.85	4	109	+2.5%
	2006	209	41.8	19.59	5	110	
Triennial Fire (unburnt 2005)	2005	35	7	1.67	4	13	0%
	2006	35	7	2.35	3	16	
Infrequent Fire (hot burn 2005)	2005	49	9.8	4.39	2	26	-24.5%
	2006	37	7.4	3.64	0	21	

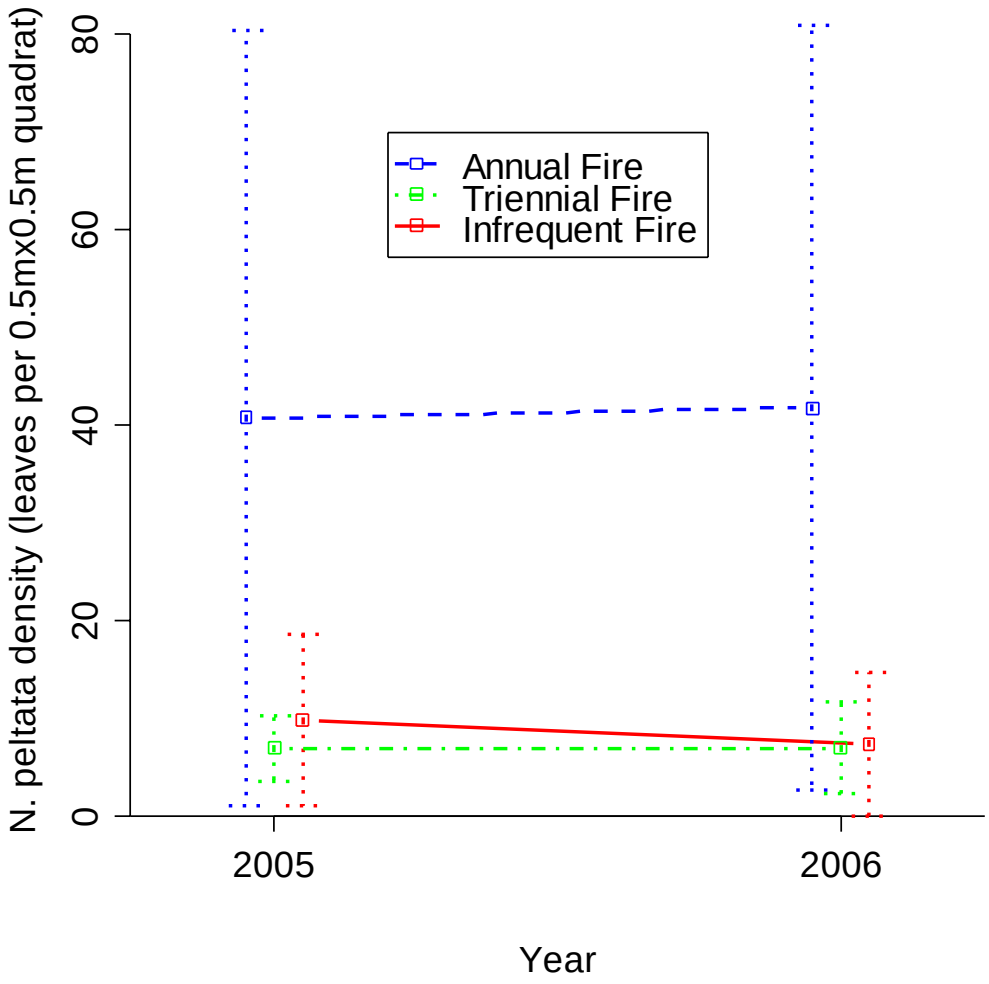

Figure 1: Mean density of *Nervilia peltata* leaves per 0.5m x 0.5m quadrat for three fire treatments in March 2005 and March 2006. The vertical dotted lines indicate +- 2 se from the mean. Note the fire treatment is the long-term regime rather than the actual burning between assessments in 2005 and 2006.

In summary the diameter data from "complete" leaves reveal (Table 2 and Figure 2):
- an apparent increase in leaf diameter in the triennial fire treatment which was unburnt in 2005.
- apparent stability in leaf diameter in the annual fire treatment which had a cool burnt in 2005.
- an apparent decline in leaf diameter in the infrequent fire treatment which was subject to a hot fire in 2005.

Table 2: Diameter of "complete" *Nervilia peltata* leaves in five 0.5m x 0.5m quadrats in each of three fire treatments in March 2005 and March 2006 at Charles Darwin National Park

Fire Treatment (fire event 2005 to 2006)	Year	Count of complete leaves across 5 quadrats	Mean diam (mm)	Standard error of the mean	Median diam (mm)	Min diam (mm)	Max diam (mm)	% change in mean diameter
Annual Fire (cool burn 2005)	2005	190	19.2	0.50	19.5	5	38	-3.1%
	2006	193	18.6	0.53	18	3	41	
Triennial Fire (unburnt 2005)	2005	35	19.3	1.17	18	7	37	+20.2%
	2006	35	23.2	1.31	22	6	42	
Infrequent Fire (hot burn 2005)	2005	43	16.3	0.98	16	4	30	-29.4%
	2006	34	11.5	1.07	9	4	28	

These preliminary data suggest a substantial impact from the hot fire in 2005 with a decline in mean leaf count and leaf diameter. Leaf count and diameter has been quite stable in the annual fire treatment while leaf diameter appears to have increased in the triennial treatment, which was unburnt in 2005. Plausible explanations of the trends include combustion of the thick litter layer during the hot fire in the infrequent fire treatment resulted in some mortality in underground tubers. The reduction in leaf size under this treatment may reflect an increase in light associated with opening of the overstory canopy by the fire. Conversely, the increase in leaf diameter in the triennial treatment, which remained unburnt in 2005, may reflect a reduction in light due to an increase in vegetation cover. There is a noticeable trend for larger *N. peltata* leaves to be situated in more shaded or protected positions. These preliminary data suggest the possibility of a substantial impact from a hot dry season fire event on this herbaceous species with an underground tuber and annual above ground parts. Note however that these results present only a preliminary analysis of data collected over a short time period. It will be very interesting to see what happens over the next wet season. Perhaps next year we will be fortunate enough to see a flower, a sight that has eluded us to date.

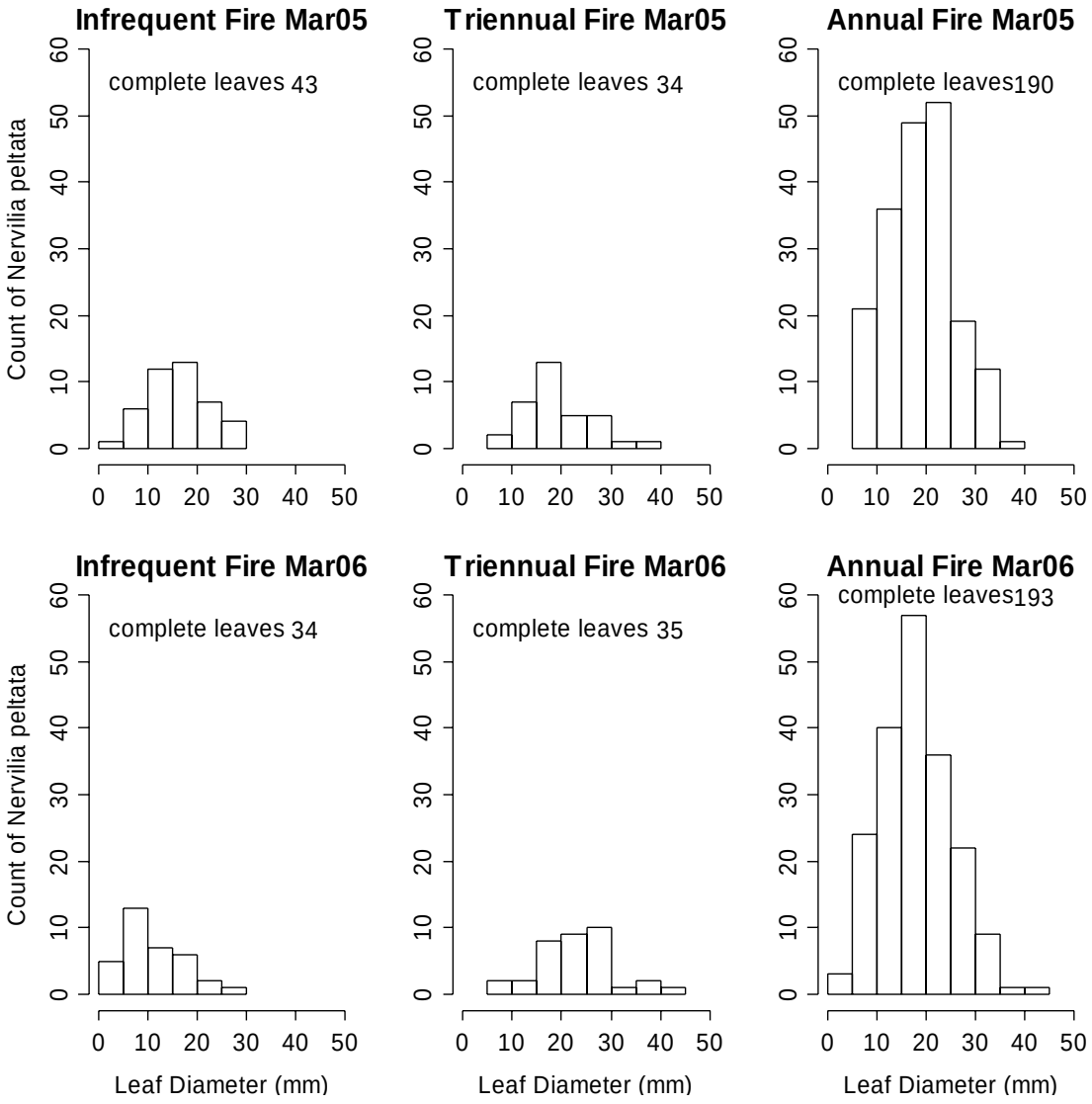

Figure 2: Histogram of *Nervilia peltata* leaves in diameter classes, based on "complete" leaves only for each fire treatment in March 2005 and March 2006.

Acknowledgements: The conduct of this project has relied heavily upon the support of Parks and Wildlife Service staff who have undertaken control burning at the cycad sites. In particular David Van den Hoek, Paul Cawood, Kristen Appel and Dal Hartley have strongly supported the conduct of this work. Members or affiliates of TENPS have contributed many hours of volunteer effort to establish, assess and observe the *Nervilia* quadrats. Volunteers have included; Barbara Bellairs, Don Bellairs, Sean Bellairs, Jennifer Cooke, Louis Elliott, Denise Goodfellow, Sally Jacka, Marj King, Michael Lardelli, Carissa Liddle, Nerida Liddle, Robyn Liddle, Grace Matarazo, Felicity Middleton, Carlia Miles, Lynda Prior, Mark Raines, Linda Rennie, Joyce Stobo, Michael Stott, David Van den Hoek and Russell Willis. Thanks to all who have supported this work.

Dave Liddle
April 2006

~ NEXT MEETING THURSDAY 20th April~

Marj King

"Plants of Patagonia (and a little further north)"

SENDER: TOP END NATIVE PLANT SOCIETY
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NT 0831

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Meeting the third Thursday of the month at 7:30 pm at Marrara Christian School Library