

NATURE TERRITORY

May 2011



Newsletter of the Northern Territory Field Naturalists Club Inc.

PO Box 39565, Winnellie, NT 0821

President:	Tissa Ratnayeke	8921 8226 (h,w)
Secretary:	Ian Hance	8945 6691 (h)
Treasurer:	Fiona Douglas	8985 4179 (h)
Membership Officer:	Tida Nou	8981 6667 (h)
Newsletter Editor:	Don Franklin	8948 1293 (h)
Committee Member:	Stuart Young	8995 5026 (w)
Committee Member:	Graham Brown	8945 4745 (w/h)
Committee Member:	Peter Holbery	8901 6105 (w)
Committee Member:	Annie Grattidge	8981 1100 (w)
Committee Member:	Bruce Maley	8985 5272 (h)

Club web-site: <http://ntfieldnaturalists.org.au/>

Meetings are generally held on the second Wednesday of every month, commencing at 7:45 PM, in Blue 1.14 (Business Faculty Building) on the Casuarina Campus of Charles Darwin University.

Subscriptions are on a financial-year basis and are: Families/Institutional - \$30; Singles - \$25; Concessions - \$15. Discounts are available for new members – please contact us.

The Red-banded Jezebel (*Delias mysis*) is a mangrove butterfly. The caterpillars of most jezebels (genus *Delias*) feed on mistletoe, but the food plant of this species around Darwin is uncertain and may not be a mistletoe.

The Red-banded Jezebel was seen on the April excursion to the mangroves along the East Point boardwalk (report on page 8), where it was photographed at a spent flower of the Star Mangrove (*Sonneratia alba*) by Tissa Ratnayeke.



CONTENTS

Club activities .. p2
water .. p5
East Point .. p8–9

Club notices .. p3
river of raptors .. p6
bird observations .. p10

grasshoppers .. p4
dolphins .. p7
recent literature .. p11

Disclaimer: The views expressed in *Nature Territory* are not necessarily those of the NT Field Naturalists Club Inc. or members of its Committee.

Club activities

May meeting. Wednesday May 11, 7:45 PM. Blue 1.14 (Business Bldg.), CDU.

Alan Andersen

" Ant biodiversity in the Top End "

Ants are a dominant faunal group throughout the world, and the NT is blessed with a remarkable number of them! Ant productivity and diversity in most NT habitats is several times higher than in climatically matched places elsewhere in the world. NT ant communities are among the richest on Earth, with >100 species routinely occurring per ha. Such extreme diversity occurs despite an exceptionally high abundance of highly aggressive, behaviourally dominant species. There is evidence that these dominant species actually promote diversity by limiting the impact of sub-dominant species through a competition cascade that parallels 3-tiered trophic cascades. Up to 15 species of a single genus can occur within a 10 x 10 m plot with very limited niche differentiation, which suggests that species co-occurrence is driven more by 'neutral' processes relating to dispersal and establishment, rather than by competitive dynamics.



Alan Andersen is a Chief Research Scientist with CSIRO Ecosystem Sciences, and Officer-in-Charge of CSIRO's Darwin laboratory. His main research interest is the biogeography and global ecology of ant communities.

Dominant ant that promotes diversity: the Northern Meat Ant (*Iridomyrmex sanguineus*). Image supplied by Alan Andersen.



May field trip. Sunday May 15. Ants of Holmes Jungle, commencing at 9 AM.

Our Club field trips are usually exciting expeditions of observation in which we marvel at fabulous birds, butterflies, dragonflies and flowers to name a few. This field trip, led by Alan Andersen, will reveal one of the most diverse and numerous, but often overlooked, insect groups in the Top End, the ants.

Meet in the car park of the picnic area at the top of the hill (on the right hand side, several hundred metres from the Park entrance). For more details, contact Tissa on 8921 8226.



Tropical Garden Spectacular & Top End Sustainable Living Festival

Saturday 4 & Sunday June 5, George Brown Darwin Botanic Gardens.

Last year, our Club had an information stall at this very popular event and we had a steady stream of visitors and enquiries throughout the two days. We plan to participate again this year. It is very good exposure for the Club and an opportunity for us to raise the public's interest in our natural environment.

We are encouraging members to be part of this event through sharing their experiences with the public by being present at the stall for a few hours on either day. **Those helping at the stall receive a free pass but numbers are limited so please contact Tissa on 8921 8226 if you're interested in attending.**

Top End Native Plant Society activities

May meeting. Thursday May 19. Marissa Fontez (landscape architect): *Landscaping with natives*.

June meeting. Thursday June 16. Brigid Oulsnam: *The illustrations of William Webster Hoare*.

General meetings are held on the 3rd Thursday of the month at the Marrara Christian College, corner Amy Johnson Ave. and McMillans Road, and commence at 7:30 PM (speaker at 8 PM). Visit <http://www.topendnativeplants.org.au/index.php> or contact Russell Dempster on 8983 2131.

TENPS Caring for Our Country project Events on Saturday April 30, Monday May 2 & Sunday May 8. For more information, see notice on page 3.

Club notices

Welcome to new members: Jon Schatz; Anke Frank.

Thank you: the previous issue was proof-read by **Fiona Douglas** and collated and mailed by **Anne Highfield**. It was printed by **Stuart Young** using equipment kindly made available by **Collections, Biodiversity and Biological Parks** from the Department of Natural Resources, Environment, the Arts & Sport.

Newsletter contributions welcome: Sightings, reports, travelogues, reviews, photographs, sketches, news, comments, opinions, theories , anything relevant to natural history. Please forward material to Don at eucalypt@octa4.net.au or the Club's postal address, or contact him on 8948 1293.

Deadline for the June newsletter: Friday May 20.

Need a Club membership form? Go to: <http://sites.google.com/site/ntfieldnaturalists/downloads>.

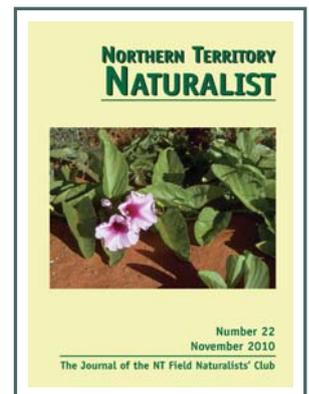
Club library: The Club's journal and book collection is available to members. Lists of holdings can be found on our web-site: <http://sites.google.com/site/ntfieldnaturalists/library>. The library is housed in two sections: **Books, reports and CDs:** at the medical clinic of Dr. Lyn Reid in the Rapid Creek Business Village. This can be accessed directly between 9 AM and 2:30 PM Tuesday to Thursday, and 4–6 PM on Tuesday, or indirectly by phoning Lyn at work on 8985 3250.

Journals: in the office of Don Franklin at CDU Casuarina (Red 1.2.34). These can be accessed directly during working hours, or by ringing Don on 8946 6976 (w) or 8948 1293 (h).

Northern Territory Naturalist: The Editorial Committee of the Club's journal, the *Northern Territory Naturalist*, is now calling for manuscripts for issue no. 23. The journal publishes works concerning any aspect of the natural history and ecology of the Northern Territory or adjacent northern Australia. and may include Research Papers (Articles or Short Notes), Reviews, Species Profiles and Book Reviews.

The *Northern Territory Naturalist* is a registered, peer-reviewed journal (ISSN 0155-4093) and is recognised as a Category C publication by the Australian Research Council (http://www.arc.gov.au/era/era_journal_list.htm). Author instructions may be downloaded from our web-site: <http://sites.google.com/site/ntfieldnaturalists/journal>. If possible, manuscripts should be submitted in digital form by email to michael.braby@nt.gov.au. Editors of the journal are Dr Michael Braby, Dr Lynda Prior and Dr Chris Tracy.

The journal page of the web-site also has an order form for back issues of the *Northern Territory Naturalist*, which are available individually or as a set (some are available as photocopies only).



Invitation to participate in TENPS Caring for Our Country project.

The Top End Native Plant Society has been awarded a Caring for Our Country grant to record 100 plant species on the Howard Sand Plain and publish them on its website. This is a Site of Conservation Significance and is a High Conservation Value Aquatic Ecosystem that supports listed threatened species. The site is coming under increased pressure as the city expands. Threats include sand mining, land subdivision, weeds, changes in hydrology (see page 5), changes in fire regime and nutrient run-off. A major issue is the lack of public knowledge and few people appreciate the plant diversity at serious risk of being lost. This project aims to address this gap by providing a free, accessible, web-based plant identification tool.

A list of target species has been developed and now that the Wet has finally ended the first of the field surveys can begin. To assist people to participate, a photography workshop will be held followed by field trips to the sand plains. Dates are as follows:

Saturday April 30, 7.30 AM: Photographing plants with Tissa Ratnayeke. Darwin Botanic Gardens, meet at the car park off Gardens Rd.

Monday May 2 & Sunday May 8, 7.00 - 11.00 AM: Howard Springs Sand Plain field trips led by Dr Dave Liddle. Meeting places to be confirmed.

Anyone wishing to participate should contact TENPS at topendnativeplantsociety@hotmail.com.

Invasion of the Pygmy Grasshoppers

Peter Holbery

Towards the end of the Wet Season a lot of insects are on the move. On the night of Saturday 26 March 2011, a large influx of small grasshoppers appeared at Dinah Beach and also in Stuart Park. They were present at Dinah Beach in high numbers for several days. After three weeks only a few individuals were still present.

The grasshoppers have been identified by Graham Brown as *Paratettix* sp. They are members of the family Tetrigidae, commonly known as Pygmy Grasshoppers or Grouse Locusts. These are small (about 10 mm length) insects which are often found near bodies of fresh water. They feed on algae and adults of some species are reported to live for more than two years.

Tetrigids are unusual in that they have the pronotum* greatly extended, often beyond the tip of the abdomen. This gives them quite a different profile to most grasshoppers. Another peculiarity is that in the species which have wings, the forewings are greatly reduced in size to small pads. The winged species fly quite well, even though the tiny forewings appear to be non-functional. Individuals commonly land on boats in Darwin harbour, even as far as one nautical mile from land. Tetrigids are also able to swim with ease and often take to the water when disturbed. They are capable of swimming both on the surface and under the water. And being grasshoppers they can also jump well.

About 70 species of Tetrigids occur in Australia and 1,400 species worldwide. Individual species may show great variation and this can make identification difficult. For example, a particular species may occur in both a fully winged and a wingless form. Within a species both the colour and the pattern may also vary considerably, as can various body proportions such as the length of the pronotum.



Invaders: *Paratettix* sp., a Pygmy Grasshopper. Photo: Graham Brown.

The grasshoppers which showed up recently were apparently diverted by, or attracted to, lights. Whether one or more species was involved, and their identity, is a task for an entomologist. It would be interesting to know the frequency and geographic extent of Tetrigid irruptions in the Top End.

Further reading

CSIRO. 1970. *Insects of Australia*. Melbourne University Press.

Rentz DCF. 1996. *Grasshopper Country - The Abundant Orthopteroid Insects of Australia*. UNSW Press.

<http://www.britannica.com/EBchecked/topic/484599/pygmy-grasshopper>

<http://bugguide.net/node/view/106>

* The pronotum is a 'plate' covering the upper side of the first segment of the thorax. The thorax is the part of the body immediately behind the head to which the legs and wings (if any) are connected.

New clam species from *Recent Literature*, page 11

Hallan & Willan (2010) (Richard Willan from MAGNT) have described two new species of miniature freshwater clams of the genus *Lentidium*. One, which they've named *L. origolacus* (shells 4–7 mm long), is known from the Gilbert River area in Queensland and from abundant fossils from bores in the Gulf of Carpentaria. "*origolacus*" means *source lake* and refers to the Ice Age lake that once occupied the Gulf. The other, named *L. dalyfluvialis* (shells to 12 mm long), is known only from a 2 km section of the Daly River at Browns Creek. "*dalyfluvialis*" means "Daly, pertaining to a river". *Lentidium dalyfluvialis* lives in beds of sand and mud at densities of about 1,000 per square metre, from which it breathes through siphon holes. Unusually amongst clams, it can move rapidly and burrow actively, adaptations that may be necessary in floodprone rivers.

Water for everyone? from *Recent Literature*, page 11

“As the volume of water stored in major reservoirs in southern Australia has steadily dwindled in recent years, speculation about the abundance of water in northern Australia has blossomed, with irrigation investors among the main proponents for developing the water resources of the North. However, the debate has focused largely on the relative quantities of runoff” (Petheram *et al.* 2010). The authors make the point that there can be a major difference between runoff and the amount of water that is available for irrigation. The first layer of constraint is physical, such as the seasonality of flow, suitability of sites for dams (and how large they could be), and levels of evaporation. Other levels of constraint include “environmental, social, cultural and economic considerations”. Petheram *et al.* provide a detailed assessment of the physical constraints.

The authors estimate that northern Australia produces 64% of Australia’s runoff, but only 45% of the nation’s “potentially exploitable yield”. The latter figure is estimated to increase by only 2% by 2050 under projected climate change. “If exploitable yield and irrigation requirement were the sole factors constraining sustainable irrigation, under a full development scenario, southern Australia could hypothetically support an area of irrigation about 60% greater than that of northern Australia (based on only 36% of the country’s runoff).” “These results suggest that efforts towards achieving and developing sustainable irrigation practices in the South will remain most important in achieving Australia’s long term irrigation potential.”

What would be the environmental consequences of reducing dry season flow in the Daly River (for irrigation purposes)? Townsend & Padovan (2009) have contributed to this evaluation by considering the maximum biomass of *Spirogyra* under varying flow regimes “along an 18 km reach of the Daly River”. *Spirogyra* is a bottom-dwelling large alga (“benthic macroalga”, plural “benthic macroalgae” – seaweed is a marine example) that contributes substantially to biological productivity through photosynthesis, and is also food for turtles. Under the model “with reduced flow, hydraulic conditions became less favourable for the growth of *Spirogyra* [maximum biomass of] *Spirogyra* was predicted for the minimum dry season flow for a 47 year period of hydrographic record using two hypothetical [water] extraction scenarios. Both scenarios produced [maximum biomasses] that were frequently less than the minimum crop under natural flows [notwithstanding its limitations,] the model communicates a reduction in the standing crop of *Spirogyra* due to reduced dry season base flows and an inferred impact on its dependent fauna and the river's nutrient dynamics.” In other words, if we allow the extraction of water for irrigation when the Daly River is low late in the dry season, there will likely be considerable adverse environmental consequences.



Daly River in the dry season.
Photo: Don Franklin.

Straton *et al.* (2009, 2011) report on modelling and consultative processes for water extraction from the Katherine and Howard Rivers respectively. For the Katherine River, they found that “[policy] instruments that enable personal relationships and local institutions and norms to play a role in water management are found to be more effective in terms of both farming income and environmental impact.”

In the Howard River catchment “Population growth has already been driving an increase in the number of bores drilled in the area and this is expected to continue the associated residential and agricultural development has increased competition for groundwater from the aquifer that Power and Water Corporation extract from to supplement Darwin’s metropolitan water supply. [There are also] concerns over water flows in popular springs and the impacts of lower water flows and pollutants on groundwater dependent ecosystems.” Straton *et al.* (2011) present four scenarios for the future of the catchment: A. development, B. haven for the environment and recreation, C. rural living haven, and D. development with climate change. These were considered by a citizens’ jury with evidence presented by experts. A key result was to dispel the “unhelpful myth” that PWC is a major extractor of water for use in Darwin – 16% of water extraction in the catchment is attributable to PWC. The process also generated an acceptance that individual and collective restraint in the use of groundwater is necessary. Although the authors acknowledge that the citizen’s jury wasn’t fully representative of catchment residents, there was consistently and surprisingly strong support for a view of the catchment as an environmental and recreational haven (your editor notes that this is very much at odds with what seems to be happening).

The Veracruz (Mexico) River of Raptors

Micha Jackson and Peter Kyne
(all photos by Micha Jackson)

The autumn migration of raptors through the Mexican state of Veracruz is one of the great wildlife spectacles of the world. Each August to November, over five million of birds of prey are channelled through Veracruz between the Gulf of Mexico and the inland mountain range. During a recent visit to Mexico we were lucky enough to witness the peak day of migration, with 473,944 raptors passing through in a single day. The flight was dominated by Broad-winged Hawks, with lesser numbers of Turkey Vultures and other species. About 20 raptor species utilise the migration pathway with movements of each species peaking at different times. During our visit, the Broad-winged Hawk flight was in full swing, while the Swainson's Hawk flight was only just beginning; it was a challenge to pick out a handful of the latter, amongst hundreds of thousands of the former. Here is a collection of photos of the migration as well as some local resident raptors.



Our visit to Veracruz was with Wildside Nature Tours' annual Veracruz River of Raptors tour (see www.wildsidenaturetours.com). Count numbers are courtesy of Pronatura Veracruz (from www.hawkcount.org).



Top right: a small proportion of the 1.7 million Broad-winged Hawks which migrate annually through Veracruz.

Centre right: resident Black Vultures.

Above left: resident Aplomado Falcons.

Left: a resident Common Black Hawk.

Right: one of the two Veracruz hawkwatch towers where migratory birds are counted.



Dolphins along the NT coast

Report on Carol Palmer's talk at the April meeting

Heather Moorcroft

Carol is conducting the first research on the three species of coastal dolphin in the Northern Territory. These are the Indo-Pacific Humpback (*Sousa chinensis*), Indo-Pacific Bottlenose (*Tursiops aduncus*) and a species recently recognised as endemic to northern Australia, the Australian Snubfin (*Orcaella* sp.). The two main study sites in the NT are at Cobourg Marine Park and Darwin Harbour. The Darwin Harbour area has been divided into several transects, and information on which species are found in which parts of the harbour has been compiled.

The species do prefer slightly different habitats; for example, the Snubfin is commonly found near Woods Inlet on the western side of the Harbour and also in the sea-grass beds off Fannie Bay. There is also moderate site fidelity; in other words, the same individuals or groups can be found around the same areas. There have been observations of two species feeding in the same area.

Globally, coastal and river dolphins are amongst the most threatened mammals, being vulnerable to incidental capture (by-catch), pollution and loss of habitat. Populations are small and isolated, and loss of breeding females can affect populations very badly because dolphins are long-lived and slow-breeding.

Whilst locally we have good habitats for dolphins, we are now faced with increasing threats. Increased boat activity on the water has affected the dolphins – they get struck by the propellers and are also potentially affected by the noise of boats.

There are no independent observers on commercial fishing boats and according to log book records no dolphin has ever been caught (this is in contrast to other parts of the world where by-catch is a significant issue for coastal dolphins). A program which includes independent observers on commercial fishing boats is needed to clarify the situation.

Coastal dolphins are hard to study because they are generally shy and cryptic. The Indo-Pacific Bottlenose is something of an exception, its habit of leaping out of the water rendering them much more obvious. As a result, there is a lack of long-term population data for most species and this makes it difficult to change the conservation classification. Under Commonwealth legislation our local dolphins are given the conservation status of Migratory, adding a requirement for even more research to clarify their population status at the local and regional level.

More recently, Carol has identified a fourth species of dolphin in the harbour, the False Killer Whale (*Pseudorca crassidens*). This has been a surprise as they are usually a species of open oceans with deeper water.

Community sighting data is collected as well. Laminated cards have been given to fishermen and other interest groups who can then report sightings. Because of the nature of the Harbour, we don't often get strandings which



Above: the Indo-Pacific Bottlenose.
Photo: Carol Palmer.
Below: Australian Snubfin "spitting".
Photo: Marguerite Tarzia.



are a source of valuable information in other areas.

Indo-Pacific Humpback with calf.
Photo: Carol Palmer.

Mangrove birds +

Report on the April 2011 field trip

Magen Pettit; photos by Tissa Ratnayake

On Sunday 17 April, the drizzly weather didn't discourage about fifteen people from joining Chris Parker on an early morning stroll along East Point Boardwalk in search for iconic mangrove bird species. Luckily for us, by the time the walk started the rain had ceased.



We ambled along the track to the easily accessible boardwalk, stopping to look mainly at birds and butterflies. There wasn't a lot of insect life due to the cloudy conditions though we did see a few caterpillars. We also took the time to observe a number of plant species in which the birds and butterflies were found. Chris' tour of the Boardwalk did not disappoint. We managed to see most of the mangrove species expected, with the exception of Yellow White-eye and Mangrove Golden Whistler. We did however, hear the latter calling in amongst the mangroves at the end of the Boardwalk.

There were a number of highlights for the birdos. These included:

- watching a pair of frisky Varied Trillers and listening to (and amused by) the excited calls of Brush Cuckoos (not sure if this was a highlight, although it was entertaining!);
- a brief sighting of a lone Rainbow Pitta at the beginning of the walk;
- good views of both a male and female Red-headed Honeyeater (seen at different locations during the walk). As the male is spectacularly coloured it obviously caused a bit more of a stir with its bright scarlet and black markings in comparison to the dull brown colouring of the female, where only her throat is tinged crimson;
- seeing a number of Black Butcherbirds during the walk and hearing their 'yodelling' calls;
- seeing a female Broad-billed Flycatcher near a nest at the end of the Boardwalk;
- observing a Collared Kingfisher catch and eat a small crab and;
- great spotting by Chris to find a Rose-crowned Fruit-dove sitting in a tree above us on the track. We all got a fantastic close view, unobscured by foliage, of this beautifully coloured bird for a reasonable amount of time before it flew away.

The full list of birds and butterflies is included at the end of this report.

As we entered the mangrove zone, Fiona Douglas explained her



method of remembering the different mangrove species. When listening to her, I had a flashback to when I was in high school trying to memorise the order of the first 30 elements in the periodic table. In a similar method which Fiona had done with her mangroves using word associations, I had done something similar to make year 10 chemistry easier!

Small snails were seen on the mangrove leaves along the Boardwalk, although there didn't seem to be a mollusc expert among us to identify them. A few members, however, did know the gastropod commonly called "long bums" (*Telescopium telescopium*, *Terebralia palustris* and maybe *Terebralia sulcata*). Long bums provide a major part of the bush tucker which can be



Well-spotted, Chris: Rose-crowned Fruit-dove.

collected in most mangrove areas in the Northern Territory, and Aborigines cook them in the coals of fire or eat them raw.

On the way back, we were passed by a man carrying fishing gear heading in the opposite direction towards the end of the Boardwalk. This puzzled a number of us as the tide was out and the mudflats were clearly exposed. We came up with the logical answer that he must have got his tide times MUDdled up! (Pardon the pun).

We came across a patch of Mother-In-Law's Tongue (*Sansevieria trifasciata*) along the track coming back from the Boardwalk. It is a herb belonging to the family Dracaenaceae (or included in Agavaceae), and is commonly seen in Darwin gardens. It is classified as a weed in Australia and is native to tropical Africa. This perennial succulent is spread by seed and stolons, a long horizontal stem that grows along the surface of the soil and propagates by producing roots and shoots at the tip.

A couple of hours later, we were back at the car park. We all had a wonderful time and considering the overcast conditions, we saw many more birds than we had anticipated.

Special thanks to Chris for leading this outing. Thanks also to everyone who shared their plant and insect knowledge with the rest of the group. A thank you should also be made to Sheryl Keates for sharing her bird identification expertise (especially since no one else could dispute her sighting of a male Mistletoebird, which appeared in our binoculars as a black silhouette way off in the distance!). Lastly, thanks to the mozzies and biting midges that were absent, allowing us to have a relaxed and extended stay in the mangrove area.



Lemon-bellied Flycatcher.

Bird list (41 species): Orange-footed Scrubfowl, Peaceful Dove (heard), Bar-shouldered Dove, Rose-crowned Fruit-Dove, Striated Heron (heard), Eastern Reef Egret, Greater Sand Plover, Bar-tailed Godwit, Grey-tailed Tattler, Common Greenshank, Great Knot, Red-tailed Black-Cockatoo (heard), Brush Cuckoo (heard), Sacred Kingfisher, Collared Kingfisher, Rainbow Bee-eater, Dollarbird, Rainbow Pitta, Mangrove Gerygone, Green-backed Gerygone, Striated Pardalote, White-gaped Honeyeater, Rufous-banded Honeyeater, Dusky Honeyeater, Red-headed Honeyeater, Brown Honeyeater, White-bellied Cuckoo-shrike, Varied Triller, Mangrove Golden Whistler (heard), Grey Whistler, Australasian Figbird, White-breasted Woodswallow, Black Butcherbird, Northern Fantail, Broad-billed Flycatcher, Shining Flycatcher, Magpie-lark, Lemon-bellied Flycatcher, Tree Martin, Mistletoebird, Double-barred Finch.

Butterfly list: Large Grass-yellow, Small Pearl-white, Swamp Tiger, Common Crow, Red-banded Jezebel, Small Brown Crow.

Flora of the Darwin Region now available on-line

Volume 2 of this Flora came out in 1995. Now Volume 1, which appears to complete the set, is now available – as free downloadable pdfs on-line, as also is Volume 2. Bookmark this page:

http://www.nt.gov.au/nreta/wildlife/plants_herbarium/darwin_flora_online.html.

An updated version of the Northern Territory plant checklist is set to be uploaded to the NRETAS web-site in the next month.



Magela Creek from *Recent Literature*, page 11

In the wet season, Magela Creek can flow at depths up to 6.2 times bankfull and flows up 15 times bankfull (Jansen & Nanson 2010). Nevertheless, dense riparian vegetation stabilises the banks. "Colonnades of bank top trees confine high-velocity flows over the channel bed at stages well above bankfull. At even larger flows, forested floodplains restrains [channel bed] velocities, in some cases causing them to decline, thereby limiting erosion." They found that narrow anabranching channels moved sediment in water more effectively than a single wide channel, but also that 29% of sediment is retained, accumulating at an average of 0.4 mm depth per year.

Interesting bird sightings

19 March to 21 April 2011

Compiled by Ian Hance

Sightings are as reported (unvetted, unconfirmed) and have been mostly compiled from the e-mail digest of the NT birder website (<http://groups.yahoo.com/group/ntbirds>) moderated by Niven McCrie.

Species	Date	Location	Observer/s	Nos./comments
Waterbirds, seabirds & waders				
Chestnut Rail	26/3	Palmerston Sewage Ponds	Don Franklin & Richard Leppitt	1, heard
Black Bittern	2/4	McMinns Lagoon	Darryel Binns	1
Little Egret	10/4	Fogg Dam	Peter Kyne & Micha Jackson	1, Asian race
Lesser Frigatebird	17/4	Lee Point	Peter Kyne & Micha Jackson	1
Pacific Golden Plover	3/4	Knuckeys Lagoon	Peter Kyne & Micha Jackson	14
Broad-billed Sandpiper	21/4	Lee Point	Dan Mantle	1
White-winged Black Tern	26/3	Palmerston Sewage Ponds	Don Franklin & Richard Leppitt	6+
Birds of prey				
Grey Goshawk	c. 20/3	Yellow Waters	Mike Jarvis	1, white form
Pacific Baza	21/3	Casuarina Senior College	Ian Hance	2
~	1/4	CDU, Casuarina	Ian Hance	1
Square-tailed Kite	4/4	near South Alligator	Chris Parker	1
Black-breasted Buzzard	10/4	Anzac Parade	Peter Kyne & Micha Jackson	1
Barking Owl	c. 2/4	Deckchair Cinema, Darwin	Magen Petit	2
Other non-passerines				
Red-backed Button-Quail	21/3	10 km east of Annaburroo	Mark Gardner	1
Fork-tailed Swift	20/3	Jingili	Al Stewart	2; also other sightings by other observers
~	20/4	Nightcliff	Sheryl Keates	20 -30
Partridge Pigeon	c. 28/3	Humpty Doo	Darryel Binns	1
Banded Fruit-Dove	4/4	Nourlangie	Marc Gardner	3
Northern Rosella	4/4	Cnr. Stuart H'way & Howard Springs Rd.	John Rawsthorne	2
Oriental Cuckoo	c. 20/3	Yellow Waters	Mike Jarvis	3; also 5 on 26/3 – Marc Gardner
Channel-billed Cuckoo	17/4	Nightcliff	Peter Kyne & Micha Jackson	1
Little Kingfisher	3/4	Yellow Waters	Chris Parker	4
Passerines				
Mangrove Grey Fantail	25/3	Palmerston Sewage Ponds	Mike Jarvis	1
Arafura Fantail	26/3	Yellow Waters	Marc Gardner <i>et al.</i>	2
~	2/4	East Point	Peter Kyne & Micha Jackson	1
Mangrove Golden Whistler	26/3	Palmerston Sewage Ponds	Don Franklin & Richard Leppitt	1
Buff-sided Robin	26/3	East Point	Peter Kyne & Micha Jackson	5

More birds from the "river of raptors" observatory at Veracruz, Mexico (page 6): left - Anhingas (close relative of our Darter); right - White-winged Doves. Photos: Micha Jackson.



Recent literature about Top End natural history

Back listings and summaries may be viewed at <http://www.cdu.edu.au/ser/profiles/ecologyintepend.htm>.

FRESHWATER ENVIRONMENT

Compiled by Don Franklin

Fish

- Berra TM. 2010. Clarification of field characters for three freshwater sharks and a photographic atlas of *Glyphis glyphis* and *G. garricki* from the Adelaide River, Northern Territory, Australia. *The Beagle, Records of the Museums and Art Galleries of the Northern Territory* 26: 109-114.
- Cook BD, Hughes JM. 2010. Historical population connectivity and fragmentation in a tropical freshwater fish with a disjunct distribution (pennyfish, *Denariusa bandata*). *Journal of the North American Benthological Society* 29: 1119-1131.
- Huey JA, Baker AM, Hughes JM. 2010. High levels of genetic structure in the Australian freshwater fish, *Ambassis macleayi*. *Journal of the North American Benthological Society* 29: 1148-1160.
- Jardine T, Pusey B, Halliday I. 2010. Big floods = big Barras. *Australasian Science* 31(8): 28-29.

Water resources

- Bunn SE. 2009. Northern Australia - all that water ... going to waste? In *Prepare for impact! When people and environment collide in the tropics*, ed. N Stacey, G Boggs, B Campbell, W Steffen, pp. 105-108. Charles Darwin University Press: Darwin.
- CSIRO. 2009. *Water in the Timor Sea drainage division. A report to the Australian Government from the CSIRO Northern Australia Sustainable Yields Project*. CSIRO: Australia. Available at <http://www.csiro.au/files/files/psjz.pdf>.
- CSIRO. 2009. *Water in the Gulf of Carpentaria drainage division. A report to the Australian Government from the CSIRO Northern Australia Sustainable Yields Project*. CSIRO: Australia. Available at <http://www.csiro.au/files/files/psjx.pdf>.
- Environment Centre NT. 2009. *Finding common ground. Report from the Tropical Rivers Futures Forum, Charles Darwin University, Darwin, 9 April 2009*. Environment Centre NT: Darwin. 16 pp. Available at http://www.ecnt.org/pdf/finding_common_ground_rivers_report.pdf.
- Nolan S. 2009. *Collaborative Water Planning Project, Rural Darwin (NT) Case: Analysis of Stakeholder Interests in the Ground Water Resources of the Howard East Aquifer*. Land and Water Australia: Darwin.
- Petheram C, McMahon TA, Peel MC, Smith CJ. 2010. A continental scale assessment of Australia's potential for irrigation. *Water Resources Management* 24: 1791-1817.
- Straton AT, Heckbert S, Ward JR, Smajgl A. 2009. Effectiveness of a market-based instrument for the allocation of water in a tropical river environment. *Water Resources Research* 36: 743-751. [Katherine River]
- Straton AT, Jackson S, Marinoni O, Proctor W, Woodward E. 2011. Exploring and evaluating scenarios for a river catchment in northern Australia using scenario development, multi-criteria analysis and a deliberative process as a tool for water planning. *Water Resources Management* 25: 141-164. [Howard River]

Miscellaneous

- Hallan A, Willan RC. 2010. Two new species of *Lentidium* (Myida: Corbulidae) from tropical northern Australia: remarkable fresh/fluviatile to brackish-water bivalves. *Molluscan Research* 30: 143-153.
- Jansen JD, Nanson GC. 2010. Functional relationships between vegetation, channel morphology, and flow efficiency in an alluvial (anabranching) river. *Journal of Geophysical Research-Earth Surface* 115: F04030.
- Moliere D.R. and Evans K.G. (2010) Development of trigger levels to assess catchment disturbance on stream suspended sediment loads in the Magela Creek catchment, Northern Territory, Australia. *Geographical Research* 48, 370-385.
- Townsend SA, Padovan AV. 2009. A model to predict the response of the benthic macroalga *Spirogyra* to reduced base flow in tropical Australia. *River Research and Applications* 25: 1193-1203.



Fish getting about

Many freshwater fish species occur in more than one river, yet seem isolated in each by dry ground and saltwater. For species distributed in the Northern Territory, north Queensland and southern Papua New Guinea, one possible explanation for their occurrence in many river systems is that the rivers were connected via the Gulf of Carpentaria during the Ice Ages. Over the last several hundred thousand years, the Gulf has variously been a plain with meandering rivers or a brackish to freshwater lake, as well as marine (see *Nature Territory* May 2009, page 7). This idea has been investigated recently for two fish species using genetic techniques.

The Pennyfish (*Denariusa bandata*) is predominantly a species of floodplain lagoons. It is found in rivers in five highly disjunct areas: the Top End, north-west Cape York Peninsula (Gulf drainage), the Queensland wet tropics, and Fly and Benbasch Rivers of PNG. Cook & Hughes found evidence that these populations have been isolated for considerably longer than the last Ice Age, though also that the ancestral form occupied the shelf between Australia and PNG. Populations appear to have fragmented from there rather than to have dispersed from one source across to others. Furthermore, some river populations became isolated much earlier than others, resulting in seemingly strange connections. For example, the population in the Daly River appears to be more closely related to that of the Jardine River on Cape York Peninsula than to other populations in the Top End.

Even within catchments, populations of *Ambassis macleayi* were relatively isolated (Huey *et al.* 2010). Among catchments, genetic differences were greater than expected if they had become separated during the last Ice Age.