



Noah's Paperbark: How Kimberley's Wildlife copes with Cyclonic Storms

Malcolm Lindsay

Broome has had the wettest year on record already, with four significant low-pressure systems providing 1,567 mm of rain at time of writing. Broome's annual average is 615mm. How has the wildlife been coping with this wettest of wets?



Mulga snake (king brown) in a paperbark. Image: Malcolm Lindsay

Some of us were lucky enough to find out after the most recent storm, which eventually became Cyclone Kelvin. I had heard of floods pushing snakes and lizards into trees. What we saw as we paddled on flooded Buckley's Plains was one of those once-in-a-lifetime nature experiences that feeds the inner child with wonder, a wonder at the core of most biologists.

As soon as Kelvin let us, Tess and I paddled our kayak north along the end of Lullfitz Drive, down firebreaks, through the saltwater paperbark woodland and onto the plain: normally an expanse of grass, saltmarsh and termite mounds. In the middle of the plain, the few islands remaining above the 1.5 m water — paperbark shrubs, termite-mound tips and grass clumps — were overflowing with animals sheltering and recovering. One two-metre paperbark held over 500 frogs, 10 skinks, four blue-tongue lizards, three goannas and two snakes. From tree to shrub we paddled, observing over 20 species, everything from Mulga (*Pseudechis australis*) to Whip Snakes (*Demansia angustica*), Yellow-spotted (*Varanus panoptes*) to Spiny-tailed Monitors (*V. acanthurus*), Plain (*Ctenotus inornatus*) to Eastern Striped Skinks (*C. robustus*), and Great (*Cyclorana australis*) to Striped Rocket Frogs (*Litoria nasuta*).

The animals had been pushed into the trees by the floodwaters. Many more were in the few trees in the middle of the plain than in the wooded fringes. The behaviour of the animals was remarkable. They were exhausted. All the animals we saw normally shelter in burrows, termite mounds and leaf litter, and many hibernate during the dry season when temperatures drop and food is less available. Yet here these cold-blooded reptiles and amphibians had to endure two days of over 70 km/hr winds, 401 mm of rain, cloud cover and the coldest February day on record (maximum temperature of 25.3 °C), clinging to the paperbark branches.

They were so exhausted that predator-prey behaviours were on hold: frogs were sitting on top of predatory snakes, small skinks sitting next to the same, balls of frogs and lizards huddling, most likely for warmth. The animals could not flee from us humans; we could have plucked goannas and snakes out of the trees.

Over the next three days we revisited the flooded plains, and Noah's paperbarks, by ourselves, with photographer Damian Kelly, and with the Yawuru Country Managers. As the wind dropped, rain stopped, clouds parted, weather warmed and water receded, the animals started dissipating, showing more energy and regular behaviours. They started jumping out of trees and swimming away as we approached, hunting, sheltering and exploring.

If we scientists were to try to measure the reptile and amphibian biodiversity of that area in the dry season we would be in the field for weeks and never come close to the abundance and diversity we observed in a two-hour paddle. It's not every day you get to see how animals respond to cyclonic conditions.

It was an awe-inspiring experience of nature. Such experiences are a large part of why we live here in the Kimberley, and why we fight to protect its biodiversity and traditional culture.



Green tree frogs huddling on a blue-tongue lizard. Image: Damian Kelly



Little spotted snake with green tree frogs. Image: Damian Kelly



Report From The Chair

Kate Golson

Hello all,

Welcome to the first newsletter of 2018. As well, you will by now have received EK's first-ever e-bulletin, by email in March. With the development and launch (finally!) of EK's new beaut website, we have a platform to better interact with you our members, supporters and others. Check out the site if you haven't already on www.environskimberley.org.au.

First, an update on events that I mentioned in my last newsletter report about the Four Corners investigation into water theft on the Murray Darling by a number of large and powerful landholders.

Eight months later, while no one has yet been prosecuted, the NSW Government recently announced that it will begin legal action against several alleged offenders, including the Harrises, who are cotton farmers. Other members of the Harris clan with a thirst for water have landholdings in the Fitzroy Valley. Last year, GoGo Station proposed to take between 50 and 200 billion litres a year from the Fitzroy River system, which scientific research found to be equivalent to half of the flow of the Fitzroy in some years.

That said, it is hard to have confidence in the government bodies that are responsible for ensuring water compliance.

The ABC program's investigations triggered five inquiries. One of these looked into the activities of the NSW water agency, which is responsible for ensuring compliance with the State's water laws, and revealed serious cultural and systemic problems in the administration of water policy. These included the agency's failure to investigate the majority of reports of compliance breaches.

As well, the Murray Darling Basin Authority (MDBA), which oversees the Murray Darling Basin Plan and has significant enforcement powers, did not act on the illegal removal of water from the rivers, despite having evidence of possible water theft for over a year. Yet, the Federal Government has chosen this body to undertake investigations into the alleged water thefts, rather than holding a national independent judicial investigation.

The future health of the Murray Darling Basin system, and ultimately the livelihoods of all those who depend upon it, is more uncertain than ever. We must never let our precious Fitzroy River catchment get into such a state.

Watch this space.

All the best

Kate

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Letters To The Editor

Environs Kimberley welcomes letters to the Editor. We accept comment and criticism, and print all letters that are not obscene, offensive or libellous. If you have a bone to pick, pick it with us.

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Thanks for helping us to protect the Kimberley environment



Director's Report

Martin Pritchard

Critical time for the Fitzroy River

March 9, 2018 was a historic day for the Fitzroy River. It was the first time anyone could recall four State Ministers attending a meeting in the Kimberley. They came to discuss and hear the views of those with an interest in the future of the River. The government is following through on its commitment to a National Park along the Fitzroy and Margaret Rivers, subject to Traditional Owner support, and a management plan along the river's entire length.

Traditional Owners, Kimberley Land Council, Prescribed Bodies Corporate, pastoralists, mining companies, local businesses, tourism operators, NGOs and environment and conservation groups Pew Charitable Trusts, Bush Heritage, Australian Wildlife Conservancy and EK, were all in the room with the Ministers. These were: Minister for the Environment Stephen Dawson, Minister for Water Dave Kelly, Minister for Regional Development Agriculture and Food Alannah MacTiernan, and the Treasurer and Minister for Finance, Energy and Aboriginal Affairs, Ben Wyatt. Our local member of parliament Josie Farrer was also present.

The Ministers and Ms Farrer strongly emphasised protecting the values of the Fitzroy River.

We were asked to provide our views on a management plan for the catchment, the National Park, a water allocation plan and any other matters. We sat on mixed tables and provided our views, which were captured on i-pads and automatically came up on a screen. It was an open and transparent process that revealed some of the development thinking and concerns of different sectors of the community.

Pastoralists expressed their views most forcibly; Jack Burton said that there were very large volumes of water



flowing along the Fitzroy every year and that the 15 pastoral leases along the River should each be given an allocation of 10 billion litres. Rick Ford from Fossil Downs pastoral lease, which is owned by Gina Rinehart, expressed similar sentiments. David Larkin, head of Gina Rinehart's agricultural interests, said that they would fight against any moves that would not be aligned with their pastoral interests. He also suggested that a 'high-level taskforce' be formed, and put his name forward to be on it. The Minister for the Environment responded by saying all comments would be taken into consideration.

While EK has much to say about the protection of the Fitzroy River and development along it, our question to the government was this: Given that the Barnett-Grylls government had invested millions into the Water for Food project to develop irrigation, and that the Feds under Barnaby Joyce had given \$5 million to the CSIRO to investigate the potential for irrigation in the Fitzroy Valley, would this government invest in sustainable livelihoods? As examples we mentioned the carbon farming, bush foods such as Gubinge, renewable energy, cultural and eco-tourism and land restoration and management. The response from Minister MacTiernan focussed on the work she has commissioned into efforts to commercialise Gubinge, which is a literature review of the industry.

It was a good start to the long-term protection of the Fitzroy River, which is the cause EK was founded on, but much work remains to be done and many challenges lie ahead to get a positive outcome.

Inquiry into fracking in WA

Towards the end of this year, a panel of five people is expected to report to the WA Government on fracking in Western Australia. This report will have a significant influence on whether fracking will be allowed in the Kimberley. EK's submission to the inquiry contains carefully documented evidence that reveals a litany of misinformation and denials from government and industry. We can safely say that fracking is too risky in the Kimberley; however it will be a political decision that determines whether this practice will be allowed here. The potential for 40,000+ gas fracking wells scarring the landscape is serious, so now is the time to influence decision-makers by writing to local members of parliament to let them know how you feel. Please pass on any responses to us (check out the EK website for a copy of our submission).

Gogo irrigation

The proposal to take 50 billion litres per year (Broome uses just 6 billion litres) from the junction of the Margaret River and Mt Pierre Creek to grow sorghum and export the grain through the Broome wharf, as well to set up a beef feedlot, is rife with problems. It would involve 8,335 hectares of landclearing, diversion of a major creek, massive dams, the potential for chemical and fertiliser pollution with unknown impacts downstream — and this is just 'Stage 1'; it looks like Camballin all over again. We need to learn from the lessons of the past and not repeat them. The Liberal-National Government didn't do that, and they were taking us down the disastrous Murray-Darling path. We now have a chance to do something different, and protect the values of the Fitzroy River that we hold so dear.

More tips to improve the sustainability of our daily lives without too much effort.

AFTER THE CYCLONES

Well, Broome people learnt a few lessons during the several blows the town experienced in January and February this year. One is surely the unsuitable nature of many of the exotic trees in our gardens, with their fine shade but shallow roots. African Mahoganies went toppling all over town, keeping tree-loppers busy. And we were all impressed by the sight of the fallen 'suicide palms', living, or rather, dying up to their name outside the Mercure. In contrast, the majority of local native species stayed firmly stuck in the ground, at worst shedding a few branches. The good old jigal (*Bauhinia cunninghamii*) must surely take the prize for sturdiness, and it provides dense shade and bears beautiful flowers. Silly not to plant it.

The next lesson is that Kimberley towns are particularly vulnerable to road closures. Who will soon forget the disconsolate shoppers wandering about the fresh-food stands in the supermarkets, pushing their empty shopping trolleys? The situation was rectified in a few days by a food drop courtesy of Qantas, but it is worth reflecting on the speed with which we ran out of essentials. What if we were to experience a prolonged period when neither trucks nor aircraft could reach us? What if there were hostilities in our neighbourhood? Blow up the road or its bridges, bomb the airport and presto! we are on our way to starvation, or at best, severe deprivation.

The original inhabitants and keen fishers would keep themselves and some of the rest of us supplied with seafood. To ward off scurvy we could raid the boob trees, for their leaves in the wet season and their pods in the dry, and neighbours' gardens for Moringa leaves. In season, we could strip wattle bushes of their seeds and make porridge. While it is comforting to remind ourselves that our natural environment is richer than most, it would be more sensible, surely, to prepare for hard times by growing the sort of food we have become accustomed to. Community veggie gardens, some specializing in tropical species that grow in the wet season, like kang kong, would go some way to fulfilling the need, and we are ever grateful to local market gardeners who keep many of us fed during the growing season. But serious investment in local horticulture is necessary to feed everyone. It is absurd that almost everything we eat comes from elsewhere, and that we still rely on long-distance transport, fossil-fuelled, to bring it to us. Forget 'water for fodder', 'food bowl of Asia' and suchlike. Food for the Kimberley is what we need.

The final lesson, hardly a new one, is that people are greedy. As a fourth possible cyclone loomed, the supermarket emptied even before any trucks were held up. Panic buying and stockpiling is unnecessary. We are not at war and no one has bombed the airport, so we only need food for a few days at times of cyclone. But we all need to eat, not just those who get in first.

Ruminating with MAD COW



DÉJA VU

When I was at boarding school, I used sometimes to imagine that my parents had put me in an insane asylum and that everyone around me was conspiring to pretend that this was a perfectly normal school.

There was nothing particularly strange about the school I went to, if you disregarded the women who glided along the corridors in long black habits reminiscent of the Arab chador muttering to themselves, beads clacking at their waists, and the almost life-size statues of the saints standing in alcoves along same corridors, watching us silently and suspected of moving around at night. And the many hours we spent on our knees in the incense-filled chapel, reciting over and over the same words we recited over and over every other day of the week. You'd think even God would have been bored. No, nothing odd about my school.

This same feeling still envelops me from time to time when I contemplate the world I now live in. Sometimes it's brought on by parliamentarians, whose interpersonal exchanges are seldom those of normal adults, while their inability to answer a straightforward question with anything other than a repetitious script that bears no relation to the matter at hand causes me to doubt their mental wellbeing.

A sense of living in a madhouse can take hold when I reflect upon matters of global concern. When it has been all too obvious for several decades that countries should be acting in concert to stop the planet from overheating, there are still heads of state who won't accept the truth because the truth doesn't suit them. Worse than these are the ones who admit the facts and, while promising remedial action, take none. Throwing money at the Great Barrier Reef to ameliorate coral bleaching is breathtakingly stupid when the main cause of bleaching isn't shortage of cash, or even the crown-of-thorns starfish, it's rising sea temperature. We don't have the starfish here, but the West Kimberley experienced its own coral bleaching two years ago, during that hellishly hot and dry 'wet' season.

Signing the Paris Climate Accord and then making plans to open new coalmines (think Adani) is not just bad faith, it's lunacy. And it is delusional to talk about 'strict environmental conditions' around such developments. Whoever heard of a carbon neutral coal mine?

Europeans introduced cane toads and innumerable other animal pests that we are now spending enormous sums of money and years of volunteer time to get rid of — mostly, in vain. Vastly more money and time are spent clearing weeds that we introduced, some, such as Neem, not so long ago. Weeding is a never-ending task, like housework; Sisyphus comes to mind.

The coup de grâce to my own sanity occurred when NBN arrived on my doorstep. I won't inflict on my readers (if any) a blow-by-blow account of the three days it took me to install the modem and the new telephone I was obliged to purchase because my old one was incompatible with it, but I am proposing a new psychiatric condition be added to the DSM (the international manual of psychiatric diagnoses): Traumatic Techstress. I'm still suffering from the post-traumatic version.

Grants Received:

The Kimberley Nature Project was successful in receiving three State NRM grants, announced in December 2017. These projects are:

Documenting Bunuba ecosystems and working to restore Country and culture

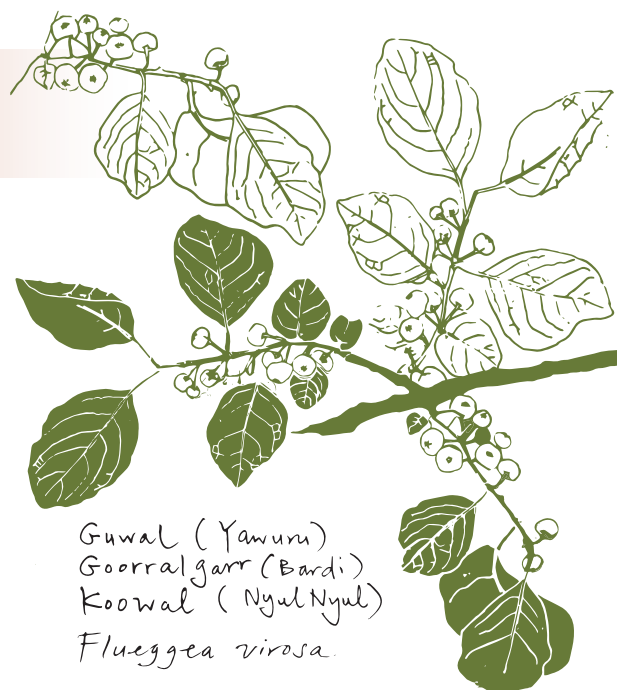
We will work with Bunuba Rangers and Traditional Owners, whose Muwayi (Country) extends across the rivers, floodplains and gorges of Bandaral Ngarri (Fitzroy River) taking in Jijiji (Diamond Gorge), Miluwindi (King Leopold Ranges) Malaraba (Erskine Range), and Dawadiya (Trig Hill). Eco-cultural survey work will expand documentation of Bunuba ecological knowledge within Balili (limestone ranges) and Garuwa (water) places, enabling us to assess resources, plan weed management and produce an enhanced ecocultural database. This project will:

- Document and support intergenerational knowledge transfer to ensure long term health of Country
- Target priority weeds such as Parkinsonia (*Parkinsonia aculeata*), Bellyache Bush (*Jatropha gossypifolia*), Noogoora burr (*Xanthium strumarium*) and Neem (*Azadirachta indica*). These are invading Garuwa sites, changing fire conditions and water flows, degrading habitat and reducing nesting sites for Freshwater Crocodile and Purple-crowned Fairy-wren
- Address unmanaged tourism threats to Bunuba Muwayi in the tourist hotspots of Darngu (Geikie Gorge) and Bandilngan (Windjana Gorge).

Kimberley Community Seedbank: Seed to Tree (working with Bardi Jawi Oorany, Nyul Nyul and Karajarri Women Rangers)

Stage 1 of the Kimberley Community Seedbank was supported by State NRM and WWF. This next stage will build on previous works to:

- Train seed collectors in sustainable & efficient collection and processing
- Enhance seedbank facilities in Broome and in the field with Aboriginal rangers
- Support revegetation within Karajarri, Nyul Nyul and Bardi Jawi Country in partnership with three remote Aboriginal schools and communities
- Update and publish the Kimberley Seed Collection and Propagation Guide
- Develop an online seed catalogue and information portal.



Guwal (Yawuru)
Goorralgarr (Bardi)
Koowal (Nyul Nyul)
Flueggea virosa

Protecting Mayingan manja balu: Endangered Vine Thickets of Yawuru Country

This project will map and manage weeds; build the capacity of vocational and community group volunteers and conduct educational activities for the Broome community to learn about the importance of this Endangered ecosystem and the impact of weeds. The MVT patches of Yawuru country are called Mayingan manja balu in Yawuru language, meaning 'places of many fruit trees'. The patches around the Broome town site have the most heavily weed-infested patches of all the MVTs of the Dampier Peninsula. Despite this, these patches have seen little weed-survey or management work until recent pilot efforts by Yawuru Country Managers (Yawuru Rangers) and Environs Kimberley.

The funding for these three projects will help the Kimberley Nature Project continue its work with five ranger groups to support and coordinate cooperative cultural-natural resource management projects in the region.



The good and the bad of a wet wet season

Kylie Weatherall

Record-breaking rains this 2018 wet season have seen Broome residents splashing in puddles and paddling in the streets. The successive rain events tested urban drainage design and created some spectacular seasonal wetlands that took weeks to subside, indicating that the groundwater reservoir was fully recharged. Slowly throughout the dry season the groundwater level on the Broome peninsula will drain away. With the water so close to the surface, it makes this a perfect year for planting trees.

An extensive wetland formed in Minyirr Park, extending from the lowest elevation point and where the most dense monsoonal vine thickets grow. Unfortunately, this wetland submerged Kimberley Nature Project's Minyirr Park revegetation site, depriving nearly 300 planted trees of oxygen, waterlogging their roots and minimising sunlight for a period of nearly eight weeks. Only one or two more mature trees, whose canopy was above water, survived. A sad loss for the many community volunteers, school groups and Green Army teams who, in 2017, spent lots of sweaty, hot hours planting these trees. On the flipside, the flooding killed the extensive weed infestations (such as buffel grass) on the site. The challenge now is to keep the weeds at bay and to get as many big shade trees as possible planted before the groundwater subsides.

The opposite occurred at the second Kimberley Nature Project's revegetation site. Located on the landward side of a large dune, the vegetation soaked up all the rain and flourished. What was, at the end of 2016, a completely bare, remodelled dune is now covered in colonising species (Acacias, vines and grasses) as well as a few well-established trees and, of course, some invasive weeds.

These were two very different sites with very different challenges. And with the 20 Million Trees Federal Government funding round finishing in June we are planning the last on-ground actions (tree planting and weeding) before handing the sites back to the land managers.

Remember — make the most of this very wet, wet season and come and join us or go and plant a few of your own trees.



Yr 12 Clontarf students Vernon Gerrard and Stewart Dryden planting trees at the old quarry revegetation site



North end of Minyirr Park reveg site, flooded



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Nyul Nyul Language Workshop

Ayesha Moss



“Nyul Nyul Mayi” is a booklet of bush plants being created by the Nyul Nyul Rangers, which showcases 17 species of large trees, small bushes and vines/scramblers. In partnership with the rangers, the Kimberley Nature Project ran a language workshop in Beagle Bay last November to discuss

Nyul Nyul words for the plants and animals of their monsoon vine thickets, and to gain approval from the community to use these words within the booklet.

The language workshop was held at the Sacred Heart School Library, where the community members were invited to attend and participate. We looked at existing Nyul Nyul language resources, such as the collaborative **Nyool Nyool: a language book** published in 2002 by the Loongabid Aboriginal Incorporation and written by George Dann and Alec Dann; **The Story of Crow: a Nyul Nyul story**, 1988, written and illustrated by Pat Torres with Nyul Nyul language text by Magdalene Williams; and **Winin: why the emu cannot fly** by Mary Charles, 1993, illustrated by Francine Ngardarb Riches. The group used the orthography as described in Winin to determine the spelling of the plants in the book.

The workshop being held in the library and on school grounds, Aboriginal liaison officers and other interested staff were able to participate. Zynal Cox, Nyul Nyul Ranger, has a strong knowledge of and interest in plants and culture. Linguist Thomas Saunders recorded Zynal on audio file pronouncing each of the Nyul Nyul words to be used in the book, creating an audio reference for future work on this and other language projects.

Other Nyul Nyul language resources we consulted were the records of the Pallottine Fathers Hermann Nekes and Ernest Worms from the 1930s to 1950s. These records can be viewed in the Notre Dame library. There are very few Nyul Nyul language speakers left today owing to the impact of colonisation, and of the mission and government policies of the period. This language workshop, the ‘Nyul Nyul Mayi’ booklet and the continuing work of the rangers and the community to record and use language is a proactive way to keep Nyul Nyul language alive.



KNP, Nyul Nyul Rangers and Tom Saunders



We need your help

We need a hand to protect the Kimberley again this year — can you help?

The EK market stall is starting up again at Easter and we are desperately looking for new volunteers! Can you spare a couple of hours a month for a good cause? We need help on our stall at the Broome Courthouse Saturday markets, or driving the market trailer. Volunteering on EK's stall is a great way to get to know what's happening in our region and help us inform the community. Anyone can help and training is provided. And it's fun.

If you can help out, please let Tess know: (08) 9192 1922 or admin@environskimberley.org.au



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Letters to the editor



Dear Editor,

I loved Ayesha's piece in the December EK News about the seedbank (actually the whole newsletter was great). I was surprised that you wrote that the *Acacia victoriae* is not in the Kimberley.

Maps here:

<https://florabase.dpaw.wa.gov.au/browse/profile/3595>
<https://bie.ala.org.au/species/http://id.biodiversity.org.au/node/apni/2904053#overview>

show that *A victoriae* does grow in patches of the Kimberley. But I wonder whether it's less attractive than other wattles, leading to the impression that it isn't there. I'm intrigued that there is the impression — likely both Aboriginal and non-Aboriginal — that this widespread wattle doesn't grow in the Kimberley, so you need to find other species for your seedbank.

Living in Central Australia I know *Acacia victoriae* intimately as it's a fire-weed here and bursts up after fire. Sometimes it's called elegant wattle, but it's not very elegant, and the prickly branches are a hazard for bare arms. Bramble wattle is another name in the books but I've never heard anyone use this name, even though it is quite brambly.

I look forward to hearing more about the seedbank.

Rosalie Schultz, Alice Springs.



Acacia Victoriae. Image: Wikipedia

G'Day Environs Kimberley

Best wishes for the New Year...and congratulations on a very impressive Issue 82/December 2017 bulletin. I'm so impressed with the professionalism of your group. There is one addition I'd really appreciate with regard to the Bulletin: you include lots of information relating to a number of Indigenous communities but I have a tendency to gloss over their names as I read them as I don't know how to pronounce them (silent "y", "n" or "g"? etc). Would it be possible to include the pronunciation (in brackets using phonetics) of the various Indigenous words e.g. whilst Paruku seems pretty easy to pronounce (par-oo-koo??) I have difficulty with words such as Nyul, Jawi, Yawuru, Ngurrara and Nyangumarta.

Kind regards,

Leonie Stubbs.



Easier said than done, Leonie; some sounds don't have English equivalents, but here goes:

Firstly, all these words carry the emphasis on the first syllable.

Nyul is a one-syllable word that rhymes with 'pull'.

Jawi rhymes with 'ah we': *Jawee*, but the *a* is short, rather like the 'u' in 'but'

Yawuru sounds to most hearers like *Yaroo*, with short *a* and continental *u*. The 'wu' is a subtle syllable, barely pronounced.

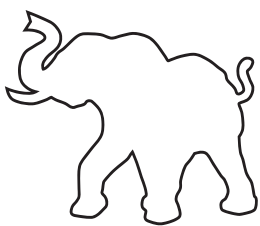
Ngurrara is a hard one for English speakers: the *ng* sounds like the *ng* in singing (no hard *g* sound). Continental *u*, followed by rolled *rr*, short *a* and unrolled *r*. *Ngoorrara* is the closest I can give.

Nyangumarta: *Nyang* rhymes with 'bang' (no hard *g* sound), continental *u*, and *marta* with soft *t*. *Nyangoomarda* is the best I can do with that.

I hope this is of some use, Leonie, and for other readers who struggle with names.

Ed.

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Timing and community key to seagrass monitoring

Fiona West



Seagrass monitoring in Roebuck Bay requires a meticulous focus on timing. We study the tides and how they relate to sunrise and sunset, to pinpoint the moment we need to walk out from the beach to the GPS site to avoid the swooping tides and monitor the meadows while there is sufficient light. Sometimes

the starting times are gruelling — it was a 5am start at Town Beach during our January monitoring session. Thank you to our highly skilled and saint-like long-term volunteers, especially Rose, Jon and Kevin, for waking in the pre-dawn darkness and bolstering the project with their expertise.



Lush green meadows at the Town Beach site January 2018. Image: Fiona West

During the January monitoring session, timing was on our side in an extra way; we managed to avoid the wildest weather of an extreme wet season — including cyclones, spectacular electrical storms, record-breaking rainfall and flooding — to complete three fun and productive days of scientific monitoring. We are happy to report that on January 19th and 20th the Town Beach and Demco sites looked incredibly lush; one long-term volunteer commented that he'd never seen such an abundance of life darting and squirming around the seagrass canopies. Jon filmed a minuscule black long-nosed swimming baby animal of some sort — it was very cute! Franky later researched and found that it could be a baby Slender Seamoth (*Pegasus volitans*), also known as Little Dragonfish. At Demco, Kevin photographed something we'd never seen before; it had orange gills, dark spots and large bundles of brown and cream-coloured bristles. Later, a member of our clever volunteer base suggested that this extraordinary creature was possibly related to the Purple-spotted Fireworm or Bristle Worm, *Chloeia flava*. We also saw an intriguing sea

snake with unusual and elaborate lace-like patterning — a real crowd pleaser! It was later identified by Bruce as a Black-ringed Mangrove Snake, *Hydrelaps darwiniensis*. We do occasionally come across this species while seagrass monitoring but, as Bruce explained, this individual was particularly stunning, with a vertebral stripe connecting the bands, which is atypical for the species. Wow!

At the Port on 21st January, it was heart-warming to see families of volunteers materialise in the rosy dawn under the boat-docking yard. It reminded me what a special community we have, to see all the mums, dads, kids and grandparents in the early hours enthusiastically pulling on their mud-boots and helping themselves to the delicious fruit and muffins, before heading out to help care for the bay. When we walked out to the Port site it seemed the storms had washed quite a lot of sediment over the meadows, but that didn't deter a colourful array of feather stars who danced enchantingly in the shallow pools of water, delighting us all.

I must extend our heartfelt thanks to Coastwest and Kimberley Ports Authority, our long-term funders, who continue to support Broome locals to run this citizen science project, part of Seagrass-Watch's global assessment program. Future seagrass monitoring is only going to get more enthralling; the main flooding in Broome occurred after our January sessions, so the next few years of seagrass monitoring in Roebuck Bay will provide data about the impacts of these record-breaking weather events. Hold onto your hats, folks! There's much more excitement in the seagrass meadows to come!



Father and daughter team study a quadrat. Image: Fiona West



Department of Parks and Wildlife





Bay Babies

Jason Fowler

Recently Roebuck Bay has experienced a series of events that has turned the world of many baby marine creatures upside down.

Normally from September onwards most of Roebuck's fish and crabs go into spawning mode and pump out millions of offspring. By November spawning is nearing its peak as parents expect a rush of food for their young brought on by the flush of fresh water, nutrients and wet-season warmth.

This wet season started with cyclone Hilda, a strange beast that formed quickly over land and passed directly over Entrance point. Hilda's south-easterly gales pummelled the northern shores, scouring away most of the seagrass beds, and dumped this critical habitat onto the beach in a sodden, rotting mass.

It didn't stop. Cyclone Joyce fluffed past, then a deep tropical low sat inland from Roebuck Plains, dumping record rainfall, with fierce north-westerly gales. It scoured the seagrass beds on the southern side of the bay and flooded Broome's sewage treatment plant, pouring sewage into the bay for over two days. Next, Cyclone Kelvin powered up and flooded the sewage plant again for another three days of overflow. Roebuck Plains became an inland sea and for two months fresh water has flooded into the bay between Crab Creek and Thangoo. So much fresh water came down that the Roebuck pearling leases were covered in tadpoles, despite being kilometres offshore! All this fresh water devastated large swathes of seagrass beds, clearing out the Dugongs' favourite tucker, *Halophila ovalis*.

Larval fish and crabs usually love a good wet season, when the water resembles a twitching pea soup. After spending a few weeks floating around as zooplankton the larvae begin to settle on the seafloor and look for somewhere safe to hide and feast. This year they must negotiate barren seagrass beds with little cover, critical at low tide when the safety of the creeks is out of reach.

For those larvae unfortunate enough to drift past Town Beach, the stench of sewage would send anyone into toxic spasms.

Most of the chemical products we use – detergent, Drano, CLR, bleach etc., end up in sewage ponds. This chemical cocktail is likely to be lethal to many babies. Their shells are soft, their scales undeveloped, vulnerable tiny bodies unequipped to deal with an onslaught of toxic chemicals – unlike the adults with their hard scales, thick skin, well-developed immune system and the ability to move away quickly.

The volume of nutrients that poured out of the sewage plant is likely to trigger another bloom of toxic blue-green algae *Lyngbya majuscula* and smother everything in the intertidal area, as has been happening more frequently since 2001 – another deadly obstacle for those babies to negotiate.

Later this year major dredging works are planned at the port. Those babies will have yet more hurdles to overcome, with thick dredging plumes and powerful underwater noise pollution shaking them to the core.

It's easy to be complacent, gazing over the beautiful jade-green water of Roebuck Bay. However, every time a disturbance occurs, such as a sewage spill, algal bloom, dredging or a cyclone, a chunk of young fish and crabs is removed from that bustling ecosystem. In ancient China 3000 years ago, the Qin dynasty came up with a method of slowly killing somebody, called 'Lingchi' or 'Death by a thousand cuts'. Next time a major disturbance happens in Roebuck Bay spare a thought for the babies of the bay. Meanwhile, tell the authorities to prevent sewage spills, and not follow the path of the ancient Chinese.

Sign petition here: <http://coralwonderland.good.do/roebuckbayisnotasewagepond/NoSewageinRoebuck/>



Sewage washout, February 2018. Image: Jason Fowler

The value of a volunteer

Since 2008 SKIPA has been undertaking experimental propagation of Kimberley native plants at North Regional TAFE, working with TAFE lecturers, contributing to TAFE gardens, building native gardens around town and giving away excess plants.

One of the annual tasks of SKIPA volunteers is to make sure the watering systems are functioning during holiday periods when all TAFE staff are on leave. And over this wet season SKIPA volunteers Diana Oliver and Jan Lewis spent many days visiting the nursery, not only checking that all plants were happy and healthy, but potting up many hundreds of Gubinge trees for the North Regional TAFE horticulture department. It is a long-term relationship and one with many mutual benefits.



Left to right: Jan Lewis and Diana Oliver.



Save the Date – Art auction 2018

This year's 15th annual Environs Kimberley Art Auction will again be exhibiting some of the best art-works the Kimberley has to offer. Come along and enjoy a night of fantastic art, delicious food, a well-stocked bar, and great company!

Saturday 21st July 2018

3–5 pm - preview of the art

5–7 pm - drinks, food and live music

7–9 pm - live auction of art pieces

This year we are having a special sneak preview of the works on Friday 20th July, 12–6 pm.

For more details, please contact Tess on (08) 9192 1922 or admin@environskimberley.org.au



EK Art Auction. Image: Julia Rau

Artists we need you

As valued supporters of Environs Kimberley, you are invited to take part in this year's event. To enter please fill in the Artist Entry Form and return by 22nd June 2018. Forms are available on the EK website (www.environskimberley.org.au/art_auction_broome) or from the EK office at 44 Blackman Street, Broome.

Save the Date

Missy Higgins has generously offered to put on a not-to-be missed show in support of Environs Kimberley:

Saturday 16th June.

Broome Chinatown Convention Centre

More details to follow shortly so please save the date for what will be a fantastic night of music to raise money for EK and to celebrate the Kimberley.

Hope to see you there!

Using your will to protect the Kimberley

One of the most significant ways to leave a lasting legacy for the nature of the Kimberley is to leave a gift in your Will to Environs Kimberley.

Large or small, when you make a bequest you are helping to provide for the future of the Kimberley. You are giving Environs Kimberley the power to speak out and act for our region and ensure its protection for future generations.

Please contact us if you'd like advice on making a bequest to EK.

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The EK gift fund is a public fund and is listed in the register of Environmental Organisations under item 6.1.1 subsection 30-35 (1) of the income Tax Assessment Act 1997.



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