

WILDLIFE DIARY

March 2012



Great Finds

Did You Know?

The beautiful **Ornate Rainbowfish**, *Rhadinocentrus ornatus* found in Eprapah Creek.

Carpet snake, *Morelia spilota* visited a chook pen at Thornlands. No casualties from either party reported.

POPULATION MATTERS

Human population growth and economic development threaten the integrity of freshwater ecosystems globally, reducing their ability to support biodiversity and provide ecosystem services (Darwall *et al*, 2011).

Tyre Dust

Approximately 3kg of tyre dust is produced by each vehicular tyre per year (Environmental Research Foundation, 1995; Councell *et al*, 2004) while zinc (Zn) release alone from tyre abrasion was calculated at 14gZn/km/yr on residential streets to 810 gZn/km/yr on high-speed motorways (Councell *et al*, 2004). Heavy metals like Zinc cannot be chemically transformed or destroyed and as Davis *et al* (2001) showed 25% of Zinc in urban storm water was estimated to come from tyre wear and 73% from residential streets (University of Wisconsin, 2000), which included tyre wear. The concern is Zinc is known to be toxic to aquatic species (University of Wisconsin, 2000) and it's often found in storm water (Councell *et al*, 2004).

Assuming there are two vehicles per each new household this represents an extra 3,744,000kg (3,744 tonnes) of tyre dust being generated annually in Brisbane and 504,000kg (504 tonnes) annually in the Redlands. Even using Atech Group (2001) more conservative figure of 0.03 g/km per tyre (1.06kg/vehicle/year) this still equates to 330,720kg (331 tonnes) of extra tyre dust generated by new dwellings in Brisbane by 2031 and likewise 44,520kg (44.5 tonnes) annually in the Redlands.

Tyre dust contains rubber (40%), HAOils (PAH), Phenols, Phthalates, Zinc (Lawrence, 2011; Swedish Chemical Agency, 2007) and heavy metals (Adachi & Tainosho, 2004). Many of these compounds are harmful to humans, the environment (Adachi & Tainosho, 2004; Swedish Chemical Agency, 2007) and in particular aquatic species. This does suggest that Moreton Bay is potentially receiving between 2,548.8 tonnes and 225.3 tonnes of toxic material annually due to tyre dust from passenger vehicles.

In memory of our dear friend Bob Douglas

"Don't cry because it's over, smile because it happened."
Dr. Seuss

Did you know Freshwaters represent one of the most threatened ecosystems globally and, despite occupying less than 1% of the Earth's surface, contain 10% of all known species including around a third of all vertebrates? Associated with this rich diversity, the world's freshwaters provide ecosystem goods and services valued at several trillion USD/year globally (Darwell *et al*, 2011).

Did you know Australian native trees, like eucalypts generally don't form hollows until over 100 years old? It takes 300 years for the maximum number of hollows to form. 20% of birds and 55% of arboreal mammals depend on these hollows. While hollow formation depends on the tree, it still takes a very long time for these essential wildlife homes to form. So look after them please.

Did you know the economic consequences of unhealthy waterways is increased water treatment costs, expected to be 10-20% increase in sediments by 2031 and this will add more than \$32 million per year. A downturn in nature based tourism as little as a 10% drop in numbers due to the poor condition of the Bay would lose the industry \$4 billion by 2031.



Great Walks

Bob & Delphine Douglas Reserve. After many years of improving the environment around their property off Bunker Road Victoria Point, Bob Douglas & Delphine Douglas were honoured

by having a park near their property named after them on 6 January 2012.

WWW

Super Quarry - it's back again
<http://www.superquarry.org.au/>

Save Moreton Bay
<http://www.savemoretonbay.com.au/>

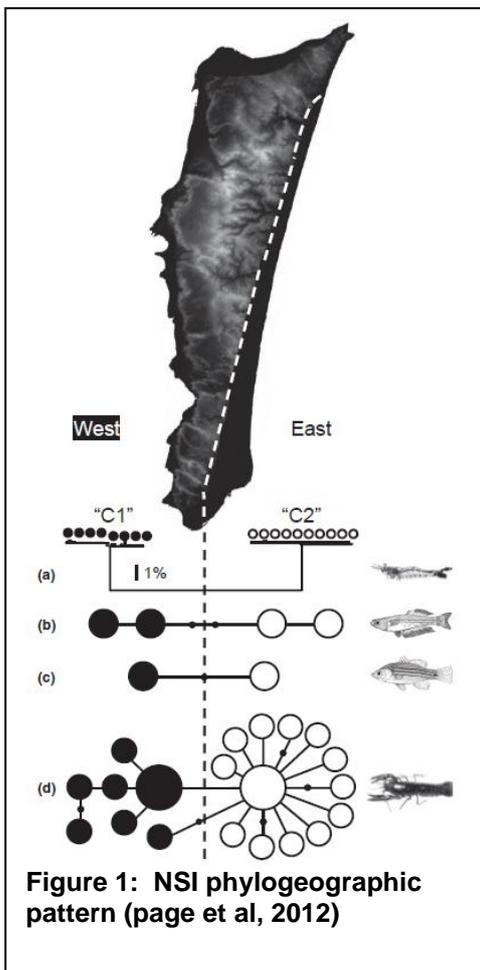
Wildlife Bayside Blog
<http://wildlifebayside.wordpress.com/>

Seagrass Watch blog
<http://seagrassmb.wordpress.com>

Phylogeography & North Stradbroke Island

Phylogeography is the overlaying of genetic (generally within-species) and geographic patterns. It is much like biogeography but at smaller geographic and evolutionary scales. Biogeography is a branch of geography that studies the past and present distribution of species. Both Phylogeography and biogeography are closely linked because similar processes generate both population- and species-level diversity.

A strong phylogeographic pattern among populations of a single species provides us with a good idea about the evolutionary and biogeographic history of a species. It may also highlight important conservation units of biodiversity which may exist beyond the species level. This is clearly the case on North Stradbroke Island.



It's Page *et al* (2012) research paper 'The world in a grain of sand: evolutionarily relevant, smallscale freshwater bioregions on subtropical dune islands' published in *Freshwater Biology* (2012) 57, 612–627, which focused on Phylogeography gives us some fascinating insight into species distribution on North Stradbroke Island.

Their study involved the survey of every major, and nearly every minor, freshwater body on North Stradbroke Island between 2003 and 2010. The result was 171 specimens from 12 fish and three decapod species from NSI and Fraser Island were genetically sequenced. What they found was fascinating.

Of 25 data sets 14 showed significant phylogeographic structuring while only 5 did not. They found 5 fish species were only found on one side of NSI (*Ambassis agassizi* and *Pseudomugil signifier* on the west side; *Mogurnda adspersa*, *Porochilus rendalhi* and *Tandanus tandanus* on the east side). However, what was really fascinating was that genetic data strongly suggested that each side of NSI hosted its own distinct populations. Same species but genetically quite different.

The east/west pattern found on NSI that Page *et al* (2012) found seems to be the result of extensive dune fields formed during nine major glacial periods of lower sea level

over the last 730 000 years. It was not only at the species level but entire biotic communities. Once, rivers from the mainland were linked to the island because a lower sea level exposed a broad plain. As time progressed these dunes developed and consequently populations were separated.

Implications of this finding are important. While South East Queensland is thought of as one bio-region for freshwater fish clearly it can no longer be so. With such divergent populations on just one island we now need to think more carefully about how we protect freshwater species.

Never doubt that a small, group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has. Margaret Mead.



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