

Marine Plants Update

When the Only Constant is Change ...

Finally the Fisheries Act (1994) has been brought under IPA. The Primary Industries and other Legislation Amendment Act (2003) came into force on 1st March 2005, bringing approvals previously under the Fisheries Act under the administration of the Integrated Planning Act (1997). Almost.

The new arrangements:

- 'legitimise' the DPI&F's growing interests in coastal management;
- provide for a more equitable appeals process for development-oriented applications;
- have created separate systems for development and non-development oriented activities; and
- provide for self-assessable permitting for deemed low-risk activities.

Some activities, including aquaculture developments within unallocated state lands and works within declared Fish Habitat Areas, will now require a 'Resource Allocation Authority' issued under the Fisheries Act – IPA / IDAS does not apply.

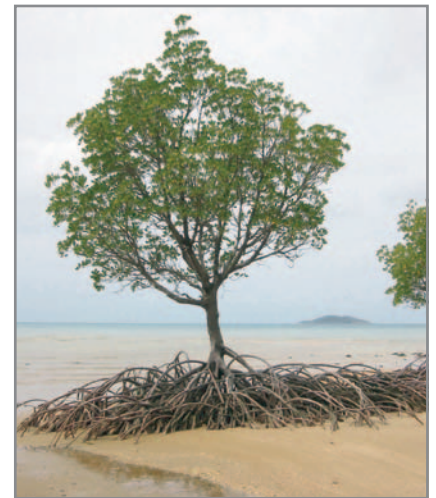
However development, that for example may disturb marine plants or impact fish movement, now requires a Development Approval. Significantly, a Development Approval is required for a much broader range of activities than the previous permit system addressed.

For example, whereas under the old legislation the s51 permitting approval process (explicitly designed to manage disturbance of marine plants) may have occasionally been 'broadly interpreted' to, in effect, manage the impacts of development on resource access, the new legislation is explicitly drafted to enable the consideration of such issues under the Development Approval process.

This is a welcome improvement to 'transparency of process'. On paper at least the DPI&F now has a significantly broader influence.

This increase in power is however balanced by a change in the appeals forum from the Fisheries Tribunal (where the odds were very much stacked in favour of the Department) to the Planning and Environment Court (except of course for those matters requiring a Resource Allocation Authority – which remain under the Fisheries Act and thus remain subject to the Fisheries Tribunal). This is also a welcome change, and one that we will be following with great interest (who was that wag that suggested Fisheries officers had better get their suits pressed?).

Without question, the law in relation to development of the coastal zone has just become more complex.



Red mangrove on Moa Island, Torres Strait.

As the 1st of March drew closer, Departmental officers were readily conceding that the new arrangements would require some bedding in. In fact as of March 1st, various Departmental guidelines relevant to the interpretation and administration of the new Act were still being drafted.

Now that the new legislation has been enacted, each of us with an interest in coastal zone management should be ready to contribute to its interpretation and the establishment of precedents. Or are we happy that the Department shoulders this responsibility alone?

For further information of how the new legislation may affect you, please contact FRC's Dr John Thorogood or Carol Conacher.

Airport Ecosystems Given The ‘Thumbs Up’

Monitoring the Aquatic Ecosystems of the Brisbane Airport



One of the waterways surveyed during the Brisbane Airport Aquatic Fauna Study.

Ask folk about fishing in the waterways of the Brisbane Airport, and you'll get a mixed response. Some will say that the fish would be contaminated and unhealthy (due to perceived pollution) whilst others frequently fish the canals for a feed. 'Shamateur' prawners certainly seem to think there's plenty to catch when the banana prawns are running.

Recent studies undertaken by FRC as part of the Brisbane Airport Aquatic Fauna Study investigated the fish and benthic faunal communities on site – and to a large extent, it's good news.

The engineered channels and waterways of the airport support an aquatic fauna that is essentially similar to other 'natural' waterways of the Moreton Bay region.

Young mullet, yellow-fin bream and mud crabs were abundant, and showed strong growth over the 12 mth period of our study.

Studies over the tidal cycle showed just how important the small, almost ephemeral tributaries were to these species.

However, whilst at first glance, the airport precinct supports extensive areas of healthy mangrove and saltmarsh, large areas were found to have a significantly reduced ecological value. No longer well-connected to

Shultz Canal, these areas of coastal wetland exhibit chronically poor water quality - and consequently support few species of invertebrates and fish.

The results of the Brisbane Airport Aquatic Fauna Study support the Airport's management team's desire to minimise the impacts of future development of the airport (and not least, of the 3rd runway), through going beyond vegetation / habitat mapping, and providing a clearly justified assessment of each habitat element's ecological value.

Additionally, the study has identified important criteria for constructing artificial habitat (be it at the airport or elsewhere). With careful planning, constructed habitats can be as ecologically valuable as 'natural' habitats.

For further details regarding the Brisbane Airport's Aquatic Fauna Study please contact FRC's Andrew Olds.

FRC Staff go Back to School

Three of FRC's aquatic ecologists, Simon Drummond, Andrew Olds and Lauren Thorburn, have recently gained national AusRivAS (Australian River Assessment System) accreditation. AusRivAS is a nationally standardised method used to assess the ecological condition of freshwater streams and rivers. It involves the description of physical habitat and the sampling of water quality and macro-invertebrate communities in various stream reaches. This information is then input to a predictive model, which compares data from a given site with reference data collected from hundreds of 'pristine' sites around the state.

Each of FRC's ecologists gained high distinctions for every module of the course, run by the University of Canberra, placing FRC's three staff consistently at the top of the course. The three also excelled in the field component of the course, which involved the sampling of various rivers and streams around south east Queensland. Now all that's left is to work on remembering how to properly capitalise the AusRivAS acronym....

FRC frequently undertakes AusRivAS-style assessments in freshwater ecosystems, across Australia. The breadth and depth of our experience allows us to add significant value when interpreting the results of model outputs, and in assessing the likely source(s) of impact. For more information on freshwater ecological assessment please contact FRC's Lauren Thorburn.



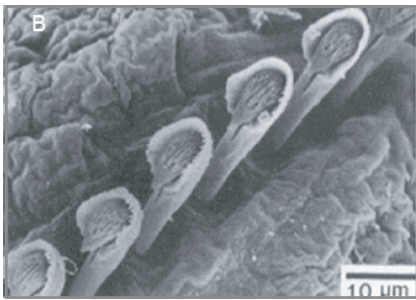
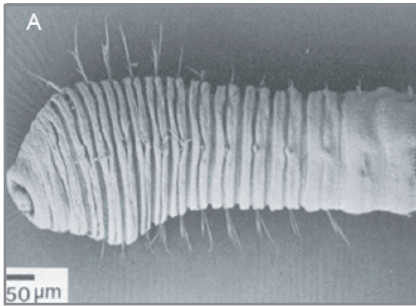
Sampling an ephemeral waterway at Phosphate Hill, Western Queensland (and yes, Andrew is wearing steel toe-capped boots!).



Sampling Tingalpa Creek in south east Queensland.

High 'Carb' Diet Bad for Worms

A new approach to the use of bio-indicators in the monitoring of nutrient enrichment



Scanning Electron Micrograph of (a) a Capitellid worm (lateral view) and (b) hooded hooks for attachment (Wilson et al. 2003).

Whilst the 'textbooks' (and ANZECC & ARMCANZ Guidelines!) tell us that capitellid worms should be a useful indicator of nutrient-enriched marine sediments, experienced ecologists cite too many 'exceptions to the rule' for the simple abundance of worms to be considered a reliable indicator of ecosystem health.

Studies in temperate climates have shown that capitellid worms 'typically' occur at extremely high densities (>1000 / m²) in waterways subject to high nutrient loads. Our experience indicates the equation is not so straightforward when applied to sub-tropical and tropical waters.

FRC Environmental's studies of the benthic invertebrate fauna of the Pimpama River estuary and Broadwater found that worm densities decreased rapidly once sediment phosphorus concentrations exceeded 500 mg / kg. A similar threshold has been observed at Bowen, where FRC Environmental monitors the impact of effluent discharge from a number of prawn farms. Our findings suggest that in sub-tropical and tropical waters, even capitellids can have too much of a good thing!

But there's some good news too, for those seeking reliable bio-indicators for the tropics. Our research has shown that populations of capitellid worms from highly eutrophic areas are highly unstable, showing significantly greater variation between monitoring events than populations from 'clean' areas. Variability in abundance is likely to reflect a population under stress.

So, supported by a well designed sampling program and some 'intelligent' interpretation of the data, capitellid worms are likely to prove highly effective bio-indicators – regardless of latitude. Their use as indicators is likely to be particularly relevant to the monitoring of sewage effluent and aquaculture discharges.



Sieving benthic invertebrate samples in the field.



Collecting benthic invertebrates with a coring device.

Get a Life!

Our Team at Play

During a recent trip to Canada, Lauren was lucky enough to visit Race Rocks, an ecological reserve of British Columbia and the southern most part of Canada's west coast. Strong tidal flows (up to 7 knots) push upwelled water from the depths of the Pacific Ocean past Race Rocks before it enters the Juan de Fuca Strait.

These currents bring a constant stream of nutrients to the area, resulting in extremely high biodiversity and productivity. Race Rocks is an important research and teaching site, and the kelp forests and diverse faunal communities providing for excellent diving on a slack tide. Lauren may have been tempted to go for a dive herself if the temperature had been just a little warmer than 3°C!



Room with a view - Californian and stellar sea lions are noisy (and smelly!) residents of Race Rocks.



The Race Rocks lighthouse is the second oldest in western Canada.

New Look - Old Values

Astute readers of Tidings may have seen it coming – our last edition broke with tradition and used a blue banner. After 20 years FRC Environmental has a new look. Over something like 18 mths, our ‘rebranding’ exercise provided an excellent focus for us to consider what FRC Environmental stood for, and what we strive to offer our clients and colleagues.

Our philosophy remains unchanged. As a team, we are committed to being the best in our business. For well over a decade now, FRC Environmental has led, rather than followed, the evolution of aquatic environmental consulting in Australia. Our close links with academic institutions and research agencies have enabled us to lead the way in fields such as cost-effective monitoring program design, the practical application of isotope analyses for effluent tracing, and the ‘commercialisation’ of otherwise labour-intensive research techniques such as QDPI&F’s ‘Mellor’s method’ of seagrass surveying. As a number of articles in this issue of Tidings highlight, FRC Environmental remains committed to the development of skills and technologies. I find it very satisfying that three of our team have recently dominated placings in the first AusRivAS certification course to be held in Queensland.

But of course technical excellence is not enough. Its application must be focused; and the outcomes generated must be effectively communicated. “So What?” is something of a mantra here. ‘So what’ is the significance of: that change in coral community structure; the absence of expected indicator species; the loss of that area of seagrass? We’re committed to identifying the issues that are important to your interests; and to going beyond mere ‘results’ to the in-depth analysis of their significance to your interests.

The adage ‘knowledge is power’ was never truer. It’s where our value to you lies.

Effective communication is also our obsession. Our most junior ecologist is encouraged to challenge anything he or she may read in a draft report that doesn’t clearly and concisely convey the intended message. Our digital video editing capabilities enable us to compliment ‘hard-copy’ reports with project DVDs (a great tool to win over stakeholders reluctant to thumb through a dry report). Finally, we are committed to an on-going engagement with resource managers and regulators. Our position in the industry means we are in frequent contact with officers at a variety of levels in agencies including the Queensland Department of Primary Industries & Fisheries, the Queensland Environmental Protection Agency, the NSW Environmental Protection Authority, the Great Barrier Reef Marine Park Authority and Environment Australia. Where opportunities arise, we very much enjoy working with these agencies in support of policy development; but we won’t shy from challenging ill-founded perceptions and flawed decisions. We believe that a credibility earned through demonstrated understanding, objectivity and integrity is often the key to the successful negotiation of sought outcomes.

Over the next 20 years, I very much look forward to FRC Environmental’s continued development; and I look forward to providing you with the value that ‘Deep thinking. Science’ offers.

Dr John Thorogood
Managing Principal

Marine, Estuarine and Freshwater

Survey, impact assessment, monitoring and environmental management

- water and sediment quality
- fisheries science
- saltmarsh, mangrove and seagrass
- benthic invertebrate ecology
- reef ecology
- wetland rehabilitation
- mosquito and midge management
- coastal zone and riparian management
- environmental flows
- river health bio-assessment (inc. AusRivAS)
- stable isotope tracking of effluent



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