

The expert witness thus contributes to:

- an assessment of the prosecution
- the identification of 'evidence gaps' and to the gathering of additional evidence, and
- to the analysis, assessment and interpretation of evidence (what does it say, is it accurate and comprehensive, and what does it mean?).

Importantly an expert may also act as an 'interpreter', helping the legal team and other experts understand the critical

issues within his / her narrow discipline. An expert must also be able to act in a timely manner in order to provide meaningful assistance. It is often critical that expert witnesses are appointed early in a case, so that they may have the required time to do their job. This is particularly so, if referred to evidence may deteriorate, or if further evidence gathering is required. 'Breaking News' from the witness box is rarely welcome and runs the real risk of exposing apparent inconsistencies in opinion.

For further information relating to frc *environmental's* capabilities in respect to expert witnessing, please contact Dr John Thorogood, Carol Conacher or Lauren Thorburn.



So that's the outfall, but exactly where were the samples taken from?

Sharks in Urban Waterways – Ecology and Management

Summer's Coming

Contrary to popular belief, sharks live not only in marine waters but also in estuarine and freshwaters. In south east Queensland, the bull shark (*Carcharhinus leucas*) is the only species of shark commonly found within fresh and brackish reaches of coastal rivers (canals and tidal lakes). Indiscriminate feeding habits, relative abundance (there are estimated to be several thousand in the Brisbane River alone mostly juveniles, but also adults exceeding 3m), increased feeding activity over the warmer months and preference for shallow and often turbid inshore waters means that this species

poses a significant danger to humans. The bull shark is responsible for the greatest number of attacks in south east Queensland, and world wide.

frc *environmental* have recently undertaken studies to determine options for excluding bull sharks from estuarine lakes in both south east Queensland and the tropical north. Physical exclusion by means of screens was considered to be the only reliable means of exclusion. An effective screen size, capable of excluding new born pups, was determined through sampling and back-calculation. The impacts of

excluding-screens on non-target species (for example fishes that migrate to spawn) was also considered and mitigations developed. Whilst the exclusion of sharks is commonly not a realistic objective, the need to consider the management of sharks and crocodiles in public waterways is increasingly seen as an essential component of a development's Environmental Management Plan. For further information relating to the development of fish, shark and crocodile management plans, please contact frc *environmental's* Andrew Olds or Dr John Thorogood.



Bull Shark



2.9m long Bull Shark caught by Terry Hesseey during the Brisbane River Classic last December

Photo c/- the ABC website:
blogs.abc.net.au/.../03/just-when-you-t.html



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ecologists and environmental scientists

tidings

A New 'Heart' for frc *environmental*

For over 20 years frc *environmental* has operated from premises in Wellington Point; in 2003 we opened an office and R&D facility in Murwillumbah; but this year sees a very significant development indeed.

In September, we open our new facility within the Grant Street Commercial Centre, Cleveland. Our new facility will accommodate our growing compliment of ecologists and environmental scientists, the significant expansion of our laboratory, and provide for the more effective management of our ever-expanding range of specialised survey and sampling gear.

Our Wellington Point office will remain our administrative centre.

These changes reflect our commitment to providing the highest level of professional service and will provide an enhanced capacity across business streams (which remain squarely focused on all facets of the aquatic environment).

Lauren Thorburn will be our inaugural manager at Grant Street and is looking forward to welcoming you all to our new 'heart'

Mining, infrastructure, ports and marinas, water supply and hydro power

generation, sewage treatment, even urban development continue to keep us on our toes from PNG to Tassie – and for that we sincerely thank our ever growing circle of clients and colleagues.

Dr John Thorogood, FAIBiol, FEIANZ
Managing Principal

Grant St Photos



Spring 2008

Stunning Science

The Most-effective way to Survey Freshwater Fish



Fishing a small ephemeral pool.



Getting in under the bank of a coastal stream.



Ready to pounce in North Queensland.

Electrofishing is an essential sampling tool in the study of freshwater fish ecology. It is a standard method used to capture a wide range of different fish species from different size classes, and can be used to determine ecological information such as presence / absence and habitat utilisation. Using electrofishing, frc *environmental* have extended the known range of several fish species including the snakehead gudgeon (*Giurus margaritacea*) and one-gilled eel (*Ophisternon bangalense*).

So how does it work? An electrofisher creates an electrical field in the water using an anode and cathode, and when a fish enters the field it loses control of its muscular system and is forced to swim towards the anode. The fish is 'stunned'. Fish are then captured using a dip net, identified and returned to the water (following recovery, which is within seconds). Overall electrofishing causes much lower mortality than other forms of sampling, such as gill nets, and is a more targeted sampling method with less by-catch. Electrofishing is generally faster and more effective than other sampling methods, making it the most cost-effective freshwater fish sampling method.

frc *environmental* offers in-house backpack and boat electrofishing units, which can be deployed at short notice with senior accredited operators who have more than 15 years experience. We have sampled in a range of environments from chilly Tasmanian waters to ephemeral central Queensland streams and tropical northern Australian rivers. All electrofishing operations comply with the standard safety guidelines outlined in the Australian Code of Electrofishing Practice.



Boat electrofishing in action.

Environmental Prosecutions: The Role of the Expert Witness

A View from the Witness Box

frc *environmental* employs some of Australia's most highly respected ecologists and environmental scientists. Not surprisingly then, we are commonly sought to act as 'expert witnesses' in both criminal prosecutions and Planning & Environment Court / Administrative Appeals Tribunal matters.

The role of the 'expert witness' is clearly articulated in the Queensland Planning & Environment (P&E) Court's practice directions: it is to 'assist the court'. So how does an 'expert' best 'assist the court'? What and equally importantly how, does an expert contribute to the Court's ability to assess the merits of a prosecution or planning appeal? In this issue, we'll focus on prosecutions, although a very similar role is played in the P&E Court.



The analysis of mangrove leaves offers a window into past water quality.

Typically, a prosecution is instigated by 'bureaucrats' (those charged with interpreting and implementing legislation, assisted by 'technicians' (in-house experts - scientists and allied professionals)) and facilitated by lawyers. The prosecution is received by the defendant (typically a 'proponent' or 'manager') who then seeks advice from his / her lawyers and in-house technicians.

The majority of prosecutions are based on a combination of indisputable facts (it was the 3rd July, by the Bremer River, where your effluent was discharged), interpreted evidence (I saw dead fish), and 'reasoned' consequences (I think your effluent killed the fish). Are the facts 'complete' and relevant; is the evidence 'comprehensive'

and has it been interpreted appropriately; and is the logic applied to deriving consequences, sound? These are areas in which an 'expert witness' can make a significant contribution.

Lawyers are of course best placed to consider issues of law; and in-house technicians clearly have the most intimate appreciation of any given process or operating procedure. So what does an 'expert' bring to the consideration of issues? Experts worthy of their fees bring:

- broad experience (the ability to provide context and comparison)
- credibility
- objectivity
- creativity – the ability to think beyond the readily apparent and reasonably obvious

However, the most important quality an 'expert' can bring to his / her role is integrity. That is, to call it like he or she sees it, and to make that call clearly and without reservation. On occasion it may be an expert's role to help the defendant or prosecuting agency see the weaknesses in their particular case, and the merit in that of the other side – in other words, to simply work towards revealing the truth of the matter.



Dr Conor Jones samples benthic macro-invertebrates to assess waterway health. (What's there to impact?)



Hmm, does this raft of scum indicate recent sewage overflow? (yes it did); and how would that affect our assessment of a one off spill?

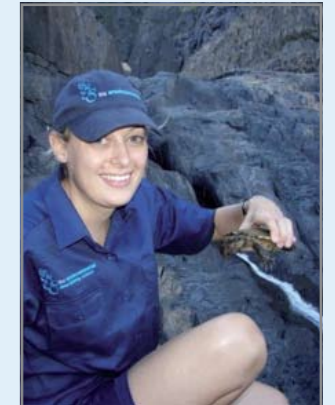
New Faces

Ashley Morton (B.Sc)

Ok, Ashley's not brand spanking new, but we've not introduced her 'formally' to the readers of Tidings.

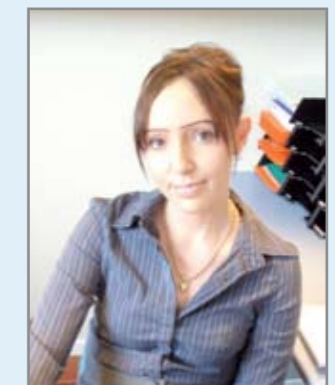
Ashley knocked on our door a little while ago explaining that she was here from Canada, accompanying her husband Steve who was engaged in a post-doc at UQ. She seemed enthusiastic so we took her in. What a find!

In Canada, Ashley worked with a specialist aquatics consultancy, surveying across the frozen tundra (sampling began with drilling holes in the ice!). Ashley currently leads our electrofishing group, is an accomplished freshwater ecologist and a project manager par excellence. She's not going home anytime soon (in fact I think I heard her supporting Australia at the 'Games').



Peta Seaton (B. CCJ)

Some of you may have noticed a new welcome at frc *environmental*. Peta is more likely than not to be your first point of contact. She does us proud! Peta has also become our travel guru: you need accommodation and 200L of freezer space in Taroom - tomorrow - Peta makes it happen. With a degree in criminology, Peta is also our unofficial 'Chief of Security'.



Seagrass: Not Just Drought-Tolerant but 'Loving It'

Reduced rainfall across south east Queensland over recent years has resulted in the significant expansion of seagrass meadows, and seagrass establishing on hitherto bare substrate. Lower rainfall translates to reduced runoff, which in turn translates to less turbid inshore waters.

However, the same conditions have also lead to an increase in mangrove dieback in south east Queensland, with mangroves dying principally in poorly drained areas, where soil salinity has increased. frc *environmental*, due to our long term involvement in monitoring and managing these habitats, is in a unique position to observe and make sense of these changes.

Carol Conacher leads frc *environmental*'s marine plants group



Flourishing seagrass meadow