

# ECA WA News

Quarterly newsletter of the Environmental Consultants Association (WA) Inc.  
ISSUE 04 Winter 2013



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ECA WA Inc meet on the third Monday of the month. Please contact committee members or Bec James if there is anything you would like to raise for discussion.

## Spring ECA WA News

Spring ECA WA News contributions should be sent to ECA Editor  
Jo Tregonning at  
[editoreca@iprimus.com.au](mailto:editoreca@iprimus.com.au) by  
**Friday 13 September 2013.**

ECA WA News is a quarterly publication of the Environmental Consultants Association (WA) Inc (ECA). It aims to inform members on the activities of the ECA and its members, events and training, and developments in the environmental industry.

The views and opinions expressed in ECA WA News are those of the article authors and do not necessarily reflect those of the ECA WA Inc..



## Environmental Assessment Training for Practitioners

17–18 June 2013 at The Vines Resort

*Above: Mitt Ramgobin (from left), Ray Turnbull, Floyd Browne, Jess Delaney, Katrina Cooper and Bridget Watkins*

*Below: Euan Sutherland (from left front), Katie Bagnall, Chris Hopkins, Stuart Campbell, Angus Morrison Saunders, Vanessa Keating and Tyrone Ridgway. Photos – Bec James*



### this issue

Subterranean Fauna P.2  
SEWPaC Offsets Calculator P.4  
Scholar Recipient Claire Brooks P.5  
Scholar Recipient Scott Carver P.6  
Environmental Assessment Training P.7  
ECA Mentor Register P.7  
YECA Event: Clients and Consultants P.9

# Comments on subterranean fauna EAG

By Karen Crews (Phoenix Environmental Sciences)

The Management Committee of ECA (WA) Inc. recently made a submission on behalf of its members to the EPA on the Draft Environmental Assessment Guideline (EAG) *Consideration of Subterranean Fauna in Environmental Impact Assessment in WA*.

## Prescriptive guidance

Overall, the EAG reads as advice about the process to follow when undertaking subterranean fauna assessment rather than the methods to use. We acknowledge this was intended but ignores the fact that a lack of prescriptive guidance is resulting in highly variable surveys in terms of effort, appropriate field sampling methods and quality.

Clarification is needed on whether Guidance Statement (GS) 54A is still valid as a whole or whether parts of the EAG supersede GS 54A. Recognising that GS 54A will be updated at some point in the future, we recommend referring to relevant prescriptive and quantitative sampling guidance but in a way that accommodates future revisions.

## Terminology

While the definitions of stygofauna and troglofauna are clear in the EAG, some revisions/further clarification are required for the taxonomic groups identified as subterranean fauna. For example, soil-dwelling fauna and burrowing fauna are excluded as subterranean fauna (e.g. troglofauna) for the purpose of the EAG. We recommend removing the segregation of soil-dwelling fauna and burrowing fauna from subterranean fauna and for each species sampled to be assessed in accordance with the survey and/or taxonomic/genetic data.

## Surrogates

There is mixed support for the use of surrogates for subterranean fauna and concern regarding the potential for misapplication. Clear guidance needs to be provided on the circumstances for using surrogates to 'provide additional evidence' that is scientifically sound. Guidance is also



*Above: Troglofauna are small, terrestrial, cave-dwelling animals that have adapted to their dark surroundings. This blind troglobitic spider is a new species (possibly new genus) from the family Trochanteriidae. Photo – Volker Framenau*

needed to determine which and when surrogates are 'appropriate'. Misapplication of surrogates could lead to inaccurate interpretations of species distribution and conservation value and therefore inaccurate assessment of impacts to species.

## Expertise

A focus on who did the subterranean fauna assessment work highlights the widespread recognition that consultants vary in terms of experience and expertise. We encourage the EPA, DEC and WAM to collaborate in an annual training course/workshop where practitioners are trained and evaluated as a form of accreditation. Given the dynamic state of knowledge within this discipline, refreshers may also

## Specimen lodgement

There is support for specimen vouchering with the WA Museum in order to facilitate the dissemination of information and lodgement. There is concern however, that enforcement of this requirement may risk delaying the assessment process.

## Contributing members

Thank you to the sub fauna practitioners that contributed to this submission: Erich Volschenk (Phoenix Environmental Sciences); Stuart Halse (Bennelongia); Nick Stevens (Outback Ecology); Lazaro Roque-albelo (Ecologia); and Tim Moulds (GHD).

For a full copy of the submission email [karen.crews@phoenixenv.com.au](mailto:karen.crews@phoenixenv.com.au) or Bec at [admin@eca.org.au](mailto:admin@eca.org.au).



*Left: Pygolabis is a fresh-water aquatic isopod from a Pilbara aquifer in Western Australia. Photo – Anna Leung (Phoenix Environmental Services)*





**Photo Story:** *Spiderman has nothing to gloat about after looking at the undersole of a gecko's foot. Oedura marmorata (marbled velvet gecko) is perfectly evolved for clinging to the rock surfaces of the gorges it calls home. This beauty was trapped at a minesite in the Pilbara during April 2013. Photo – Mike Brown and Claire Brooks (Biologic Environmental Surveys)*



**Photo Story:** *An aquaculture farm loading beach at 5 am near Derby. Early mornings are the best time to be out on the water in the Kimberley – bushfire smoke and dew hang in the air, giving everything an eerie feel while the wet season storms slowly build. Photo – Ben Davis (Oceanica Consulting)*

# 'Decimal offset policy' By Linda Kirchner (AECOM)

A recent workshop on SEWPaC's offsets calculator revealed a number of subjective inputs are required to use the calculator that will need clear reasoning to justify the numbers entered.

I attended the Offsets Calculator Workshop along with about 20 other consultants on the 11 April 2013 where we quizzed the presenters from the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) on the principles behind the calculator and then had a chance to plug some numbers in to see how it worked. The presenters opened with the proviso that the calculator could not be used to justify an action that was clearly unacceptable e.g. seismic activity in Ningaloo.

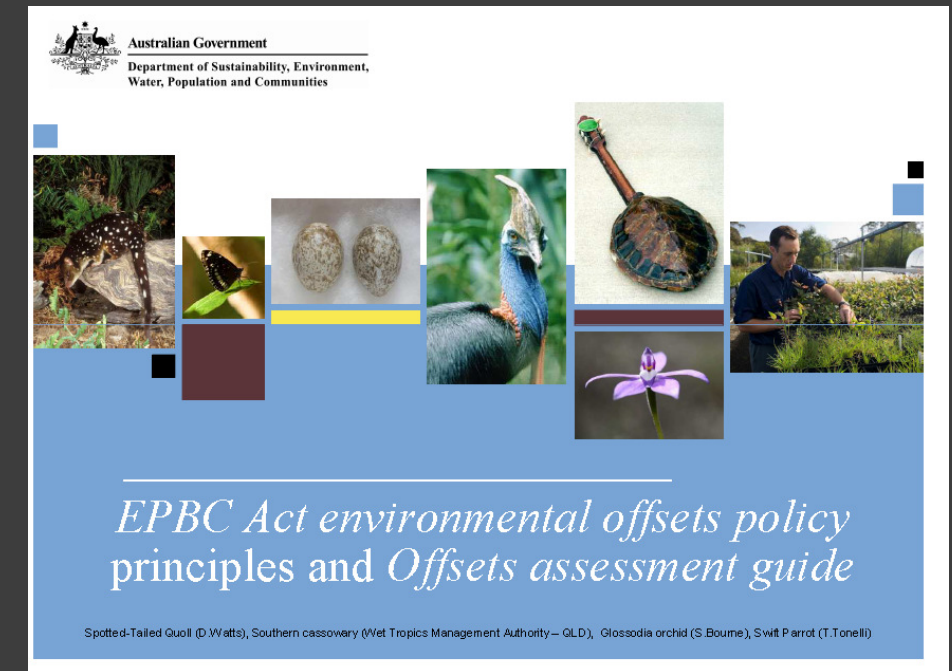
I have decided to call the offsets calculator the 'decimal offset policy' as there are 10 offset principles and most of the inputs into the calculator are ratings out of 10. Most of these principles are embodied somewhere in previous policy so I'll write about **five principles** that were new or rebadged to me.

The first is that **offsets only come into play after avoidance and mitigation still result in Residual Impact**. That term comes from our State offset policy so I found it interesting that it is now in SEWPaC policy.

Secondly, **you can only use an area for an offset if it is at risk of loss or degradation** itself. The reasoning is that it already exists as habitat, so simply protecting it does not necessarily provide a conservation gain.

The **concept of conservation gain** is the third principle I found interesting and is central to the calculator, which concentrates on determining the conservation value of the impact area and of the selected offset site along with the predicted conservation gain or improved vegetation condition of the selected offset site.

Fourthly, there is a concept in the principles that concerns **the timing of the offset**. The times in the calculator are for the duration of the offset not the impact. If the offset can be put in place before the



Above: Offsets workshop presentation by Kelly Pearce. Download the presentation at [www.eca.org.au/attachments/074\\_Offsets Workshop Presentation Kelly Pearce.pdf](http://www.eca.org.au/attachments/074_Offsets%20Workshop%20Presentation%20Kelly%20Pearce.pdf)

impact occurs then it will rate better in the calculator and reduce the area you need.

Finally, there is one concept that has not previously been factored into offsets before – **the concept of scientific certainty**. This is to account for the possibility of the offset not succeeding and is applied as a percentage probability which I find quite uncertain, but maybe that's just me.

So in summary, there are a number of very subjective inputs required to use the offsets calculator which then spits out an area in hectares down to two decimal places. The inputs are to do with the vegetation condition or quality of the impacted area, the vegetation condition of your proposed offsets, what you think it may change to if you do nothing, and what value you can change it to with some management. A rating out of 10 is required for all these fields. This result is then factored by the probability of extinction of the species, the probability that your mitigation will succeed and the timing of your mitigation actions.

All I can recommend is that you will have to be very clear with your reasoning of your value/ condition assessments to be able to justify the numbers you put in the calculator. At least we will all be struggling

with the same concepts in the name of consistency and transparency.

## Coming Events for ECA WA Inc.

**ECA WA Inc. Annual General Meeting**  
**Tuesday 13 August 2013**  
Notification coming soon.

**Pre-European Aboriginal Fire in South West WA: implications for managing present-day native vegetation**  
**Wednesday 5.30pm–7.30pm**  
**October (date TBA—check weekly ECA WA Inc. emails)**

*The Biggest Estate on Earth: How Aborigines Made Australia* by Bill Gammage (2011) uncovers an extraordinarily complex system of land management using fire. Today, most of the pre-1788 grassy plains have been replaced by dense forest or woodland. Guest speaker Bernie Masters will discuss the use of fire as a management tool for remnant native vegetation in south west WA, using the Ludlow tuart forest to outline the positive and negative implications of a return to Aboriginal fire regimes

Please register your interest with Bec James via email [admin@eca.org.au](mailto:admin@eca.org.au).

# Ratting out rakali

By Claire Brooks (Biologic Environmental Surveys)

**Researching rakali in the Greater Perth Region led to a love for field research and ecological studies for 2009 Ray Hart Memorial Scholar Claire Brooks (nee Smart).**

My honours project didn't start very successfully back in 2009. In fact, it began disastrously. My original research topic had fallen through, my supervisor went on leave, and the public were extremely unhelpful – throwing away and stealing my cage traps every other week. Funds and morale were low. Investigating the Ray Hart Memorial Scholarship forced me to reconsider and critically question where my research was heading and what I wanted to achieve with it. The main criterion of the scholarship said it all for me; to show “a commitment to apply field research to achieve a broad and pragmatic insight into interdisciplinary ecological studies”.

My honours thesis investigated the environmental factors influencing the current distribution and habitat preferences of the reclusive water rat, or rakali (*Hydromys chrysogaster*). Effective conservation of biodiversity in urbanised catchments requires an in-depth understanding of how aquatic species respond to changing habitat quality, water seasonality, and pollutant concentrations. Mammals have been used on numerous occasions as bio-indicators of habitat quality, and this is

especially true of small mammals such as rodents.

After conducting cage trapping at more than forty sites in the Greater Perth Region with a disappointing result of only two rats, I quickly concluded that water rats were not as common as first thought. The gradual drying up of water bodies along the Swan Coastal Plain is potentially damaging to many aquatic species, especially because many remaining wetlands and lakes have become nutrient enriched, saline, urbanised, or contaminated by heavy metals and pesticides.

I was able to identify some key environmental factors that appeared to influence the presence of water rats using a combination of my own records and those of the Department of Environment and Conservation. The distribution of rakali was negatively associated with the concentration of lead – a toxic and non-essential metal in ecological systems, and positively associated with the concentration of iron. Water rat presence was also found to strongly correlate with high-value habitat quality characteristics such as high bank stability, habitat diversity, stream cover and foreshore vegetation. This data could be useful in potential future endeavours to translocate populations, and also assist in the management of Perth wetlands and rivers if indeed the success of *H. chrysogaster* is linked with the persistence of important wetland ecosystems.

The Ray Hart scholarship allowed me to extend my field work further than I could have ever originally budgeted and hoped for, and allowed me discover my love for field research and ecological studies. Since then I've travelled to Africa and Costa Rica to be involved in animal research and I've volunteered in research programs with everything from spiders to echidnas to leatherback turtles. I have developed my skills for cage trapping, animal handling and data analysis. I now work for Biologic Environmental Surveys conducting fauna surveys for resource companies around Western Australia. I get to apply the skills

and knowledge that I learnt during my honours year, and apply them with the same passion and enthusiasm that pushed me through it.

I've already seen such amazing critters through my job, like mulgara, ghost bats, and Pilbara olive pythons, and have experienced fantastic landscapes from the rugged Pilbara to the beaches of South America. And that same sentence still applies today, four years later, and will for the rest of my career: to show a commitment to field research and to gain insight into ecological studies.



Above: One of the most exciting finds of my work surveys so far... 'Olivia' the Pilbara olive python. Photo – Ray Lloyd



Left: One of only two water rats I trapped making its way back out into Lake Goolellal, Perth. Photo – Claire Brooks

## Ray Hart Memorial Scholarship

The Ray Hart Memorial Scholarship encourages and assists a deserving student to pursue field research in natural history.

If you would like to contribute to the scholarship fund you can download the donation form at [www.eca.org.au](http://www.eca.org.au).

Students wishing to apply for the scholarship can obtain more information by contacting Sophie Peoples on [sophie.peoples@uwa.edu.au](mailto:sophie.peoples@uwa.edu.au) or 6488 8071.



# From mozzies to big cats and back again By Scott Carver

Globetrotting wildlife disease ecologist Scott Carver began his studies in wheatbelt WA studying mosquito-borne disease ecology. Since this time, his research has taken him to North America and back to Australia; studying the ecology of small mammals, wild and domestic cats, recent studies on Tasmanian devils, and new directions in mosquito-borne disease.

Six years ago I was a struggling PhD student trying to complete my fieldwork and scrape together bits of funding to pay for it. Looking back on that time, it is amazing how seemingly small events accumulate to have significant impacts on the direction of your life and career. One of those notable events for me was being awarded the Ray Hart Memorial Scholarship in 2007 – so when I was asked if I would write something for the WA Environmental Consultants Association Inc. about how this has benefitted me, I was only too happy to have the opportunity to express my gratitude for the benefits of this award.

For my PhD I was studying the relationship between dryland salinity in the wheatbelt and vector-borne disease ecology. This may seem an unusual relationship, but the larvae of the major Ross River virus vector mosquito, *Aedes camptorhynchus*, in southern Australia are extremely salt tolerant, and the expansion of dryland salinity was perceived to be a threat to human disease cases. Through a combination of field surveys, field experiments and mathematical modelling my research showed that:

- In salt affected areas the mosquito vector became much more abundant owing to reductions in aquatic competitors and predators of their larvae;
- Mammal communities were not substantially affected by salinity likely owing to historical impacts associated with agriculture and invasive species;
- There was a greater potential for larger Ross River virus outbreaks in salinity affected areas, but outbreaks were unlikely to be self-sustaining – a finding supported by very few disease cases over time from this region; and
- I also learned a lot about trying to avoid kangaroos while driving at dawn and dusk, and that the university gets a little upset when you return their vehicles with roo-dents in them.



*Above: A Ross River virus vector, Aedes camptorhynchus, enjoying my arm...this one was not infectious. Photo – Scott Carver*

The Ray Hart Memorial Scholarship directly enabled me to fund a significant portion of the fieldwork associated with this project and also contributed to some of the software costs associated with the disease modelling. Indirectly, this award enabled me to spend more time focussing on publishing my research than trying to find additional funding for it, and also reflects success with competitive funding on my CV. These indirect implications are non-trivial because they played an important role in securing two postdoctoral fellowships in the United States and ultimately an academic position at the University of Tasmania, where I am now a Lecturer in Wildlife Ecology.

I feel pretty lucky about the opportunities and experiences that have been afforded to me. In the US I worked for two years in beautiful field locations in Montana studying the ecology of small mammals and a zoonotic hantavirus (Sin Nombre virus) that on occasion spills-over from deer mice (*Peromyscus maniculatus*) to humans causing 35% mortality. I also spent two years in Colorado studying diseases of mountain lions, bobcats and feral domestic cats. The thrust of this research was to understand predictors of disease exposure and cross-species transmission among these cats where they have overlapping home ranges (the fringes of urban and natural areas). I shifted to Hobart late last year to embark on my new academic position. This exciting new career chapter includes continuing existing international collaborations (diseases of big cats in North America), resurrecting previous research interests (vector-borne disease in Australia) and new directions (Tasmanian devil facial tumour disease and management in wombats). It is great to be back down-under. I am relishing the new opportunities, and deeply thankful for events that have helped me along the way.

If anyone would like further details or copies of publications from any of the aforementioned work, please contact me at [scott.carver@utas.edu.au](mailto:scott.carver@utas.edu.au).

*Left: An 18-month old mountain lion Puma concolor which was heavily sedated and had just been fitted with a radio collar...and enthusiastic biologist Scott Carver. Photo – Scott Carver*



# Environmental Assessment Training for Practitioners 2013

By Ian Le Provost (Le Provost Environmental)

**Another of the joint ECA/OEPA two-day residential training courses was successfully concluded on June 17 and 18.**

As in past events it was held at the Vines Golf Resort in the Swan Valley which was an absolute picture this year with the autumn colours on the vines. Dr Angus Morrison-Saunders again led the discussion after having updated the course material to incorporate recent changes in Administration Procedures and new guidance material.

The course was well attended by a mix of environmental professionals from industry and regulators as well as consulting firms. Senior OEPA managers Mark Jefferies and Sally Bowman were on hand to answer questions and provide deeper insight into current OEPA practice. Ian Le Provost

represented ECA WA and introduced the after-dinner guest speaker – which this year was Melinda Macleod. Many of you will remember Melinda from her days at OEPA. For the past 2-3 years she has been heading up BHPB Iron Ore's Environment Improvement Team charged with undertaking a strategic review of all the company's current and future operating sites and looking for ways to improve operations that might result in greater efficiencies in timing and cost of environmental approvals.

Melinda provided the following advice to consultants from her perspective of being both a regulator and client:

- Do not overpromise and under deliver;
- Do keep the client informed of progress of project and budget;
- Do involve the regulator early in the project and be aware that they can

often provide valuable advice that can save you time later in the assessment process. Keep the regulator informed of progress and issues as they arise;

- Don't write thick reports. A small well synthesised document backed up by technical appendices is highly regarded. Deliver quality not quantity.

This is good advice from a highly-respected professional, and one that is still very passionate about the industry. Thanks to Melinda and also to Angus for delivering yet another great course with such enthusiasm that he 'must be on drugs'. Also many thanks to Bec James (our ECA secretary) who organises the event and is there for the entire time to ensure everything runs smoothly.



## ECA Mentor Register

By Charlie Welker (Strategen)

**ECA will be forming a Mentor Register and perhaps establishing a mentoring category of membership.**

The Mentor Register will fulfil a demand from the less experienced membership to learn from those members with extensive experience in the areas of environmental assessment, management, measurement, investigation and reporting. Long-standing member, Murray Ryall, has been working with a number of long-term members and has developed a proposed framework for

the provision of mentoring services. The intention is for mentors on the register to share their knowledge and consulting experience with less experienced ECA consultancy members, thereby helping to raise professional and technical standards.

Mentoring is to be achieved through:

- Structured mentor programs;
- Group mentoring workshops; and
- One-on-one consultation.

Members will be eligible to be registered as mentors if they satisfy the following criteria:

- At least 20 years' experience in one or more of the following areas of environmental practice:
  - Environmental management;
  - Environmental impact assessment;
  - Environmental measurement and investigation; or
  - Environmental reporting.
- Has been consulting in one or more of the above areas for at least 15 years.

Those members who wish to express an interest in being on the Mentor Register should contact Bec James at [admin@eca.org.au](mailto:admin@eca.org.au).





**Photo Story:** *Mother and calf whale play in the shallows offshore from Mindarie, providing entertainment for the morning commute to work. A rare but spectacular treat, moments like this are few and far between. Photo – Ben Davis (Oceanica Consulting)*



## Photo Story

Have you taken a ripper photo and have a great yarn to tell about the photo? We'd like to hear from you!

Photos and accompanying stories will feature in *ECA WA News*. ECA members will have the opportunity to vote and the winning entry will be announced at the 2013 ECA (WA) Inc. Annual General Meeting.

Please send your photo and story to Jo at [editoreca@iprimus.com.au](mailto:editoreca@iprimus.com.au).

**Photo Story:** *On a tiny dirt road outside of a town in the Pilbara lies a little known picnic area. The sides of the gorge are lined with old rock sketchings of local animals, people, symbols and landscapes. It is an amazing place to stop and reflect on the country you are in and consider the depth of its significance to the people there long before you. Photo – Shae Callan and Claire Brooks (Biologic Environmental Surveys)*



# Clients and Consultants – what makes a good consultant?

By Lauren Elvidge (Sinclair Knight Merz)

On 20 June the Youth Environmental Consultants Association (YECA) ran their third event for the year. Young consultants from many different companies attended the evening hosted by Sinclair Knight Merz. The purpose of the event was to provide young professionals, who are new to the consulting industry, with the basics for what makes a good consultant and what clients are looking for.



Katharine Cox (front row from left), Adelaide Bevilaqua and Michael Curran. Simon Lunn (middle row) and Louise Tomlin. Mitchell Ranger (back row), Ross Gordon and Shaojun Lin at the recent YECA event. Photo – Lauren Elvidge

## Client's Perspective

YECA was very lucky to have the Environment Branch Manager from the Water Corporation, Suzanne Brown, discuss what she as a client is looking for in a consultant. Some of the key points she mentioned were:

**Understand your client** before telling them what you think they want. Make sure you have an idea what they are about. What is their main line of work or what are they trying to achieve at a larger scale?

**Communication and regular contact** with the client is essential, even if there isn't a project on at the time.

**Provide adequate supervision** of junior staff.

**Ensure timeliness** on deliverables. If it is unlikely you will be able to deliver within the discussed timeframe then let your client know upfront. If clients are not told upfront and they have to ask why the deliverable is late, the trust is broken.

**Don't assume that clients are 'informed buyers'**; that's why they have engaged you as they don't have the skills/expertise in-house to take care of it.

**Remain within the scope of works**; the client does not want to pay or have a consultant spend time on anything that wasn't discussed during the proposal stages of the project.

**Maintain expertise** throughout the project and don't remove key technical staff that were promised to see the project through from start to finish.

Rupert Duckworth, Approvals Manager at the Water Corporation also came along to the event and suggested:

**Correct spelling and grammar** is one of the most important things to get right. If you can't get the basics right then how can the client be confident that the detail is right?

**Pick up the phone and speak to your client** and don't hide behind emails as a message sent isn't always a message received!

## Consultant's Perspective

Michelle Rhodes, Director at 360 Environmental, drew on her many years of experience as a consultant to share 'what makes a good consultant'. Some of her key points included:

**Actively listen** and always ask for client feedback.

**Aim to work with the client** to form a trusting relationship.

**Never do work outside of scope**; if you need to do variations make sure you have prior agreement with clients.

**Realise efficiencies** to deliver under budget.

**Manage your contract**; ensure all insurances are up to date; make sure you meet your clients HSE procedures; ensure environment is never on a critical path.

**Learn from your mistakes** and take time out to reflect and adapt.

**Know your seasons** and make sure to state the limitations in your research and management plans.

**Ensure adequate planning.**

## Questions and Answers

Following the presentations, young consultants were given the opportunity to ask Suzanne, Rupert and Michelle questions. This led to a very interactive half-hour of discussion. Some of the questions and the replies are provided below.

Q: As a young consultant how should I best manage my workload? Some people in my office are working far more than the allocated 40 hours?

A: Try not to work more than the set hours

work each week as your home and social life will suffer. Occasionally more than the allocated hours will be required but this shouldn't be happening all of the time. Keep in mind that if you are driving home after being awake for 17 hours, you are driving home with an equivalent blood alcohol level over the legal limit.

Q: What tips can you suggest to us as young consultants?

A: Plan and project manage your work. Work out what's important.

Do a course in time management.

Keep conversations focused and on a need to know basis only.

Seek a career mentor outside of your company and know that over time you may grow out of your mentor and will need to seek out a new one.

Q: Young people these days don't seem to stay in a job role/company for more than four years. How does that affect client relationship? For instance, would the client follow the consultant to a new company or continue on with the consultancy even though their key consultant has left?

A: Suzanne said yes, clients will follow a person to new employer unless of course the client has formed a strong bond with the consultancy company over a number of years.

Following on from the presentations and the Q&A discussion, participants spent half an hour of networking/interaction time over nibbles and drinks. This was a great time for YECA members to ask our guests any burning questions which they might have, and also to spend a bit of time getting to know other members. Overall the night was a great success and I think we all gained a lot from Michelle, Suzanne and Rupert.

## Recent website uploads

**Indian Ocean Climate Initiative** to support informed decision-making, on climate variability and change in WA. Visit [www.ioci.org.au/](http://www.ioci.org.au/)

**Research and conservation: Western Australia's microbialites.** Presentations and discussion summaries from the international symposium can now be accessed at <http://www.dec.wa.gov.au/management-and-protection/threatened-species/wa-s-microbialites-research-and-conservation-symposium.html>

**State Recovery Plan for Carnaby's cockatoo** under DEC policy statement 44 "Wildlife Management Programs" can be found at [www.dec.wa.gov.au/management-and-protection/threatened-species/saving-carnabys-black-cockatoo.html](http://www.dec.wa.gov.au/management-and-protection/threatened-species/saving-carnabys-black-cockatoo.html).

**Honey possum diets in banksia heathland infested with *Phytophthora cinnamomi*.** Download Bulletin 2 at [www.foresthealth.com.au/html/resources\\_bulletins.php](http://www.foresthealth.com.au/html/resources_bulletins.php).

**Identifying marri canker disease**  
The fungal pathogen *Quambalaria coyrecup* has been identified as the causal agent of the severe canker disease contributing to the decline in marri (*Corymbia calophylla*). Correct diagnosis can be difficult. Download Bulletin 3 at [www.foresthealth.com.au/html/resources\\_bulletins.php](http://www.foresthealth.com.au/html/resources_bulletins.php).

**Ecological Management and Restoration Project** summaries that are showing good or promising results in Australia. Formerly published in the print version of the journal, selected summaries are now freely available at <http://site.emrprojectsummaries.org/>

**Plant migration and persistence under climate change in fragmented landscapes**  
Research findings of new modelling predicts the likelihood of plant species moving through fragmented landscapes fast enough to keep up with changing climate. Visit [http://www.foresthealth.com.au/files/2012Bulletin128PUNNCCmodel29\\_LR.pdf](http://www.foresthealth.com.au/files/2012Bulletin128PUNNCCmodel29_LR.pdf).

## Apps

**WA PestWatch** allows users to report aquatic pests and diseases, track other pest reports and access additional information about common marine and freshwater pests. Developed by the Department of Fisheries for iOS and Android phones and tablets, the free app can be downloaded from the iTunes App Store and Google Play Store. A web-based version is available at [www.fish.wa.gov.au/Sustainability-and-Environment/Aquatic-Biosecurity/Identifying-Pests-And-Diseases/Pages/WA-PestWatch.aspx](http://www.fish.wa.gov.au/Sustainability-and-Environment/Aquatic-Biosecurity/Identifying-Pests-And-Diseases/Pages/WA-PestWatch.aspx).

**iGIS** allows users to load, view, investigate, create and export their own data over a background of Google Maps imagery. Free from iTunes app store for Apple phones and tablets.

**Field Guide to Pest Animals of Australia** app includes maps, photos and tracks, scats, traces and calls of 31 pest vertebrate species. Free Apple app at <https://itunes.apple.com/au/app/field-guide-to-pest-animals/id634197149?mt=8>

**Weeds Ute Guide** app allows users to search, identify, compare and email photographs of the most common, annual, biennial and perennial agricultural weeds in Southern Australia. Visit [www.grdc.com.au/Resources/App-Store](http://www.grdc.com.au/Resources/App-Store).

### Spring ECA WA News

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Previous editions of **ECA WA News** available at <http://www.eca.org.au/downloads>

## Conferences

### 9 July

**Kwongan workshop** on the ecology of WA's arid zone, University of Western Australia. Cost: \$375. Call Barbara Jamieson on 6488 1782.

### 21–26 July

**Building a Sustainable Earth through Remote Sensing**, Melbourne. IGARSS 2013: IEEE International Geoscience and Remote Sensing Symposium. Visit [www.igarss2013.org/](http://www.igarss2013.org/).

### 28 July 8.30am–4.30pm

**12<sup>th</sup> Annual Dieback Information Group Conference**, State Library of WA, Perth. Cost: \$100. Visit <https://www.dieback.info/>.

### 31 July–2 August

**Balancing Communities and Coasts**, Esperance. 2013 WA State Coastal Conference. Visit [www.2013wacoastalconference.com.au](http://www.2013wacoastalconference.com.au)

### 9–11 September

**2013 BiodiverCities Conference**, Joondalup, Perth. The program will feature group discussions, field trips and presentations from environmental experts addressing biodiversity conservation in a changing climate. Visit [www.joondalup.wa.gov.au/Live/Environment/Biodiversity/BiodiversityConference2013.aspx](http://www.joondalup.wa.gov.au/Live/Environment/Biodiversity/BiodiversityConference2013.aspx)

### 15–20 September

**Solving the Groundwater Challenges of the 21<sup>st</sup> Century**, Perth. Convention and Exhibition Centre. International Association of Hydrogeologists 2013. Visit [iahcongress2013.org/](http://iahcongress2013.org/).

### 8–11 October

**Greenhouse 2013**, Adelaide. Conference on climate change science, communication and policy. Visit [www.greenhouse2013.com](http://www.greenhouse2013.com).

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9am–5pm Monday

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