

International Guidelines on Cave and Karst Protection & Urbanisation Issues

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Planning and Urbanisation in Karst Lands Workshop

This morning I gave a talk on the draft Department of Environment & Conservation (DEC) policy on Caves and Karst. This afternoon I have been asked to give a brief presentation on the 1997 IUCN *Guidelines for Cave and Karst Protection* (Watson *et al* Eds, 1997) in the context of urbanisation of karst. I am speaking here as lead editor of that publication and not in my role as a DEC officer. However, there are some interesting similarities with current work in another rapidly expanding urban centre where I live, namely Albany, and where we have pressure to clear more and more remnant native vegetation for future urban housing. I will use that non-karst example to suggest a number of possible strategies that also may be relevant in addressing the urbanisation of karst on the Swan Coastal Plain.

The IUCN *Guidelines for Cave and Karst Protection* were drawn up after I was involved in preparing a similar set of international guidelines for mountain protected areas in 1991 (Poore, 1992). Having established the IUCN Working Group on Cave and Karst Protection (now the Caves and Karst Task Force) at the 1992 World Parks Congress in Venezuela, I felt that a sister publication to the *Guidelines for Mountain Protected Areas* would be a valuable addition to the IUCN literature. Whereas the IUCN (the World Conservation Union) had specialist commissions or theme groups such as Marine, Mountains, Forests, World Heritage, threatened species *etc*, there was no similar group within the membership focusing on caves and karst. The primary aim of the guidelines was to raise awareness of the special needs of caves and karst *within IUCN itself and also within protected area agencies around the world*.

We must have done a reasonable job as the guidelines are still being used (for example, someone thought them relevant to today's workshop !) and although I believe some progress has been made on an update, no revision has yet

appeared. As well as targeting *agencies*, the guidelines also targeted planners. A clear message was given that the guidelines were pitched at a very broad generic level and needed to form the basis of more specific locally written guidelines around the world.

So, it is pleasing that in Western Australia, for example, we now have:

- significant progress towards a draft set of cave and karst policy objectives across all aspects of DEC's role Statewide,
- an excellent set of guidelines already produced by the Environmental Protection Authority (EPA) (EPA, 2008) which is focused more at the area or sub-regional level,
- and more localised management guidelines at the individual site level such as for the tourist caves in this area.

However, a few fundamentals first...

- Karst boundaries are notoriously hard to determine as we are dealing with both surface catchments and underground catchments, both of which generally extend beyond the surface karst occurrence itself. I am sure many planners continue to overlook this.
- Principles of wetland protection and management are perhaps the best comparison we can use to raise awareness of karst issues with such people. However, for many people caves are 'out of sight/out of mind'...unlike wetlands and mountains which are very visible.
- Over a quarter of the world's population live on karst – my guess is that an even higher proportion of the population in Western Australia do especially in the expanding suburbs of Perth and elsewhere along the Swan Coastal Plain.

The guidelines suggest a range of threats to karst from total destruction to less obvious and more subtle susceptibility to pollution and other discharges. They also stress the range of resilience to threats as being largely determined by the water input and associated energy levels. This is similar to the principles of dealing with marine oil spills – wave action on high energy coastlines rapidly disperses the oil whereas in low energy inlets and mangroves the vegetation and fauna may remain impacted by oil for months if not years. In urban Western Australia we are dealing mainly with low energy hydrological systems and hence there is great potential susceptibility to threatening processes.

Population data for 2004-2006 for a number of country centres in Western Australia and for the Perth Metropolitan Area, show exceptionally rapid growth in Ravensthorpe and Albany. This reflects the anticipated operation of a nickel mine near Ravensthorpe and a magnetite mine near Albany. The Ravensthorpe population growth has now reversed due to BHP Billeton closing the new Ravensthorpe mine in January 2009. However, the rapid demand for housing in Albany continues and has created environmental impacts of another kind in an area that is renowned for its high biodiversity (Myers *et al*, 2000).

Indeed the Albany hinterland contains a huge range of threatened flora and fauna species. These species are located throughout the landscape in so called ‘remnant vegetation’, much of which is privately owned and already targeted for future urban growth. Such areas often retain valuable habitat as well as landscape vegetation connectivity through corridor linkages. In order to assist planning authorities and the EPA in assessing proposals for release of more land for urban growth, a regional vegetation survey is now in progress basically to

identify remnant vegetation that is particularly important in a sub-regional context and not well represented elsewhere in the region. Areas with populations of threatened species are also being identified and some areas noted for their vegetation connectivity function.

The Albany Regional Vegetation Survey may provide some useful precedents for dealing with and prioritising the urbanisation of karst. In Table 1 I have listed some key points of the Albany survey in the left column and suggested some equivalent actions or strategies for addressing pressure on urban karst in the right hand column. Whether we like it or not, urban expansion will continue and the challenge we face is to minimise the overall impacts, protect the especially unique and get the planners to think globally (*i.e.* catchment wide) and not locally in the context of karst. However, to reinforce this we will need to present a strong *economic business case* for planners and developers to sensitively consider ‘living with karst’ and thereby minimise future building and infrastructure management and maintenance costs.

So to conclude

- Millions of people world wide already live on ‘urbanised karst’
- Thousands more will do so in our own lifetimes, especially in Western Australia
- We need to convince planners to think more strategically with regard to urban expansion impacts on karst values
- Both environmental *and business cases* will be needed to maximise optimum outcomes for karst with a win/win outcome.

Urbanisation Assessment Priorities

Albany Vegetation

- Where possible protect locations of Declared Rare Flora and Priority Flora
- Avoid clearing poorly represented vegetation communities, proposed Threatened Ecological Communities (TECs) and special fauna habitat
- Maximise vegetation connectivity within urban and peri-urban zone
- Prioritise regionally
- Include business values of vegetation (eg tourism, landscape)

Swan Coastal Karst

- Where possible protect unique or highly valuable karst locations
- Avoid urbanising quality vegetation, Threatened Ecological Communities (TECs) and special habitat and in association with karst
- Maximise karst continuity/linkages within urban zones
- Prioritise on a hydrological catchment and associated karst vulnerability basis, and regionally if possible
- Present an economic business case for minimising karst impacts

Table 1

References

- Environmental Protection Authority (2008). Guidance Statement No 33, *Environmental Guidance for Planning and Development*, Chapter B9 Karst, subterranean wetlands and fauna, May 2008.
- Myers N, Mittermeyer, M A, Mittermeyer C G, da Fonscoa G A B and Kent J, (2000). *Biodiversity hotspots for conservation priorities*, Nature, 403, 853-858.
- Poore, Duncan, Ed. (1992). *Guidelines for Mountain Protected Areas*, IUCN, Cambridge, UK 47pp.
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