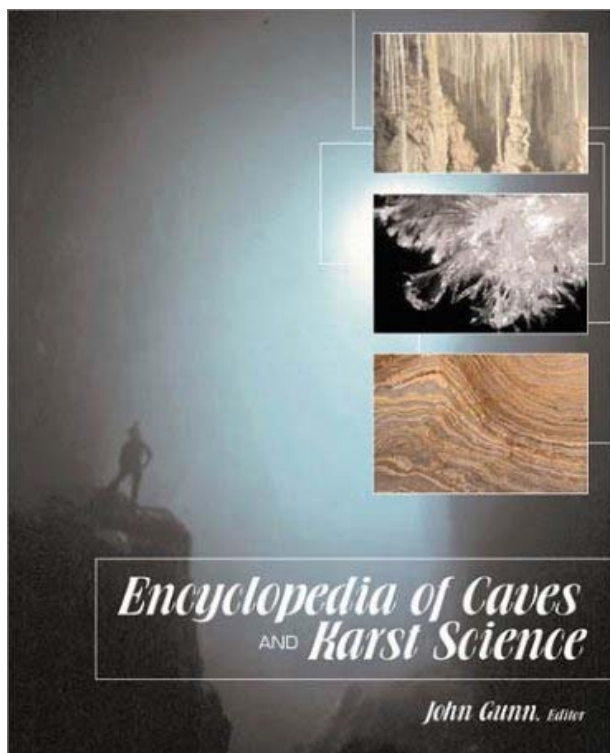


REVIEWS

ENCYCLOPEDIA OF CAVES AND KARST SCIENCE. John Gunn, editor. Fitzroy Dearborn, New York; 2004. ISBN 1-57958-399-7. 8.5 by 11 inches, xviii+902 pages plus 8 color plates, hardbound. \$150. **Reviewed by Bill Mixon** <billmixon@worldnet.att.net>.



To this eagerly awaited and massive volume, 202 authors from 36 countries have contributed 353 articles, according to the table of contents. (The introduction says 351, perhaps a trap for unwary reviewers.) The articles range from one page of two-column, 9-point type to several pages, and most are illustrated by a few black-and-white photos, maps, or other illustrations. Subjects range from the general ("Caves") to the specific ("Canary Islands: Biospeleology"). Despite the many nationalities of the authors, all the articles are in quite readable English-well, except perhaps some of the biospeleological ones, which tend to be a bit dense with biological names. Each article ends with a bibliography, which authors have nicely been allowed to separate into "works cited" and "further reading", saving them from having to shoehorn into their texts mention of everything they wanted to list. There are also a very few references to web sites.

There have been works before of encyclopedic scope in some fields of speleology, notably biology, but this is the first book to cover everything. A helpful second table of contents is sorted by field, such as archaeology, caves and caving, and geoscience, which makes it easier to find articles of interest. There is of course some evidence that the choice of topics was partly determined by what authors could be found to or volunteered to write, but this is seen more in inclusions than significant omissions. Because the encyclopedia lacks the multitude of really short entries that are often found in general encyclopedias, only a couple dozen of all the

significant caves in the world have articles under their own names. To get a better idea of the scope of the work, I tracked down in the eleven-thousand-line index references, other than to the long and deep lists themselves, for forty-three of the fifty longest caves in the world and thirty-three of the fifty deepest. (I meant that "tracked down". Users of the index have been warned.)

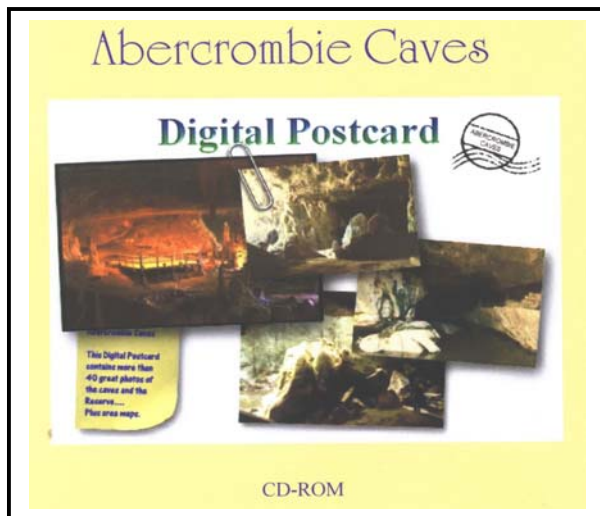
The reader will turn first, out of curiosity, to the subjects he is most familiar with. There he will likely be somewhat disappointed by the authors' choices of things to mention and works to list in the bibliographies. The topics choice is of course a matter of opinion, and disagreements are inevitable, given the limit on the lengths of the articles. Anyway, one doesn't buy an encyclopedia to read about what he already knows, and the articles will be useful to somebody else, and other articles useful to him.

The bibliographies are also matters of personal choice, but some really major works have been left out. Most of the authors have, perhaps following instructions, limited themselves to individual papers or books that can be cited in the traditional author-year manner. Therefore, for example, the American Caving Accidents series is not listed in "Accidents and Rescue". Many of the bibliographies show an academic bias; the article on Carlsbad and Lechuguilla lists neither the wonderful Lechuguilla picture book nor the books on the exploration of those caves.

The reader will also find mistakes. For example, in "America, Central", several prominent Mexican caves are mis-located on the area map, and the authors claim that cave research in Mexico started with the exploration of Gruta del Palmito in Nuevo León between 1835 and 1857. Palmito was discovered in 1906; Grutas de Cacahuamilpa in Guerrero is probably intended. These problems are small compared to the overall effort. Getting anything at all out of two hundred cavers and speleologists would have been a great feat. Any professional in the field must have it. Many cavers who would enjoy the *Encyclopedia of Caves and Karst Science* will be deterred by the \$150 price, but it is hard to accuse it of being excessive. The thing does weigh six pounds.

I know of considerably smaller speleological monographs that sold for more, though not to me. Keep an eye open for discounts. *Speleobooks* <<http://www.speleobooks.com/>> may still have some at a pre-publication price. At this writing, Amazon's web site still thinks the book will list for \$US 250 and not be available until six months from now (currently listed on Amazon @ \$US 200, and *Speleobooks* @ \$US 150. This review, slightly modified here, first appeared in NSS News - Ed).

ABERCROMBIE CAVES – DIGITAL POSTCARDS (CD ROM). Barry Cubitt, Senior Guide. \$10.00 + postage. Available from Abercrombie Caves, Via Trunkey Creek, New South Wales. 2795. <abercrombie@jenolancaves.org.au> **Reviewed by Kent Henderson.**

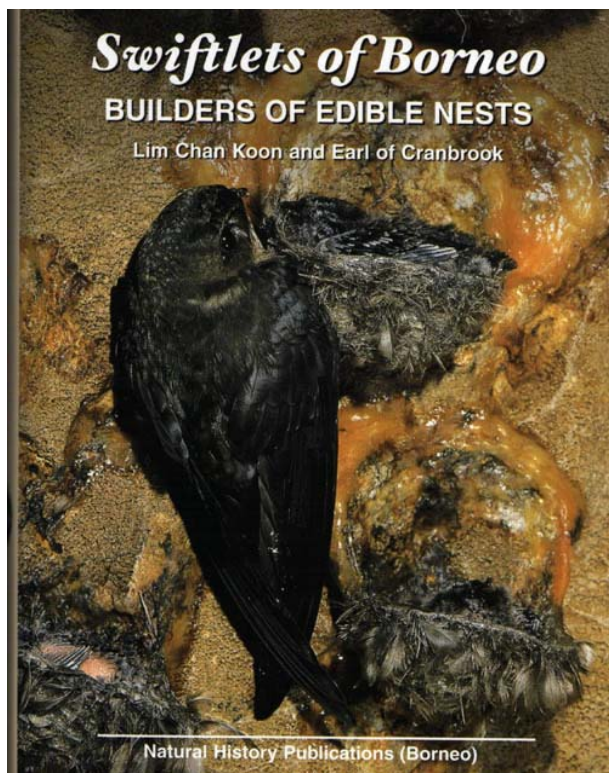


This recently released CD ROM by Barry Cubitt is something of a gem. Barry, a long-standing ACKMA member, has been Senior Guide and on-site manager of Abercrombie Caves, New South Wales, under one designation or another, for about as long as I can remember.

It is truly a 'Digital Postcard', and contains more than forty photos of the Caves and Reserve as well as several maps.

Bonuses included on the CD-ROM are a special folder containing the largest version of the photos, and stereo audio files (.wma) of Lyrebirds at Abercrombie Caves, and of a musical concert (underground Music Show) that was performed in the caves in 1986. It is a tremendous souvenir of Abercrombie, and has been very professionally put together. At \$10 it is a bargain. The word? – Get a copy!

SWIFTLETS OF BORNEO – BUILDERS OF EDIBLE NESTS. Lim Chan Koon and Earl of Cranbrook. Natural History Publications (Kota Kinabalu, Borneo). <http://www.nhpborneo.com> 2002. x + 171 pp. 132 colour fig. 15 x 21.5 cm. \$US 25.00. Weight: 700g. **Reviewed by Liz Price.**



Aerodramus. Many cave areas are described in Malaysia (Sabah and Sarawak) and Indonesia (Kalimantan).

There is information on the lives of these troglodytic birds, their ecology and breeding habits, then the nature of the nests and how they are collected and prepared and exploited as a highly valuable resource. The final chapters deal with birds' nest management and conservation.

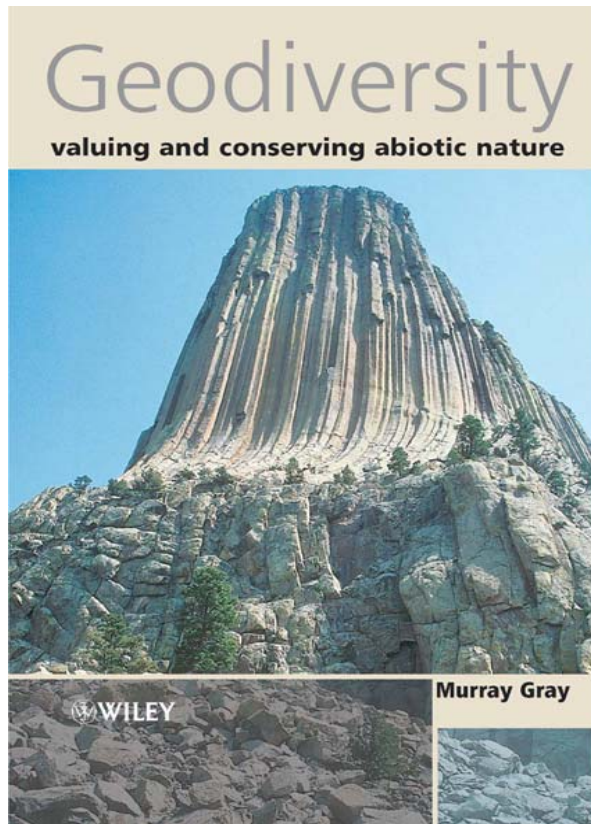
Each chapter is very detailed and amply illustrated with colour photos. The history of collection and use of birds nests is covered, dating back to the 16th centuries. It is interesting to note that in those days although nests were already prized as a valuable commodity no one really knew what the nests actually consist of. As modern analysis has shown, the nest is composed of carbohydrate, protein, ash and moisture. This concoction has been used for centuries mainly by the Chinese as a medicine. Tables list the prices of kilogrammes of black and white nests over the years. Today a kilo of white nests can fetch RM5000.

Today swiftlet nests are being commercially farmed in modified or purpose-built houses. This is particularly common in Java and Sumatra in Indonesia, and now people in Peninsula Malaysia are jumping on the bandwagon. There is controversy whether this type of farming is good or bad for the long term survival of the birds. The book covers every aspect of this amazing industry. The 132 photos are all of excellent quality. Many caves and hills where the birds are to be found are pictured. This book is definitely a worthwhile addition to the bookshelves of cavers and indeed anyone interested in natural history.

"Since the close of the 16th century AD, the edible nests of swiftlets have roused the perplexed curiosity of European travellers to South-east Asia, whilst at the same time providing one of the most important constituents of traditional Chinese medicine."

This excellent book details the lives of the swiftlets and explains what the highly prized industry of bird nests is all about. The main focus of the book is on the Bornean cave swiftlets, Collocalia and

GEODIVERSITY – VALUING AND CONSERVING ABIOTIC NATURE. Murray Gray (University of London). John Wiley & Sons Ltd. Paperback: £27.50. Hardback: £75.00 ISBN: 0-470-84896-0. Orders: <http://www.wileyeurope.com/WileyCDA/> **Reviewed by Ian Houshold.**



Karst managers, probably more than most others, should intuitively understand the perspectives in this book. Through our daily work we cannot escape the conclusion that maintaining and rehabilitating the natural diversity of the physical (or abiotic) world is equally important as the maintenance of natural biodiversity. Working from an Earth Science section in (what's left of) a conservation agency it is clear that many policy makers still do not necessarily share this view, nor have yet begun to consider its importance.

For many reasons, management of the biological components of ecosystems receives the lion's share of attention and resourcing. There is a common attitude amongst policy makers, some managers and much of the community that flora and wildlife conservation is the primary goal of nature conservation, with the abiotic elements of ecosystems merely providing 'habitat'. The proprietor of a well-known 'natural history' bookshop in Melbourne's southern suburbs recently argued adamantly with me that landforms such as caves do not comprise natural history – he didn't have any cave books!

Working in magnificent cave systems that often exist in the absence of almost any life at all, karst managers can clearly see the problems with this. The way that we manage and interpret karst systems will be a key to redress this imbalance. Through subtle changes in cave and surface karst

interpretation programs, the value of conserving geodiversity in karst should become self-evident. Just as threatened species have provided 'hooks' for the promotion of biodiversity conservation, more directed interpretation in karst areas would provide our best chance of encouraging public support for geoconservation in karst. Recognition for other geomorphic, soil and bedrock systems should follow.

What has been badly needed is a book to bring together the diverse ideas that have developed over the past few decades into a coherent discussion of the merits and potential pitfalls in promoting the concepts of geodiversity and geoconservation. Murray Gray's book is the first to gather and analyse this work on an international scale. His aims are:

- to raise awareness of the values of geodiversity of the planet;
- to point out the threats to this diversity;
- to examine ways that this diversity can be conserved, managed and restored;
- to outline the need for a more holistic approach to nature conservation and land management; and
- to propose a vision for the future based on current best practice.

This review is longer than generally published in the journal. Because of the importance of generating discussion on this newly emerging topic I have gone into some depth outlining some of Murray's more important concepts.

Chapters are devoted to the following areas:

Chapter 1. Defining geodiversity,

Although semantics are generally pretty tedious, correct definitions are very important at this early stage in the argument, as without a common language, discussion will be prone to misunderstanding and misrepresentation. The definition of geodiversity that Murray proposes is slightly altered from that originally proposed by Chris Sharples (as used in The Australian Natural Heritage Charter), reading:

"Geodiversity: the natural range (diversity) of geological (rocks, minerals, fossils), geomorphological (landform, processes) and soil features. It includes their assemblages, relationships, properties, interpretations and systems". (p.8).

Murray recognises that the obvious inherent differences in biological and abiotic systems (such as sexual reproduction of biological species vs the obvious lack of it in landforms!) do not necessarily preclude the use of similar descriptive terms, if *all*

that is implied is a description of the range of classes of life forms, bedrock types, landforms or soils rather than any comparison of genesis, reproduction etc. The only significant criticisms of the concept and terminology associated with it that Murray describes are those of Australians Bernie Joyce and Errol Stock who believed (in 1997 at least) that the composition, function and timescales of geo-systems are too different to biological systems to warrant such a similar sounding term (p.347).

Having read both it is clear that the implications of the term were probably misunderstood at the time, and that there is really little substance to the objections if the context is accepted to be that in italics above.

What Murray does not raise is the issue of 'the missing word'. Whilst it is very easy to use the term 'biological' to describe the entire spectrum of living components of ecosystems, there is no comparable adjective that my colleagues and I know of to encompass the whole of geology, geomorphology and soils. As Murray points out, to use the term 'geological' would be far too restrictive because physical geography (a major component of geomorphology) and soil science are not necessarily subsets of geology – consult any dictionary!

As a concrete example of the potential pitfalls of misleading terminology, I have been involved in various resource management inquiries in Tasmania where the use of the word 'geological' to describe all three disciplines provided professional geologists in powerful mining or exploration lobbies with an immediate advantage over geomorphologists and soil scientists who have trained as physical geographers or in agricultural science faculties (the most likely background for earth science professionals engaged in nature conservation).

Chris Sharples' description of the Dismal Swamp enquiry (ACKMA Proceedings 13) provides an illustration of the pitfalls of trained structural or mining geologists arrogantly assuming that they have somehow become competent geomorphologists or soil scientists through some form of extra-curricular osmosis. If the term 'geological' is used to encompass all three fields it will only encourage them!

Chapter 2. Describing geodiversity.

Murray provides a very concise description of the features, systems and processes of the Earth's bedrock, landforms and soils. This must have been an horrendous task, the most difficult part of which would have been deciding which bits to leave out. Obviously it is a fairly superficial overview, but for non-professionals it provides a taste of the enormous complexity of the task of describing geodiversity in a structured way. (Karst landscapes are described as part of a section on weathering environments on p. 59).

Whilst the chapter provides a very broad typology it does not go into the issues related to classification of geo-features and processes that must form the basis

of any objective characterisation of geodiversity. Conservation of representative and outstanding examples of the range of geodiversity will require the development of defensible classifications, particularly for landforms. Luckily, biologists have had Linnaeus and over 200 years to plug things into pigeon holes, but the classification of geological, geomorphic and soil systems is nowhere near as well or, more importantly, uniformly advanced. A discussion of issues in the *classification* of geodiversity would be useful in a future edition.

Chapter 3. Valuing geodiversity

An interesting (and absolutely necessary) diversion into environmental philosophy that, attempts to provide a framework to describe and measure value or significance in the abiotic world. Prior to more traditional discussions of cultural, aesthetic, economic, functional, research and educational values, an innovative section discusses the degree to which something, (whether living or non-living), may possess intrinsic (or existence) value – that is a value or significance outside of the perceptions of people. Does a bird, or an ant, or a stalactite have a 'right' to exist independently of whether humans say it has a right to exist? Is a healthy soil profile 'valuable' to a worm? Do rocks have rights?

The section on cultural value describes religious values including the enormous diversity of landforms attributed to the work of the Devil, including those in karst:

"The Devil may have even been held responsible for geomorphological sounds. The *Guardian* (27 August 2001) reported that a cavern in Derbyshire, England, has changed its name back to its Anglo-Saxon one of the Devil's Arse, because of the noise made when water that has built up in the cavern drains away. As a result, visitor numbers have increased by 30%!" (p.70).

Speaking of which, cave and karst tourism is briefly covered under a general geotourism section, however my biased outlook suggests that, given the potential importance of karst interpretation in promoting geoconservation, a little more should have been made of it.

The section on economic values contains some interesting statistics on the use of limestone. Murray quotes A.M. Evans who, in his book on economic geology rates limestone as "probably the most important industrial rock or mineral used by man" because of its use in producing concrete and other industrial processes. Environmental effects of mining in karst are briefly described on p. 142.

Chapter 4. Threats to geodiversity

This chapter characterises threats according to land use. At the outset, Murray makes the excellent point that

"There is perhaps a general tendency to think of the biological world as fragile and vulnerable and therefore in need of conservation, whereas the

abiotic world of mountains and rock is seen as stable, static and much too prolific ever to be endangered. This is a gross oversimplification, and many threats to the geodiversity of the planet or local areas are comparable to those facing biodiversity.” (p. 133).

Once again, an important opportunity exists in our cave and karst interpretation programs to dispel this myth – once in a cave it is self evident that in most cases the opposite is true, and that timescales for restoration of abiotic features are usually considerably longer than for biotic systems, if restoration is indeed possible at all.

The chapter includes an interesting discussion on the relative intensity of threats according to the sensitivity of different elements of geodiversity, using the scale developed by Dr. Kevin Kiernan.

Murray uses some karst examples to illustrate his points; limestone pavement extraction issues (p.138), pollution of agricultural karst aquifers (p. 146, 156-7) effects of logging on karst (p.153), and cave visitation (p.161) are all addressed.

Chapter 5. Conserving geodiversity: the protected area and legislative approaches,

and

Chapter 6 Managing geodiversity: new approaches for the wider landscape

Lots of good examples here of specific legislative tools, strategies, codes of practice and so on that have been used to conserve geodiversity, along with suggestions for incorporating geoconservation in other existing structures. Sections particularly relevant to karst management (or of general interest) include:

- a feature on karst specific US legislation, including the *Federal Cave Resources Protection Act* (1988), the *Lechuguilla Cave Protection Act* (1993) and the *National Cave and Karst Research Institute Act* (1998) which established the national karst institute at Carlsbad Caverns National Park (p.203-4).
- a description of the operation of World Heritage Agreements in relation to geodiversity, and the concepts behind the international geoparks proposal, presently under discussion in UNESCO. This initiative aims to “... enhance the value of nationally important geological sites while creating economic development, employment and geotourism as part of an integrated program.”(p.194).
- Australian systems are well described (p249-254) where, following relentless badgering, Murray was convinced to include a large section on Tasmanian initiatives in geoconservation

Chapter 6 contains many important suggestions as to the role of broad scale landscape characterisation and regionalisation in setting the context for geoconservation assessments. The British Landscape Character Assessments, Australian Land Systems Analysis and Canadian Natural Regions Analysis are broad scale systems incorporating many landscape variables.

The “georegionalisation” system presently being developed in Tasmania is described. This has more specific aims of mapping the variation in character and controls on individual themes in geodiversity such as fluvial, coastal or karst systems, along with regional variation in sensitivity of features and processes.

This chapter also describes numerous approaches to land rehabilitation and restoration (although, disappointingly, John Gunns ‘quarry blasting’ proposals for limestone mine rehabilitation aren’t countered by descriptions of more ecologically focussed approaches such as used in the Exit Cave quarry rehabilitation).

The section on Natural Heritage Charters (p. 337 – 339) refers to The Australian Natural Heritage Charter (2002) as “the most impressive Charter incorporating geodiversity”. It is based on the principles of intergenerational equity, existence value (intrinsic value), uncertainty (accepts that knowledge may be incomplete) and the precautionary principle, and incorporates references to geodiversity and geoconservation throughout the document.

Of the entire book’s chapters these are the most practically useful as they describe ways in which statutory protection intertwines with broader, less prescriptive (but potentially more user friendly) approaches.

Chapter 7. Comparing and Integrating Geodiversity and Biodiversity

Whilst it is almost trite to point out that ideally, all land management activities should incorporate both biotic and abiotic components as necessary, this chapter provides compelling reasons why each of these should initially be analysed separately.

As discussed earlier there is a great need to redress the current imbalance of emphasis on biological components in nature conservation, by recognising the equal, and in some instances greater significance of geological, geomorphic and soil systems. From our own perspective, karst areas potentially provide the best focus for this to occur, as they already support well-developed tourism industries entirely reliant on effective geoconservation.

The Integrated Catchment Management Strategy for the Mole Creek karst is highlighted in this chapter, with a useful focus on the Mill-Kansas (Croesus /Shooting Star/Rathole) system. Management of this system has languished under a ‘conditional forest’ classification for many years now (with visitor impacts to caves remaining unaddressed by the

managers, Forestry Tasmania). However, Forestry has just recently committed to production of a management strategy for karst in State Forest at Mole Creek, and the Tasmanian Resource Planning and Development Commission have recommended the Mill-Kansas area for formal reservation in its review of the Mole Creek Karst National Park Management Plan. Hopefully publication in this benchmark edition, together with the karst strategy, will help speed the process.

The final section in this chapter deals with potential conflicts between promoters of biodiversity and geodiversity. Generally this should be rare, however Murray describes cases in rehabilitation work where some (although certainly not all) biologists promote an aim of maximising biodiversity in an area through artificially creating a diversity of habitats where few would have existed naturally. (Arguments for the 'enhancement' of habitat for cave fauna by retaining artificially high nutrient inputs -such as deliberate retention of old timbers in tourist caves- fall into this category).

Whilst this may in fact initially increase the biodiversity of that area these schemes often fail as the physical components of the stream, hillslope or cave system attempt to return to a less complex, more natural state. It also ignores any potential value in restoring the geomorphic components of the landscape *for their own sake*. Although not often expressed, many people value the natural geodiversity of such things as rivers, coasts and karst features, regardless of the plants and animals that inhabit them (even though if you asked them a good few couldn't tell you what geomorphology is!).

Murray describes another common area of contention, where biologists attempt to halt natural geomorphic processes in order to preserve an ecosystem as a snapshot in time (often to preserve a remnant of a threatened species). He quotes a recent United Nations Environment Program report on mountain areas which saw South America's mountains as "particularly vulnerable to 'destructive earthquakes' with approximately 88% of the mountain land area deemed at risk" (!).

An approach that uses pre-impact or 'natural' systems as baselines for management of rehabilitation work would be the least risky aim for a truly biophysical approach to land management and rehabilitation. Authors such as Gary Brierley, (with his River Styles approach to stream rehabilitation and management), suggest that rehabilitation of degraded systems should be planned according to their potential to be returned to an essentially natural state.

Progress towards that state, either by restricting ongoing impacts or commencing on-ground rehabilitation works would be prioritised according to a system providing best value for money. This generally involves favouring systems already close to natural as compared with badly degraded sites (often accepting that complete restoration may never be possible).

For many dynamic systems, Murray suggests that use of geoinicators such as geomorphic monitoring of rivers; coastlines, streams and cave systems may be proving more efficient (and cheaper) in the long run than the use of certain traditional bioindicators.

From my own experience the amount of expensive ecological research necessary to understand even the simplest stream ecosystem makes it highly tempting to monitor and manage the *geomorphic environment* of the biota within bounds of historical change (which is also a lot easier to assess than the history of biological change), as well as managing to conserve geomorphic systems *for their own sake*, rather than just for the biota itself.

Ian Houshold with Lana Little
– ACKMA Conference 2003



Chapter 8. Towards a vision for Geodiversity Conservation.

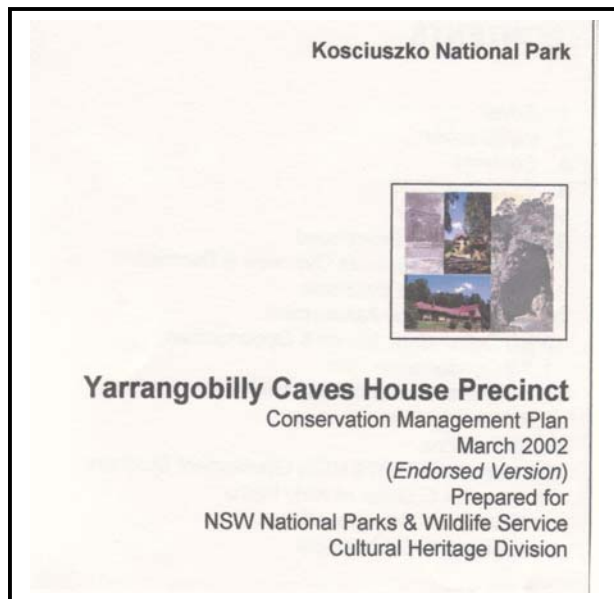
The conclusions really need to be read for themselves. As might be imagined, Murray puts a strong case for maintenance of geodiversity and provides a convincing argument for universal adoption of 'geodiversity', 'geoconservation' and associated terms in common language. He also provides a vision for geodiversity conservation in 2025, written as if it were a report produced in that year. One of the achievements for 2025 has apparently been the production of a volume entitled "the Geodiversity of Tasmania"...Better get cracking!

Further information about geoconservation in general may be obtained from the Tasmanian Parks & Wildlife Service website (Nature of Tasmania Geoconservation) <<http://www.parks.tas.gov.au>>.

This site contains a variety of relevant material including a major contribution by Chris Sharples who, for reasons of modesty, declined Kent's offer to write this review because of the great original contribution he has made to the geoconservation debate, and to Murray Gray's (well acknowledged) thoughts.

PS: after many decades of blissful ignorance, Murray is now slowly reconciling himself to the reaction that his name generally generates on first encounter with Australians. Please treat him gently!

YARRANGOBILLY CAVES HOUSE PRECINCT Kosciuszko National Park – Conservation Management Plan. CD ROM. NSW National Parks & Wildlife Service, Cultural Heritage Division. March 2002 (final endorsed version). Reviewed by Kent Henderson.



The Yarrangobilly Draft Management Plan was released (on CD ROM) in March 2002. It has since been through its exposition process, and the final plan produced (also on CD ROM – this one!).

In the small space available here I cannot review it *per se*, other than to note its principle contents, which include an Executive Summary, Historical Background, Cultural Features, Overview & Description, Contextual Synthesis, Significance Assessment, Constraints, Issues & Opportunities, Conservation Policy, Implementation Recommendations, and Bibliography.

It also contains some useful Appendices, including a 1920's New South Wales Government brochure, details of the early and Yarrangobilly hydro. They are quite interesting from a historical perspective, too!

In short it is definitely worth obtaining a copy for one's own future reference. Contact Peter Bell: <ozcavebear@bigpond.com>

DELVING DEEPER – HALF A CENTURY OF CAVE DISCOVERY IN NEW ZEALAND. Compiled by Moira Lipyeat and edited by Les Wright. New Zealand Speleological Society. Special Pre-Conference discount price: \$NZ 50.00 (see adjacent advertisement). **Reviewed by Van Watson.**

Hey. That's 50 years of exploration. How could you write about that?

From what I know of New Zealand caving, small groups of enthusiasts get up momentum, get underground, really thrash a project and then something else comes along so they all drift off and do something else with their lives, there's a lull, and then 'boooof', away goes another surge.

Along the way caves are explored and recorded, commas are used indiscriminately, friendships are made and a lot of perfectly good caving gear is ruined. In NZ, science is seldom used as an excuse for exploration and endeavour.

This book follows this same pattern. One paragraph we are deep in Nettlebed, two days away from daylight, and then over the page we are in some 50m long mud wallow somewhere out the back of Hawkes Bay. It's all there, the whole 50 years. The 50km of Bulmer and the 50m-mud wallow out the back of Hawkes Bay are there. Nettlebed is right there at 889 metres (890 if you stand on a rock at the far end) and still the 50m wallow dropping 2m over its entire length is right there as well.

So, it's a history book. If you ever went caving in New Zealand your name will be in there somewhere. If you are ever in a corner of New Zealand and wonder who found what and where, it will be in there.

It shows a social trend, where the early Caving Clubs with laborious gear and transport, evolve into small teams of individuals using helicopter access

and lightweight gear; and all the while the NZSS is used as the one national body and repository of all the hard won information on the New Zealand underworld.

These guys opened that repository. They were very brave. It's a New Zealand reference. It has good photos. The one of me on the cover is particularly good!



Van Watson – taken somewhere or other....

