GEOTOURISM IN SOME SMALL RURAL COMMUNITIES IN AUSTRALIA

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Andy Spate at the East Asian Geoparks Conference, Taipei, Taiwan

ABSTRACT

Australia is one of the largest countries in the world and is the only one to occupy an entire continent. There are a large number of protected areas but the Commonwealth/State arrangements and the constitution make for a large range of management approaches. Increasingly there is emphasis on conservation and better interpretation of biodiversity and geodiversity values on private lands as well as on the protected areas.

This paper looks at four different approaches to geodiversity management and interpretation where there is a strong community involvement linking the geotourism opportunities on both public and private lands. The paper points to the need to involve the community effectively where private lands are to be managed and used in association with government projects.

INTRODUCTION

Australia has a large number of protected areas reserved for their natural and cultural heritage under government control. In recent years there has been increasing recognition of the fact that reservation is not necessarily the best way to achieve long-term conservation and sustainability of natural and values.

Some protected areas do not receive effective management and may be neglected in spite of their long-term contribution to regional economies and their many scientific, recreational and cultural values. All too often reservation is seen as being a satisfactory and practical conservation outcome but effective on-the-ground management is often lacking. Natural and cultural values, including geodiversity on private lands may also be poorly managed, appreciated or interpreted.

However, it must be said that there are spectacular successes in conservation and management of both government-managed protected areas and in community-based management approaches. In recent years there have been a number of geotourism initiatives linking both public and private lands.

In Australia, each State has the responsibility for land management whilst the Commonwealth government attempts to set achievable standards for natural resource management. As a result there are at least nine different sets of management approaches that apply to the management of Australian natural values in protected areas.

This paper reviews five geotourism ventures in Australia. These are:

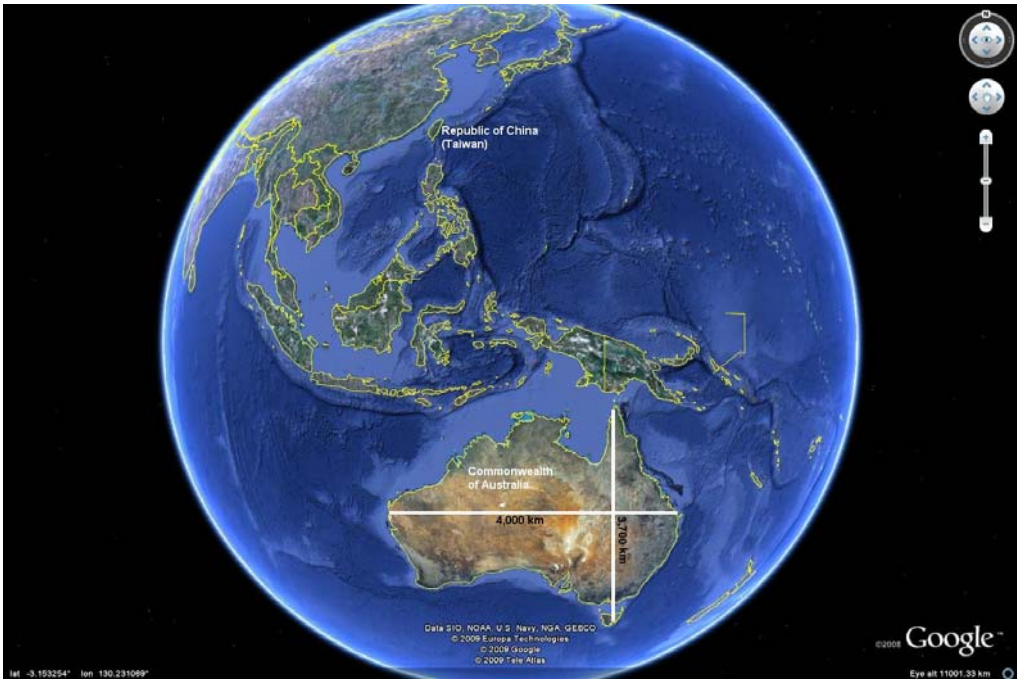
- The Kanawinka Geopark that straddles the border between the two states of Victoria and South Australia. It covers around 20,000 square kilometres and covers both protected areas and private lands;
- The Mountains of Memory Geotourism Project in South Australia. This large area is recognised as one of Australia's National Landscapes and again it is made up of protected areas and private lands;
- The small rural community of Wee Jasper is partially supported by a variety of locally generated geotourism activities; and
- The Wellington Caves is a small show (tourist) cave operation on public lands but operated and managed by local government.
- A project that seeks to include the above two ventures as part of a much larger concept.

THE COMMONWEALTH OF AUSTRALIA & THE REPUBLIC OF CHINA

It is as difficult for Australians to comprehend the geography, society and culture of a small country (by Australia standards) such as the Republic of China (Taiwan) just as it is for Taiwanese people to understand huge, empty Australia. Just the relative sizes and latitudinal location and extent are impressive differences.

The latitudinal extent of mainland Australia and the large offshore island, Tasmania, is ~35 degrees as opposed to Taiwan's ~3.5 degrees (Figure 1). The latitudinal extent, coupled with the vast oceans to the west, south and east produces a wide variety of climatic conditions and consequently landforms and ecosystems. Australia is the driest continent (after Antarctica) and has extreme variability in its climate - even in the better-watered areas. A large proportion of the continent has no rivers or lakes - except after cyclonic rainfall events. But parts of the Tasmanian and Queensland coasts have average annual rainfalls in the order of three to four metres.

Figure 1. The relative position and size of Taiwan and Australia.



The table below provides some basic statistical comparisons.

Table 1. Basic statistics – Taiwan and Australia. Source: CIA World Factbook online.

	Population	Area (km2)	Coastline (km)	Persons /km2	Arable (%)	Cropped (%)	Other (%)
Taiwan	22,920,946	35,980	1,566	637	24	1	75
Australia	21,007,310	7,682,300	>59,500	2.7	6.15	0.04	93.81
Taiwan as a %age of Australia	109	0.47		-	-	-	-

Note: These statistics should be treated with caution. Two thirds of Australia has no runoff at all and much of this is not forested, arable or pasture! Mountains in Taiwan and desert in Australia.

Population distribution is markedly skewed. Half the area of the Australian continent contains only 0.3% of the population, and the most densely populated 1% of the continent contains 84% of the population. Much of the continent is extremely old with some rocks of the Western Australian craton amongst the oldest in the world.

It is a very stable continent and earthquakes are infrequent and generally of low magnitude. There are no active volcanos with the most recent eruptions being more than 4,000 years old. There are very few warm springs – and these are not terribly warm. However, as discussed below, there are some very young rock types and geological features.

Very little of Australia's mainland (~40 km2) was affected by Pleistocene glaciation. Since mid-Tertiary times Australia has become increasingly arid and the former vast rainforests are now represented only by small remnants along the east coast - further depleted by the activities of European settlement over the last 213 years. The Indigenous people of Australia have been here for 70,000 years or more.

PROTECTION OF NATURAL RESOURCES

As has been pointed out above there are a number of differing management agencies and systems managing Australia's protected areas. Even terms such as 'national park' mean different things in different States.

There is only one 'nation' but each State or Territory, and the Commonwealth claims to have 'national' parks. Recently each agency has been asked to place their reserves into the International Union for the Conservation of Nature (IUCN) protected area categories as shown in Tables 2 and 3 for Taiwan and Australia respectively.

Amongst other things this compilation indicates that Australia has an area more than 17 times the size of Taiwan in protected areas!

However, what matters is not total area but what is important is the effectiveness of the management practices and regimes that are put in place to conserve each protected area.

Table 2. Taiwan Protected Areas by IUCN Category. Source: World Database on Protected Areas http://www.wdpa.org/

IUCN Category	Number	Area (km2)
Category I	14	>>960
Category II	3	1941.32
Category III	0	0
Category IV	2	unknown
Category V	0	0
Category VI	0	0
Not specified	23	>>22,160
TOTALS	42	>>24,000

[We apologise for the deficiencies in the statistics in this table. Much searching on the Internet has not enabled me to find definitive categories or areas for many of Taiwan's reserves.]

Table 3. Australian Protected Areas by IUCN Category.

IUCN Category	Number	Area (km2)
Category I	2,030	230,388
Category II	603	243,045
Category III	660	2,717
Category IV	1,397	3,253
Category V	151	8,611
Category VI	376	117,208
Not specified	34	165
TOTALS	5,251	614,386

Increasingly in Australia we are coming to accept that conservation of species and communities cannot be achieved only by the creation of protected areas.

Considerable effort is being placed on encouraging community and landholder-based approaches to resource conservation by such practices as tax relief, land management assistance and the provision of fencing materials. Sites of geological significance such as caves and fossil sites are not always suitable for such off-park approaches.

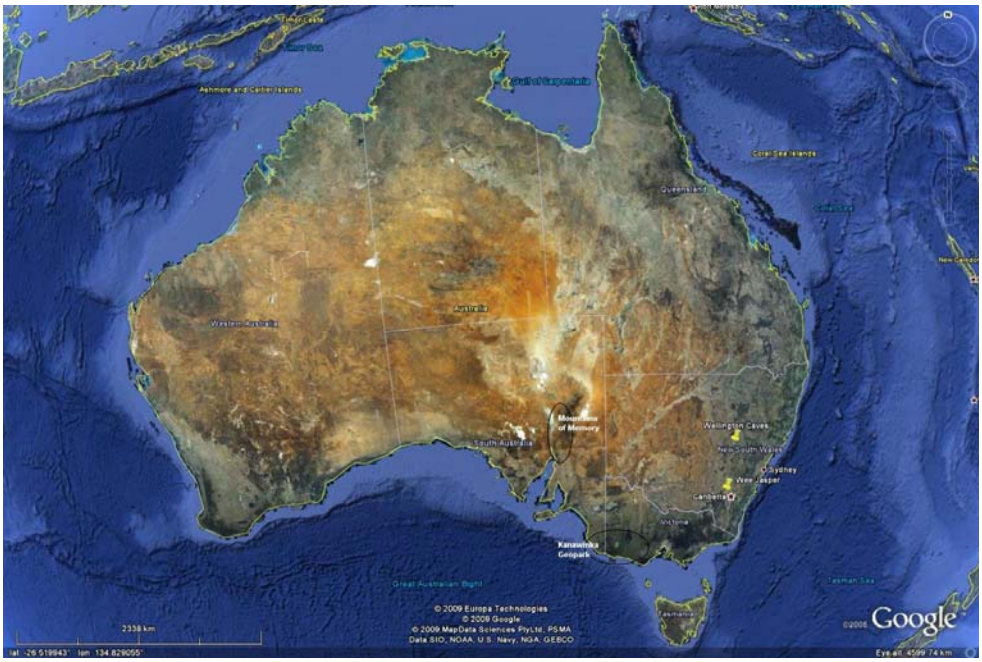
The Golden Waterfalls, northern Taiwan. The tufa deposits are heavily coloured with iron compounds. Photo: Andy Spate.

FIVE CASE STUDIES

We present five case studies of geotourism ventures here – two covering large areas and a mixture of public and private lands with a large range of geodiversity and other natural values.

Two, much smaller, areas with correspondingly fewer public and private land owners and natural values are also discussed as well as a proposal to include these as part of a larger concept. Clearly the scale and complexity of the first two studies is much greater than on the smaller areas.

Figure 2. Location of the five case studies.



KANAWINKA GEOPARK

Tagline: Land of Tomorrow (from Indigenous language-supposed meaning of Kanawinka)

Kanawinka Geopark is Australia's most extensive volcanic province, stretching across south-western Victoria and south eastern South Australia. The Geopark encompasses an area of approximately 20,000 square kilometres, geologically significant for its 350 known eruption points ranging from 7 million years ago to around just 5,000 years ago. The western extent of the volcanic plain has been overlain by limestone, which has influenced volcanic development and given rise to features not seen in other parts of the Geopark. Hence, the Geopark has considerable diversity of geological features giving rise to many potential stories to tell.

Figure 3. Starlight Cave on the south coast of the Kanawinka Geopark, Victoria. This cave is developed in Tertiary Limestone.

Constructing the Kanawinka Geopark has been a means of linking a large number of visitor experiences across a large landscape and encouraging cooperation across administrative boundaries. The Geopark spans two state governments and eight local government boundaries.

The Geopark has been divided into four precincts:

- Lakes and Wetlands;
- Cones and Falls;
- Craters and Limestone; and
- Coast and Caves

Each precinct has both Indigenous and European cultural heritage stories in addition to interpretation of the natural landscape. Each local community has involvement and benefits from their landscape and the stories it tells. The following briefly describes each precinct and activities that are currently undertaken.
Lakes and Wetlands

This is the most easterly and oldest section of the Kanawinka Geopark. As the name suggests, this precinct has a number of significant lakes of volcanic origin. Some of these are internationally significant in their own right, such as the Ramsar-listed Lake Bookar and Lake Coorangamite. Mount Noorat is a traditional meeting and bartering place for the Kirrae Wuurong people, while Mount Elephant is one of the most obvious volcanoes in Australia, rising high above the Victorian plain. It is often referred to as the 'swagman's lighthouse', as it was a guiding landmark for early explorers and settlers. Recently discovered footprints of extinct Australian megafauna have provided this precinct with another feature which can be interpreted to visitors. The Lakes and Wetlands Precinct includes a large section of the Great Ocean Road, one of the great drives in the Australian landscape. Visitation is strongly biased towards the coast, with tourism experiences developed around the volcanic features used to draw visitors inland to other communities.

Cones and Falls

This precinct features a series of volcanic systems linking a number of major cones with the ocean via extensive lava flows. Located in western Victoria where annual rainfall is usually high enough to create significant runoff, there are a number of low but spectacular waterfalls. Wannon and Nigretta Falls offer a stark watery contrast to the typical Australian landscape and the visitor experience is about enjoying the aesthetic qualities of the waterfalls. Australia is an unpredictable country though and the rivers feeding both of these falls have declined to such a level that the falls are no longer running. This is having a significant impact on the operator who established visitor accommodation adjacent to the falls.

Also within this precinct is the Byaduk Caves complex. These lava caves are easily accessible to the public with limited infrastructure in place and no guided experiences currently on offer. In contrast, Tower Hill Reserve is a major visitor attraction, operated by the local Indigenous community. It is one of the largest maars in the world with its geological features complemented by outstanding wildlife. The site generates revenue for the local community, creates employment for the local Indigenous community immersing visitors in their culture.

COAST AND CAVES PRECINCT

Lake Condah is the main feature in this precinct, where the local Gunditjimara people harvested eels and fish. It is considered one of the oldest examples of aquaculture in the world. Remnants of stone huts, fish-traps, channels and weirs constructed of stones from lava flows are still visible. The site may be visited with a local guide creating employment for Indigenous people. Mount Eccles, or "Budj Bim" in traditional language is a significant attraction for visitors travelling through. Cape Bridgewater on the coast is not volcanic sediments, but aeolian limestone in which many small caves have formed. The Great South West Walk is 120 kilometres long joining the towns of Cape Bridgewater and Nelson, further diversifying visitor experiences available within the Geopark. A number of recreational activities are available on the Glenelg

River, one of the few major water courses across the volcanic landscape.

Craters and Limestone Precinct

The western section of the Geopark is across the state border in South Australia. Most of the landscape is limestone, punctuated with a series of very young craters. Most of these eruptions have been quite explosive due to the water bearing limestone through which the magma has erupted.

Some of these craters have filled with water and one, the Blue Lake, is famous for its colour change from a sombre blue/brown in winter to a brilliant turquoise during the summer months. Mount Gambier, the largest regional centre in South Australia surrounds the Blue Lake and other Crater Lakes and is a hub for regional tourism. A diverse range of activities has been developed around the natural features, including walking trails, tours in limestone caves, wildlife parks and water related activities on the coast.

What it all means

The Kanawinka Geopark has been divided into four precincts or interpretation areas based on geological features. Currently, no interpretation plan has been written to guide development of visitor experiences for each precinct. Interpretation is largely what was in place prior to the Geopark listing.

This does not detract from the overall effectiveness of the Geopark in promoting and presenting geological values, but does not clearly delineate interpretation along precinct boundaries. One issue that may arise is the duplication of interpretation or visitor experience in two or more precincts. This, while not ideal, may not significantly impact on the economic benefit derived by each community within the Geopark.

FLINDERS RANGES

Tagline: Mountains of Memory

The Flinders Ranges in South Australia has a history extending back more than one billion years. It is comprised of sedimentary rocks laid down in the Adelaide Geosyncline, the folded, uplifted and eroded over millions of years to create a landscape of immense beauty, intrigue and complexity.

It contains a record of the first multi-cellular life on Earth, the Ediacaran Fauna and has the only Global Stratotype Section and Point (GSSP) in the southern hemisphere. Indigenous people have a strong connection to the landscape and evidence of the duration of their habitation is recorded in many artworks. European settlers established themselves during a period of relatively good rainfall, only to succumb to a series of droughts. Beginning to understand the landscape like the Indigenous people took many years and relicts of failed settlements litter the Flinders Ranges landscape.

Figure 4. Wilpena Pound,
Flinders Ranges, South Australia.

The Mountains of Memory Geotourism Project is an operator driven initiative that aims to stimulate economic development by expanding tourism product and experiences offered in the Flinders Ranges in South Australia. It is very new and yet to be implemented, but is an excellent example of a project developed around geological values. The Flinders Ranges has been declared a National Landscape under a new strategy of the Australian Government and this in combination with the Mountains of Memory strategy will guide future development. Seeking Geopark status in the future may be considered once the project is fully implemented.

The Mountains of Memory Strategy was written by Lorraine Edmunds, a local with a huge knowledge and deep understanding of the complex nature of the Flinders Ranges. She identified a number of key characters that differentiate the area from other Australian landscapes:

- Landscapes that pose tantalising questions about the nature of time and evolution of life on Earth;
- Landscapes that archive climate change for more than one billion years;
- Landscapes with a palpable spiritual values for Indigenous and non-Indigenous people;
- Landscapes in which species from temperate and arid Australia are juxtaposed; and
- Landscapes that contain great diversity across a small geographic area.

From these characters, a positioning statement was developed:

> *The Flinders Ranges, where ancient landscapes inspire its peoples and reveal the story of life on Earth.*

Consultation with a number of stakeholders took place over a twelve month period, gathering community interest and knowledge and importantly project support. In an approach different to that of the Kanawinka Geopark, Mountains of Memory has been developed along interpretive themes with the primary objective to develop new products and experiences, rather than the linking and promoting existing product.

The Thematic Approach

Developing themes for interpretation is an approach advocated by a number of writers and practitioners. It can guide and focus written and spoken interpretation and has been used in the development of Mountains on Memory to develop different story lines for each town and district, while retaining a strong link back to the central theme.

Visitors exploring the region will hopefully make the links and understand how each piece contributes to The Billion-Year Journey. This slogan or tagline implies a journey for the visitor and encapsulates the enormous time period the Flinders Ranges represents.

Central theme

A central theme was written to guide interpretation.

Few places on Earth provide a more extraordinary journey through time than South Australia's Flinders Ranges

The theme captures the idea that travelling through the Flinders Ranges is a journey, it is several hundred kilometres from the north to south, and the enormous span of time recorded in the geological history. From this nine sub themes were written. Three examples are presented below.

Wilpena District

Tagline: *The Meeting Place*.

Two worldviews, one rational, one spiritual, give meaning to the landscapes of the Flinders Ranges.

To fully appreciate the significance of Wilpena Pound one needs to hear both the Aboriginal and geological explanations;
Wilpena has long been a meeting place for Aboriginals and non- Indigenous peoples;
The landscapes of the Wilpena district have inspired artists past and present; and
In the Flinders Ranges you can travel down a corridor of time.

What it all means

The Wilpena district is now the central site for park interpretation and visitor accommodation. Traditionally for Indigenous peoples it was also a meeting place. Award winning interpretation has been installed around Old Wilpena Homestead, the original house built by the first settlers, with strong recognition to the Indigenous people who preceded them.

Art is an important selling point for the region and it attracts many artists who continue to be inspired by breathtaking landscapes. Brachina Gorge has been developed as a self-drive tour, travelling across 600 million years of time through rocks exposed on the landscape. These themes both describe interpretation and experiences already developed, but provide direction for and will differentiate new products developed in this district.

Parachilna/Beltana

Tagline: *When Life Gets Complex*.

- Things were simple before Ediacara but then life suddenly became complex;
- Our family tree may lead us back to Ediacara as we search for our most distant ancestor; and
- So significant were the Eciacarans that a new rung in the ladder of time was named after them.

What it all means

This district has the best examples of Ediacaran fauna fossils, the first multi cellular life forms on Earth. Fossil researchers are eagerly seeking the first animal to show evidence of a vertebral column, which would in fact make it the ancestor to all vertebrates in the animal kingdom. Although controversial, it appears this fossil has been discovered. The Ediacaran Period has been acknowledged with the first southern hemisphere GSSP and the first new geological time period dedicated in 2005. This district in the Mountains of memory project has a strong fossil focus.

Quorn

Tagline: *Lines in the Landscape*.

Lines in the landscape are reminders of past journeys, ancient and recent:

- Lines in the landscape reveal that ancient rocks, like visitors today, are also travellers;
- Lines in the landscape mark the journeys of the ancestors who created the land;
- Lines in the landscape reveal the dreams and aspirations of a settler culture; and
- Lines in the landscape, in soil and air, mark the journeys that animals and birds have made for thousands of years.

What it all means

Quorn lies at the southern end of the region hence was once of the first districts settled as people moved northwards. It was from here that settlers forged northwards on their journeys seeking to establish new lives. The lines are both the evidence of their first incursions into the Flinders ranges and also symbolic of animal movements. Quorn is an entry point at which many visitors commence their Flinders Ranges Mountains of Memory experience.

WEE JASPER

Tagline: *An Ancient Seascape*.

Although only 45 km northwest of Canberra, the Wee Jasper Valley must be considered as remote. Indeed, that is part of its charm. It has attracted cave explorers, geologists, palaeontologists and

similar like-minded people since the 1830s. It is an internationally significant site for Early Devonian fish fossils and has many other important geological values including a nationally significant suite of cave and karst features – both geological and biological.

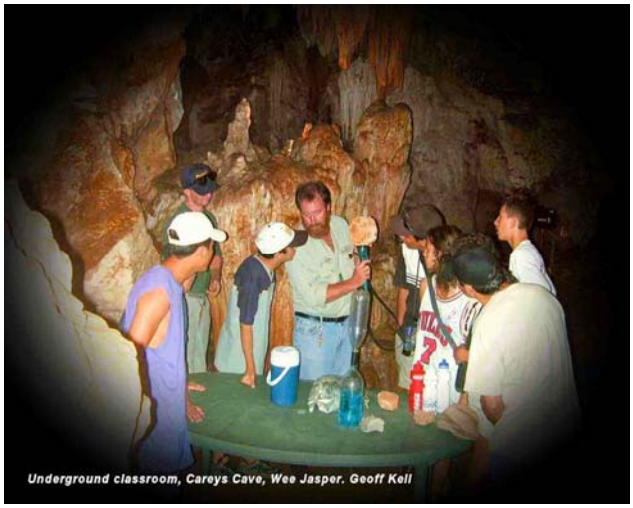


Figure 5. Underground classroom in Careys Cave, Wee Jasper, New South Wales.

Promotion of geotourism is seen as a way to arrest the population decline in the valley and to provide for employment in a rural environment at a time of difficulties in agriculture enterprises. To this end the Wee Jasper community is seeking to establish links with other communities where geotourism is important for sustainability of rural populations.

Although the hamlet of Wee Jasper lies only 45 km north-west of Canberra it can be regarded as remote as no roads directly join it with Canberra and there are still unsealed portions of road leading to the village. The population is about 65 people with a largely ageing population – although the village does support a school albeit with only 10 pupils. The area was settled in the early 1820s or '30s and has been largely dependent on pastoralism and tourism ever since. However, during the 19th Century a number of the caves became attractions for visitors and locals. In recent decades cave usage has increased and a number of other geologically based activities have developed.

Geological setting

The Goodradigbee Valley at Wee Jasper is carved into the western limb of a north-south trending anticline. The valley is aligned along strike and bedrock exposure of the various Devonian limestone units is very good and there are many scenic exposures of strata and structures en route to, and at, Wee Jasper itself. The valley floor is dotted with biohermal reef masses of purer limestone.

Most of the caves and many of bedrock fossils are found in these masses. At the junction of the Goodradigbee and Murrumbidgee Rivers a large basin has been excavated in the limestone with Cave Island in the centre. Much of the limestone is seasonally inundated by the backed up waters of the Burrinjuck Reservoir and the resultant lichen removal and etching of the limestone surface makes for a very dramatic display of the bedrock fossils.

The caves and karst

There are hundreds of caves – largely on private property – scattered along the valley. The most significant of these are those of the so-called Thermal Paddock where they are warmed and watered by thermal springs. Church Cave contains a maternity site for the vulnerable Eastern Bent-wing Bat. There are also endemic cave invertebrates of great evolutionary significance and many sites with Pleistocene fossil deposits.

Careys Cave was developed and provided with electric lighting in 1968 but was shown regularly to visitors well back into the 19th Century. It is probably the smallest show cave operation in Australia but is a beautiful cave with beautiful rock sculpturing and colours. Other caves provide recreation opportunities and bring benefits to the district through supplying goods and services for these groups.

Palaeontological values

The Taemas Limestone and, indeed, the other sedimentary rocks on the rock sequence are often highly fossiliferous through a period of 20 million years sediment deposition. It is said to be one of the best continuous sections anywhere in the world at this part of the Lower to Middle Devonian – about 410 to 390 million years ago. The upper two kilometres of the sequence documents a transition from marine to freshwater conditions with river and lake deposits with abundant fish, plant and some arthropods. Two major events in Earth history occurred during this time interval: evolution of the first forests and the transition of fish-like vertebrates into terrestrial environments as the first land animals.

The Burrinjuck fossil fish fauna in one of the most diverse known from rocks of this age and includes 48 genera and species that have been documented in over fifty scientific publications. Thick-skeletoned placoderms are the most abundant, and the exquisite preservation of the fossils permits examination of the neural system. The oldest lungfish in the world occur here, as does the oldest known braincase of a bony fish. Exceptional specimens from the area include a perfectly preserved 'eye capsule'. To quote Gavin Young (pers. comm. 2007):

This structure completely enclosed and surrounded the soft tissues of the eye, and reveals intricate details including nerves and muscle attachments controlling eye movement, and tubules connecting the optic nerve and associated blood vessels to the retina. No comparable specimens exist elsewhere in the world.

This extraordinary fossil record provides the community with an interpretive opportunity not available elsewhere. Many other groups of

animals are represented in the bedrock including corals, molluscs, conodonts (very primitive fishes) and even algae.

Whilst there has not been any systematic work on the Quaternary fossils for many years there is still much fossil-bearing material in Wee Jasper cave deposits. A single tooth of Thylacoleo, probably T. carnifex in Goodradigbee [now Careys] Cave was discovered in the Nineteenth Century. Elements of the extinct megafaunal marsupials including the giant wombat-like Nototherium sp. and the giant kangaroo, Sthenurus sp. have also been discovered.

As well as the extinct megafauna many other extinct (or locally extinct) small to medium mammal species have been found including such iconic species as the extinct Thylacine (Tasmanian Tiger, Thylacinus cynocephalus).

Current geotourism activities

The valley is a popular destination for campers and day-visitors who fish (when there is any water!), appreciate the scenery and quiet surroundings and visit the caves. There is a plethora of accommodation in the valley and this is the backbone of a number of family enterprises.

The caves are heavily used by casual and organized caving groups. Visitor numbers to each of the Dip and Punchbowl systems exceed 300-400 a month with many of those visitors camping and contributing, if only in a small way, to the local economy. However, many of these visitors receive little or no appreciation of the geological heritage and treat the caves only as 'underground gymnasia'.

Still more, but considerably less than 10,000 visitors, come to visit Careys Cave annually. The tours of this beautiful cave place considerable emphasis on providing a meaningful appreciation of the geological heritage of the cave and of the valley.

In recent years, fossil tours have been conducted on Cooradigbee Station where both invertebrate fossils and fragments of armoured fishes can be seen in the water-etched limestone. The Quaternary fossils are not included in geotourism interpretation at this time. The community has recently established activity weekends designed to showcase and bring extra people into the district to supplement the declining rural economy. Wee Jasper Naturally weekends are now held twice a year and include:

- Specialist cave tours;
- Guided walks over Punchbowl Hill explaining the nature of karst landscapes and the evolution of the Canberra-Yass-Wee Jasper landscape;
- Fossil tours on Cooradigbee Station;
- Wild cave inspections;
- Caving safety, equipment and technique sessions;
- Static displays of cave and karst features; and
- Evening lectures on flora and fauna.

Leaflets, slide shows and films accompany some of these activities. These activity weekends are forming the basis of a more substantial involvement in fossil-based geotourism in New South Wales as part of a discovery trail.

Students and researchers also visit the valley from the universities and schools of nearby Canberra and region as well as from further afield. Many of these visits are geologically based.

The way forward

With the pastoral industry virtually static and perhaps, declining, a number of residents of the valley are looking for ways to augment the community economy. The current long-term – seemingly endless – drought has dramatically reduced tourist numbers and thus inputs to the valley economy. Currently the valley hosts a range of accommodation styles from high quality to basic bush camping, a small vineyard, a café stocking basic grocery items and some fishing equipment, a tavern and small tourist cave operation. The New South Wales Lands Department operates five very popular camping areas three of which offer only basic facilities. The facilities at Careys Cave are very basic.

Ideas for the future are largely based around Careys Cave and fossil tours of the bedrock fossils revealed by the low levels of water in Burrinjuck Reservoir. Even if the current record-breaking drought continues, irrigation and environmental flow demands are such that low levels will continue for the foreseeable future. In 2007 the community sought an Australian Tourism Development Program – Category 2 – Integrated Tourism Development Projects grant for the development of a museum/visitor centre at or near Careys Cave under the banner of an Ancient Seascape Interpretive Centre. The grant application had wide support from tourism groups, scientists and an organization concerned with cave, karst and fossil education and research but was ultimately unsuccessful. Other grant approaches are being pursued.

Opportunities for further geotourism activities building on the Wee Jasper Naturally weekends are limited, especially as the pool of people available to lead activities is very limited and signs of declining enthusiasm are evident.

But for Wee Jasper itself it seems that unless a visitor centre or similar facility is established that can be at least partially self-supporting geotourism will remain the low-key operation that currently exists. Such a centre would warehouse, archive, educate and build appreciation of this small, but significant part of Australia's heritage. Given the manifold and easily seen geological values – the caves, karst, fossils and scenery – it seems unfortunate that the area cannot be better used and appreciated, and have a better economic base.

WELLINGTON CAVES

Tagline: *The birthplace of Australian palaeontology*.

The Wellington Caves are important for their scientific and historic value. The limestone is part of the early Devonian Garra Formation and contains fossils of marine invertebrates, many of which are type species. Fossil bones of many vertebrates, mostly mammals, are found in sediments that were deposited in caves and fissure over the last two million years.

This includes type species for a number of marsupials that were part of the extinct megafauna. The caves are therefore an important type locality for both Devonian and Quaternary fossil species. The subterranean waters of the caves are the home of a highly significant invertebrate community.

The Wellington Caves are one of the most significant mammal fossil sites in the world and they contain the largest deposit of Plio-Pleistocene mammal fossils in Australia. It was at Wellington Caves that fossils of Australian marsupials were first discovered in 1830.

The discoveries attracted international scientific attention during the nineteenth century and were important in the development of evolutionary ideas by Darwin.

A great diversity of vertebrate fossils including reptiles, birds and mammals are found at Wellington Caves and the caves are the type locality for many extinct species including Diprotodon optatum.

The Phosphate Mine preserves a rare example of early twentieth century mining technology. It illustrates a mode of life which has passed into history and which now forms part of the area's historic cultural heritage.

The values and significance of this site were recognised by its listing on the Register of the National Estate. A nomination is being prepared for listing of Wellington Caves in the new National Heritage List.

The degree of significance of this subterranean aquatic community justifies national recognition and potentially international recognition through nomination as a Ramsar Wetland.

The Wellington Caves Reserve is an important regional tourist attraction. The Reserve is one of six show cave sites within New South Wales and the only site away from the Eastern Highlands. Some 45,000 people visit the site and its caves each year and their patronage makes a valuable contribution to local economic activity.

Wellington Caves are on a Crown Lands Reserve for Preservation of Caves and Public Recreation. Thus it is on government land but it is managed and operated by local government advised by a community-based advisory committee. The Reserve totals 154.98 hectares.

The management of Crown Lands as a single reserve allows for the local generation and reinvestment of revenue to offset the ongoing requirements of reserve management. This is in concert with the initiatives of the State Government to encourage both entrepreneurial activity and local management of the State's resources. As well as the day-to-day operation of the Wellington Caves Reserve by the Wellington Shire Council and its advisory committee, a Friends of Wellington Caves group provides further community input and expands the community awareness of, and support for this significant regional attraction.

The public are guided through two electrically lit show caves where information about the caves and their geological setting and development are explained. There are also other caves such as Anticline Cave (Figure 6) that can be used for geotourism purposes.

The Phosphate Mine is a series of caves that were formerly mined for their phosphate deposits have been developed as a further guided tour where the public see mammalian fossils in situ as well as phosphatic minerals and early 20th Century mining technology.

A small constructed pathway leads visitors through the Field of Fossils where they are introduced, via a leaflet and signs, to the invertebrate fossils.

There is also a small visitor centre and life size-models of the extinct megafauna and their skeletons (Figure 8). The Reserve also has camping, caravanning and motel-style accommodation on site.

Figure 6. Educational tour in Anticline Cave, Wellington Caves, New South Wales.

Due to the Caves' strategic location on north-south and east-west transport routes school groups are a particular market segment that provide a base load of visitors. The organisers of school groups are particularly attracted to curriculum relevant activity programs.

Wellington Caves is in reasonably close proximity (in Australian terms) to the Australian Fossil and Mineral Museum at Bathurst and to The Age of Fishes Museum at Canowindra. Thus it will form an important part of the New South Wales Fossil Trail described below.

New South Wales fossil trail

tagline: Travel through time – discovering the fossils of New South Wales.

Wellington and Wee Jasper will be linked as part of a proposed fossil site and museum promotion project across the state. A fossil trail has been developed in South Australia linking the Ediacaran sites in the Flinders Ranges with the World Heritage Naracoorte Caves Pleistocene/Quaternary fossil mammal site as well as other sites in that state.

In Queensland a 'Dinosaur Highway' trail has been developed linking Winton, Richmond and Hughenden with the Cretaceous dinosaur stampede site at Lark Quarry and with the World Heritage Tertiary vertebrate fossil at Riversleigh.

The concept is of links in New South Wales taking in:

1) Opal and Fossil Centre, Lightning Ridge
2) The Wellington Caves Pleistocene/Quaternary fossil site;
3) Australian Fossil and Mineral Museum, Bathurst;
4) The Age of Fishes Museum at Canowindra;
5) The Australian Museum in Sydney;
6) The Devonian fish and invertebrate fossils of Wee Jasper; and
7) The National Dinosaur Museum in Canberra.

The underlying concept is to build connections between the eastern Australia fossil sites and museums to cross-promote the various businesses and to build a better understanding of Australian geology and of the evolution of landscapes and life forms development amongst the travelling public.

Figure 7. Location of the sites on the New South Wales Fossil Trail.

CONCLUSIONS

Australia is so large that some geotourism experiences span many hundreds of kilometres so communicating and linking between communities can provide special challenges. Geotourism in Australia has been most successful where communities have been involved in developing the concepts. The Kanawinka Geopark and Mountains of Memory projects link a number of small communities providing each with a story to tell. In particular, the Mountains of Memory project clearly articulates the story each town or district is expected to deliver. This can avoid duplication and hence competition between communities that may otherwise benefit equally from tourism activity.

The development of geotourism activities at Wee Jasper is entirely based on the local community with no government input whilst at Wellington Caves the devolvement from central to local government requires that the local community understand and support their operation as site for geotourism.

Our Australian experiences show greatest results have been achieved by observing the following when considering geotourism products involving small communities:

- Involve all communities within the region;
- Involve all sections of each community;
- Avoid top-down, overly bureaucratic approaches – especially where private lands are involved;
- Create one big story with a diversity of smaller stories; and
- Linking of stories will link activities and communities.

Although much of Australia's geodiversity is on protected, public lands there is an enormous array of sites under private ownership that deserve better appreciation and management. Community based geotourism is one way of achieving that goal.

Figure 8. A cast of Diprotodon in installed in the Bone Cave part of the Phosphate Mine, Wellington Caves.

REFERENCES

This paper has been written using the personal experiences of the authors with the projects and utilising resources produced for each project. Most of these are not published but are available by contacting the authors.