Geodiversity of the Lightning Ridge area and the importance of geotourism to the region’s prosperity

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Geodiversity of Lightning Ridge – Simone Meakin – GSNSW – September 2010
Great Australian Basin - sedimentary opal deposits

Early Cretaceous
(110 – 95 million years)
Outline

Geodiversity
- Cretaceous features
- Palaeogene-Neogene (Tertiary) features
- Quaternary features

Geotourism
- Local enterprises

Management of Lightning Ridge
- Problems and possible solutions

Conclusions
Stratigraphy - Lightning Ridge area

Coocoran Claystone

Wallangulla Sandstone

Finch Claystone

Opal dirt
Tertiary gravels
- often silicified (silcrete)
- no primary opal

Cretaceous sandstone
Most opal recovered from within 30m of surface

Cretaceous claystone
- opal dirt
Nobbie opal

Seam opal

Opal infilling cavities after ?roots, burrows

Fossils
Fossils

- Diverse fauna (shells, turtles, fish, birds, sharks, reptiles, mammals, crayfish, eels, dinosaurs)
- Dominantly a freshwater setting (to shallow marine)
- Very rare, valuable and beautiful
- Reliance on miners for discovery
Opal formation - constraints

Late Tertiary (Miocene) sediments, silcrete

5-23 million years

Early Tertiary colluvium

Late Cretaceous weathering event

Opal formed: Late Cretaceous

Early Cretaceous sandstone, claystone

110 - 95 million years
Genesis - opal filling a cavity

Meniscus indicates low (atmospheric) pressure

Microbes – low T

(Behr, Behr & Watkins in prep.)
Palaeogene–Neogene (Tertiary)

- Gravels of quartz, chert, jasper, petrified wood, topaz, agate
- Silicrete bands containing well-preserved plants
- Aboriginal quarries
Quaternary alluvial systems

- Several generations of fluvial systems
- Lakes, claypans
- Source-bordering dunes and lunettes
- Vegetative associations
Cuddie Springs prehistoric site

(Murray, 1984)
Aboriginal cultural heritage sites
Narran Lake – aboriginal sites

(Ramsar wetland)
Geotourism attractions

- Walk-in mine
- Fossicking
- Australian Opal Centre
- Bore baths
- Tours of opal fields
- Car-door tour (self-guided)
- Lunatic Hill open cut
- Opals
- Fossils
- Miners
- Cuddie Springs open days
Lunatic Hill open cut

A SLICE THROUGH TIME AT LUNATIC HILL OPEN CUT

QUATERNARY SEDIMENTS
(less than 1 million years old)

COOCORAN CLAYSTONE

WALLANGULLA SANDSTONE
containing lenses of Finch Claystone

FINCH CLAYSTONE

Photo: Warwick Schofield
Preserved Fields

- Older mining areas (approx 63 sq km over 5 non-contiguous zones)
- Endorsed by range of stakeholders
- Scientific value (mineral, fossils)
- Unique character (camps)
- Mining heritage
- Aesthetic
- Low impact tourism
- Managed by a Crown Trust?
Tourism trends

Lightning Ridge visitor numbers

Data courtesy of Lightning Ridge tourist info centre
Employment sectors

748 employed,
(2006 census)
Opal exports 1989-2008
Problems

- Abandoned mine workings unsafe and unrehabilitated
- Stakeholder conflict
- Farmers and green groups unhappy with rehab
- Miners and scientists want workings left accessible
- ‘Ratting’ and social problems
- Hard to police (4000 claims)
- Limited Aboriginal involvement in management
- No royalties collected for NSW
Geotourism – a solution?

- Supported by all stakeholders
- Benefits all community (services, facilities, jobs)
- Consistent with ecologically sustainable development principles
- Educates
- Encourages commercial partnerships (e.g., ARC Linkage Grant involving unis and museums)
- Ensures prosperity of region in hard times
- Supports NSW State Plan targets
Conclusions

- Unique and exceptional geodiversity
- Potential for sustainable, low-impact, high-yield growth in tourism to support the region’s development
- Whole-of-Government responsibility
- Need for brochures, information
- A Geopark?
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