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A PRELIMINARY SUBMISSION IN SUPPORT OF RECOMMENDATIONS MADE IN THE REPORT;

'A BIOLOGICAL SURVEY OF THE NULLARBOR REGION SOUTH AND WESTERN AUSTRALIA IN 1984.'

Submitted to:-

Policy Directorate
Dept. of Conservation and
Land Management

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The Speleological Research Group Western Australia has participated since its inception during 1972 in active conservation of caves and Karst areas. Conservation projects have ranged from the Leeuwin-Naturaliste Ridge to Tasmania and the Nullarbor Plain.

The primary aim of our society is to promote caving for its scientific and recreational benefits. To achieve these aims, members have conducted cave awareness tours for members of the public, schools, institutions and the disadvantaged as well as giving lectures on the subject.

Since the publication of the Australian Speleological Federation's *'Resource Management of the Nullarbor Region, W.A.' (1978)* which formed the basis of the speleological section of the *'Biological Survey of the Nullarbor Region South and Western Australia in 1984'* significant discoveries have been made.

The object of this submission is to acquaint you with a short overview of this additional material with a view to amending some of the recommendations of that *'Survey'*.

SRGWA

October 1987

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Nullarbor Caves*

comments on fauna conservation with particular reference to Mullamullang and Nurina Caves.

M.R.Gray
Australian Museum

PREAMBLE

With an area of 200,000 km^2 the Nullarbor Plain ranks as one of the largest expanses of limestone in the world. Australian Karst areas are not well endowed with caves, the Nullarbor being no exception. As such, protection of such a scarce resource is paramount.

The majority of caves in the W.A. section of the Nullarbor Plain is to be found in the coastal strip south of the transcontinental railway. These caves are largely unprotected, whether located on Vacant Crown Land, private lease or existing reserves.

The caves of the Nullarbor were once thought to be relatively secure, due to their remoteness from large concentrations of the Australian population, but since the early 1970's cave visitation has increased significantly by members of the touring public, local roadhouse and station staff, organised divers and speleologists as well as commercial tour operators.

Recent speleological discoveries are summarised below in addition to our society's proposed amendments to those of the *'Biological Survey'*.

ENDORSEMENTS

This submission is supported by those whose names appear below;

Dr. Mike Gray	Arachnologist	Australian Museum
George Kendrick	Palaeontologist	Western Australian Museum
Dr. Brenton Knott	Zoologist	Univ. of Western Australia
Norman McKenzie	Biologist	Dept. of Conservation and Land Management
Lloyd Robinson	President	Australian Speleological Federation Inc.

WEEBUBBIE CAVE N2

As indicated by data collected during 1985, this cave situated some 14km north of Eucla, has the highest visitation of any cave on the Nullarbor. The cave has a history of abuse as outlined by Davey in *Resource Management of the Nullarbor Region, W.A. 1978'*.

The cave is inhabited by a small colony of bats and birds which roost in the cave's twilight zone. Biological discoveries in the cave have been significant. Gray (1973) described a troglobitic hunting spider, Janusia muiri. This spider is recorded only from Weebubbie and Pannikin Plain (N47) Caves and is the only troglobitic representative of the family Miturgidae. In October 1981 a troglobitic isopod was discovered by R. and N. Poulter (Poulter 1982) and a blind cockroach several months later although this may be a Trogloblattella nullarborensis as recorded by Richards 1971.

During December 1985 SRGWA and others carried out an extensive cleanup of the cave (Poulter 1987) during which a carabid (beetle) was captured. According to Dr. Mike Gray of the Australian Museum (pers. comm. 1987) this is the first troglobitic carabid captured on mainland Australia (Moore, in prep)

MULLAMULLANG CAVE N37

Mullamullang Cave has traditionally been considered to be the longest cave on the Australian mainland since its discovery in 1964 and contains some of the best halite (salt) decoration of the Nullarbor Plain.
It was from Mullamullang that the unique web building spider now known as Baiami mullamullangensis (Gray 1973, 1981) was discovered in 1967 in addition to the blind cockroach Trogloblattella nullaborensis (Mackerras 1967). Living specimens of these creatures have only been found in the Dome, some 5-6km from the entrance of the cave.

Visitation from speleologists, divers and members of the public (casual cavers) appears to have significantly increased in recent years and latterly commercial tour operators offering *'wild cave tours'* have included the cave (amongst others) on their itinerary.

Such is the attraction of the arduous round trip to the Dome that it has become common practice amongst speleologists and divers to *'DO THE DOME!'* also known as the *'DOME SYNDROME'* (Boland 1987). As a result of such activity, habitat disturbance and destruction appears to have led to a sharp decline in the population of the spider and cockroach leading to the conclusion by a biological expedition from Murdoch University (1985) that both are locally extinct. This society concurs with this conclusion. The spider has not been seen since 1972 and the cockroach 1985. At the suggestion of Dr. Gray, SRGWA is proposing that a 10 year voluntary ban be imposed on visiting the Dome, to give any remnant population a chance to recover.

Casual cavers and commercial tour operators seem to confine their activities to the Easter Extension section of the cave, which contains the majority of the Nullarbor's unique halite decoration. Extensive damage has resulted to the Coffee and Cream decoration of the Extension, although as yet, little damage is apparent in the Salt Cellars section of the same Extension (Poulter 1982).

NURINA CAVE N46

Davey made only passing reference to this cave in his report of 1978, the main significance at the time being the aesthetic value of its joint-controlled phreatic passages, numerous small photogenic lakes and the fact that it was one of the few cave located on the Roe Plain. Since that time however, the importance of the cave has greatly increased as has its vulnerability due to easier access and local knowledge.

Prior to 1981, a cockroach (thought to be Trogloblattella nullarborensis) was the only troglobite known to exist in the cave. During 1982, a troglobitic amphipod was discovered in the lakes of the cave (Knott. 1983, 1985; Poulter 1982) and is still the only aquatic troglobite known from the Nullarbor.

Since that time, the troglobite species list (most new to science) has grown to seven, prompting Dr. Gray of the Australian Museum to declare that since the cave posessed such a high diversity of troglobitic fauna it ranked with the greatest known in Australia and that it certainly had the highest diversity (of troglobitic fauna) of the Nullarbor Plain and is listed below.

	TROGLOBITE	*FOUND BY*	
1.	cockroach Trogloblattella nullarborensis		
2.	amphipod (aquatic, Knott, in prep)	(Barnes/Poulter	1982)
3.	spider - Baiami sp. (Gray, in prep)	(Poulter	1985)
4.	spider - Icona sp. (Gray, in prep	(Poulter	1987)
5.	isopod (family Oniscidae	(Edwards	1987)
6.	beetle (family Carabidae (Moore, in prep)	(Gray	1987)
7.	centipede sighting only	(Edwards	1987)

Dr. Barry Moore of the Division of Entomology, CSIRO has stated that the carabid is the most highly specialised troglobitic beetle yet taken from an Australian cave. The equally specialised spiders provide important zoogeographic links between eastern and western forest and cavernicolous spider faunas (Gray, pers. comm.).

The cave and its entrance has suffered from casual visitors in the recent past. Access to the cave has been made much easier with the construction of an *'un-authorised'* road by persons connected with the recent upgrading of the Eyre Highway. This road leads to an equally *'un-authorised'* quarry several kilometres south of the cave on Vacant Crown Land.
A vehicle track has been formed from this road to the cave.
Visitors to the cave have been digging in the entrance doline in search of fossils, increasing the risk of surface erosion and siltation of the cave lakes.

From observation it appears that the amphipod population is highly dependant on one small lake close to the entrance rockslope for nutrients arriving with periodic surface runoff. As such they are vulnerable to habitat disturbance from increased visitation and surface erosion.

BAIAMI MULLAMULLANGENSIS

The blind spider Baiami mullamullangensis or closely related species has now been discovered in four caves other than Mullamullang.

Phyllistine Flattener Cave	N194	(Murdoch Univ.	1985?)
Murdoch Sink		(Murdoch Univ.	1985?)
Nurina Cave	N46	(Poulter	1985)
Thampanna Cave	N206	(Geelan/Greenhill	1985)

Phyllistine Flattener Cave and Murdoch Sink are located on Madura Station approximately 21km north of Mullamullang Cave.

Nurina Cave, on the Roe Plain, is approximately 36km SSW of Mullamullang Cave.

Thampanna Cave, on Mundrabilla Station, is approximately 42km east of Mullamullang Cave.

Dr. Mike Gray (pers. comm.) is now making a detailed study of the Baiami spiders from the five sites. This suggests that although they may have a common ancestor, significant genetic differences caused by isolation are now evident.

MURRA-EL-ELEVYN CAVE N47

Concern is expressed by this society at the increased human activity by divers and others in this cave. As far as we are aware, the cave is the only known maternity site for bats on the Nullarbor Plain. The bat maternity season is approximately November through to February and corresponds to the highest tourist/caving/diving period, although a large group of divers were camped at the cave during Easter 1987

Such concentrated visitation leading to increased disturbance of the bats could result in high mortality among newly borne bats. Management of this cave should seek to minimize such disturbance.

It is assumed that most visitors do not bother (or are unaware of the

need) to apply for permits to enter this or other caves that occur in the Cocklebiddy region of the Nuytsland Nature Reserve.

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RECOMMENDATIONS

In supporting the recommendations of the *'Biological Survey of the Nullarbor Region of South and Western Australia in 1984'* relating to caves of the Western Australian section of the Nullarbor Plain, this society would further recommend that;

1. Nurina Cave be given the highest form of protection possible. The cave lies within Vacant Crown Land already recommended by the *'Survey'* to be added to the Nuytsland Nature Reserve.

   However, paper protection is insufficient.

   Therefore, we further recommend the cave be securely gated without disrupting the ecology of the cave and that access be granted only for bona-fide speleological and scientific purposes. Random surveilence is also recommended.

2. the 'un-authorised' quarry located south of Nurina Cave be landscaped and rehabilitated by those responsible for its creation and the 'un-authorised' road leading from the Eyre Highway also be rehabilitated and closed to the general public.

3. the Department of Conservation and Land Management take a much higher management profile with the existing reserves and appoint rangers in the field. If the areas sought by the current *'Survey'* are successfully transferred from VCL and private leases to Reserve status then field management will become imperative.

4. a management/access plan be drawn up in relation to Murra-El-Elevyn Cave to protect the bat population and the integrity of the maternity section. Monitoring of this population is needed.

5. should Mullamullang Cave become a satellite reserve within the boundary of Madura Station, then a management /access plan should be drawn up in an effort to avoid further damage to the decorated sections of the cave and visitation to the Dome be prohibited, except for scientific monitoring, for at least ten years.

6. should Madura Cave become a satellite reserve within the boundary of Madura Station, or because of its proximity to the northern boundary of the proposed extension to the Nuytsland Nature Reserve, be added to that Reserve - steps should be taken to preserve its archaeological significance. Madura Cave may be of significance to local Aboriginal people. Fencing has long been advocated for this cave.

7. should Weebubbie Cave be transferred to the control of the Department of Conservation and Land Management, then on-site management is appropriate to protect its archaeological significance, fauna and aesthetic value. Surface erosion rehabilitation and surface rubbish removal also need to be addressed.

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WHAT WE HAVE NOW IS LESS THAN WE HAD YESTERDAY.

NPOULTER

Nullarbor Caves - comments on fauna conservation with particular reference to Mullamullang and Nurina Caves.

M.R. Gray

Australian Museum

The identification and maintenance in good condition of cave ecosystems which include significant troglobitic communities should be a primary aim of any Nullarbor cave fauna management program. Such caves usually possess a diverse non-troglobitic fauna as well. At present the lack of genuine monitoring work means that there is little information on the effects that prolonged caving activity has had on these faunas.

Anecdotal evidence certainly indicates that there are problems associated with intensive localised activity. The best example is given by the decline of the troglobitic fauna in the Dome Chamber of Mullamullang Cave. Up until 1972 both the blind spider *Baiami mullamullangensis* and the blind cockroach *Troglоblattella nullarborensis* were readily found in the Dome, the former in obvious webs among rocks or on the lower walls, the latter in the rockpile. Since that time the spider has completely disappeared while the once common cockroach is now extremely rare. This appears to be a direct consequence of caving activity resulting in web destruction, trampling and rockpile disturbance. Trampling is also a problem in other areas, notably on the Dune, a large region of sculptured sand deposits which are a feature of Mullamullang.

Of twelve Nullarbor caves from which troglobitic species were known, ten have 1 or 2 species only. Consequently Mullamullang Cave with 3 troglobites (the two mentioned above plus a centipede) as well as a large troglophillic fauna has been regarded as especially significant biologically.

This places into perspective the importance of the diverse troglobitic fauna discovered in recent years in Nurina Cave on the Roe Plain (largely through the efforts of the SRGWA). The 7 species so far recorded include the cockroach, spider and centipede also recorded from Mullamullang (or

sibling species of same) plus a theridiid spider, a carabid beetle, an isopod and an amphipod. The amphipod is particularly noteworthy as the first life-form to be found in Nullarbor cave waters. This fauna provides outstanding opportunities for insights into the faunal and geomorphological history of the region and cavernicole speciation patterns

Caving activity at Nurina has been moderate and subjectively seems to have had little impact so far upon this unique ecosystem. Fortunately, the cave is not easy to move about in and is not as large and spectacular as many others. However, its position on the Roe Plain close to Madura does attract casual visitors and degradation of the small doline due to fossil digging is already evident.

Caves such as Mullamullang and Nurina (others could also be cited) which have features of special significance, be they faunal (the main concern here), geological or anthropological, should be given some form of protection, preferably through National Park or Nature Reserve status. Some areas should have the further protection of restricted access (for management orientated scientific or exploration projects only). The Dome chamber of Mullamullang and parts (or all) of Nurina Cave are examples. Other areas, such as the Dune in Mullamullang could be given additional protection by designating and marking approved routes for traversing vulnerable environments. A permit system for visits to caves in a Park or Reserve area is essential so that some estimate of usage rates is available and ideally a ranger responsible for such cave areas should be appointed.

While such measures may be anaethema to some Nullarbor cavers it is a fact of life that caving pressure will continue to increase there and damage is already apparent. Already the caving fraternity through the Australian Speleological Federation Inc. has sensibly deemed it necessary to ban camping underground in Mullamullang Cave. Despite this, such camping and its attendant problems of pollution and over-use still occur. If at least some of theseunique Nullarbor cave ecosystems are to survive relatively intact it seems clear that formal protection through some type of effective Reserve status is the only reasonable course.

The comments above were written prior to my seeing the CALM survey document. It is unfortunate that this document specifically excluded cave invertebrate faunas from consideration. Any conservation plan for the Nullarbor region must take some account of this unique and vulnerable component of its fauna. The recommendations made by SRGWA are a reasonable attempt to redress this omission and have my support. As individual cave faunas become better known a more solid basis for conservation decisions will be created. The present recommendations are an important step along that way.

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This submission relies on the reader being aware that papers referring to Nullarbor caves, troglobitic fauna, surface landforms and flora are suitably referenced in *'Resource Management of the Nullarbor Region, W.A. 1978'* AND *'A Biological Survey of the Nullarbor Region South and Western Australia in 1984'*.

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