CAVE GATING

An integral part of a cave management plan

Heather Jefferies

Speleological Research Group of Western Australia

1. INTRODUCTION

The question of whether or not to gate a cave has historically proven to be a contentious issue, and one which concerns both cave users and cave managers.

1.1 Visitation pressures on most well-known caves have increased over recent years, and this trend is expected to increase as the public's attention is focused upon caving through cave education programmes set up by various land managers (such as the Caveworks "Ecomuseum" at Margaret River, W.A.).

1.2 "Adventure Caving" by both commercial and non-commercial groups is an activity which has also seen a great increase in the last 10 years. This also focuses public awareness upon caving experiences outside of the range of guided trips presently offered by Land Managers.

1.3 Cave gating must be seen as only one part of an integrated cave management plan. Gating may be undertaken for a variety of reasons. Prior to the formulation of any cave management plan involving the gating of a specific cave, equal consideration must be given to both sides of the cave gating argument.

2. WHY GATE CAVES?

2.1 Principally, cave entrances are gated to limit the intentional and the unintentional damage which inevitably occurs when there are no limitations on visitation of a site. "Intentional" damage considers acts of both vandalism and indifference. "Unintentional" damage considers the damage that occurs by accident, and by those uninformed about cave environments and requirements. Accidental damage is an inherent quality of even the most cautious and experienced of caving groups.

Damage within a cave may occur to:

i) formations
ii) specific fauna and their associated ecosystems, and to
iii) the cave environment itself.

The unique nature of caves presents special problems with respect to any potential or actual damage which may occur:

i) Formations sometimes take many thousands of years to form; damage may therefore be irreparable, at least on human time scales.
ii) Fauna and their ecosystems survive within caves at a tenuous level; even trivial damage may upset the fine balance, disrupting ecosystems and endangering fauna.

iii) The cave environment is the sum interaction of a number of different factors (including air and water flow, humidity, temperature, etc). Even the most innocent disruption to one aspect of the cave environment (such as the gating of a cave interfering with cave airflow, or the excessive tramping of a mud floor) may potentially result in a devastating and widespread effect upon the whole cave environment.

2.2 The gating of a cave (or cave section) may be a logical step in the management of a specific cave. Accordingly, gating of a cave (or section of a cave) may be appropriate if the cave:

i) possesses significant decoration or features, which are vulnerable to damage from open visitation.
ii) possesses fauna deemed significant, and which are vulnerable to damage from open visitation.
iii) environment is assessed as fragile, and vulnerable to damage from open visitation.

In these cases, the gating of a cave or section may be appropriate, and should be considered if other cave management procedures would not, or have not been successful in preventing such damage.

Caves may be deemed capable of supporting limited visitation. Implementation of concurrent alternative cave management processes (for example, track-marking, interpretive sign posting etc.) can facilitate minimisation of the impact of limited visitation. In these situations, the gating of a cave may present a sound means by which visitation numbers can be limited. Gating will facilitate cave use in "a manner and quantity consistent with the preservation of the resource". (1) Regular assessment of the impact of such visitation should then be implemented (see sections 4.6, 5.4), the results of which may enable alteration of visitation numbers accordingly.

These following reasons for gating caves are secondary arguments:

2.3 Caves, by their nature, present a potentially dangerous environment. The very nature of the features within a cave present risks to cave users. Mazes, vertical pitches, water, loose rocks, and CO2 present potential hazards. It then follows that cave gating (as one aspect of an integrated management plan) may then be advisable in order to decrease the risks presented to inexperienced cave users.

Cave gating, and the regulation of visitation through, for example, the permit system already in place in the Leeuwin-Naturaliste National Park, is one method by which to ensure that groups entering a cave possess the specific skills required for each individual cave (for example, possession of vertical roping skills, an appropriate degree of caving experience, etc). In this manner, gating allows regulation of the "**quality**" of the cave user.

2.4 Gating of caves which may present a potential risk to cave users, and the regulation of access to these caves ,may be seen as a form of risk-minimisation or risk-prevention by the land managers. As such, they may in some part decrease their liability should a caving accident occur.

2.5 The gating of caves, and the regulation of access, would allow archaeological/scientific research to be conducted relatively uninterrupted, and without intentional or unintentional interference.

2.6 Cave gating facilitates and enhances the effectiveness of a "user-pays" access system which is capable of generating funds. All funds from the Permit System currently in place within the Leeuwin-Naturaliste National Park are utilised specifically for cave restoration and management.

3. WHY NOT GATE CAVES?

3.1 Cave gating may be unnecessary. Gating will not significantly decrease the risk to cave or cave user if:

i) the cave does not possess valuable or vulnerable decorations/ fauna/ ecosystems/ environment.
ii) the cave does not currently receive significant visitation. (This may be a function of the location of a cave, how conspicuous the cave entrance is -including the degree of bush cover present, and the degree of public knowledge concerning the cave.)
iii) the cave does not possess a significant risk to cave users.

3.2 Effective gating of a cave may be too costly. Gating the entrances of many caves could be expensive exercises in logistics. The limited management funds available may be better used implementing other cave management strategies.

3.3 Gating the entrance to a cave may potentially restrict airflow within the cave system. This can result in a marked change in cave temperature pattern and in this manner alter the cave environment. Ecosystems may accordingly be altered.

3.4 The gating of a cave may be counter-productive. It may sufficiently provoke some individuals as to encourage them to vandalise or remove the gate. The cave may be liable to suffer as a result of these actions. In this form, gating may serve to increase visitation to a cave, and therefore in itself, gating presents a potential risk to a cave.

3.5 Gating may be considered to limit the rights of the individual to visitation of specific caves. (In actuality, as in the Leeuwin-Naturaliste National Park, this right is limited by Permit Systems already in place.)

3.6 A cave gate is by its nature an unnatural structure; thus gating can be seen as an intentional "vandalism" of a cave; an act which may potentially damage the cave entrance, as well as the fauna and flora resident there.

3.7 Cave gating will limit (unofficial?) group access to a cave. Commercial groups may consider that they may suffer financially as a result of this action.

3.8 Gating may potentially limit access to part-time cave occupants such as birds and bats.

4. CAVE GATING AS AN INTEGRATED PART OF A CAVE MANAGEMENT PLAN

Cave gating is certainly not the only, and often not the most appropriate form of management strategy which can be implemented to protect a cave and its environment. There are many alternative management options available which indeed may be more effective. Gating is viewed by some individuals as prohibitive, and as such, alternatives to gating may be considered more "user-friendly".

4.1 Appropriately based interpretive signs are essential in any cave management plan. Placement of these signs is just as important as their content. Placement inside a cave can serve to produce a "conspiratorial" attitude of caring for the cave. Inside placement also ensures information is supplied to caving parties at relevant points in the cave, and thus maximises the effectiveness of such signs. Conversely, interpretive signs outside a cave may be detrimental in that they:

i) draw unnecessary public attention to the cave
ii) may be inadequately read in the rush to "get in"
iii) may be forgotten in the course of the trip
iv) may provide a challenge to some individuals (the vandals)

As mentioned previously, alternative management strategies may be more effective than gating, as is the experience in Hollow Hill cave in New Zealand - in this cave, rather than gate the entrance, interpretive signs have been placed at a position a considerable distance into the cave, but at a position immediately prior to a section where mud poses a risk to formation. This sign alone has proven extremely effective in co-opting cave users to protect the valued decoration from the effects of the mud.

4.2 Appropriate track-marking, which is informative yet aesthetic can reduce or prevent visitation to sensitive areas, whilst not detracting from the cave experience.

4.3 Some form of regulation of access (numbers and quality of cave users) may be essential in a Cave Management Plan. This system of regulation can be on a small scale, for example, the controlling of a single cave, or on a large scale; for example, the Permit System of the Leeuwin-Naturaliste National Park.

4.4 Proximity relays at the entrance of a cave may be an effective and less costly alternative to gating. However, unless these relays are set to provide only a visual and/or sound deterrent to the undesired cave user, such a system would require the proximity of some form of supervision.

4.5 Gating of a cave cannot be seen as a management strategy in itself. Rather, it needs to be conducted as part of an integrated management plan. Furthermore, once gated, a cave inevitably requires that further management measures be implemented, for example, to direct traffic away from vulnerable areas. Gated caves still require some system in place to decide who, and how many people gain access to the cave.

Experience in other parts of the country suggests that gated caves are most effective when they are in close proximity to some form of supervision (for example, in the Jenolan Caves region). This serves as a deterrent to individuals to dismantle/remove/vandalise any gate (such as has occurred at Tantanoola Lake Cave, S.A., a rather isolated cave where vandals drove off with gate attached), and also allows a degree of supervision of the sites.

4.6 Once gated, the management plan for a cave must include regular Limits of Change surveys in order to assess the effectiveness of gating and other management plans. According to the results of such surveys, strategies may be altered, discontinued, or commenced as required. Visitation numbers may be altered in accordance with results.

It goes without saying that in order for a Limits of Change survey to be relevant, the appropriate cave inventory and survey must be conducted prior to gating, in order to provide baseline data.

5. CONSIDERATIONS PRIOR TO THE GATING OF A CAVE

Each cave must be considered on an individual basis; furthermore, the gating of a cave must be considered for its effects upon other caves within the region – for example, how the gating of a particular cave may effect visitation patterns of other nearby caves.

In any region considering an overall management plan which includes the gating of some caves, gating priorities must be set:

5.1 SETTING PRIORITIES

* Which caves are the most valuable, and which of these are most vulnerable to visitation? (Cave surveys and inventories will provide this data.)
* Which of these caves receive the highest rate of casual visitation? (Visitation surveys will provide this data.)
* Which caves are already somewhat protected by their location, or their inconspicuous nature?
* Which caves in the region provide the most significant risks to cave users.

5.2 CONSIDERING INDIVIDUAL CAVES

* Is it logistically possible to gate the cave?
* What are the management objectives for this cave, and will gating meet these objectives?
* Would other management strategies be more effective for this cave?
* If gated, what additional management strategies will need to be implemented?
* Will gating adversely affect the cave environment or ecosystems?
* Will installation cause significant damage to the cave in any way? (And will the benefits of a gate outweigh this damage?)

5.3 GENERAL CONSIDERATIONS

* Is there enough money to gate the cave(s) required?
* Are the gating priorities for the region clear?
* Has the management body (in this case, CMAC) approved the gating procedure?
* Who will construct and install the gate?
* Who will conduct maintenance once the gate is installed?

5.4 FOLLOW-UP

As mentioned previously, regular Limits of Change surveys will be required after a gate has been installed in order to assess the effectiveness of that specific intervention, as well as the other strategies implemented within a particular cave.

6. PROCEDURE FOR THE LOCKING OF A CAVE

i) Gather all available data on the cave, then if necessary:
ii) Conduct a cave inventory and survey, and a casual visitation survey
iii) Formulate clear management objectives for gating the cave
iv) Outline the expected gating impact upon the cave
v) Submit a written application (outlining i & ii) to the local cave management authority, (and/or interested parties such as Caving Clubs)

vi) Parties such as Caving Clubs may then make relevant proposals to the appropriate management authority
vii) The management authority recommendations are then submitted and acted upon.

ALTERNATIVE PROCEDURE

i) The management authority canvasses clubs for suggestions on gating priorities, or concerning the gating of a specific cave.
ii) These suggestions are brought back to management authority and the decision is made at this time.

RECOMMENDATIONS

1. Before considering the gating of a particular cave or the setting of gating priorities by the management authority, background data with which to work must be obtained. It is strongly recommended that the management authority consider obtaining the services of groups or individuals, paid or unpaid, to conduct the necessary surveys ie.:

   i) casual visitation survey
   ii) cave survey and inventory

   Without this data forming the basis of decision making, any action with respect to cave gating will be uneducated and amateurish, and may result in unintentionally causing more damage to a cave(s) within the region.

2. By the very act of gating a cave, it is suggested that to breach a gate is trespass of some form. It would also be an act of vandalism. Without the appropriate penalties for such actions, gating may be ineffective. Provision of some form of supervision for the gated caves of the region would potentially increase both the effectiveness of cave management strategies, and decrease the incidences of vandalism (both to gates and to caves themselves). Therefore, it is strongly recommended that prior to considering further gating in the region, the management authority initiates appropriate penalties for cave / gate vandalism, and also strongly considers appointing a full time ranger whose duties are dedicated specifically to caves.

3. An entrance impact study must be conducted before gating any cave, in order to assess the impact of the gating not only on the cave in question, but also on all the other caves within the region.

REFERENCES

Hunt, G., Stitt, R.R. (1981) ***Cave Gating : A Handbook***
National Speleological Society: Huntsville, Alabama (p.1)

ACKNOWLEDGMENTS

N. Poulter (SRGWA)
R. Webb (WASG)
E. Hamilton-Smith
W. Tyson (SRGWA)