Caving

Australian Adventure Activity Good Practice Guide

Guidance for horizontal and *vertical caving*.

Outdoor Council of Australia
Representing the Outdoor Sector Nationally

Traditional Owner Acknowledgement

We acknowledge the *Traditional Owners* of Country throughout Australia and their continuing connection to land, waters and community. We pay our respects to the people, the cultures and the Elders past and present.

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Version details

Version	Date	Details
1.0	23 Sept 2019	Version one release.
2.0	2026	

Foreword

"When I experience dadirri, I am made whole again. I can sit on the riverbank or walk through the trees; even if someone close to me has passed away, I can find my peace in this silent awareness. There is no need of words. A big part of dadirri is listening."

Dr Miriam-Rose Ungunmerr-Baumann AM

The Australian Adventure Activity Standard and Good Practice Guides are designed to ensure effective, responsible, sustainable and safe delivery of adventure activities to *dependent participants*. They can help people across the outdoor sector to develop appropriately managed adventure activities which enhance individuals and our communities, while protecting the environment and culturally significant places. In doing this, these documents can help ensure that people will continue to enjoy the benefits of adventure activities well into the future.

Best wishes for all your adventures.

The Australian Adventure Activity Standard Steering Committee.
Outdoor Council of Australia

Creation

The Australian Adventure Activity Standards (AAAS) and accompanying Good Practice Guides (GPGs) were developed through a national project and launched in 2019. They drew together, and built upon, the various state and territory-specific adventure activity standards that had previously operated across Australia, replacing a fragmented set of arrangements with a single, nationally consistent voluntary framework. The original development drew on the input of a wide range of outdoor and adventure activity experts with extensive experience, supported by expert advisory groups and informed by open consultation across *activity providers*, education authorities and other stakeholders.

The Steering Committee gratefully acknowledges the members of the various focus groups, industry consultation, working groups and expert advisors for their work and contributions, and thanks the State and Territory Governments for funding the original development.

The AAAS and GPGs are now maintained by the Outdoor Council of Australia (OCA). They are subject to comprehensive review at least every five years, with targeted reviews undertaken in response to serious incidents, fatalities, relevant court decisions, or material changes in regulation or practice. Reviews are overseen by the Steering Committee and conducted in accordance with the AAAS Review and Update Methodology — a pragmatic, mixed-methods process combining legislative and regulatory analysis, currency checking of cited standards and instruments, stakeholder consultation, data-informed *risk assessment*, and structured expert input through the Expert Advisory Group, followed by open public consultation before endorsement.

The first comprehensive review under this methodology was undertaken in 2025–26. The review was facilitated, and the Standard and Good Practice Guides drafted, by The OREAS Group Dr David Marsden for and on behalf of the Outdoor Council of Australia. The Outdoor Council of Australia gratefully acknowledges the contributions of all who took part in the review:

- Dr David Marsden (PhD), Lead Consultant (The OREAS GROUP)
- Lori Modde, Project Sponsor (OCA Chair)
- the members of the AAAS Steering Committee, who provided governance, direction and endorsement of the reviewed documents;

  Lori Modde, OCA Chair, Outdoors NSW, ACT
  David Marsden, Lead Consultant, The OREAS Group
  Andrew Atfield, Tasmania Government
  Andrew Knight, Outdoors Victoria
  Dom Courtney, Outdoors Queensland
  Jodie Freund, South Australian Government
  Katie Brown, Outdoors WA
  Mitchell Hardy, NT Government
  Neil Le Febvre, Outdoors WA

- the members of the Expert Advisory Groups, who contributed specialist knowledge and reviewed drafts across the Core and activity Good Practice Guides; and
- the *activity providers*, education authorities, peak bodies and individuals who contributed through public consultation, focus groups, and submissions.

Further details of the creation and review of the AAAS and GPGs can be found at www.australianaas.org.au, where updates are also published.

Funders

The Steering Committee gratefully acknowledges and thanks the State and Territory Governments for funding the original development and 2026 review.

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Preface

About these documents

The Australian Adventure Activity Standard (AAAS) and related Good Practice Guides (GPGs) are an industry good-practice framework for safe and responsible planning and delivery of outdoor adventure activities with *dependent participants*.

The AAAS and related GPGs provide guidance on responsible activity delivery, including safety and respect for the environment, cultural heritage and other users. They are not a full legal compliance framework.

Activity *providers* are encouraged to obtain independent professional and legal advice in relation to their obligations and duties in delivering adventure activities and should reference the relevant laws to the area in which they intend to undertake the adventure activity.

Dependent Participants

A *dependent participant* is a person who is owed a *duty of care* by the *activity provider* and who wholly or partially on the provider's systems, processes and operational practices for the support, supervision, guidance or instruction needed to take part in an activity. In most cases this means a participant who reasonably relies on the provider for their safety. The degree of dependence may vary over the course of an activity.

Considerations for determining whether a person is a *dependent participant* may include, but are not limited to:

- whether the organisation is providing a service or product to the person
- whether the organisation owes the person a *duty of care* in the circumstances
- whether the person reasonably relies on the provider for the support, supervision, guidance or instruction needed to participate safely.

Considerations for determining the **level of dependence** may include, but are not limited to:

- the foreseeable level of competence of the participant in the activity, and the degree of reliance this creates on the provider's work system, including reliance on *activity leaders*
- the foreseeable level of self-reliance of the participant to reasonably manage their own safety
- the variation, or possible variation, in the degree of dependence or self-reliance throughout the activity
- the individual context, nature and circumstances of the activity
- the relevant circumstances and particular facts relating to the responsibilities assumed by the provider.

Does the Standard and Good Practice Guides apply to me?

The Australian Adventure Activity Standards (AAAS) and associated Good Practice Guides (GPGs) are primarily designed to support activity *providers* conducting lead or supported adventure activities involving *dependent participants* with the aim of delivering safe, responsible and well-managed experiences. Each *provider* must determine, based on their specific circumstances, whether the participants they work with are dependent and/or their level of dependency on the provider's systems and operations. Providers should use the AAAS and relevant GPGs to ensure that the activities they lead are planned and delivered in accordance with the Standard.

Australian *providers* operating internationally can use the AAAS and GPGs as a benchmark for safe practice, while complying with the laws and relevant standards of the jurisdiction in which the activity is conducted. Legal advice should be obtained where activities cross jurisdictions.

Activity providers include outdoor education and adventure businesses, schools, universities, TAFEs, camps, clubs and organised "meet-up" groups, youth organisations, not-for-profits, and community-based organisations that deliver adventure activities to *dependent participants*. An individual may also be an *activity provider* where they hold the ultimate legal *duty of care* to participants. "The Standard" and the GPGs apply to a provider as a "whole organisation" rather than to "specific roles" within it.

Some providers may have their own standards or guidelines appropriate to their *duty of care*. These should be reviewed periodically to ensure current *duty of care* expectations are met, and "the Standard" and the GPGs may assist with such reviews.

Are they legally binding?

The AAAS and GPGs are not legal requirements. However, they may refer to specific laws and regulations which may be legally binding on activity *providers*. Some *land manager*s and other organisations may require compliance. This may be as a condition of obtaining a licence, permit or other permission, or some other condition (e.g. a contract).

Under Australian common law and relevant legislation, *providers* have a legal *duty of care* towards *dependent participants* in some circumstances. In broad terms, the legal duty requires *providers* to take reasonable care that their actions and omissions do not cause reasonably foreseeable injury to *dependent participants*.

It is important to be aware that adventure activities in Australia operate within a complex legal landscape. *Activity providers* must understand the obligations that apply to them and seek independent professional and legal advice where any obligation is unclear.

The following obligations include, but are not limited to, those set out in detail in Appendix A — Principal legal obligations, grouped by the function each obligation performs:

- Work health and safety — the foundational legal duty for the majority of providers, including the primary *duty of care*, officers' due-diligence duty, consultation, safe systems of work, and notifiable-incident reporting.
- *Duty of care*, negligence and consumer protection — the common law *duty of care*, the Civil Liability Act (or equivalent) of each state and territory, and the Australian Consumer Law.
- Protection of children and vulnerable persons — Working with Children and Working with Vulnerable People schemes, Child Safe Standards and Reportable Conduct Schemes.
- Transport of participants — land, water and air — heavy vehicle, road transport, domestic commercial vessel, recreational marine and civil aviation obligations.
- Land access, environment and cultural heritage — park, Crown land and reserve licensing, the EPBC Act, Aboriginal cultural heritage law(s) and/or regulation(s), and biosecurity duties.
- Information privacy, equity and employment — the Privacy Act and Australian Privacy Principles, anti-discrimination law(s) and/or regulation(s), and the Fair Work Act and relevant award.
- Substances, food and licensed items — medicines and poisons, food safety, liquor and tobacco, and firearms obligations.
- Activity-specific licensing — fisheries and recreational fishing licensing, and animal welfare duties.

Appendix A is an orientation only and is not exhaustive. It does not constitute legal advice, and the relevant law(s) and/or regulation(s) of the jurisdiction(s) of operation must in each case be determined and complied with.

Structure of the Standard and Good Practice Guides

The guidance for adventure activities comprises several related documents. For any activity, the AAAS (the Standard), the Core GPG, the relevant activity GPG, and any applicable Explanatory Notes issued by the Outdoor Council of Australia, from time to time, should be consulted.

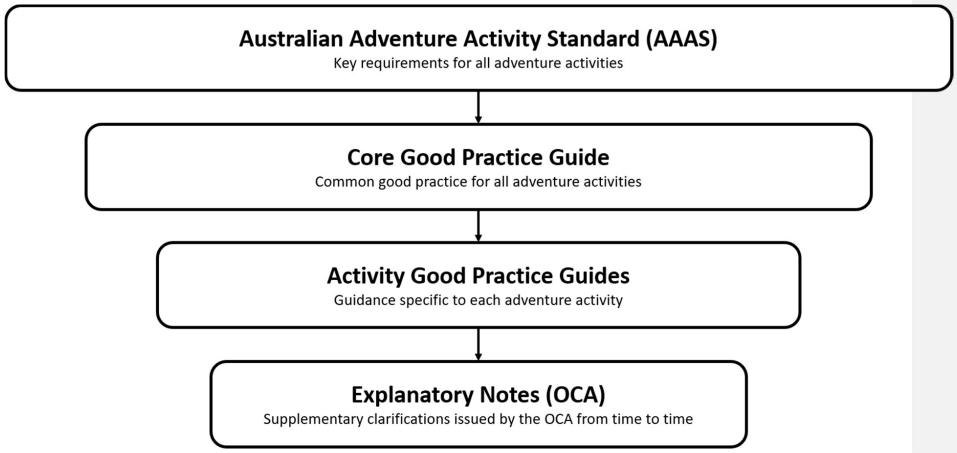

Figure 1.1: Structure of the Standard and Good Practice Guides

The documents present cumulatively more specific information. Providers should determine how they use the AAAS and GPGs based on their context and need, and are encouraged to draw on them when developing and reviewing their standard operating procedures. Activity providers are encouraged to obtain independent professional and legal advice on their obligations and to reference the laws relevant to the area in which they operate.

Interpretation of the Standard and Good Practice Guides

The following words and phrases are used in all documents and have specific meanings:

Must: used where a provision is mandatory, if the provider is to operate fully in accordance with AAAS or GPGs. (This is equivalent to the keyword "shall" used in other voluntary standards e.g. Standards Australia, other International Standards Organisations (ISOs) etc.)

Should: used where a provision is recommended, not mandatory. It indicates that the provider needs to consider their specific situation and decide for themselves whether it applies or is relevant. A "should" statement describes good practice. Departure from a "should" statement does not of itself establish a breach of duty — a provider may meet its obligations by other means appropriate to its context — but providers should be able to explain the basis for a different approach.

Can/cannot: indicates a possibility and capability.

May/need not: indicates a permission or existence of an option.

But are/is not limited to: used to indicate that a list is not definitive and additional items may need to be considered depending on the context.

The following formatting is used throughout:

Defined words are in italics. They are defined in the Glossary.

Examples are in smaller italic 9-point font.

In document references are underlined. References are to section heading titles.

External web or Australian AAS & GPG document links are dotted underline italic.

1 Introduction

1.1 Caving

Caving is entering and/or moving through an underground passage and/or cavern created by natural geological processes. The underground passages and/or caverns are called caves. A cave may have passages and/or caverns of varying sizes and complexity.

The common feature is the total absence of light and communication difficulty with the surface beyond the entrance of the cave. Other challenges involved in entering and/or moving through caves include a limited ability to see the terrain where the feet are to be placed, negotiation of vertical climbs or drops, tight *squeezes* and water hazards.

Caves can be sensitive environments. Further information on specific caves, can be obtained from relevant *land managers* and the *Australian Speleological Federation* (ASF).

Those introduced to caving should experience role modelling of the appropriate relevant procedures.

Caving activities are categorised in this Good Practice Guide (GPG) into three activity types: simple caving, *horizontal caving* and *vertical caving*.

1.2 Simple caving

A "*simple cave*" is a cave with the following attributes:

A *simple cave* must not contain any area that has the attributes of a *horizontal cave* or *vertical cave*; the classification applies to the cave in its entirety, not only to the portion accessed during an activity.

- caverns where light from an exit is always visible OR single caverns where progression to an exit is obvious by moving in either direction
- AND there are no water hazards requiring submersion, swimming or *roof-sniffing*
- AND there is minimal risk of *foul air*
- AND any vertical features are protected by fixed ladders or staircases (i.e. the cave does not contain unprotected vertical features)
- AND there is no loose rock or material likely to cause rockfalls
- AND the cave is of sufficiently low difficulty that a *responsible person* with no caving experience could find their way out of the cave if the cave leader/instructor became incapacitated.
- AND a *simple cave* may involve walking, limited scrambling, or crawling (and any vertical movement is limited to fixed ladders or staircases), but does not involve the complex or challenging movement associated with *horizontal caving* or *vertical caving*.
- AND a *simple cave* does not contain significant drops, unstable vertical features, loose rock, or rockfall hazards.

1.3 Horizontal caving

Horizontal caving is traversing through a cave where any fall safety required can be achieved by assistance (e.g. spotting). It may involve walking, scrambling, crawling through narrow or low spaces, fording pools or streams and climbing up or down short rock faces/rock piles. Water hazards such as moving water may be present. A wide range of assistance can be used.

Spotting is a support process provided by a person, or persons, who offer physical protection of the head and upper body of a person should they fall. (Note that this differs from helping to guide the hand and foot placement while clambering up or down obstacles, which is called "*marking*" in this GPG. *Marking* helps to prevent falls while *spotting* helps protects the person if they fall.)

Climbing while *horizontal caving* can occur on short steep slopes and may use *spotting* as the means of providing fall protection.

1.4 Vertical caving

Vertical caving is the descent, traversing and/or ascent of vertical or near vertical caves, where fall safety can only be achieved with a *belay system* due to the *fall height*.

It may involve the use of ropes, ladders and/or descending/ascending equipment to climb up, down or traverse vertical drops. *Vertical caving* can involve *single-pitch* or multi-pitch abseils and climbs, as well as sections of *horizontal caving* as described above.

Abseiling is descending vertical or near vertical natural surfaces using ropes and descending friction devices to manage the descent. It is also known as rappelling. *Abseiling* involves descending a rope by either walking backwards down a vertical or near vertical surface or lowering while free hanging.

Climbing is ascending, traversing or descending vertical or near vertical natural surfaces. For the purposes of this GPG climbing may also include ascending a fixed rope or using a ladder.

Climbing or *abseiling* without an equipment-based fall-protection system is considered unacceptable, except where the *fall height* is short, the consequence of a fall is rated low, and *spotting* (or another approved assistance technique) is appropriate to the climber, route, and conditions.

1.5 Exclusions

Activities that are not covered by this Good Practice Guide are:

- unexplored caves
- *tourist/show caves*
- *artificial caving* such as man-made features such as drains, mines or tunnels
- *cave diving*
- water obstacles that involve breath holding (e.g. duck under, swimming underwater)

Appendix A extended stays (e.g. camping in caves).

Where a *provider* may encounter water obstacles involving breath-holding or submersion as part of cave access, refer to the Canyoning GPG and Core GPG risk-management provisions; this GPG does not provide activity-specific guidance for those obstacles.

1.6 Related activities

Abseiling and *climbing* related information is generally included in this Caving GPG. However, the Abseil and Climbing GPG is a recommended reading resource.

Where *bushwalking* occurs to access caves, then the Bushwalking GPG should be complied with.

Where *canyoning* occurs to access caves, then the Canyoning GPG should be complied with.

2 Management of Risk

Risk management in outdoor and adventure settings is highly context-specific. In natural environments there is an almost infinite range of combinations of participants, purpose, weather and local conditions, and every provider differs in structure, size, philosophy and operating environment. *Risk management* therefore cannot be a 'tick-the-box' exercise or a 'one size fits all' approach; risk systems should be flexible, adaptive and highly responsive to the circumstances of each activity, drawing on recognised frameworks such as AS ISO 31000:2018 and AS ISO 4980:2023.

The section guides providers to build a risk system that fits their own structure and operating environment rather than copying another organisation's. A volunteer-led club might apply it as a lightweight but documented plan with strong dynamic assessment in the field; a commercial operator might use it to underpin a formal, audited *risk management* system. In every case it directs the provider to make risk thinking flexible, adaptive and responsive to the actual circumstances of each activity.

2.1 Context Matters

See Core GPG (Management of Risk).

2.2 Risk management framework and process

See Core GPG (Management of Risk).

2.3 Risk management plan

See Core GPG (Management of Risk).

2.4 Dynamic risk assessment

See Core GPG (Management of Risk).

2.5 Incident reporting

See Core GPG (Management of Risk).

3 Planning

Sound planning is what turns intent into safe and consistent delivery. Clear management and approval processes help a provider manage risk, with the people responsible for approving processes, plans and procedures varying according to the organisation's context. Good planning considers the purpose of the activity, the people involved, group size, the cultural and environmental values of the place, and what to do when conditions change or things go wrong.

Here the guidance helps a provider translate intent into a repeatable, defensible process. Approval roles can be scaled to context — a single coordinator in a small operation, or a tiered sign-off structure in a larger one. The material can shape activity-plan templates, prompt early engagement with *Traditional Owners* and *land managers*, and ensure emergency planning and field documentation are in place and reviewed before participants arrive.

3.1 Management and approval of activities

See Core GPG (Planning).

3.2 Activity plans

Activity plan considerations should include but are not limited to:

- aims and objectives of activity
- selection of suitable caves that are able to withstand repeated visits
- cave environment and hazards:
    - wet
    - dry
    - cave temperature
    - possible *foul air* hazards
    - possible transmission of diseases

    - potential for cave flooding
    - rock stability
    - flora
    - fauna
- obstacles to overcome (e.g. *horizontal caving* sections, squeezes, single pitch or multi pitch vertical sections, water hazards)
- navigation difficulty
- access and remoteness of the cave system
- the leadership requirements including but not limited to:
    - supervision requirements specific to the site
    - competencies required by *activity leaders*
- relevant items listed in leadership sections
- toileting facilities and appropriate waste disposal options
- sustainability requirements and protection of cave features
- contacting sources of local knowledge
- participants involved including but not limited to:
    - group size
    - relevant items listed in participant sections
    - the skill level of the participant group
    - the equipment appropriate to the activity and to the participant group
- obtaining further information on specific caves, which can be obtained from relevant *land managers* and the *Australian Speleological Federation* (ASF).

See Core GPG (Planning) for the general requirements and further detail.

3.3 Group size

See Core GPG (Planning).

3.4 Cultural, environmental and historical values

See Core GPG (Planning).

3.5 Emergency management planning

Also refer to Core GPG - Emergency management planning.

A *non-participating contact* must be used as part of the emergency management plan for all caving activities. Before the activity commences, the *activity leader* must ensure the surface contact is informed of: the planned cave entry location and route; the expected entry and exit times; a trigger time after which the surface contact must initiate emergency contact procedures, including contacting emergency services (Triple Zero — 000).

Emergency management plans must include:

- communication requirements for emergencies, including:
    - communication within the cave system (noting that voice communication underground is limited in range and *activity leaders* may be out of voice contact for periods of time);
    - communications between the cave entrance and the *non-participating contact* above ground;
    - communications, where required, with emergency services (e.g. via the *non-participating contact*, mobile coverage at the cave entrance, satellite messenger, or other available means);
    - procedures to follow when the *non-participating contact*'s nominated emergency action time is reached, including the actions to be taken at the cave entrance, the cave-to-

surface communication *trigger points*, and the surface-to-emergency-services escalation pathway.

- management of cavers trapped in *squeezes*
- guidance on *trigger points* for considering the possibility of *harness hang syndrome* occurring (refer Appendix X)
- appropriate actions to follow where *harness hang syndrome* is suspected, including but not limited to the relevant first aid treatment.

Events must be treated as an emergency where a person is hanging in a harness and is:

- unconscious or
- is unable to continue to progress either up or down for an extended period of time.

Activity leaders must be competent in using relevant rescue systems, and procedures must be practiced periodically.

See Core GPG (Planning) for the general requirements and further detail.

3.6 Activity leader required documentation

See Core GPG (Planning).

4 Diversity, equity and inclusion

Adventure *activities* are delivered by, and for, people of diverse identities, abilities, cultures, life experiences and circumstances. Recognising that diversity, and providing equitable opportunities for safe and meaningful participation, is fundamental to safe and effective practice.

In practice this section guides providers to design activities that include rather than exclude, applying across interactions between leaders, participants and others encountered during an activity. A provider can use it to review enrolment and communication practices for barriers, build cultural and psychological safety into leader briefings, and ensure complaint and review mechanisms are visible and accessible. It is intended to be read alongside the Participants and Responsibilities sections rather than in isolation.

The recommendations in this section apply alongside, and inform the application of, the subsequent sections of the Core, including without limitation 5 Participants, 5.3 *Vulnerable participants*, 5.5 Privacy of information, j2pqeh53snxp3zsexu8e3ee94.3 Cultural safety, 4.4 Psychological safety and dignity, and 8 Responsibilities and roles. Those sections continue to apply in their own terms; where requirements overlap, the more onerous applies.

4.1 Diversity of participants and leaders

See Core GPG (Diversity, equity and inclusion).

4.2 Inclusive practice

See Core GPG (Diversity, equity and inclusion).

4.3 Cultural safety

See Core GPG (Diversity, equity and inclusion).

4.4 Psychological safety and dignity

See Core GPG (Diversity, equity and inclusion).

4.5 Information, communication and consent

See Core GPG (Diversity, equity and inclusion).

4.6 Leader competence

See Core GPG (Diversity, equity and inclusion).

4.7 Concerns, complaints and review

See Core GPG (Diversity, equity and inclusion).

5 Participants

Every activity depends on the people taking part, and on the information and support they receive before and during it. Pre-activity information and communication help potential participants, parents or legal guardians and client organisations make an informed decision about taking part, and continue through consent, acknowledgement of risk, and the care of those who may be vulnerable. Supporting participants well — from first enquiry to supervision in the field — is central to safe and respectful practice.

Its purpose is to help a provider ensure people know what they are signing up for and are appropriately supported once they arrive. Pre-activity information can be adapted to the audience and activity, participation restrictions set defensibly, and additional safeguards put in place for *vulnerable participants* and minors. The supervision guidance lets a provider calibrate direct versus *indirect supervision* to the activity, environment and group.

5.1 Information provided to participants pre-activity

Pre-activity information provided to participants should communicate:

- expectations and activity conditions
- potential hazards and risks
- any necessary pre-requisite skills & knowledge to undertake the activity.

5.2 Participant restrictions

Pre-activity planning should consider whether a pre-activity assessment of prerequisite participants skills and knowledge is required.

When prerequisite participants skills and knowledge are required an appropriate pre-activity skills and knowledge assessment should be conducted.

Participant restrictions may include screening for:

- items listed in the Core GPG - Participate restrictions section
- a minimum age
- those that are socially, emotionally or psychologically unsuited
- those that experience claustrophobia
- those uncomfortable in water where *roof-sniffing* is required to progress through the cave
- individual body size restrictions if there is no practical alternate route for:
    - tight *squeezes* or
    - where a required length of reach is essential to overcome obstacles.

5.3 Participant health and wellbeing

See Core GPG (5 Health and wellbeing).

5.4 Supervision and management during the activity

5.4.1 Overview

Appropriate supervision must be provided at all times during the activity.

5.4.2 Caving group size considerations

Considerations when determining group size must include:

- cave capacity (including *land manager* requirements)
- characteristics of the cave including tight spaces, temperature and water hazards
- the *vertical caving* safety systems required or being used
- ability to implement sustainability practices and protect features within the cave
- cave related legislation, regulation or *land manager* requirements
- the time allowed to enable all participants in the group to complete the activity is sufficient and realistic and does not compromise safety
- hazards to the caving environment
- assessment of remoteness and the time and distance involved to complete the activity
- considerations for determining group size outlined in Core GPG.

5.4.3 Caving supervision considerations

Considerations for determining supervision requirements must include:

- characteristics of the cave including tight spaces, vertical sections and water hazards
- the *vertical caving* safety systems required or being used
- participant competence
- the number of participants
- supervision requirements of participants who are waiting to use *vertical caving* safety systems
- time for the *activity leaders* to allow all participants to undertake the activity being sufficient and realistic
- cave related legislation, regulation or *land manager* requirements
- general considerations for determining supervision requirements outlined in Core GPG.

The supervision requirements and ratios for programs that train/teach participants to become leaders or instructors should be determined on a case-by-case basis, according to the progress of those participants towards being fully independent leaders or instructors themselves.

5.4.4 Simple caves recommended supervision

The supervision for *simple caves* must be determined on a case by case basis taking into account the above-mentioned considerations.

The recommended supervision for a *simple cave* is:

1 a minimum of 1 caving leader/instructor and 1 assistant caving leader

~~2~~ a ratio of no greater than 7 participants to 1 *activity leader*.

5.4.5 Horizontal caving recommended supervision

The supervision for *horizontal caving* must be determined on a case by case basis taking into account the above-mentioned considerations.

The recommended supervision for *horizontal caving* is:

- having a minimum of 2 *activity leaders*
- with a minimum of 1 caving leader and 1 assistant caving leader
- a maximum group size of 12 including *activity leaders* (i.e. ratio 5 participants to 1 *activity leader*).

5.4.6 Single and multi-pitch vertical caving recommended supervision

The supervision for single and multi-pitch *vertical caving* must be determined on a case-by-case basis taking into account the above-mentioned considerations.

The recommended supervision for pre-rigged *vertical caving* is:

- having a minimum of 2 *vertical caving* leaders/instructors
- a maximum group size of 10 including caving leaders/instructors (i.e. ratio 4 participants to 1 caving leader/instructor).

The recommended supervision for 'rig as you go' *vertical caving* is:

- having a minimum of 2 *vertical caving* leaders/instructors
- where there is a reduced ability for *direct supervision* during the activity a maximum group size of 8 including caving leaders/instructors (i.e. ratio 3 participants to 1 caving leader/instructor)
- otherwise a maximum group size of 10 including caving leaders/instructors (i.e. ratio 4 participants to 1 caving leader/instructor).

Abseiling and climbing system supervision

Recommended supervision is 1 x *vertical caving* leader/instructor to 1 x *belay system* in use.

Participants that are *non-actively participating*

Consideration must be given to the type of supervision participants require when *non-actively participating* (i.e. who are waiting to abseil or climb).

In cases where participants who are *non-actively participating* in *climbing*, *abseiling* or belaying require *direct supervision*, that supervision must be provided by an *activity leader* not providing *direct supervision* of an activity or by a *responsible person* as appropriate.

5.5 Managing caving activities

The *Australian Speleological Federation* (ASF) has information and resources that can also provide activity safety guidance.

5.5.1 Knowledge of site

The knowledge and experience of the activity site that *activity leaders* require before leading participants at that site, should be considered when allocating *activity leader* roles.

5.5.2 Activity information provided to caving participants

The required information to be given to participants must be determined prior to the activity.

Required information must be provided at the appropriate time before or during the activity.

Activity information that should be provided to participants includes but is not limited to:

- the plan for running the activity
- who is controlling the activity and who to ask for guidance
- relevant participant responsibilities
- strategies for conservation
- site specific hazards and risks
- the correct fitting of personal equipment and this is to be checked before use
- any appropriate technique(s) for the activity
- communications systems and requirements
- lost procedure
- toileting arrangements
- relevant permit conditions for entry

- any other relevant activity information or procedures.

5.5.3 Managing darkness

Light sources must be used while moving in darkness.

Also see 5.1.2 Darkness.

5.5.4 Progression through a cave

Procedures must be used to reduce the potential of:

- unanticipated changes in water levels impacting activity safety
- slippery surfaces related hazards and risks
- rock fall hazards and risks
- getting lost (also see 5.1.3 Cave navigation)
- group becoming separated
- water related hazards and risks (refer below 7.5 Water hazard management)
- falls from height hazards and risks (refer below 7.6 Falls from height management and 7.7 Vertical caving management)
- damaging features in the cave
- equipment failure.

Considerations while progressing through a cave must include:

- selection of a route that best provides a suitable adventure for the participants while keeping within the accepted level of risk
- what alternative route options can be offered to participants to meet their individual abilities or requirements
- monitoring participants actions to avoid damaging features in the cave
- what warnings need to be provided regarding current hazards and risks
- what instruction is required to avoid or minimize current hazards and risks
- what alternative techniques that may be used to overcome obstacles or hazards and/or reduce risks (e.g. swimming rather than walking on slippery rock etc.)
- avoiding interference with animals
- the supervision required as participants encounter and/or use techniques to overcome obstacles or hazards
- what aids can be used to address risks (e.g. establishing traverse-lines etc.).

Procedures to manage progress must include:

- each person having visual contact with the person directly in front of them
- regularly monitoring the physical and psychological condition of the group
- maintaining control of the pace of the group
- regularly monitoring to ensuring all members are still with the group
- having a designated person as the last person of the group
- where appropriate having the group *marking* each other whenever necessary to reduce the possibility of falls.

5.5.5 Negotiating tight spaces

Factors to consider when negotiating tight spaces must include:

- the person's size in relation to the tight space
- correct and incorrect movement techniques
- equipment becoming snagged
- high water levels blocking access to air
- obstacles blocking the passage

- potential for participant panic
- *activity leader* inability to assist due to their size.

At least one *activity leader* must be able to negotiate the tight space to access the participant in an emergency.

Activity leader intervention must be possible, at all times during tight space activities (e.g. voice or physical contact).

Tight space activities should suit the abilities and size of participants and *activity leaders*.

Where the planned exit involves a challenging tight space there should be alternative options for exiting the cave.

Before entering tight spaces, equipment should be arranged to make it unlikely to snag.

For tight spaces that involve water, refer 7.5.1 Tight spaces involving water below.

5.5.6 Falling objects

Procedures to minimise the possibility or impact of falling objects must include:

- ensuring appropriate helmets are worn as specified in the equipment section
- briefing participants on potential hazards and how to avoid dislodging objects
- briefing participants on how a group's and individual's exposure within potential fall areas is minimised
- supervision of participants while they are located above other people
- checking the site and *anchors* prior to use if *vertical caving*
- designating *waiting areas* that reduce the expose to falling objects if *vertical caving*.

Procedures to minimise the possibility or impact of falling objects may include where allowed, removal of loose objects that are likely to fall prior to running the activity.

Also see 5.1.6 Loose rock and 7.4.9 Cave-ins and rockfall.

5.5.7 Foul air

Areas of *foul air* must not be entered except in exceptional circumstances.

Procedures must address the potential for entering *foul air*:

- monitoring for early signs of entering *foul air* (see Appendix Y)
- monitoring to identify potential areas for *foul air* (see Appendix Y)
- not using fires or stoves in caves
- caves with known issues are appropriately tested immediately prior to taking a group in using suitable equipment.

Also refer to Appendix Y Foul air.

5.5.8 Preventing disease transmission

Also refer:

- Environment 5.1.5 Disease transmission
- Environment 5.5 Wildlife safety
- Environmental sustainability procedures 5.7.6 Respect wildlife.

5.5.8.1 Animal to human disease prevention

Procedures to address the potential for people contracting diseases must include:

- not drinking water from sources that are possibly contaminated via the catchment system

- avoiding caves at times of year where inhaling histoplasmosis fungal spores are most likely (e.g. dry season)
- avoiding direct contact with bats and bat droppings
- avoiding water potentially contaminated with water borne infections, including wading or swimming in the water.

5.5.8.2 Human to animal disease prevention

Procedures to address the potential for animals contracting diseases may include:

- using appropriately cleaned equipment and clothing (refer section 6.4)
- checking international visitor's footwear and clothing has been appropriately cleaned to reduce the potential spread of *White Nose Syndrome*
- wearing gloves while caving in sensitive areas.

5.5.9 Cave-ins and rockfall

Unstable areas in a cave with elevated risk of cave-ins or rockfalls must be avoided.

5.5.10 Other situations requiring management

An appropriate system of communication must be developed and used throughout the activity.

A plan must be in place to appropriately manage those with claustrophobia.

Those with pre-existing medical conditions (e.g. allergies, asthma, diabetes, etc.) must be monitored for the occurrence of the condition's symptoms.

Playing tricks on others must be strongly discouraged.

Other situations requiring management

- Refer below for 7.5 Water hazard management
- Refer below for 7.6 Falls from height management
- Refer below for 7.7 Vertical caving management.

5.6 Water hazard management

5.6.1 Tight spaces involving water

Movement involving *dependent participants* through tight spaces filled with water must:

- have an airspace to breath (i.e. the water level allows for *roof-sniffing*)
- not involve breath holding or full submersion (e.g. *duck-unders*, *sumps*).

5.6.2 Water activity information for participants

The information and requirements to be communicated for water hazards *may* include but are not limited to:

- information and requirements listed in 7.4.2 Caving activity information above
- suitable information and instruction on hazard avoidance including but not limited to:
    - wading and/or swimming techniques suited to the route to be negotiated
    - ways to recognise hazards where appropriate.

5.6.3 Water activity management

Water activity management must include:

- addressing the hazards and risks (refer Appendix Z Water hazards and considerations)
- monitoring that water levels are within the maximum and/or minimum water level *trigger points*
- prior to entry monitoring weather conditions and where possible weather forecasts and warnings including flood and flash flood warnings where available

- consideration of:
    - the water temperature
    - the length of swims or wades
    - the overall amount of swimming or wading involved
    - the need for buoyancy aids (refer Appendix A7.4 Buoyancy aids)
    - use of appropriate water activity management procedures (refer Appendix Z Water hazards and considerations)
- appropriate storage or management of ropes to avoid entanglement while in water
- consideration of hazards and risks and appropriate activity management procedures for:
    - crossing moving water (refer Appendix A7.2 Crossing moving water)
    - jumping into water if it occurs (refer Appendix A7.3 Jumping from height into water).

5.7 Falls from height management

5.7.1 Falls from height considerations

Considerations for the likelihood of a fall from height should include but are not limited to:

- how close to the edge cavers are
- the slope of the surface being stood on
- the stability and grip (or slipperiness) of the surface being stood on
- obstacles that need to be negotiated
- abilities of participants including the ability to follow instructions.

Falls from height can be unprotected or protected. Protection can be achieved by using:

3 an equipment-based fall safety system such as a *belay system* or *traverse-line*
4 *spotting*.

5.7.2 Unprotected climbing

Unprotected climbing must only be used where the risk of a fall from height is acceptably low and this indicates the climb does not require the use of a fall protection system.

5.7.3 Fall protection systems

Considerations when determining the type of fall safety system used should include but are not limited to:

- the likelihood of falling
- the *fall height* involved
- the hazards within the *fall zone*
- whether the surface has holds on vertical, inclined and/or overhanging surfaces
- the body orientations of the person that the holds permit (e.g. if they fall the person's body orientation means they will land headfirst or horizontally on their back)
- the supervision required.

5.7.4 Spotting

Spotting is a support process provided by a person, or persons, who offer physical protection of the head and upper body of a person should they fall. *Spotting* may occur together with *marking*.

Where there is a risk of an unprotected fall from height and this is not appropriate, the use of *spotting* or an equipment-based fall protection system must be considered.

Where a risk of an unprotected fall from height and/or a risk of a fall from height protected by *spotting* is not appropriate, the use of an equipment-based fall protection system must be used.

5.7.5 Equipment based fall protection systems

An equipment-based fall protection system must be used where:

- unprotected *climbing* and/or *spotting* is not appropriate
- bridging gaps
- ladders are used to climb up or down, and involve a *fall height* where unprotected *climbing* is not appropriate.

Refer 6.1.3 Vertical caving equipment requirements and 6.3 Use of vertical caving equipment.

5.7.6 Participants belaying or spotting

Considerations for when participants operate *belay systems* or *spotting* should include but are not limited to:

- participants are willing and capable
- appropriate training is provided
- the need for ongoing monitoring to ensure:
    - correct technique is used
    - attention to the task is maintained
    - equipment is used correctly
    - appropriate communication with the caver *climbing* or *abseiling*.

5.8 Vertical caving management

5.8.1 Vertical caving activity information provided to participants

Activity information that should be provided to participants *vertical caving* includes but is not limited to:

- the activity information listed above in section 7.4.2 Activity information provided to caving participants
- specific risks for vertical situations
- the correct use of the belay or other fall protection systems.

5.8.2 Vertical caving falls from height

Also refer to 7.6.1 Falls from height considerations section above.

To protect from a fall from height, procedures must include checking participant(s):

- equipment is correctly fitted before participants need to rely on a safety system
- correct attachment to the *belay system*, abseil system and/or other safety systems.

To reduce the potential for and/or severity of falls from height, procedures must include:

- ensuring ropes are of a sufficient length for the pitch and have a knot tied in the end located at the bottom of the abseil
- removal of unnecessary slack in belay or *anchor system* before use
- monitoring the correct use of *belay systems*
- monitoring attachment to *anchors* or *belay systems*
- monitoring belay rope(s) to keep them at the appropriate length
- monitoring *belay systems* to remove unnecessary slack in belay ropes as cavers progress
- providing appropriate instruction to mitigate risks caused by the stretch in *dynamic rope*
- designating what areas that are not to be entered
- designating *waiting areas*
- designating areas that can only be accessed when attached to the *belay system*
- checking correct attachment to the *belay system*, safety or other systems.

Bridging gaps

An appropriate fall protection system must be used when crossing significant open spaces/gaps.

5.8.3 Use of ladders and staircases

Fixed in-place ladders and staircases must be checked to verify that they are suitable to use.

Procedures should include managing the use of staircases and fixed ladders.

Ladders

Procedures should ensure only one person uses a ladder at a time.

Rigid ladders must be checked that they are fixed or secured appropriately to prevent movement.

The need for using a *belay system* while climbing ladders must be determined by an appropriate *risk assessment* on a case by case basis.

A belay must use when using wire ladders.

An appropriate briefing on avoiding hand and finger entrapment must be provided when using wire ladders.

5.8.4 Swinging falls

To reduce the potential for injury or damage to participants or equipment consideration should include but is not limited to the possibility of participants:

- taking a route on an angle that creates the potential for a pendulum swing if control is lost
- swinging or falling against or across hard, abrasive or sharp objects.

5.8.5 Entanglement and snags

Belay ropes should be monitored to keep them at the appropriate length and tension, to prevent the possibility of a slack rope becoming entangled or snagged.

To avoid entanglement in ropes and devices:

- long hair must be secured to stop it being able to be entangled
- loose jewellery (e.g. bracelets and necklaces) should be removed or secured
- loose clothing and drawstrings should be secured.

To avoid being caught or snagged, where there is such a risk:

- rings should be removed or taped over
- body piercings should be removed or taped over.

5.8.6 Anchors and the belay & activity systems

Anchors should be sufficient to withstand the loads likely to be experienced in a fall or during rescue.

All abseil ropes must have a knot tied in the end located at the bottom of the abseil.

Procedures to ensure that all systems function as intended must include:

- *anchor systems* are assessed as suitable to support the intended loads
- *anchor systems* and equipment are suitable for the activity, site and participants
- appropriate knots and connections are used
- regular inspection of all *anchors* and connections where practicable
- operating procedures and checks used will prevent unplanned disconnection of any part of the system
- checking attachment to and disconnections from the system during the activity.

Where a *belay system* requires a *belayer*, either the *belayer* must be:

- a competent *belayer*; or
- under *direct supervision* of an *activity leader*.

Also refer equipment section 6.3.6 Rescue systems and rigging for rescue.

5.8.7 Belay systems

Equipment and systems to affect a vertical rescue must be available.

At least one appropriate belay method must be used to protect a caver *abseiling* or *climbing*.

Appropriate communication systems (e.g. calls, whistles, radios, rope tugs) must be able to effectively communication between the top and bottom of the pitch.

Belay methods include but are not limited to a *top belay* system and *bottom braking*. (For example, a *top belay* system for using ladders, *bottom braking* for single rope techniques for descending.)

A *top belay* system must be used for participants when ascending or descending ladders and ascending ropes.

Considerations for using a *top belay* system should include but are not limited to:

- any stretch in the *belay system* still allows it to effectively protect a fall
- appropriate communication between the top and bottom of the pitch
- the likelihood of the abseiler spinning and twisting the belay and abseil ropes together e.g. free *abseiling*, *abseiling* over overhangs.

Bottom braking must be used for participants when descending using single rope techniques (SRT).

When *bottom braking* is used the appropriate equipment must be used and correctly adjusted to ensure the descent speed is appropriate.

Refer section 7.7.10 Bottom braking below for considerations for using *bottom braking*.

5.8.8 Traverse-lines

To protect from a fall from height, procedures when using a *traverse-line* should include but are not limited to:

- having attachment points easily accessible and in safe locations
- lines rigged above waist height
- monitoring so that lines remain above waist height
- avoiding the use of lanyards to protect vertical travel in conjunction with *traverse-lines*
- consideration of peak forces on cavers and equipment when:
    - establishing *traverse-line* angles and *anchors*
    - choosing the type of equipment used (e.g. static or dynamic material)
- methods for staying attached at change over points that still require protection (e.g. 'add protection before you subtract protection')
- checking *carabiner* use, locking and orientation
- the number of cavers using it at one time is appropriately limited
- a maximum of one caver between each intermediate *anchor* point.

5.8.9 Longer abseils

Considerations for longer abseils should include but are not limited to:

- appropriate communication systems (e.g. calls, whistles, radios) to enable effective communication between the top and bottom of the pitch
- use of an appropriate *belay system* that effectively protects a fall including checking if *bottom braking* is effective over the length of the abseil
- use of an appropriate descender device to handle the heat build-up over the length of the abseil
- issues caused by the weight of the rope(s)
- the time the abseiler will be suspended in a harness
- strategies to manage the varying amount of friction experienced over the length of the abseil.

5.8.10 Bottom braking

A *bottom braking* belay must be directly supervised by an *activity leader*.

Considerations for using *bottom braking* should include but are not limited to:

- that any stretch in the *belay system* still allows it to effectively protect a fall
- the appropriate equipment required to ensure the descent speed is appropriate
- the ability of the *belayer* to react in time to stop the abseiler
- the *belayer* having an appropriate location to operate the belay from, including but not limited to stable footing
- the *belayer*'s competence or the ability to be appropriately supervised
- the activity aims, and objectives being suited to the participants
- any policy requirements of the organisation engaging the provider to deliver activity for its participants (e.g. education department policy)
- the appropriateness of the site
- the additional risks where abseilers are free hanging and/or negotiate overhangs and this is suited to the participants
- the ability of the *belayer* to communicate with the abseiler at all times
- the likelihood of objects falling on the *belayer*
- the ability of the *belayer* to see the abseiler at all times
- appropriate communication between the top and bottom of the pitch.

5.8.11 Abseiling in waterfalls or into water

Abseiling in vertical water flows (e.g. a flowing waterfall) must only occur where:

- is appropriate for the aims and objectives of the group
- an appropriate *risk assessment* has been completed
- the vertical water flow is such the abseiler is not impacted directly by the force of the water
- appropriate management procedures are used to address the risks created by the vertical water flow.

Abseiling directly into water must only occur where:

- an appropriate *risk assessment* has been completed
- appropriate management procedures are used to address the risks created by the water including its depth and if it is flowing water.

5.8.12 Multi-pitch activities on the same vertical section

This section refers to multi-pitch activities where to ascend, traverse or descend the same vertical section, progress is made by using more than one pitch and establishing *belay systems* mid route (e.g. on a ledge). In this situation, additional considerations are required that are not required when completing a series of single pitch sections that are separate from each other.

The appropriateness of activities involving multi-pitch caving where *belay systems* need to be established mid route on the same vertical section must be:

- determined on a case-by-case basis
- appropriate for the aims and objectives of the group.

A pre-activity check and ongoing monitoring must be used to confirm that the activity follows and uses the correct route and belay station locations.

Participant management practices should be used to prevent overcrowding at belay stations.

Participants should have:

- prior experience in the activity or the opportunity to undertake a single pitch of the activity, before being committed to completing a multi-pitch activity
- the competence in using basic skills to temporarily operate out of line of sight or communication of an *activity leader*.

Procedures must enable appropriate communication between groups at each *belay system*.

Additional pre-activity information should include but is not limited to the method of transferring from the activity *belay system* to a fixed *anchor* and back to the activity *belay system*.

5.8.13 Activity leader positioning

An *activity leader* with the appropriate rescue competencies must be positioned to affect a timely rescue if required.

An *activity leader* must be positioned to check the connection to safety systems prior to using the safety system.

There must be an *activity leader* positioned at the top and the bottom of vertical pitches.

An *activity leader* should where practicable, have contact with the abseiler(s) and/or climber(s) throughout the ascent or descent.

5.8.14 Communication

A system of clear & unambiguous verbal or non-verbal communications must be used to manage the activity.

Having line of sight and communication by sound should be used as the preferred means of supervising participants wherever possible.

5.9 Vulnerable participants

See Core GPG (Participants).

5.10 Privacy of information

See Core GPG (Participants).

5.11 Activity leader to participants ratios

See Core GPG (Participants).

5.12 Activity briefing

See Core GPG (Participants).

6 Environment

Environmental conditions can directly affect the safety of an activity, and everyone involved shares responsibility for protecting the natural and cultural heritage of the places they visit. Weather, fire, water, terrain, wildlife and the requirements of *land owners* and managers all shape what can be done safely and respectfully. Providers must actively identify, reduce and manage both the risks the environment poses and the impact an activity has upon it.

For providers, the guidance encourages planning around the localised, in-situ conditions at the specific time and place of an activity, rather than relying on general assumptions. The trigger-point approach can set clear go/no-go and modification thresholds, fire and severe-weather planning can be aligned with the relevant guidance material, and *land manager* requirements confirmed. Activity-specific detail is expected to come from the relevant activity GPG, with this section providing the common baseline.

6.1 Caving environments and hazards

6.1.1 General cave environment

Environmental considerations for caving other than weather may include but is not limited to:

- the terrain (e.g. steep slopes, uneven or unstable footing, cliff edges etc.)
- the lack of natural light
- the lack of ability to communicate with the surface
- the temperature of the cave environment including air and water temperature
- possible *foul air*
- water hazards
- the potential for flooding
- navigation in complex cave systems
- sharp surfaces
- loose rock and unstable scree slopes

- sediments (e.g. stalactites, stalagmites, sand, mud)
- rockfalls and cave-ins
- erosion
- falls from height
- the fauna which is expected and/or protected (e.g. bats, snakes, spiders etc.)
- guano piles
- bone deposits
- historical, heritage and/or cultural items or materials (refer Core GPG and section 5.7 Environmental sustainability procedures below)
- the type and location of flora expected *(e.g. tree roots)*.
- sensitive parts of the cave system (e.g. speleothems, drip holes, flowstone, cave pearls, paleosols, archaeological deposits).

6.1.2 Darkness

Planning and procedures must address the following associated with operating in darkness:

- having personal light sources and appropriate backup sources
- route finding and navigation
- *activity leader* competence to eliminate possible disorientation and maintaining location awareness
- appropriate participant supervision to keep the group together
- possibility of personal injury.

Also see 7.4.3 Managing darkness.

6.1.3 Cave navigation

Planning and procedures must address:

- correct route finding and following an appropriate route
- navigation systems to maintain location awareness
- keeping the group together
- where necessary, suitable mapping of routes, hazards and exits.

Where caves involve multiple passages or challenging navigation, planning and procedures must include:

5 use of appropriate navigational aids
6 use of route finding and tracking aids (e.g. removeable reflective markers).
7 use of minimal-impact route-finding aids (e.g. removable markers and string lines that leave no permanent trace).

Also see 7.4.4 Progression through a cave.

6.1.4 Foul air

Planning and procedures must address the following associated with the potential for entering *foul air*:

- prior knowledge of cave system to identify actual or potential areas for *foul air* (see Appendix Y)
- monitoring for signs of entering *foul air* (see Appendix Y).

Caves or sections known to have *foul air* issues should not be used for *dependent groups* unless an appropriate site reconnaissance and seasonal assessment has confirmed the specific section is suitable for use at the time of the planned activity, and ongoing monitoring procedures are in place (refer Appendix Y).

Refer to Appendix Y Foul air and 7.4.7 Foul air.

6.1.5 Disease transmission

Planning and procedures must identify and address the potential for disease transmission:

- to humans (e.g. histoplasmosis, rabies related disease such as Australian Bat Lyssavirus (ABLV), water borne disease, etc.)
- from humans to animals and between animals (e.g. *white nose syndrome* (WNS)).
- planning for appropriate sanitation above and below ground, including procedures to prevent contamination of cave water systems and disease transmission pathways (refer 5.7.3 Dispose of waste properly).

Also refer:

- leadership section 7.4.8 Preventing disease transmission
- 5.5 Wildlife safety section below.

6.1.6 Loose rock

Procedures must be developed prior to the activity, to manage any movement through areas of loose rock.

Also see 7.4.6 Falling objects.

6.2 Water hazards

6.2.1 Assessment of water hazards

Assessment of potential and/or current water hazards must consider:

- seasonal variation in water levels
- the ability to cross any water bodies or streams
- the temperature of the water
- the velocity of the water
- the possibility of water levels rising while in the cave
- what water levels allow *roof-sniffing* and/or create *traps*, *siphons*, *sumps* or *duck-unders*.

6.2.2 Rising water

The causes of rising water and fast flowing water hazards for the caves used must be identified and addressed in the *risk management plan*.

Considerations relating to rising water levels and fast flowing water hazards must include:

- where an exit has to be made against the water flow of an inflow cave
- understanding local catchment areas
- associated dangerous weather patterns or dam operations
- likely water rising rates for particular weather patterns and catchment surface conditions (e.g. snowmelt, rain in dry periods causing rapid water level changes, additional water entering an already saturated catchment area, etc.)
- the best weather and water level forecasting service available for area
- when to cancel due to water level concerns
- methods for monitoring water rising rates, water level indicators, and maximum safe water levels
- procedures for dealing with rising water levels including safe *waiting areas*, escape routes, and evacuation procedures.

6.2.3 Flooding

Cave areas known to be flooded must not be used.

Areas subject to current flood warnings should be avoided.

During rain, *severe weather* or thunderstorms or when they are forecast, areas likely to experience flooding should be avoided.

The crossing of swollen waterways or entering of floodwaters should be avoided.

6.2.4 Drinking water

Refer Core GPG - Drinking water safety section.

The safety of water within a cave system must be considered prior to use of the water as a drinking source.

Considerations relating to safety of water in a cave system for drinking must include:

- possible contamination of the catchment system (e.g. farm runoff, waterborne microorganisms such as *E.coli* or *Giardia* species).

6.3 Vertical caving

Vertical caving must consider all the items listed in the *horizontal caving* section along with the following items.

Safety considerations for *climbing* or *abseiling* include but are not limited to:

- stability of the rock surface
- stability of features (e.g. loose rocks)
- availability and location of *anchors* or natural features to use for *anchors*
- safety requirements for access and egress including the likelihood of a fall from height before and after participation.

Any approved modification or removal of natural surfaces must be approved by the *land manager* and undertaken by an appropriately competent person.

Any approved installation of permanent artificial *anchors* in natural surfaces must be approved by the *land manager* and undertaken by appropriately competent person.

6.4 Weather

6.4.1 Weather information

Weather information must be obtained from the Bureau of Meteorology or other appropriate reliable source.

The Bureau of Meteorology provides a range of services and for details refer to:
http://www.bom.gov.au/weather-services/WeatherGuideLand.pdf

6.4.2 Weather trigger points

Trigger points must be based on the relevant Bureau of Meteorology weather warnings and relevant actual weather conditions.

The *risk management plan* and emergency management plan should include guidance on *trigger points* and associated actions for:

- actual or forecast rain
- *severe weather* warnings
- severe thunderstorm warnings.

Actions for weather *trigger points* may include but are not limited to:

- cancellation of activity
- evacuating to a safe location
- avoidance of locations effected by tides or surf

- avoiding areas that have the potential for flooding
- preparations to avoid the risks associated with lightning.

6.4.3 Lightning

Whilst thunder is audible groups should avoid:

- cave entrances
- immersion in water.

Procedures must follow the *provider's* organisational lightning protocols. Refer also Core GPG — Bush fire, *prescribed fire* and fire danger / weather-related provisions for general lightning guidance.

6.5 Environmental conditions, safety and impact management

See Core GPG (Environment).

6.6 Bushfires, prescribed fire and fire danger

See Core GPG (Environment).

6.7 Tree safety

See Core GPG (Environment).

6.8 Drinking water safety

See Core GPG (Environment).

6.9 Food safety

See Core GPG (Environment).

6.10 Wildlife safety

Procedures should be in place to minimise the risks associated with wildlife that may be encountered.

The types of wildlife encounters that may need to be considered include but are not limited to:

- bats
- reptiles (e.g. snakes & lizards)
- birds
- invertebrates (e.g. spiders, scorpions, centipedes, ticks)
- mammals (e.g. wombats, Tasmania devils, possums, platypus, cats etc.).

Any handling of wildlife including bats must be completed by an appropriately competent person using gloves.

Procedures relating to bats must include:

- the possibility of contracting disease from bats or bat droppings (e.g. histoplasmosis, rabies etc.)
- any dead or dying bats not being handled.
- the possibility of seasonal cave closure during bat hibernation periods, particularly for caves supporting hibernating bat colonies — *activity leaders* must check with the relevant *land manager* before the activity
- the vulnerability of hibernating bats to disturbance from noise or artificial light — even brief arousal from hibernation can significantly increase bat mortality risk; where hibernating bats are

present or likely, groups must minimise noise and avoid directing light towards roosting areas, in addition to the requirements in Section 6.7.6.

Considerations in reducing the above wildlife encounters may include but are not limited to:

- briefing participants in how to respond to encounters
- conducting a site assessment before use
- using alternative locations if necessary.

Also refer:

- 5.1.5 Disease transmission above
- leadership section 7.4.8 Preventing disease transmission.

See Core GPG (Environment) for the general requirements and further detail.

6.11 Environmental sustainability procedures

See Core GPG (6 Env. sustainability (App L)).

6.11.1 Plan ahead and prepare

Planning ahead and preparing may include but is not limited to:

- understanding cave sensitive features
- being aware of the location of sensitive features in the cave
- developing plans to protect or avoid sensitive features
- identifying the best *anchor* points available in terms of safety and minimising impact
- pre-planning to reduce the need for unnecessary exploration
- choosing sites that are appropriate for the group size and composition.

6.11.2 Travel and stop on durable surfaces

Travelling in an area on durable surfaces may include but is not limited to:

- use established routes and defined paths
- monitor progress to stay on established routes
- actively managing groups to minimise impact
- move throughout caves slowly, deliberately and thoughtfully
- have procedures that ensure only robust surfaces are being used or touched
- move in way that avoids stirring up dust clouds
- minimise disturbance near streams, in entrances, or in muddy areas
- avoid touching, walking or crawling on cave deposits or features that may be damaged (e.g. drip holes, stream sediments, paleosols, crusts, flowstone, cave pearls, bone material, potential archaeological sites, cave fauna, speleothems, crystal weathering, evaporitic deposits, tree roots, soil cones, etc.)
- avoid touching cave walls and speleothems with bare hands because of the potential for contamination from skin oils
- use of boot washing stations or cleaning boots where required
- if necessary, to walk on flowstone remove muddied boots and/or clothing, use boot wash stations if provided and consider wearing alternative clean soft-soled footwear
- have procedures to monitor head placement to prevent accidental damage to formations
- not allowing mud fights
- the use of temporary edge protection when using ropes
- the installation of artificial *anchors* or equipment only being carried out with the permission of the Landowner or *Land Manager*
- no *camping* in caves.

6.11.3 Dispose of waste properly

Disposal of waste may include but is not limited to:

- all rubbish, food and food crumbs to be carried out and disposed of appropriately
- all food is eaten over a container to catch crumbs
- all human waste and hygiene products to be carried out in a suitable container and disposed of appropriately
- removal of any waste others have left.
- consideration of food choice prior to entry to minimise crumbs, packaging waste, and food types that may attract or harm cave fauna.

6.11.4 Leave what you find

Leaving what you find may include but is not limited to:

- not excavating, disturbing or removing archaeological, historical, bone, fossil and cultural artefacts
- not interfering with any markers (e.g. survey markers)
- not interfering with any rock and cave decorations
- having procedures to prevent touching rock art
- having procedures to prevent introducing or transporting non-native species
- caving clothing, boots and relevant equipment is appropriately cleaned after every trip to minimise the spread of bacteria, fungi and non-native species
- not hiding items (e.g. snacks) as part of the activity for group members to "find"
- chemical light sticks being used with care so that there is no leakage of the chemicals from its container.

6.11.5 Minimise the impact of fires

Minimising the impact of fires or stoves must include:

- no fires being lit in a cave
- no smoking in a cave
- no use of stoves in a cave
- no use of flares in a cave
- no use of carbide lighting.
- no vaping or use of e-cigarettes in a cave.

An alternative to using stoves should include carrying hot drinks in a thermos.

Minimising the impact of fires should include procedures to appropriately manage any use of items with a naked flame (e.g. butane lighter, candles).

6.11.6 Respect wildlife

Respecting wildlife must include but not limited to:

- not touching wildlife
- using indirect light and avoiding using direct light to view them
- talking quietly in areas where bats may be resting
- avoiding disturbing bats with camera flashes
- avoiding disturbances to wildlife habitats (e.g. webs, snares, nests, tree roots, organic debris, guano)
- understanding what wildlife that could be encountered so that procedures can be used to protect them and their habitat (e.g. nests).

6.11.7 Be considerate of your hosts and other visitors

Be considerate of your hosts and other visitors may include but is not limited to:

- seeking and gaining appropriate permissions to access sites

- following *land manager* or landowner instructions or requirements
- determining and complying with any *traditional owner* and cultural heritage requirements
- negotiating with other users regarding shared use of a site
- talking quietly.

Also refer Core GPG – Environmental sustainability procedures.

6.12 Land owner and/or manager requirements

See Core GPG (Environment).

6.13 Water environments

See Core GPG (Environment).

7 Equipment and logistics

The right equipment, well chosen and well maintained, is fundamental to safe delivery. Equipment requirements differ from one activity and context to another, spanning personal and group gear, first aid and medication, communications and transport. Deciding what is genuinely needed, keeping it fit for purpose, and organising the logistics around it are everyday responsibilities for any provider.

It helps a provider decide what equipment is genuinely needed, who is responsible for it, and how it is kept fit for purpose. The framework can drive equipment checklists matched to each activity, inspection and maintenance schedules appropriate to scale, and communications and first aid provisions matched to the remoteness and risk of the activity. It supports consistent logistics decisions without imposing a single equipment list on every provider.

7.1 Framework for equipment requirements

See Core GPG (Equipment and logistics).

7.2 Equipment requirements

7.2.1 Caving equipment requirements

Helmets must be brimless and manufactured for use in the context of the activity. Refer Appendix U Equipment related standards.

Risk management procedures must ensure adequate lighting and provision for managing any failure or reduced performance of a light source.

Each person must have:

1. a primary light source
2. a secondary light source available
3. an appropriate helmet.

Primary light sources must be attached to the helmet.

Secondary light sources should either be attached to the helmet or be capable of being attached to the helmet.

Secondary light sources must not be a chemical light stick or a wind-up torch (wind-up torches provide limited light output and require two hands to operate).

Handheld light sources must not be used as primary or secondary light sources. Where a handheld light is carried as a supplementary light, it must have a wrist strap.

Flares must not be used.

Groups must carry:

1. a reasonable number of additional light sources determined by the *risk management plan* as a backup for both primary and secondary light source failures
2. a watch for monitoring the time
3. an appropriately rated rope or tubular tape *hand line*, with a length determined by the *risk management plan* (refer Appendix U Equipment related standards).

Groups must determine by the *risk management plan* what equipment they need to carry for:

- navigation
- first aid and rescue.

Example equipment lists can be found in Appendix T Equipment.

Having light reduces caving risks. Those introduced to caving, should experience role modelling that entry into any cave requires each person to have 2 light sources. Primary and secondary light sources need to be suitable for moving through the cave.

The *Australian Speleological Federation* (ASF) has information and resources that can also provide equipment safety guidance.

7.2.2 General equipment requirements

Procedures must be in place to ensure appropriate clothing for the expected and foreseeable conditions is available.

Procedures must be in place to ensure appropriate footwear for the expected and foreseeable terrain is used.

Footwear and clothing must be fit for purpose.

Considerations for suitable footwear include:

8 fully encloses and protects the foot
9 provides adequate grip
10 adequately secured to prevent slipping off.

Considerations for wearing gloves should include:

- protecting the person's hands
- protecting the cave environment
- gloves worn are lint free.

Example equipment lists can be found in Appendix T.

7.2.3 Vertical caving equipment requirements

All equipment must be manufactured for use in the context of the activity. Refer Appendix U Equipment related standards.

Such equipment may include:

- accessory cord
- artificial fixed *anchors* used
- ascending devices
- belay devices
- *connectors* (e.g. carabiners)
- *cow's tails* or personal *anchor systems*
- descending devices
- *dynamic rope*

- gloves
- harnesses
- helmets
- pulleys
- removable bolt plates
- slings
- *static rope*
- wire ladders and traces
- any other equipment that is part of the safety system used.

Gloves must be appropriate for the task and of a suitable fit.

Example equipment lists can be found in Appendix T Equipment.

7.2.3.1 Rigid ladders

Rigid ladders must be appropriate for the task they are being used for.

Rigid portable ladders must meet the Australian Standard AS 1892.1:2018 Portable ladders: Performance and geometric requirements.

Rigid ladders must be fixed or secured appropriately to prevent movement.

7.2.3.2 Rescue and emergency equipment

Appropriate vertical rescue equipment must be readily accessible when *vertical caving*.

Vertical rescue equipment may include but is not limited to:

- ascending devices
- belay devices
- *connectors* (e.g. carabiners)
- *cow's tails* or personal *anchor systems*
- knife
- pulleys
- prusik loops
- rope long enough for the longest pitch
- slings.

An additional rope long enough to effect a rescue for the longest pitch must be available for rescue purposes.

Procedures must be in place to ensure appropriate emergency response equipment and a drinking water supply is available.

7.2.3.3 Cow's tail requirements

Cow's tails using static material for the tails must not be used as a fall arrest system. (For example, static material tails suitable for a *restraint line*, is not suitable for a fall arrest system which requires dynamic material to help absorb the impact of the fall.)

Considerations for *cow's tails* used during caving must include:

11 the tails being made of appropriate dynamic material (e.g. *dynamic rope* of suitable diameter) that has an appropriate *safe working load*

12 the two tails are of differing lengths

13 the longest tail is of an appropriate length for the user to correctly operate (e.g. arm's length)

14 where knots are used to construct the *cow's tail*:

14.1 they are appropriate knots and

14.2 the knots assist absorb the impact of fall (e.g. figure of eight or barrel knots) and

14.3 the knots are correctly dressed and if needed, has its movement around the connector restricted, so that the knot cannot slide and cause incorrectly load of the connector (e.g. slide over the carabiners gate).

7.3 Use of caving equipment

All equipment must be used with reference to the manufacturers instructions.

Training in the use of equipment used must be provided to *activity leaders* and participants.

An appropriate helmet for protection must be worn while caving.

Handheld torches must not be hung around neck; a wrist loop is to be used instead.

Procedures must be in place to facilitate appropriate inspection and cleaning of equipment. (Also refer 5.7 Environmental sustainability procedures, 5.1.5 Disease transmission, and 6.4 Maintenance of equipment.)

7.4 Use of vertical caving equipment

7.4.1 Vertical equipment use

Before use, the compatibility between and correct functioning of all equipment must be confirmed.

Where the manufacturers recommended usage for retirement purposes includes events that need to be tracked (e.g. number of falls), an appropriate record must be kept so retirement occurs within the manufacturers recommendation.

Harnesses must be worn so that all buckles and connections can be visually inspected at any time (i.e. worn on the outside of all clothing/overalls).

The *risk assessment* must assess if harnesses can be a sit harness or needs to be either an appropriate full body harness or a combination chest and sit harness.

An appropriate sit harness that has been manufactured and rated to an appropriate standard must be used.

Chest harnesses must only be used in combination with an appropriate sit harness that has been manufactured and rated to an appropriate standard.

Use of a full body harness or combination chest and sit harness should be considered:

15 when inversion is likely
16 when the security of a sit harness cannot be relied upon due to body shape of the person
17 when the security of a sit harness cannot be relied upon if the person were to experience a pre-existing health, medical or personal condition episode (e.g. epilepsy)
18 for the very young
19 based on the expected length of time in harness and positioning (e.g. extended time periods at height).

7.4.2 Equipment loading

Equipment will have a *stated strength* that may or may not include a *safety factor*. The type of *stated strength* rating needs to be known before use to ensure equipment is safely loaded. (Refer Appendix V Equipment load ratings for more details).

Equipment with the *stated strength* providing the *Minimum Breaking Strength* (MBS) must have a suitable *safety factor* applied and a *Safe Working Load* (SWL) calculated.

Equipment with the *stated strength* providing the *Safe Working Load* (SWL) must only be loaded to the maximum of the *Safe Working Load* (SWL).

Reference to the manufacturers instructions must occur when determining a *safety factor* and/or *safe working load*.

The expected peak load and possible additional loads should a rescue be carried out must be considered when determining equipment loading.

7.4.2.1 Cow's tails loading

When using *cow's tails*, the systems and procedures used should ensure the *fall factor* involved is as low as practicable but not exceeding a *fall factor* of 1.0. (The persons harness attachment point should not be above the anchor point (e.g. a traverse-line should be established at waist height, not ankle height).)

The manufacturers recommended usage requirements of *cow's tails*, including regarding retirement must be followed.

When a *cow's tail* has been provider constructed (e.g. the *activity provider* constructs the *cow's tails* from suitable material) and the *cow's tail*:

20 it is loaded by a fall that exceeds a *fall factor* of 1.0, the *cow's tails* dynamic materials must be retired and be replaced at the end of the activity

21 is loaded by any fall, the knots should be appropriately relaxed and re-dressed at the completion of the activity or at the first safe opportunity. (This ensures as much force as possible from any subsequent fall is absorbed i.e. the *cow's tails* have as much dynamic absorption as possible.)

7.4.3 Connections

Connection methods, equipment and systems used must be periodically reviewed.

Considerations when determining connection methods, equipment and systems should include but are not limited to:

- the type of *anchor* or *anchors* being used
- the redundancy available should an *anchor* fail
- what needs to be attached to the harness (e.g. direct connection to rope or a descender device)
- the experience and context of who is completing the connection of the rope to the harness or descender device
- the availability of an *activity leader* to supervise or check the connection that is completed by a participant
- the conditions within the cave that effect equipment operation (e.g. mud).

7.4.4 Connectors and practices relating to use

Carabiners must be used so that no load is across the minor axis or gate.

Systems that have cyclical loads constantly applied or subject to vibration should be inspected at an appropriate frequency to confirm the correct system arrangement remains unchanged.

The type of *connector* used must be suitable for the task.

All connections must be checked by an *activity leader*.

The connection of devices (e.g. belay device, ascenders) must use either a *locking connector* or *auto-locking connector.*

Belay rope connections to a harness should use direct tie in with an appropriate knot.

All *connectors* used in *belay systems* and *anchor systems* must meet an appropriate published standard (e.g. EN, AS/NZS or UIAA — refer Appendix U Equipment related standards).

7.4.5 Other equipment use considerations

Static rope must be used when using single rope technique (SRT).

An appropriate rope must be used for the belay rope based on the activity, fall-factor expectations, and technique used. *Static rope* or semi-*static rope* is generally appropriate for caving belay applications where

fall factors are minimised and appropriate belay techniques are used; *dynamic rope* should be used where higher *fall factors* are foreseeable or where manufacturer's instructions for the *belay system* require it.

A procedure regarding participant supplied equipment should be developed.

Where a participant supplies any personal *climbing* or *abseiling* equipment, this must comply with the above equipment requirements and equipment use sections and be serviceable.

Wearing gloves should be used when *abseiling*.

7.4.6 Rescue systems and rigging for rescue

Anchor systems and *belay systems* must be rigged for a timely and effective potential rescue.

Considerations in rigging systems for rescue must include but are not limited to:

- load direction
- load magnitude
- ability to lower the person
- ability to enable an *activity leader* to complete a *contact rescue*
- ability to raise the person.

7.5 First aid equipment and medication

See Core GPG (Equipment and logistics).

7.6 Communications equipment

See Core GPG (Equipment and logistics).

7.7 Transport

See Core GPG (Equipment and logistics).

7.8 Maintenance of equipment

All safety, rescue and *vertical caving* equipment must be checked that it is serviceable before each activity or before being used.

All equipment must be appropriately cleaned after use.

Considerations for cleaning equipment must include:

- removal of mud and grit from all equipment including ropes
- disease control specific methods including reducing the spread of *White Nose Syndrome* (WNS) fungus (refer www.caves.org.au/conservation for details).

Appropriate procedures must be in place for equipment inspections and determining the time periods between inspections.

Equipment and inspection records must conform with any legislative or regulatory requirements.

An equipment record should be maintained.

Where used, an equipment record should record but is not limited to the:

- item individual identifier
- age (e.g. date of manufacture)
- date of inspections
- recommended or maximum lifespan.

A retirement of equipment policy should be developed.

Considerations for a retirement of equipment policy may include but are not limited to:

- type of use
- frequency of use
- prevailing conditions when used
- actual deterioration, wear and tear
- extreme usage events or patterns (e.g. impacts, falls, 'catches')
- age
- years in service
- manufacturers recommendations.

See Core GPG (Equipment and logistics) for the general requirements and further detail.

7.9 Storage of equipment

Activity equipment must be stored in accordance with the manufacturers recommendations or instructions.

Where no manufacturers recommendations exist, considerations for storage of equipment may include but are not limited to:

- equipment is clean and dry
- the storage is free from harmful chemicals
- the storage is free from damp conditions
- the storage is free from environmental exposure including Ultraviolet (UV) light and avoids extremes of temperature
- the storage is free from interference of fauna or vermin.

See Core GPG (Equipment and logistics) for the general requirements and further detail.

8 Responsibilities and roles

This section sets out the responsibilities and roles of persons involved in the planning and delivery of caving activities under this guide. It must be read in conjunction with Core GPG Section 8, which contains the generic responsibilities and roles framework applicable to all outdoor activities. Where a sub-section below states 'See Core GPG', the full requirements for that sub-section are set out in the Core GPG and apply without modification to caving.

8.1 Responsibilities and roles framework

See Core GPG Section 8.1 — the responsibilities and roles framework, including the three operational leadership roles of Leader, *Assistant Leader* and *Support person*, applies without modification to caving activities delivered under this guide.

8.2 Naming conventions

See Core GPG Section 8.2. The Caving Guide uses the following role titles:

Caving leader — this title is used where the Core GPG uses 'Leader'
Assistant caving leader — this title is used where the Core GPG uses '*Assistant Leader*'
Support person — as defined in Core GPG Section 8.4.3

8.3 Provider responsibilities to prepare and support leaders

See Core GPG Section 8.3 — the provider responsibilities to prepare and support leaders apply without modification to caving activities delivered under this guide.

8.4 Leader responsibilities and role descriptions

See Core GPG Section 8.4 — the leader responsibilities and role descriptions, including the role descriptions for Leader (8.4.1), *Assistant Leader* (8.4.2) and *Support person* (8.4.3), and the leader fitness for work requirements (8.4.4), apply without modification to caving activities delivered under this guide.

8.4.1 Leader — operational responsibility in the field

The Leader carries operational responsibility in the field for the activity and all participants, working within the provider's systems and direction; see Core GPG Section 8.4.1 for the full role description.

8.4.2 Assistant Leader — delegated responsibility

The *Assistant Leader* supports the Leader and carries delegated operational responsibility for defined elements or participant groups, operating under the Leader's direction; see Core GPG Section 8.4.2.

8.4.3 Support person

The *Support person* is a non-technical role that assists *activity leaders* in managing participants and fulfilling general supervisory and organisational duties, and does not carry the technical responsibilities of a Leader or *Assistant Leader*. The key responsibilities of this role, and its important limitations — including that a *support person* must not be treated as an *activity leader* for the purpose of calculating *activity leader* to participant ratios unless they also hold the relevant caving knowledge and skill — are as set out in Core GPG Section 8.4.3.

8.4.4 Leader fitness for work

Leaders and *assistant leaders* must be physically and psychosocially fit for the demands of the role; providers must take reasonable steps to manage risks arising from factors including physical and psychosocial fitness, alcohol, medication, other substances and fatigue; see Core GPG Section 8.4.4.

8.4.4.1 Physical and psychosocial fitness

The provider must ensure, so far as is reasonably practicable, that each person assigned to a Leader or *Assistant Leader* role is physically and psychosocially capable of the demands of caving — which vary with the activity category, cave system and participant group. Leaders must self-assess their fitness before accepting a role; see Core GPG Section 8.4.4.1.

8.4.4.2 Alcohol, medication and other substances

Alcohol and other substance consumption should be discouraged during or immediately before an activity where it could impair a leader's performance. Leaders must carry sufficient medication for the full duration of the caving activity and have a contingency if it is lost, damaged or unavailable underground; see Core GPG Section 8.4.4.2.

8.4.4.3 Fatigue

Physical and mental fatigue creates significant risk in underground environments; providers must implement reasonable controls including appropriate scheduling, role allocation, trip duration and self-assessment procedures; see Core GPG Section 8.4.4.3.

8.5 Leader readiness and capability

See Core GPG Section 8.5 — the leader readiness and capability requirements, including leadership knowledge, skill and experience (8.5.1), provider responsibilities under the Outdoor Leader KSE Framework (8.5.2), first aid (8.5.3), knowledge and skill acquisition (8.5.4), verification (8.5.5), currency (8.5.6) and verification and currency records (8.5.7), apply to caving activities delivered under this guide.

The detailed knowledge, skill and experience required of a Leader is set out in Appendix M of this guide, and of an *Assistant Leader* in Appendix N. The program planning matrix (leader-matching tool) is set out in Core GPG Appendix O, the recognition-of-competence pathways in Core GPG Appendix P, and the indicative experience bands in Core GPG Appendix Q.

8.5.1 Leadership knowledge, skill and experience

The provider must ensure each person in a Leader or *Assistant Leader* role holds integrated knowledge, skill and experience appropriate to the responsibilities of the role and the specific caving context. This is a non-delegable provider obligation that cannot be satisfied by a qualification alone — it requires active, documented verification against the role's responsibilities; see Core GPG Section 8.5.1.

8.5.2 Provider responsibilities under the Outdoor Leader KSE Framework

Providers must verify the capability of every person assigned to a Leader or *Assistant Leader* role across the nine domains of the AAAS Outdoor Leader KSE Framework, scaled to the activity context and the capability level required for the caving activity; see Core GPG Section 8.5.2. The caving activity scope, and the leader requirements that flow from the activity category and cave system, are set out at the head of Appendix M.

8.5.3 First aid

Leaders must hold a current first-aid qualification appropriate to the activity, environment and applicable work health and safety law(s) and/or regulation(s); for remote and extended underground activities a remote or wilderness first-aid qualification should be considered. See Core GPG Section 8.5.3 and Core GPG Appendix L (first aid and medication considerations).

8.5.4 Knowledge and skill acquisition

Knowledge, skill and experience may be developed through, but is not limited to, formal qualifications, industry training, provider-based programs, structured participation or a combination; no single method has primacy; see Core GPG Section 8.5.4.

8.5.5 Verification

For each person in a Leader or *Assistant Leader* role, the provider must verify knowledge, skill, experience and currency in context before the person carries the role. The detailed caving knowledge, skill and experience against which verification is made is set out in Appendix M (Leader) and Appendix N (*Assistant Leader*), and pathway guidance is in Core GPG Appendix P; see Core GPG Section 8.5.5.

8.5.6 Currency

Knowledge, skill and experience must be current. The provider must determine the minimum currency and recency requirements appropriate to the context — having regard to the activity category, the cave system, the role, the frequency of practice, and the consequences of a lapse in capability — and verify currency for each person in a leadership role before they carry the role. The means by which currency may be established are set out in Core GPG Section 8.5.6.

8.5.7 Verification and Currency Records

Providers must maintain records of how verification was conducted — including the basis, method, date and person responsible — for each person in a leadership role, retained consistent with the provider's record-keeping obligations; see Core GPG Section 8.5.7.

Glossary

AAAS: Australian Adventure Activity Standard – See Introduction for details.

Australian Speleological Federation (ASF): the national peak body that represents the interests of caving throughout Australia and internationally on the International Union of Speleology. Refer to www.caves.org.au

Abseiling: descending vertical or near vertical natural surfaces or artificial surfaces using ropes and descending friction devices to manage the descent. It is also known as rappelling.

Anchor: Any load bearing attachment to which any part of a *belay system* is attached.

Anchor system: a group of individual *anchors* to which any part of a *belay system* is attached.

Artificial cave: a manmade underground passage and/or cavern. For example, a mine, a drain.

Artificial caving: caving in an *artificial cave*.

Bad air: See *foul air*.

Belay System: The means by which the caver is protected from an uncontrolled fall or descent.

Belayer: A person that operates the *belay system*.

Bottom braking: The controlling of the descent of an abseiler, by a *belayer* located below the abseiler applying tension to the abseil rope.

Bushwalking: walking in natural areas.

Carabiner: (refer *connector*).

Camping: the use of a temporary site for overnight camping.

Canyoning: the descent, traversing and/or ascent of a canyon using a range of techniques.

Cave: an underground passage and/or cavern created by natural geological processes.

Caving: entering and/or moving though underground passages and/or caverns.

Cave diving: the use of breathing apparatus for caving underwater.

Climbing: ascending, traversing or descending vertical or near vertical natural surfaces or artificial surfaces.

CO: Carbon Monoxide. An odourless *foul air* gas that in high enough concentration can cause death.

CO_2: Carbon Dioxide. A naturally occurring odourless *foul air* gas that in high enough concentration can cause death.

Contact rescue: a rescue requiring an *activity leader* to manoeuvre to the person's actual location to physically assist them.

Connector(s): a metal device used to link components together. A *connector* may be:

- *Non-locking*: a *connector* that cannot be locked to prevent it opening.
- *Locking*: a *connector* that can be manually locked and unlocked to reduce the possibility of it opening
- *Auto-locking*: a *connector* that will automatically lock to prevent it from opening and requires two or more deliberate actions to unlock.

Cow's tail(s): two short lanyards with *connectors*, that are used to connect a safety harness to a fall protection system. As the lanyards or tails need to arrest falls, they are made of *dynamic* material (e.g. *dynamic rope*) that is manufactured for use in climbing and abseiling and should have a short and long tail (Refer section 6.1.3.3 Cow's tails).

Duck-under: A constriction in a passage where water is at or close to the cave roof for a short distance, which requires a caver to become (more or less) fully submersed for a brief period before continuing. Also the act of going through a duck-under.

Dynamic rope: a specially constructed rope that is somewhat elastic under load. The elastic 'stretch' under load is what makes the rope 'dynamic'. (Also see *static rope*.)

Fall factor: is the ratio of the height of a fall (h) (measured before the rope or lanyard begins to stretch) and the rope or lanyard length available to absorb the energy of the fall (L). It is used as a representation of the severity of a fall when arrested by a *belay system*. It is calculated by (h) divided by (L).

Fall height: The vertical distance between the climber's or abseiler's lowest body element and the surface beneath.

Fall zone: The surface that can be hit by a climber or abseiler falling.

Foul air: any atmosphere which has a noticeable abnormal physiological effect on humans. Also known as '*Bad Air*'.

GPGs: Good Practice Guide(s) – See Introduction for details.

Harness hang syndrome: medical complications due to being suspended and motionless within a body harness for a prolonged period of time (5 to 30 minutes). (Refer Appendix X)

Horizontal caving: caving where any fall safety required can be achieved without using a *belay system*. It may involve walking, scrambling, crawling through narrow openings, fording pools or streams and climbing obstacles.

Karabiner: See *Carabiner*

Marking: helping to guide hand and foot placement while clambering up or down obstacles. (This differs from *spotting* as it helps to prevent falls while *spotting* is safety protection in the event of a fall.)

Minimum Breaking Strength (MBS): is the magnitude of a load that may permanently distort or damage equipment but not cause it to break. (Refer Appendix V Equipment load ratings).

Non-actively participating: waiting to but is not currently doing the activity.

Pitch: a section of a natural surface or artificial surface that requires no greater than one length of rope to ascend, traverse or descend. (Also see multi-pitch and *single-pitch*.)

Rappelling: see *abseiling*.

Responsible person: a *competent person* who is able to complete those delegated elements or tasks during an activity that do not require all of the activity-specific competence of a caving leader/instructor or assistant caving leader. (Refer Core GPG – Framework for leadership roles and *Responsible person* role.)

Restraint line: is the line securing a person to a point of anchorage and is used to prevent a person from reaching a point from which he or she could fall.

Rock Climbing: ascending, traversing or descending vertical or near vertical natural surfaces. At times also used to describe *climbing* on artificial surfaces. (Also see *climbing*.)

Roof-sniffing: the act of edging along a small water-filled passage on your back, with only sufficient airspace for eyes and nose.

Safety Factor: the ratio between the *Minimum Breaking Strength* (MBS) and *Safe Working Load* (SWL) to provide a safety margin. It is expressed as a ratio, example 8:1. (Refer Appendix V Equipment load ratings).

Safe Working Load (SWL): is the magnitude of load that does not permanently distort, weaken, damage or break equipment and includes a safety margin. (Refer Appendix V Equipment load ratings).

Show Cave: refer *tourist cave*.

Simple cave: a *cave* with the following attributes:

22 caverns where light from an exit is always visible OR single caverns where progression to an exit is obvious by moving in either direction
23 AND there are no water hazards requiring submersion, swimming or *roof-sniffing*
24 AND there is minimal risk of *foul air*
25 AND any vertical features are protected by fixed ladders or staircases (i.e. the cave does not contain unprotected vertical features)
26 AND there is no loose rock or material likely to cause rockfalls
27 AND a *responsible person* with no caving experience would be able to lead a group out of the cave if the *caving leader* or *caving instructor* became incapacitated.

Single-pitch: a section of a natural surface or artificial surface that requires no greater than one length of rope to ascend, traverse or descend.

Spotting: a support process provided by a person, or persons, who offer physical protection of the head and upper body of a person should they fall. (This differs from *marking* as *spotting* is safety protection in the event of a fall while *marking* helps to prevent falls.)

Stated strength: the magnitude of load that is either the *Minimum Breaking Strength* (MBS) or *Safe Working Load* (SWL) marked on equipment or listed in manufacturers literature. (Refer *Appendix V Equipment load ratings*).

Static rope: a specially constructed low stretch kernmantle rope, that has low elongation under load. The low elongation or 'stretch' under load is what makes the rope 'static'. (Also see *dynamic rope*.)

SRT: Single rope technique

Sump: a pool of water completely filling a submerged passage.

Squeezes: A small opening in a cave which is passable with effort.

Top belay: Belaying a caver from the top of a pitch.

Tourist Cave: an actively managed cave that typically allows regular tours by the general public that may be professionally guided or self-guided. A *tourist cave* has suitable infrastructure so that it requires little to no caving experience to enter. May include caves with regular open and closed times, constructed trails or stairs, being lighted during open times, handrails and other barriers for safety and protection of cave features. Also known as a *show cave*.

Traverse-line: A *belay system* secured in a generally horizontal direction to allow horizontal movement.

Trigger point: a particular circumstance or situation that causes an action to occur.

Vertical caving: caving that includes the descent, traversing and/or ascent of vertical or near vertical surfaces, where fall safety requires the use a *belay system*. It may involve the use of ropes, ladders and/or descending/ascending equipment to climb up, down or traverse vertical drops.

Waiting areas: a location in which to wait prior to undertaking the activity, where it is reasonable for a person to not be required to use equipment to protect them from a fall from height.

White Nose Syndrome (WNS): a fungal disease that affects bats during winter hibernation. It has a very high mortality rate. Thorough cleaning of clothing, equipment and footwear is essential to prevent its spread and is a crucial consideration for overseas visitors. Refer www.caves.org.au/conservation for up to date details.

Acronyms

The following acronyms are used in this Good Practice Guide.

AAAS: Australian Adventure Activity Standard

CO: Carbon Monoxide

CO2: Carbon Dioxide

GPG: Good Practice Guide

ISO: International Organization for Standardization

MBS: Minimum Breaking Strength

OCA: Outdoor Council of Australia

SRT: Single rope technique

SWL: Safe Working Load

UV: Ultraviolet

Appendices

Appendix A Principal legal obligations

See Core GPG (Appendix A).

Appendix B Management of Risk

See Core GPG (Appendix B).

Appendix C Summary of AS ISO 31000 – risk management

See Core GPG (Appendix C).

Appendix D Risk management process

See Core GPG (Appendix D).

Appendix E Risk analysis information

See Core GPG (Appendix E).

Appendix F Risk management plan template examples

See Core GPG (Appendix F).

Appendix G Dynamic risk assessment process

See Core GPG (Appendix G).

Appendix H Benefit–Risk Assessment

See Core GPG (Appendix H).

Appendix I Emergency management planning framework

See Core GPG (Appendix I).

Appendix J Health & wellbeing considerations for risk management

See Core GPG (Appendix J).

Appendix K Privacy of information

See Core GPG (Appendix K).

Appendix L Environmental sustainability procedures

See Core GPG (Appendix L).

Appendix M First aid and medication considerations

See Core GPG (Appendix M).

Appendix N Knowledge, skill and experience — Leader

Each knowledge, skill and experience requirement in this appendix is to be applied by the provider within the context of the planned caving activity — including the activity category (simple caving, horizontal caving, single-pitch or multi-pitch vertical caving), the cave system and the provider's own program structure. The requirements are not a minimum checklist to be satisfied mechanically — they are a framework for the provider to assess and confirm the capability of each person in a leadership role against the demands of the specific activity. This appendix contains only the requirements specific to caving; the generic Leader knowledge, skill and experience is set out in Core GPG Appendix M.

Activity scope and leader requirements

This guide applies to the planning and delivery of caving activities across the range of activity categories and settings commonly undertaken in Australia. The knowledge, skill and experience required of a Leader varies significantly with the category of caving activity — from simple caving through horizontal caving to single-pitch and multi-pitch vertical caving.

Caving encompasses a technically diverse range of underground activities, each carrying distinct hazard profiles and technical demands on the leader. The requirement for technical rigging and vertical systems, the management of flooding and foul air risk, and the complexity of underground rescue all escalate substantially across the activity categories. The table below identifies the primary activity categories and their implications for the technical requirements of the Leader role.

Table N.1: Activity variants and operating settings — caving

Activity variant	Setting and characteristics
Simple caving	Walking or easy scrambling through accessible cave systems; no rope-based systems; suitable for

	introductory groups
Horizontal caving	Crawling, squeezing and negotiating confined passages in systems without significant vertical sections; navigation and tight-space management are primary technical demands
Vertical caving — single pitch	Single vertical sections requiring descending and ascending devices, anchor assessment and construction, and belay systems; single-pitch rescue capability required
Vertical caving — multi-pitch	Multiple vertical sections with deviations and rebelays; complex rope management and advanced multi-pitch rescue; highest technical demands covered by this guide

Activity leaders must hold the specific competencies required for the category of caving they are leading and must not lead activities that exceed their competency. All activity leader competencies needed for a particular role must be clearly defined before each caving activity.

The program planning matrix (leader-matching tool) is set out in Core GPG Appendix O. The domains below contain only the requirements specific to caving; they do not repeat the generic content of Core GPG Appendix M.

Safety and risk management

the Leader identifies and manages the hazards specific to underground environments, including absence of natural light, foul air, flooding, rockfall, disease transmission and the physical demands of confined passage.

Knowledge

The Leader understands the hazard profile specific to underground caving environments, including foul air, flooding, disease transmission, rockfall, darkness management and participant psychological risk.

This should include, but is not limited to: foul air hazard indicators and the physiological effects of oxygen-depleted or carbon dioxide-elevated atmospheres; cave flooding risk factors including catchment rainfall, cave system hydrology and water level change rates; disease transmission risks including histoplasmosis from bat droppings, leptospirosis from contaminated water, and White Nose Syndrome equipment decontamination requirements; loose rock and cave-in assessment criteria including the effect of water on rock stability and falling-object hazards in vertical sections; darkness management including primary and backup light source specifications and the consequences of total darkness for group management; and claustrophobia recognition, prevention strategies and management procedures for participant anxiety in confined underground environments.

Skills

The Leader applies cave-specific safety management skills throughout all phases of the activity, from pre-entry assessment through underground management to emergency response.

This should include, but is not limited to: monitoring for foul air indicators before and during cave entry and directing group exit in response to early warning signs; assessing flooding risk using weather forecasts, field observations and cave system knowledge before and during the activity; implementing disease prevention procedures for equipment cleaning, bat dropping avoidance and contaminated water contact; identifying loose rock hazards and minimising participant exposure in horizontal and vertical sections; managing multiple light sources across the group and responding to equipment failure in underground darkness; and recognising and managing participant claustrophobia including alternative route planning and calm de-escalation.

Experience recommended

The Leader has assessed and managed cave-specific hazards across multiple cave systems and conditions.

This should include but is not limited to: assessing and managing foul air, flooding and rockfall hazards across multiple cave systems; managing darkness-related emergencies and light source failures in underground environments; and applying disease prevention and equipment decontamination protocols in caving contexts.

Technical activity leadership

the Leader applies the technical skills required across all activity categories covered by this guide. Requirements escalate from simple caving through horizontal caving to single-pitch and multi-pitch vertical caving.

Knowledge

The Leader understands the technical content of caving across the activity categories within their scope, including cave navigation, tight-space management, water hazard management, equipment requirements and vertical systems where applicable.

This should include, but is not limited to: simple and horizontal caving including cave navigation methods using cave maps and compass, tight-space assessment and negotiation techniques, caving equipment requirements (helmet specifications, multiple independent headlamp systems, protective overalls, kneepads and gloves), spotting techniques as fall protection for short climbs and scrambles, and water hazard management in caves; single-pitch vertical caving including anchor types, anchor assessment criteria and anchor system construction for single-pitch descents and ascents, descending and ascending devices (racks, bobbins, stop devices, hand and foot ascenders), cow's tail configurations and karabiner gate orientation requirements, belay systems for vertical caving, and single-pitch rescue techniques including counterbalance rescue and hauling an incapacitated participant; and multi-pitch vertical caving including multi-pitch rigging techniques, deviation and rebelay placement, the effect of rope angle on anchor loads, techniques for passing pitch-heads and rebelays while ascending and descending, and advanced rescue and extraction techniques for multi-pitch vertical environments.

Skills

The Leader applies the practical technical skills required to operate caving activities safely across the relevant activity categories, including navigation, equipment management, rigging and rescue.

This should include, but is not limited to: navigating through cave systems using cave maps and compass; assessing and managing tight spaces including selecting appropriate routes and guiding participants through confined passages; fitting and inspecting helmets and headlamp systems on participants before entry and monitoring light source status throughout; spotting participants on short climbs and scrambles in horizontal caving; assessing and managing water hazards including wading and swimming sections and flood risk; assessing and constructing safe anchor systems for single-pitch vertical caving; rigging descent and ascent systems and managing participants through a single vertical section; operating descending and ascending devices; performing single-pitch rescue including counterbalance techniques and hauling; rigging and managing multi-pitch vertical systems including deviations, rebelays and rope management; and performing advanced rescue and extraction in multi-pitch vertical environments.

Experience recommended

The Leader has led dependent participants through the relevant caving categories across multiple cave systems and conditions, and has maintained rescue competencies through regular practice.

This should include but is not limited to: leading dependent participants through horizontal caving systems across multiple caves and conditions; rigging, operating and de-rigging single-pitch vertical systems with dependent participant groups; performing or practising single-pitch rescue techniques in realistic conditions; rigging and managing multi-pitch vertical caving systems; practising advanced rescue techniques appropriate to multi-pitch environments; and maintaining all caving rescue competencies through regular practice.

Leadership and group management

the Leader manages the specific group supervision challenges of underground environments, including communication in confined and noisy passages, group spread in darkness, and participant management at vertical sections.

Knowledge

The Leader understands the group management and communication requirements specific to underground caving environments.

This should include, but is not limited to: communication systems and signals appropriate to cave environments including whistle and rope signals for vertical caving and voice contact maintenance in noisy or confined passages; and group management procedures for maintaining visual and physical contact with all participants in darkness, including each person maintaining visual contact with the person ahead and the use of a designated tail-end leader.

Skills

The Leader applies the group supervision and communication skills required to manage participants safely in underground environments.

This should include, but is not limited to: maintaining group contact and communication in underground environments including managing pace, headcount and participant monitoring in darkness; managing participants waiting to use vertical systems and supervising those who are not actively caving during pitch operations; and managing participant psychological state across the duration of a caving activity including recognition of fatigue, cold and anxiety in confined underground environments.

Experience recommended

The Leader has managed group cohesion and communication in underground caving environments across varied cave systems.

This should include but is not limited to: managing group cohesion and communication in underground caving environments across varied cave systems; and supervising participants waiting at vertical sections and maintaining group safety during pitch operations.

Decision-making and judgement

the Leader applies activity-specific judgement thresholds for underground environments where evacuation is complex.

Knowledge

The Leader understands the specific factors that limit modification or exit from cave environments once underground, and the go/no-go criteria specific to caving.

This should include, but is not limited to: factors that make modification or exit from a cave difficult or impossible once underground, including flooding risk, participant fatigue and equipment failure scenarios; and specific go/no-go criteria for caving including weather conditions that increase flood risk, water level trigger points within cave systems and foul air indicators.

Skills

The Leader applies conservative judgement and clear decision-making for caving activities based on evolving underground conditions.

This should include, but is not limited to: making and communicating proceed, modify and exit decisions based on cave-specific environmental triggers, participant condition and water level monitoring; and

anticipating delayed-evacuation scenarios and applying conservative judgement when underground conditions are evolving.

Experience recommended

The Leader has made real-time decisions in cave environments in response to changing conditions and has reversed or modified activities when conditions warranted.

This should include but is not limited to: making real-time go/no-go and modification decisions in cave environments in response to changing conditions; and reversing or modifying cave activities in response to flooding risk, participant condition or equipment concerns.

Planning and program management

the Leader manages the planning requirements specific to caving, including cave access, land-manager requirements and underground emergency planning.

Knowledge

The Leader understands the access, permit and emergency planning requirements specific to caving activities.

This should include, but is not limited to: land-manager access requirements, permit conditions and cave-specific codes of practice for the caves used, including Australian Speleological Federation resources and guidance; and emergency management planning requirements specific to caving including underground rescue procedures, surface communication protocols and the role of cave rescue organisations in the jurisdiction.

Skills

The Leader applies cave-specific planning and emergency management skills for the cave systems they use.

This should include, but is not limited to: obtaining and complying with land-manager access permits and cave-specific conditions for each cave used; and developing emergency management plans that address the specific scenarios presented by underground environments, including flooding, participant incapacitation and equipment failure.

Experience recommended

The Leader has planned and delivered caving activities with appropriate permissions and emergency planning.

This should include but is not limited to: planning and delivering caving activities with appropriate land-manager approvals and cave-specific emergency management plans; and liaising with cave rescue organisations or coordinating emergency management planning for vertical caving programs.

Environment and place-based knowledge

the Leader applies knowledge of specific cave systems and their catchment environments to plan and manage activities safely.

Knowledge

The Leader understands the geology, hydrology, fauna and weather sensitivity of the specific cave systems they use.

This should include, but is not limited to: the geology, hydrology and formation types of the cave systems used and their effect on water flow, flood risk and rock stability; cave system catchment hydrology and the relationship between surface rainfall, runoff rates and underground water level changes; cave fauna including bat species, invertebrates and aquatic fauna present in the cave systems used, and the sensitivities and legal protections applicable to them; and weather patterns affecting cave flooding risk

including the time lag between surface rainfall and underground water level change for specific cave systems.

Skills

The Leader applies cave system knowledge and weather interpretation skills to manage flooding risk and environmental sensitivities.

This should include, but is not limited to: interpreting weather forecasts in the context of known cave system hydrology to assess and monitor flood risk; identifying and briefing participants on fauna, formations and environmental sensitivities of the specific cave systems used; and applying cave-specific knowledge to select safe routes, timing and participant management strategies.

Experience recommended

The Leader has operated in the specific cave systems they use across multiple seasons and conditions.

This should include but is not limited to: caving in the specific cave systems used across multiple seasons and conditions including wet-season operations; and undertaking site-specific induction for each cave system used with dependent participant groups.

Communication and interpersonal skills

the Leader maintains communication with participants in underground environments where voice contact may be compromised.

Knowledge

The Leader understands the rope and whistle signal systems used in vertical caving and the alternative communication strategies required in noisy underground environments.

This should include, but is not limited to: rope and whistle signal systems used in vertical caving and their standard meanings for common commands; and voice amplification and communication strategies for noisy cave environments including water-filled passages and pitch-heads.

Skills

The Leader applies standardised caving communication signals and maintains clear communication with participants across all phases of the underground activity.

This should include, but is not limited to: establishing and using standardised rope and whistle signals with participants before vertical caving operations; and maintaining clear communication with participants at the head and foot of pitches and across the group in confined or noisy passages.

Experience recommended

The Leader has used caving communication systems effectively in single-pitch and multi-pitch vertical caving with dependent participant groups.

This should include but is not limited to: using rope and whistle signal systems in single-pitch and multi-pitch vertical caving with dependent participant groups; and maintaining group communication in varied cave environments including confined and noisy passages.

Self-management and professional practice

Not modified for caving — the requirements of Core GPG Appendix M (domain M.8) apply in full.

Outdoor living, activity and travel skills

the Leader manages travel to and from cave systems and the physical demands of extended underground activities.

Knowledge

The Leader understands the approach, thermal management and nutrition requirements for caving activities, including remote cave access and extended underground sessions.

This should include, but is not limited to: bushwalking approach requirements for remote cave systems including appropriate footwear, navigation tools and access track conditions; thermal management for extended caving activities including the effect of cave temperature, wet conditions and physical exertion on participant core temperature; and nutrition and hydration requirements for extended underground caving activities including food and water management for multi-hour sessions.

Skills

The Leader applies approach travel and underground living skills relevant to the cave systems and activity durations covered.

This should include, but is not limited to: navigating to and from cave entrances across varied terrain including remote bush and steep approach tracks; managing participant clothing and thermal layering for underground temperatures and activity durations; and managing food and water requirements for participants across the duration of extended caving sessions.

Experience recommended

The Leader has led approach routes to cave systems and managed participant welfare across extended underground caving activities.

This should include but is not limited to: leading approach routes to cave systems across varied terrain and in multiple seasons; and managing participant thermal comfort and hydration across extended underground caving activities.

Appendix O Knowledge, skill and experience — Assistant Leader

This appendix sets out the knowledge, skill and experience expected of an Assistant Leader (assistant caving leader) carrying the role described in Section 8.4.2. The role is structured against the same nine domains as Appendix M; the requirements of Appendix M apply, with the variation that each domain is applied at the level of the delegated tasks, under the direction of the Leader and within the provider's systems. This appendix contains only the requirements specific to caving; see also Core GPG Appendix N.

Safety and risk management

As for Safety and risk management — the Assistant Leader must be able to identify and report caving-specific hazards (including foul air indicators, water level changes and rockfall), follow the Leader's safety procedures and contribute to emergency response under the direction of the Leader.

Technical activity leadership

As for Technical activity leadership — the Assistant Leader must hold the caving skills and equipment knowledge sufficient to assist in caving activities as delegated by the Leader, but is not required to hold the rigging, vertical system or rescue competencies of a vertical Leader unless specifically assigned and assessed as competent for those tasks. The Assistant Leader must not assist with anchors, vertical systems or rescue procedures beyond their confirmed competence without direct supervision of the Leader.

Leadership and group management

As for Leadership and group management — the Assistant Leader must maintain contact with, and supervision of, participants within their assigned section of the cave under the direction of the Leader, reporting changed conditions or participant difficulties promptly.

Decision-making and judgement

As for Decision-making and judgement — the Assistant Leader must recognise changing cave conditions and report them promptly to the Leader, and make immediate safety decisions within their assigned tasks while referring all rigging, vertical system and rescue decisions to the Leader.

Planning and program management

As for Planning and program management — the Assistant Leader must be familiar with the activity plan, the cave access requirements and the emergency management plan for the caving activity.

Environment and place-based knowledge

As for Environment and place-based knowledge — the Assistant Leader must have place-specific knowledge of the cave systems they are assigned to assist in, including relevant fauna, formation sensitivities and water hazard considerations.

Communication and interpersonal skills

As for Communication and interpersonal skills — the Assistant Leader must be proficient in the communication systems used in their assigned role, be able to brief participants on their assigned task requirements, and communicate promptly with the Leader about anything affecting safe delivery.

Self-management and professional practice

As for Self-management and professional practice — the Assistant Leader must self-assess fitness for work, maintain currency in the competencies relevant to their assigned tasks, and operate within professional and ethical boundaries under the direction of the Leader.

Outdoor living, activity and travel skills

As for Outdoor living, activity and travel skills — the Assistant Leader must be able to travel to and from the cave system, manage their own thermal comfort and hydration, and assist participants with physical demands appropriate to their assigned tasks.

Appendix P Recognition of competence: pathways to verification

See Core GPG Appendix P. The recognition-of-competence pathways — formal qualifications and training, provider-based assessment and prior learning — apply without modification to caving activities.

Appendix Q Indicative experience bands and evidence expectations

See Core GPG Appendix Q. The indicative experience bands and evidence expectations support the provider's verification of leader experience for caving activities.

Appendix R Australian Bureau of Meteorology weather warnings and trigger points

See Core GPG (Appendix R).

Appendix S Program planning matrix: leader-matching tool

See Core GPG Appendix O. The program planning matrix (leader-matching tool) applies without modification to caving activities. Providers rate the three factors — provider support and backup availability, environment and proximity, and activity complexity — and read off the recommended minimum leader configuration. For caving, activity complexity is informed by the activity category and cave system characteristics. Note that the activity category has a significant bearing on the appropriate support-availability level — multi-pitch vertical caving and extended horizontal caving in remote systems require

substantial self-reliance even in relatively accessible settings, given the complexity of underground evacuation. The activity category, cave system characteristics and availability of external rescue support should all be considered when positioning the activity on the matrix.

Appendix T Equipment

The equipment required and the appropriate "type" of equipment used is dependent on the specific context of the activity.

Caving equipment

Personal equipment

Equipment used for caving per person must include:

- appropriate helmet
- helmet mountable appropriate light source (e.g. LED battery headtorch) and batteries
- one spare light source
- appropriate footwear.

Other equipment used for caving may include but is not limited to:

- overalls
- other clothing appropriate for the environment and conditions
- gloves
- knee pads
- supply of water and food.

28 personal thermal protection:
28.1 thermal clothing
28.2 wet suit
28.3 dry suit
28.4 beanie
28.5 gloves
28.6 booties
29 lifejacket
30 other buoyancy aids.

Group equipment

Safety equipment used for caving must include:

- two spare light source(s)
- a watch.
- a first aid kit in waterproof storage (refer Core GPG — First aid equipment and medication)
- a waterproof method of storing and carrying documentation and communications equipment.

Safety equipment used for caving may include but is not limited to:

- whistle (that is suitable for water environments)
- a means of producing an open flame to test for *foul air*.

Other equipment used for caving may include but is not limited to:

- supply of water and food
- cave map
- route navigation equipment (e.g. removable reflective markers, removable string line etc.)
- swimming masks
- buoyancy aids
- toiletry aids.

Vertical caving additional equipment

Additional equipment used for *vertical caving* may include but is not limited to:

- accessory cord
- artificial fixed *anchors* used
- ascending devices
- belay devices
- *connectors* (e.g. carabiners)
- *cow's tails* or personal *anchor systems*
- descending devices
- *dynamic rope*
- gloves
- harnesses
- helmets
- ladders
- pulleys
- removable bolt plates
- rescue equipment
- ropes – static and dynamic as appropriate
- rope protectors
- slings
- *static rope*
- whistle (for communications or emergency)
- wire ladders and traces
- any other equipment that is part of the safety system used.

Rescue equipment may include but is not limited to:

- additional rope long enough for the longest pitch
- accessory cord
- ascending devices
- belay device
- *connectors* (e.g. carabiners)
- *cow's tails* or personal *anchor systems*
- knife suitable for cutting ropes (preferably on a lanyard)
- pulleys
- prusik loops
- slings.

General equipment

Specific general equipment may include but is not limited to:

Emergency/rescue

- documentation (see Core GPG - Activity leader required documentation)
- emergency communication equipment (see Core GPG -Emergency communication)
- first aid kit in waterproof storage (see Core GPG - First aid equipment and medication)
- a waterproof method of storing and carrying documentation and communications equipment
- specific activity context equipment required
- emergency shelter where appropriate for the context
- emergency equipment to keep a person warm (e.g. mat, sleeping bag, space blankets) where appropriate for the context.

Activity Leaders

1 communications equipment (standard communication rather than emergency communication where this differs) and spare batteries or backup "power banks"
2 relevant maps and navigation information
3 a waterproof method of storing equipment and carrying maps and navigation information
4 compass and/or other navigation aids
5 pen/pencil and blank writing paper
6 watch or equipment suitable to tell and measure time for first aid purposes
7 same as for participant.

Participant

31 personal medications (including for asthma and anaphylaxis)
32 personal hygiene requirements
33 clothing appropriate to the weather conditions
34 spare prescription glasses.

Group

35 backpack to carry equipment
36 toileting equipment to carry out waste
37 toilet paper
38 hand sanitiser
39 water purification system
40 repair kit
41 food for duration plus spare
42 rubbish bags
43 multi-tool with knife
44 sunscreen
45 insect repellent
46 first aid kit common content (see Core GPG).

Vertical caving activities

47 small personal backpacks to carry personal equipment with suitable attachment for hauling/lowering
48 inter-group communication equipment (e.g. whistle, portable two-way radios)

Appendix U Equipment related standards

Current as at 14 May 2019.

Equipment and the relevant standards that might apply may include:

49 Accessory cord (EN 564:2023)
50 Braking devices (EN 15151-1:2012, EN 15151-2:2012)
51 Carabiners or other connectors (EN 362:2004, EN 12275:2013, AS/NZS 1891.4:2025 or ISO 10333-5:2001)
52 Descending devices (EN 341:2011)
53 Energy absorbing systems EN 958:2024
54 Frictional anchors EN 12276:2013
55 Helmets (EN 12492:2025, UIAA 106 (4th ed., 2025))
56 Harnesses (EN 358:2018, EN 361:2002, EN 813:2024, EN 12277:2015+A1:2018, AS/NZS 1891.4:2025 or equivalent)
57 Ladders (Rigid) (AS 1892.1:2018)
58 Lanyards (EN 354:2010)
59 Rope clamps EN 567:2013
60 Rope – dynamic (EN 892:2012+A3:2023)
61 Rope – static (EN 1891:1998, CI 1801:2025)
62 Personal fall protection equipment - anchor devices (EN 795:2012)
63 Pitons (EN 569:2007)
64 Pulleys (EN 12278:2007)

65 Slings (EN 566:2017, AS 1353:1997 (series) or AS/NZS 1891.4:2025)

AS/NZS

66 1353:1997 Flat synthetic-webbing slings Product specification
67 1891 Industrial fall-arrest systems and devices
68 1891.4:2025 Part 4: Selection, use and maintenance
69 1892.1:2018 Portable ladders Performance and geometric requirements
70 2316.1.1:2021 Artificial climbing structures and challenge courses Part 1: Fixed and mobile artificial climbing and abseiling walls.
71 2512 Methods of testing protective helmets
72 2512.1 Part 1: Definitions and headforms

CI

73 1801:2025 Low Stretch And Static Kernmantle Life Safety Rope

EN

74 341:2011 Personal protective equipment against falls from a height—Descender devices
75 354:2010 Personal protective equipment against falls from a height—Lanyards
76 358:2018 Personal protective equipment for work positioning and prevention of falls from a height—Belts for work positioning and restraint and work positioning lanyards
77 361:2002 Personal protective equipment against falls from a height—Full body harnesses
78 362:2004 Personal protective equipment against falls from a height—Connectors
79 564:2023 Mountaineering equipment—Accessory cord—Safety requirements and test methods
80 566:2017 Mountaineering equipment—Slings—Safety requirements and test methods
81 567:2013 Mountaineering equipment—Rope clamps—Safety requirements and test methods
82 569:2007 Mountaineering equipment. Pitons. Safety requirements and test methods
83 795:2012 Personal fall protection equipment. Anchor devices
84 813:2024 Personal fall protection equipment—Sit harnesses
85 892:2012+A3:2023 Mountaineering equipment—Dynamic mountaineering ropes—Safety requirements and test methods
86 958:2024 Mountaineering equipment. Energy absorbing systems for use in klettersteig (via ferrata) climbing. Safety requirements and test methods
87 959:2018 Mountaineering equipment. Rock anchors. Safety requirements and test methods
88 12275:2013 Mountaineering equipment—Connectors—Safety requirements and test methods
89 12276:2013 Mountaineering equipment. Frictional anchors. Safety requirements and test methods
90 12277:2015+A1:2018 Mountaineering equipment—Harnesses—Safety requirements and test methods
91 12278:2007 Mountaineering equipment—Pulleys—Safety requirements and test methods
92 12492:2025 Mountaineering Equipment - Helmets For Mountaineers - Safety Requirements And Test Methods
93 15151-1:2012 Mountaineering equipment. Braking devices. Braking devices with manually assisted locking, safety requirements and test methods
94 15151-2:2012 Mountaineering equipment. Braking devices. Manual braking devices, safety requirements and test methods
95 1891:1998 Personal protective equipment for the prevention of falls from a height—Low stretch kernmantel ropes

ISO

96 10333 Personal fall-arrest systems
97 10333-5:2001 Part 5: Connectors with self-closing and self-locking gates

UIAA

Commented [DM1]: AS 2316.1-2009 was superseded in 2021 and split into three parts: AS 2316.1.1:2021 (belayed climbing and abseiling walls), AS 2316.1.2:2021 (bouldering walls) and AS 2316.1.3:2021 (climbing holds). Citations updated to AS 2316.1.1:2021; for bouldering/crash-pad contexts AS 2316.1.2:2021 applies - please confirm the correct part(s).

98 106 (4th ed., 2025) Helmets

Appendix V Equipment load ratings

Refer Equipment section for equipment requirements and usage.

Equipment loading introduction

Appropriate load safety margins are needed for any equipment that is used under load. The guidance given in the equipment section uses a range of specific terms related to equipment load ratings and safety margins. This appendix explains these terms (i.e. *Stated strength*, *Safe Working Load* (SWL) and *Minimum Breaking Strength* (MBS)).

Equipment loading

Proper understanding and use of equipment load ratings (*stated strength*) is needed to allow for an appropriate safety margins (*safety factors*) to be used. This ensures that equipment is never loaded to a point it is in danger of breaking or being damaged.

Manufacturers provide details of the load ratings for equipment either stamped on the equipment or in available documentation. This is called the *stated strength*. *Stated Strength* is the magnitude of load that is either the *Safe Working Load* (SWL) or Minimum Breaking Strength (MBS).

It is critical to understand the difference between *Safe Working Load* (SWL) and Minimum Breaking Strength (MBS) because SWL has a *safety factor* already applied to it, while MBS does not.

Safe Working Load (SWL): is the magnitude of load that does not permanently distort, weaken, damaged or break equipment. It is safe to load equipment to 100% of the SWL.

Minimum Breaking Strength (MBS): is the magnitude of a load that may permanently distort or damage a piece of equipment but not cause it to break. An appropriate *safety factor* needs to be applied to the MBS. The MBS is a load, determined by the manufacturer, that might not break a piece of equipment but may make it unusable or unsafe to use. Equipment should never be loaded to the MBS, even for testing purposes when testing a system before being use, the test should not exceed the SWL. Some equipment may be in danger of being overloaded even at less than half the MBS. It should be noted that the stated MBS value is calculated from tests on a selection of items, not on each individual item. It is therefore likely that a small percentage of similar items, (usually less than 1%) will break slightly below their stated MBS value.

Safety Factor: The ratio between the Minimum Breaking Strength (MBS) and *Safe Working Load* (SWL) which is used to provide a safety margin. It is expressed as a ratio (e.g. written as 4:1 or 8:1, etc.). An appropriate *safety factor* is chosen based on the type of equipment and intended use. The *safety factor* applicable may be specified in relevant standards or manufacturers instructions. It is recommended to follow known safe practices, manufacturers recommendations, relevant standards or calculated assessments when determining *safety factors*.

Examples

Refer to Climbing and Abseiling GPG for examples.

Kilonewtons (kN) of force vs kilograms (kg) of load (mass)

Newtons, (abbreviated to N) are the metric units of force. A 102kg object applies, approximately, 1,000 N, (1kN) downward force at the surface of the earth, (due to its mass and gravity).

In a simple vertical loading situation, it is generally accurate enough to convert a load mass of 100 kg to a force of 1kN. Forces can exist in any direction, not just up and down. Force is calculated by multiplying mass by acceleration. Gravity at earth's surface produces approximately $10 m/s^2$ of acceleration, (the exact valve varies and is slightly less).

Therefore, equipment rated 1 kN of force equals equipment rated approximately 100kg of load (1,000N divided by 10 = 100kg of load). So 1kN of force = approximately 100kg of load. Note that peak loads can vary and allowance for these should be made, including but not limited to taking into account weight, fall factor (see Appendix W) and rope stretch under load.

Examples:

Refer to Climbing and Abseiling GPG for examples.

Appendix W fall factors

See the Core GPG.

Introduction to fall factor

Safety systems (e.g. a *belay system*, traverse lines) are used to protect cavers from falls from a height. When a caver falls, the equipment needs to be able to withstand the load placed on it and stop the fall. When stopping the fall, the safety system places an impact force on the person as it stops them. The *fall factor* is how severe that impact force is on the person falling.

Appropriate equipment needs to a) stop the fall and b) minimise the amount of impact force on the person as they are stopped from falling.

The guidance given in the equipment section uses *fall factor* as the way to consider the impact force on the person when their equipment stops their fall. For example, the type of rope used in a *belay system* (e.g. *dynamic rope* vs *static rope*). This appendix explains what *fall factor* is and how to calculate it.

Fall factors

Fall factor is the ratio of the height of a fall (h) (measured before the rope or *cow's tail* begins to stretch) and the rope or *cow's tail* length available to absorb the energy of the fall (L). It is used as a representation of the severity of a fall when arrested by a *belay system*. It is calculated by (h) divided by (L). *Fall factor*s are illustrated in the following diagram A5-1. fall-factor-diagram

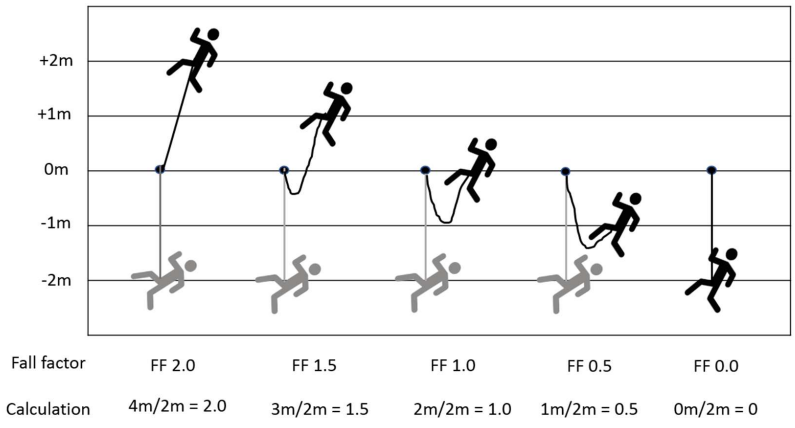

Figure W.2: Fall factors

Fall factors in caving contexts

The choice of rope type significantly affects the impact force on a person when a fall is arrested:

99 *Dynamic rope*, where used for a *belay system* in accordance with Section 7.3.5, stretches under load, absorbing energy and reducing peak impact force — particularly important where falls of any height are possible.

100 *Static rope* has low elongation under load. When used in a top-rope configuration where the belay attachment point is always above the climber (fall factor approaching 0), the reduced energy-absorption of static rope is less critical because peak forces remain low.

For caving *belay systems*, *activity leaders* should design and rig systems to achieve the lowest practicable *fall factor*. In a top-rope configuration, the *fall factor* should not exceed 0.2. In all cases, the *fall factor* for *cow's tail* systems must not exceed 1.0 (refer Section 7.3.2.1).

Appendix X Harness hang syndrome

See the Core GPG.

Appendix Y Foul air

See the Core GPG.

Indicators to consider

Potential situational indicators to consider may include:

101 high use caves with areas of poor ventilation (human respiration producing carbon dioxide (CO_2))
102 signs of fires or use of cooking stoves (both produce CO and CO_2)
103 known bat habitat's (bat respiration producing CO_2) or decomposing guano (ammonia is a by product of decomposition)
104 poorly ventilated low-lying areas where organic matter accumulates
105 geothermal activity (release of hydrogen sulphide/other sulphur gases).

Signs of foul air

Typically, there is no smell or visual sign of *foul air*.

The physiological effects can include:

106 increased pulse
107 increased breathing rates
108 lack of energy or feeling fatigued
109 clumsiness
110 unable to concentrate
111 severe headaches
112 dizziness
113 nausea
114 falling unconscious
115 death.

Note that not everyone shows the other physiological signs of *foul air* prior to falling unconscious or dying and that different people display different symptoms and severity.

Care should be taken to not to confuse physiological effects of *foul air* with other health issues (e.g. low blood sugar) or *vice versa*.

Experiencing symptoms

Immediately move out of the area at a slow pace (i.e. avoid increasing the breathing rate) in a direction that enables access to a cave exit (i.e. avoid moving through the suspect area and especially if it would cut off the means of escape).

Testing for foul air

The most appropriate means of testing for foul air is using an air analyser meter. When an air analyser meter is unavailable, a means of testing air suspected of being *foul air* is by lighting a naked flame (the naked flame test). In higher concentrations of *foul air*, it will fail to ignite or burn. The naked flame test can be completed by attempting to light a match, candle, or butane (cigarette) lighter. Ideally cavers should use a butane lighter flame.

The failure of a naked flame test or experiencing symptoms is a reason to exit the area immediately.

Note that the naked flame test is not conclusive that there is an absence of *foul air*, only that the concentration is low enough to allow a flame and the concentration may still be sufficient to have adverse health effects. While the naked flame test does not measure carbon dioxide (CO_2) concentration, in the

majority of cases, if a person has any of the symptoms of elevated carbon dioxide concentration, a simple naked flame test will fail to ignite (Smith, 1998).

Reference

Non Toxic "Foul Air" Can Kill. Garry K. Smith "Rescue Australia". December 1998 found at:
http://nhvss.org.au/wp-content/publications/Foul%20Air%20Rescue%20Australia.pdf

Appendix Z Water hazards and considerations

Swimming and wading

Hazards and risks when swimming and wading that must be considered include:

116 water temperature
117 swimming ability of participants
118 any pre-existing or past medical conditions/injuries
119 if prescription glasses or contact lens are being worn
120 hazards including those at the current activity location and downstream
121 the velocity of the water
122 the amount of aerated water and the buoyancy available
123 the depth of the water including being too shallow or too deep for the method used
124 the base of the watercourse including its stability and grip
125 the spacing between and the progress of participants.

Swimming and wading activity management considerations should include but are not limited to:

126 matching the activities to the participants abilities
127 using appropriate routes to address entrapment or other hazards and risks
128 wearing appropriate thermal protection or clothing in cold water
129 monitoring the group for risks associated with cold water immersion
130 swimming competence being checked prior to commencing the activity
131 assessment of swims and wades to ensure:
131.1 appropriate supervise can be provided
131.2 appropriate intervention can be used if needed
131.3 direct supervision of difficult swim, wade, exit points or where exiting at a point is integral to avoiding hazard(s)
132 managing weaker swimmers by:
132.1 using alternatives to avoid the swim or wade
132.2 swimming with an activity leader
132.3 providing extra buoyancy
133 the location and difficulty of the exit from the water
134 how clear the water is and if the base of the watercourse can be seen
135 the depth, velocity, and amount of water needed to be overcome to avoid being washed away (see below A7.2 Crossing moving water)
136 the base of the watercourse (e.g. pebbles, sand, small rocks or large rocks) that can increase the danger of foot entrapment and/or reducing the likelihood of maintaining stable footing.

Crossing moving water

When assessing the suitability of a potential crossing, consideration should be given but is not limited to:

- if there is debris floating or flowing in the current as this can indicate the risk of being hit and/or swept away by debris

- how clear the water is and if the base of the crossing be seen as this can help determine the depth of crossing
- the depth of the crossing as this can indicate the amount of water and force needed to be overcome to avoid being washed away
- the velocity of the water as this can indicate the volume of water and force needed to be overcome to avoid being washed into hazards
- where the water flows as the flow may wash people into dangerous situations (e.g. into *sumps*, into narrow rock crevices)
- the base of the crossing (e.g. pebbles, sand, small rocks or large rocks) as moving water can move the base increasing the danger of foot entrapment and/or reducing the likelihood of maintaining stable footing during the crossing.

Jumping from height into water

Hazards and risks when jumping into water that must be considered include:

137 ability of participants
138 any pre-existing or past medical conditions/injuries
139 any items worn that may be loose or become dislodged, lost or damaged (e.g. prescription glasses, contact lens, dentures, hearing aids, insulin pumps, cameras, etc.)
140 difficulty and exposure of access routes
141 exposure to potential unintended falls from height
142 falling or jumping outside of the intended *fall zone*
143 the features of the take-off area
144 the horizontal travel distance from the take-off position to the *fall zone*
145 obstacles within the route of the jump
146 the *fall height* involved (see below A7.5 Water impact)
147 the depth of and obstacles within the *fall zone*
148 the impact forces when entering the water (see below A7.5 Water impact)
149 degree of aeration of the water
150 equipment being carried impacting the jumper on landing
151 fast flowing water in the *fall zone* flowing into hazards.

Procedures to assess the suitability and safety of a deep-water *fall zone* must be developed and used.

Appropriate assessment by a suitably competent person must be undertaken prior to the use of a deep-water *fall zone*.

Procedures must protect against the possibility of anyone using a deep-water *fall zone* being swept into a downstream hazard.

Instruction on how to take-off and land if balance or control is lost must be provided.

Jumps should not be from a height greater than 10 metres.

Jumping into water activity management considerations should include but are not limited to:

- participant management ensures they do not interfere with each other's stability in access and take-off areas
- the *fall zone* is clear of other people before each person jumps
- difficult access, take-offs and/or landings have direct supervision
- appropriate protection against falling used while accesses the take-off areas
- appropriateness of wearing a pack (e.g. height of jump, impact forces, type of pack, weight of pack etc.)
- physical characteristics of the participants
- actively managing jumps into difficult *fall zones*
- positioning an activity leader at the bottom to indicate the required *fall zone* and/or mark a hazard
- providing a suitable alternative where relevant (e.g. lower jump, abseiling or being lowered)
- the location and difficulty of the exit from the water
- features of the take off and technique used
- when wearing a lifejacket, it must be correctly fitted and the correct technique used to ensure the lifejacket does not dislodge on impact and effect movement
- appropriate technique so that helmets and chin strap do not cause injury when a helmet hits the water on higher jumps.

Buoyancy aids

Considerations on the use of lifejackets or other buoyancy aids must include:

- the likelihood of falling into or moving through water
- the safety systems used to protect from falling into water
- the water hazards and risk involved
- the water temperature
- the aeration of the water
- the amount of buoyancy provided by the clothing worn or the equipment used
- the amount of reduced buoyancy caused by clothing worn or the equipment carried
- the amount of buoyancy provided by the lifejacket or aid
- the likelihood of being in water for a long time
- the likelihood of being washed downstream
- the swimming ability of participants
- the impact of the length of the journey and environmental conditions on the participants ability to swim
- if needed to assist with jumps into shallow water
- if needed as a means of holding or supporting people
- if needed as a means of helping people out of water.

Water impact information to consider

The impact experienced hitting water when jumping needs consideration. Refer to Canyoning GPG for information.

Detailed Contents