New Zealand Speleological Society Inc

NZSS Cave Conservation Guidelines

To be read in conjunction with the NZSS Minimum Impact Code, which guides the actions of NZSS members, and hopefully other cave users, in relation to caves.

The New Zealand Speleological Society believes that:

- caves and karst areas have unique ecological, scientific, recreational, scenic, and cultural values;
- these values may be compromised by careless and intentional vandalism, and extractive industries such as mining, quarrying, and logging;
- once these values have gone, they cannot be recovered; and
- responsibility for protecting cave and karst areas must be assumed by those who scientifically study them, and those who pursue recreational opportunities in them.

The Society supports two different approaches to the care of caves, depending on the values of the cave:

"Conservation" is the wise, balanced, and sustained use of our natural resources, and requires a responsible approach to protection, conservation, development, and use of New Zealand's cave and karst resources.

"Preservation" is the most rigorous level of conserving karst features, which in the most extreme case may require non-entry to caves and karst areas, and is regarded by the Society as the appropriate protection for the most vulnerable sites.

Accordingly, the Society will:

- Work not only for the pursuit of recreation and scientific study in caves, but also for the appropriate conservation and preservation of our caves and karst areas;
- Encourage conservation awareness among Society members and other cave users;
- Provide information to minimise the damage to caves and karst areas;
- Promote education and research on cave conservation to prevent damage to caves and karst areas; and
- Cooperate with other groups involved in the conservation of natural environments.

The Society supports and encourages efforts by individuals, organisations, and government agencies to protect caves and karst areas, and in particular:

- Opposes the sale of subfossil faunal remains and speleothems;
- Supports effective protective measures, including entrance controls, where appropriate;
- Encourages the monitoring of user impacts; and
- Promotes the cleaning and restoring of over-used caves.

Principles of cave conservation

"Caves and karst feature are extremely valuable, vulnerable, and irreplaceable. These sites are repositories for a vast range of scientific information that is not available elsewhere." – International Union of Speleology (UIS), 2008.

Caves are a limited resource: the world's most fragile wildernesses. They provide irreplaceable habitat for rare species, and house records of past environments not preserved anywhere else. Caves may be regarded as "time-capsules," preserving a record of past biological, geological, and atmospheric conditions for those who know how to interpret them. Cavers and cave scientists have a collective duty to pass on a legacy of unspoilt caves to future generations. The experience of future generations in our caves must not be degraded, compared to what we have today.

Focus on the cave and its features

This is the basic and simplest rule for maintaining the state of a cave. If, on the contrary, the focus is on something other than the cave, such as financial gain, personal objectives, rescue, etc., then the cave will suffer. Visiting a cave is like borrowing a book at the library; it must be returned in the same state as you received it.

"Leave No Trace" is the key principle

Every caving trip makes an impact, however small, and contributes to the cumulative degradation of the cave. Ideally, all caving trips should aim to have some kind of return – apart from personal enjoyment – to make up for the damage inflicted, in the form of documentation (such as survey, photographs, scientific observations). Knowledge is the most important legacy we can provide for others.

The only permanent marks that are acceptable in caves are:

- unobtrusive (generally removable) survey station marks;
- other reference points for mapping, cave monitoring, and scientific investigations;
- flagging tape tied across passages to block them from general access;
- route and track markers.

Track marking

Routes are often marked through a cave to delineate floor areas that can be walked on, usually forming a narrow track about 40 cm wide, marked on both sides. This minimises damage to the floor, and to formations on the walls and ceiling. Try to avoid leaving footprints, and avoid spreading mud on walls and speleothems.

The new standard for marking routes is 3mm synthetic cord, which is positioned a few centimetres above the floor and pinned in place with thin steel pegs to form a "stringline". Flagging tape is best avoided on floors, as it degrades easily, is often chewed by rats, and has also been known to be absorbed into flowstone floors.

When established routes exist, stay on them to help keep other areas of the cave pristine. If you visit new or less-travelled passages, keep your team to one route to minimize your impact on the cave and establish a route for future visitors. Blocking a fragile portion of the cave non-destructively (e.g. with flagging tape or cord) may be appropriate in some instances to minimise future impact.

Protect caves by protecting the surface

Trash (including dead animals) dumped in a sinkhole can enter and harm a cave ecosystem. It can also pollute the water that drains to underground streams and natural reservoirs that supply drinking water. Keep surface areas near entrances free of sources of pollution. Clean out karst features, such as sinkholes, that have been used as receptacles for rubbish.

Cave rescues

During a cave rescue, the focus is naturally, and appropriately, on the victim and the transport logistics. This is the only situation where excessive trampling. Wear, and in some cases, passage widening may have to be accepted. However, similar damage is sometimes unavoidable during rescue practice (training). Therefore, rescue practice should be restricted to only a few already damaged caves and *never* performed in newly discovered or otherwise pristine caves.

Withhold cave locations

Increasing casual visitors to wild caves by geocaching or posting locations on the Internet is a misuse of cave location information. This may lead to vandalism, pillaging of cave artefacts such as sub-fossil bones, inadvertent damage, and overall degradation of caves. Excess visits can also upset landowners, causing them to close their caves.

Show caves and adventure caves

Development of a show cave (tourist cave) imposes a major change on the cave, as it will be transformed into a transport corridor for thousands of tourists, which will inevitably leave on-going impacts. Despite that, show cave development may be an effective way of conserving a cave from uncontrolled "wild" caving, and can protect undeveloped sections of the cave away from the tourist route. Show caves also relieve stress on other vulnerable caves in the vicinity, and can have a useful educational role in conveying information on the cave environment and cave science.

Sustainable show cave development

The prescriptions and guidelines of the International Show Caves Association, as endorsed by the UIS, should be used to guide development of show caves. The principle should be to utilise removable installations, in preference to permanent materials such as concrete. High efficiency lighting should be employed, and cables should be concealed without damaging the cave. The development and subsequent use should have minimum impact on the natural environment of the cave. Environmental conditions should be monitored for change, such as development of algae near lighting.

Focus on education rather than entertainment

Show caves have great potential for conveying knowledge and stimulating interest in the natural sciences and in the relationship between caves and human activity. Development of show caves should involve collaboration with speleologists in order to ensure maximum display of the cave's educational potential.

The results of research and exploration in the cave and its vicinity should be popularised and made available to management of the show cave.

Adventure caving must be sustainable

Any damage caused to a cave diminishes the legacy bequeathed to future generations. To minimise impact by adventure tourism, outdoor education, and commercial recreation groups, party size must be restricted, especially in low energy and small caves (less so in river caves), and groups must be controlled by guides who are aware of cave conservation. *Conservation of the cave environment must take precedence over all economic considerations.*

Competitions must not be held in caves

Although caving is a sport and may involve elements of performance, competitions of any sort are inappropriate in caves, because heavy physical use diminishes their natural values. Risking damage to caves in the name of sport is totally unjustifiable, and must be opposed by cavers.

Sampling in caves

Caves have become an important target for scientific sampling in recent years, and research in caves is accelerating globally, particularly with the growing interest in climate studies.

Sampling should be undertaken by well-qualified experts

Scientific sampling should be performed in show caves, if possible, as it deflects impact from equivalent wild caves, and the resulting information can be incorporated in the cave's "story".

Samples and specimens must not be traded

Trading in specimens from caves (whether scientifically purposed or otherwise), such as speleothems and fossils must be discouraged in every way. Trading and private ownership of material from caves should be dishonoured. Such material should be kept in the cave, or if previously removed, in a museum. Fossils or specimens in private custody cannot be scientifically studied, as the specimen is not publicly available as reference material.

Follow local practice for permission

A collecting permit from the Department of Conservation and local iwi is required for all sampling on public conservation land administered by the Department. Elsewhere permission must be obtained from landowners prior to starting collection. Restrictions are likely to vary, depending on land ownership and cultural significance. The manner of collection must be discussed with, and approved by, the land owner or manager, and must in any case have the least possible impact.

Store research materials with data repositories

To minimise unnecessary duplicate sampling, research results should be freely available. Analysed samples and specimens must be deposited in a museum or research institution, where it is curated and made available for other researchers.

Living organisms

Cave environments are extreme and subterranean organisms are correspondingly fragile, vulnerable, and often only present in very low numbers. Thus sampling must be carefully considered, and should only be undertaken by well-qualified experts. Organisms kept alive must not be released elsewhere, because population characteristics may be highly localised.

Speleothems

The irreplaceability of speleothems must be understood. The removal of a growing speleothem from a cave on public conservation land is prohibited by law. No formation, including broken pieces, should be removed without the permission of the land manager. Where sampling is permitted, non-destructive methods such as coring should be used in a discrete area.

Sediments

Sediments in a cave form the habitat of many organisms, and contain records of past environmental history. As with any other cave deposit, they should be treated with respect and not be trampled, moved, or sampled indiscriminately.

Archaeological, fossil, and sub-fossil deposits

These deposits are irreplaceable and of great value to science, and so should only be excavated by qualified professionals after having first obtained permission. Excavations should remove only a fraction of the deposit of interest, to ensure that a major portion is left untouched for future work; the only exception is if removal of the materials is the only way to guarantee their preservation (e.g. in a quarry, or rapidly eroding bank of an active river passage).

Cave restoration

Repeated visits to caves, even with the best of intentions, cause accumulated degradation to caves. Damage may include, among many other things:

- Breakage of delicate formations, such as straws;
- Trampling sediment floors;
- Tracking mud across rock, flowstone, or boulder floors;
- Depositing mud on walls and formations when passing by.

Some aspects of this damage, such as breakage of delicate formations and tracking in soft floors, cannot be repaired. However, there is a certain amount that can be improved, and cave clean-up operations are occasionally undertaken with the intention of removing mud from walls and floors, improving route markings through the cave, and providing discrete signage.

Restoration work may be coupled with new initiatives to protect the cave, such as marking of designated “boots-off” areas where boots are removed and progress is in socks (or specially provided clean footwear). Such areas will normally be marked with signs made from waterproof paper.

NZSS holds equipment for cave restoration at Waitomo and in Nelson, including pressurised water sprayers for cleaning, as well as stocks of cord and pegs for route marking. Contact the NZSS Conservation Coordinator for further information.