



Understanding Underwater Cave Rescue: A Call for Cross Training and Practice

by Germán Yáñez Mendoza

Caving rescue teams around the globe work constantly to respond to crises quickly, efficiently, and safely. This volunteer work takes a different form in each country according to the terrain and local techniques and philosophies. All teams have developed interesting ways to help cavers. Cave and cave diving rescue requires not just training and experience but also the important element of creativity. Because each scenario is different, on-site rescue may require methods not described in books or used by other rescue schools.

Cave rescue vs. recovery

Cave rescue is a "highly specialized field of wilderness rescue in which injured, trapped or lost cave explorers are medically treated and extracted from various cave environments" (Wikipedia 2021). Recovery, on the other hand, is the act of "bringing back to the surface a buddy with no vital signs from an underground environment" (author's definition). All cavers and cave divers should understand the distinction.

Origins suggest technical differences

Modern cave rescue began in 1962 with the first congress in Brussels, Belgium. Groups from different European countries began to organize and to develop protocols and techniques. Most importantly, they established a resource to help others. From this congress sprang the British Cave Rescue Council (BCRC), the first cave rescue organization. Ten years later, the Spéléo Secours Français (SSF, or French Caving Rescue) was born, followed three years later by the US National Cave Rescue Commission (NCRC). Today all of these groups remain well organized and stand ready to support other groups worldwide if they have a need in a cave rescue operation.

The history and groups' origins help to explain how their techniques are similar but not the same. Some groups started using mountaineering principles, others urban rescue techniques, still others caving practices. Each region's practices and technologies vary according to the types of caves and environmen-

tal conditions, which in turn determine equipment and configuration, use and access.

Individual teams differ according to their field experience with real accidents, their communication systems, and their technology. The number of volunteers and specialized cavers further defines the team's practices, as does the individual background of each caver.

After 32 years as a caver I can see the pros and cons of each school and philosophy. The point is not to judge who has the better way, but to understand that we as rescuers may need to adapt to the conditions, situations, and laws of a different country while working as a unit.

At the end of the day, the different schools all work fine. What's important is to understand the need for conducting training and rescue exercises continuously with our own groups and with other groups. In this way our knowledge increases, and we learn other ways to work. One day you may need to use that way.

What about underwater cave rescue?

Probably the first underwater cave fatality documented was in 1949 in England's Wookey Hole. Great Britain's Cave Diving Group (CDG), the world's first cave diving organization, was also the first to document an underwater cave recovery. The victim's name was James Gordon Ingram Marriot.

In 1977 during an international cave diving camp in Great Britain, the Cave Diving Group (CDG) formed the first section of underwater cave rescuers. Its goal was to assist in underwater cave accidents using a methodology.

Five years later, the Cave Diving Section of the National Speleological Society (NSS-CDS) authorized creation of an organized group for rescue and recovery missions. Sheriff Henry Nicholson, an NSS-CDS instructor, led the group which included divers from both the NSS-CDS and the National Association for



Packing in water, food, and medical supplies. © Germán Yañez

Cave Diving (NACD). The group evolved into what is today the International Underwater Cave Rescue and Recovery Organization (IUCRR) under the direction of Henry Nicholson and Robert Laird in 1999. Today this great organization offers workshops and creates liaisons with local and international authorities to resolve underwater cave accidents. It assists law enforcement, more often with recoveries than rescues. The IUCRR is the authority for cave rescue/recovery in all of the Americas.

Getting organized in México

Formal underwater cave rescue started following accidents in different regions of México. During the 1980s, a major politician's son died in an underwater cave in Chacalal Bay, Puerto Aventuras, Quintana Roo. In those times we didn't have cave divers trained in recovery. The victim's family called Steve Gerrard to help them. This was the first organized, methodical underwater cave recovery made in a spring in México.

Two other early events in México involved sumps. The first was the fatality of Ian Roland, a British cave diver who died in 1994 during Bill Stone's Huautla expedition. The team was able to perform a successful recovery in this very technical cave.

The second event occurred in the mountains of Puebla in 2004. Mariano Fuentes died while attempting to connect Oztoque cave with a second sump. The recovery was a challenge for us as Mexican underwater cave rescuers. We joined forces with Steve Omeroid and Dave Milhollin, learning from them other

techniques and methods to search and recover a caver in a sump.

Conditions were really bad in terms of visibility, temperature, narrow passages, and logistics. The team decided this operation was too high risk, so we focused first on bringing the equipment to the surface. Mariano's body could not be recovered.

This sad event represented the first team effort for Mexican cave divers learning sump recovery. The team consisted of Juan Carlos Carrillo, Alejandro Álvarez, and myself. In spite of the tragedy, it was a good introduction to learning how complex a sump can be.

At the end of the 1980s I had the chance to meet Parker Turner and Steve Gerrard. They wanted me to take a recovery class so that I could help respond to emergency cave situations in my country. I was unable to do this because it was difficult for me to travel to the US.

Later, Steve called me to ask if I could go cave diving with Henry Nicholson when he visited México. I proposed to Steve that Henry could teach a group about cave recovery methods and protocols. After a couple of days Steve called back to confirm that Henry would teach. This was the first underwater cave recovery class in México. I am lucky to have had the honor of meeting Henry and to be trained by him.



A sherpa transports gear through the sump. © Germán Yañez



Swimming the stretcher to the next dry area. © Germán Yañez

A few years later we had the chance to work with Lamar Hires under the auspices of IUCRR. We organized a workshop to train members of the Circulo Espeleológico del Mayab A.C as IUCRR first responders.

“Speaking the same language”

Today we can see a ‘fracture’ between rescue operations in dry caves versus underwater caves. By “fracture,” I mean that each team often doesn’t understand well what the others’ jobs involve: They speak in different languages, which is something should be avoided. Both dry rescuers and underwater cave rescuers should understand the role each has in a mission and their personal capacities and limits.

In dry cave rescue, all is well established. The team understands the many skills needed, such as rigging, underground communication, hauling systems, pulley systems, transporting a stretcher, and more.

By contrast, most cave divers are not trained in these activities, which complicates the chain of command during more complex scenarios.

In addition to having strong cave diving experience, cave divers should ideally get involved in dry cave

rescue protocols. This will promote understanding of the different roles to be had during a cave rescue, which is not always in an underwater cave.

Different time constraints, logistics, and skill sets

Conducting a recovery in a sump is markedly different from a spring recovery. Both environments present their own challenges.

Springs, for example, can have long underwater passages, strong flow, and significant depths. They mostly (but not always) have good visibility. However, it is generally recognized that the victim is already dead. The recovery team can take all the time it needs to plan and to gather the divers. There is no hurry to stabilize the patient, no need for complex lifts and stretchers, no rush to medical care. In other words, the job is all underwater and with no time pressure.

In a sump operation, the local authorities usually designate an incident commander. All rescuers, whether underwater or dry cave, must understand the operation’s hierarchy. This means respecting the commander’s decisions and conforming to the operation’s hierarchy, regardless of prior experience or disagreements.

The team may be underground for weeks in a remote location. Staging the operation may require them to create hot points and bivouacs. It goes without saying that everyone involved needs self rescue and survival skills.

Sump rescuers absolutely must be well versed in single-rope techniques. Deep vertical pits require careful negotiation, sometimes for many hundreds of meters, on rope. Rescuers must be able to set up and check their own rigging, as well as rig and manage the stretcher, the hauling systems, and the pulley installations. They will be installing spits or drilling parabolts, then drilling, diving, and doing it again. And again.

After reaching the patient, rescuers will need to evaluate and stabilize the person—to maintain the airway, stop major bleeding, protect against hypothermia, and treat major injuries, such as immobilizing fractures (see related article in this issue).

The team decides about how the transport can most safely be accomplished. The visibility usually is bad. A full-face mask is the safest way to evacuate an injured person through underwater passages.*

Sometimes the dry rescue cavers don't dive, so after the first sump the diver must be able to do everything that that the dry cavers did in the first chambers.

Knowledge base for rescue and recovery divers

In addition to law enforcement aspects, trainees should learn about:

- the Incident Command System;
- proper rigging techniques;
- the proper use of pulley and haul systems;
- how to rig and safely mobilize a stretcher in dry areas or underwater passages;
- advanced first aid;
- underground communication systems;
- full face mask use for unconscious patients in sump transitions;
- survival skills;
- single-rope techniques; and
- teamwork.



Open-circuit scuba is acceptable for practice. But using a full face mask is the safest way to swim an unconscious diver out of a sump. © Germán Yañez

So the cave itself is like a filter: The further you penetrate, the more skills you must know. This is something all cave divers who are involved in a rescue operation must understand.

When responding to a rescue or recovery operation, we need to observe before we act. If we are on site first, we should act as first responders. We can start organizing the command post, obtain information from witnesses, get the GPS coordinates, and assess for logistics. What is the operation likely to need in terms of communications, ropes, underwater equipment, food, tenders, access, diving gases, and rigging equipment?

Firefighters, police, army, civil guard members, and urban rescuers initially work hand-in-hand with cave rescuers. Once they see the complexity and the skills that these missions require, however, usually they let the cave rescue organizations work with their own methods.

Perspective, practice, and creativity

Performing a cave rescue in a dry or underwater cave is not for everybody. It is not fun. We need to leave the egos behind and ask ourselves if we genuinely are qualified for such a mission. Being a rescuer requires years of not just continuous training, but also

** The photos of rescuers practicing exercises with conventional scuba assume that the patient is conscious and fairly well. The best way to remove an unconscious diver from a sump is with a full face mask.*

participating in field exercises with different groups. Each experience gained is part of a learning process.

Remember that something that may work in Florida caves may not work in Thai caves, or even worse, in Central México's deep pits and sumps such as Huautla. Every scenario is different, and we are not all prepared for all rescues. This is especially true if you haven't practiced performing rescue exercises with other groups in many cave scenarios. Even if the caves are similar, each cave usually requires creativity during a real incident or accident.

You should always have with you your imagination and creativity. By using these qualities in the rescue field, you will always be one step ahead.

Prevention is the key: Don't be part of the problem. You may want to help—but by making a bad decision you could create a problem during a rescue operation ,or worse, become a victim.

Be safe.

During the last two years, I have been working on an underwater cave rescue manual for the Mexican Federation of Diving Activities (FMAS-CMAS). My goal is to streamline the basic concepts we use in dry cave rescue so that 1) underwater cave rescuers understand them and 2) we all speak the same language. This manual does not attempt to establish one method; it considers different ways that we can perform a rescue or recovery and what is required to complete the mission.

Please feel free to contact me if you are interested in underwater cave rescue methods. I can also point you toward information about rescue groups in your country.

— Author's note

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Removal from the water. © Germán Yañez