

expedition in the caves in 1989. The remains date back to the glacial Pleistocene Era (2.5 million to 12, 000 years ago). The presence of the now extinct species in the CCS is shrouded in mystery and only speculations can be made about their existence in the caves.

Archaeology



Photo by David Larson

The Chiquibul Cave System is a window into the cultural past of the area. The Institute of Archaeology considers the entire CCS an archaeological site. Within the cave system there are several chambers that hold archaeological artifacts. Artifacts within the caves are vulnerable to looting but a number of artifacts are still in place and undoubtedly, many still remain, undetected.

Mayans believed that caves as well as standing bodies of water were entrances to the underworld. The nature of the CCS and observations made shows that the caves had been heavily used by the ancient Maya for cultural and spiritual activities. Ceremonially placed bones from humans and deer, areas for incense burning, the location of pots and bowls, and collections of concentrated pottery shards all point towards ancestral Maya activity in the caves. Evidence found in the caves indicate that these were used by the ancient Maya as a source of drinking virgin water and an area to perform religious rites, ceremonial dump sites, burials and art galleries.

Management

In 2008, Friends for Conservation and Development (FCD) entered in a co-management agreement with the Institute of Archeology for the on the ground management of this cave. Management of this cave is guided by a five year management plan. The goal of

the management plan is to maintain the Chiquibul Cave System as a world class heritage site within the Chiquibul Forest recognizing its great cultural, archaeological, geological and biological significance. The vision is to *promote, conserve and protect the biological, geological, and cultural environments of the internationally recognized and unique Chiquibul Cave System in a sustainable manner for Belize and the world.*



Photo by David Larson

This Management Plan is based on an adaptive management framework which lists various management programs including Research and Monitoring, Cultural and Natural Resources Management, Infrastructure and Public Use. The Plan takes into consideration the numerous opportunities that exist for strengthening the management of the CCS, and sets the stage for long-term sustainable management of this system.



3 Photos by David Larson

For more information contact:
Friends for Conservation and Development
Tel: 00501-823-2657
E-mail: fcd@btl.net
Websites: www.fcdbelize.org



Bear photo in front cover by Daniel Reed

Chiquibul Cave System

The longest cave system in Central America containing the largest cave room in the western hemisphere

Introduction



Photo by David Larson

The Chiquibul Cave System (CCS) is the longest and largest known network of caves in Central America. The largest known cave room in the Western Hemisphere has been discovered in the CCS along with over 55 km of cave passages. The CCS is located within the Chiquibul National Park (CNP), which is the largest protected area in Belize, consisting of over 264,000 acres of broadleaf forest, located in the Cayo District, Belize. Due to its extent and integrity, the caverns represent a unique and prestigious cultural, geological and biological feature of the Chiquibul forest worthy of global importance and for designation as a World Heritage Site.

This huge cave system is the underground passage of the Chiquibul River consisting of four huge caverns and numerous sinkholes. The caverns are known as Kabal, Tunkul, Cebada, and Xibalba. The vast system stretches through the Maya Mountains and across the border with Guatemala to the west. The 70-100 million year old Maya Mountains consist of granitic, sandstone, volcanic and limestone elements. Some of the most conspicuous

features of the CCS are a result of the limestone geology. As an integral part of CNP the Chiquibul Cave System offers a unique opportunity to study the current and past biology of caves. They also provide a window into the cultural past of the area through remnants of Mayan culture found preserved in the huge caverns.

Karstic Formations



In Belize a main component of the geology is limestone rock. It has been estimated that the Chiquibul caves began to form at least 800,000 years ago. The slow process of karstification has created the vast caverns of the CCS. Other natural features in the CNP have been created as a result of the karstic geology in the area, including sinkholes and natural arches. Sinkholes are formed when erosion is so severe that a cave ceiling collapses and natural arches are formed similarly to caves but their entrances are so large that you can see through the next side of the formation.

Importance



Photo by David Larson

The Chiquibul Cave System lies in the Chiquibul-Maya Mountains Key Biodiversity Area, a region highlighted as

a world 'hotspot for species diversity', and considered critical for the preservation of the biodiversity of the Western Hemisphere. The combination of North American, South American and Caribbean life forms provides for a unique assemblage of plants and animals which has resulted in a region particularly rich in biodiversity – with 8% of the world's known plant species, and 10% of its vertebrates. Hydrologically, the CCS plays an important role in the Belize River watershed. The CCS is a conduit for flood water and impacts the drainage of both the Mopan and Macal rivers.

The opportunity for research in the areas of archaeology, geology and paleontology is tremendous. Most of the research in the cave so far has focused on the exploration and mapping of the layout of the cave system. The CCS also has a high tourism and educational potential as well as an opportunity for promoting civic pride.

Fauna



Photo by Boris Arevalo/FCD

At least 70 invertebrate species have been found in the Chiquibul Cave System. Species of snail, spiders, isopods, shrimp, crab, springtails, and insects have all been recorded. Bats, catfish, snakes and rodents have also been recorded in this cave system. Only four or five species found deep in the caves show significant adaptation to the cave environment. Both the cave-dwelling (troglobitic) shrimp and crab have reduced or no eyes and lack pigmentation as is typical in animals adapted to life in the dark zone of caves.

Thousands of bat skeletons have been found in the CCS representing at least eight different species including the remains of an extinct species of large vampire bat (*Desmodus draculae*). Indications of other extinct fauna are present as well. Remains of a Florida Cave Bear (*Tremarctos floridanus*) were discovered during an

