

# WARREN CAVE NATURE PRESERVE MANAGEMENT PLAN

## **Introduction**

Warren Cave, in Alachua County, Florida, is a most unusual cave. First, it has three separate levels of passageway are located between the ground surface and the water table, and contain a thumping four miles of passageway. It is, in fact, the longest cave in Florida, and is likely to remain so. No other cave more than half that length has been found in the history of the Florida Speleological Society.

Second, Warren Cave is the "type location" for the blind crayfish *Procambarus pallidus* (Hobbs, 1942), which was described by Horton H. Hobbs (presently the Senior Biologist at the Smithsonian Institute) in his book *Crayfishes of Florida* (University of Florida Press, 1942). The crayfish is presently on the endangered species list in Florida, and is classified (we believe) as rare. We have not seen the crayfish for several years, but this is not particularly unusual, since the water in the cave's lower level has receded out of reach in recent years. We know from research that a considerable amount of water-filled passageway exists below the area where the crayfish were last seen and fresh nutrient material in the form of organic surface debris still siphons into this lower area. We expect the crayfish to be reported again when a rising water table brings them back into view.

Finally, Warren Cave features prominently in the early history of the area and has been the subject of considerable interest periodically, since its discovery in the 1830's.

## **History Of The Property**

During the 1850's, Florida was embroiled in the Seminole Wars. A series of battles was fought up and down the Florida peninsula. Militia and home guard units sprang up everywhere and settlers built strategically located forts throughout the states. Among the many engagements of the wars was one which is closely tied to the history of Warren Cave. On September 11, 1836, Colonel John Warren led his men in the battle of San Felasco Hammock near the site of Warren Cave.

John Lee Williams, writing in 1837, gives this account of the battle *In The Territory of Florida*:

On the tenth of September a cart attended by three white men and two negroes was sent from Newmansville (near the present town of Alachua) to gather corn in a field about a mile from the village; they were fired upon by Indians. The men and Negroes escaped to the fort, but left the cart in the hands of the enemy. It was a rainy evening: the spies were sent to discover the situation and force of the enemy. They were discovered in the hammock of San Felasco four miles distant, about 300 in number.

The next morning (Sabbath) Colonel Warren marched out to attack them at the head of 150 men, 100 mounted volunteers, 25 gentlemen citizens, and 25 United States troops. He advanced in three columns, the right led by Col. Warren, the left by Col. Wills and the centre by Capt. Tompkins with the regulars and a 24 pound howitzer. Within three quarters of a mile of the hammock they were met by the enemy, and the battle immediately commenced along the right wing and centre, while the enemy attempted to turn the left flank; but were charged with spirit by Col. Wills, who drove them into the scrub on the border of the hammock from which they were routed by the artillery, which played upon them with great effect.

Their next attempt was on the right; but they were soon driven again under range of the howitzer, which did good execution. The Indians twice charged upon the centre, to take the howitzer, but were repelled, and they were at length routed at all points and driven one and a half miles into a dense hammock (probably that in which Warren Cave lies, judging from the map in William's book).

Whether or not Colonel Warren was actually the discoverer of Warren Cave, as local tradition claims, history at least lends some basis for the assumption. Colonel Warren did at least lend his name to the cave.

A narrow stagecoach road passed near the cave during the latter 1800's and early 1900's. One of the stage stops, in fact, was quite near the cave. Warren Cave came to be well-known through north-central Florida and when the USGS mapped the area in 1894, they figured Warren Cave predominately on the topographic sheet.

As it remains today, Warren Cave was a popular spot for week-end outings. Early adventurers explored the cave by the light of torches and kerosene lanterns. The soot they left on the walls and ceilings remains today -- heavy up to the pit just within the entrance and almost imperceptible as you approach the end of the Historical Section. Two of these early explorers are known to have fallen to their deaths while trying to attempt to cross over the

top of the pit. Sometime during the 1890's an attempt was made to commercialize the cave and wooden ladders were installed in the pit. Needless to say, the attempt was a failure.

## **Resources**

### **Biological**

The Warrens Cave Reserve is located within an area historically known as the San Felasco Hammock. This once-expansive, moist, southern temperate forest has been greatly reduced through lumbering and agriculture. Near the Warrens Cave Reserve, a portion of this forest has been preserved as the San Felasco Hammock State Preserve.

Cultural impacts have had significant effects upon the terrestrial biota of the Warrens Cave Reserve. The Reserve was logged for pine and deciduous hardwoods perhaps several times in the past. Loblolly pines have lately been planted in rows among a few relict (lumber rejects or seed trees) sweetgum, white ash, southern red oak and longleaf pines. Some of these older trees are greater than two feet in diameter. These relicts have brought seedlings and new trees and shrubs have invaded via other natural means. The diversity of the mixture is indicated by the list of 24 species of trees and shrubs known to occur on the Reserve.

Terrestrial animal populations have likewise changed due to impacts. Bear and panther are seldom seen in this area. Although other animals such as deer, bobcat, raccoon, armadillo and turkey probably utilize the Reserve to some extent, probably only the armadillo is common. The cottontail and several small rodents are also present. Bird populations are relatively diverse due to (a) the diversity of plants on the Reserve; (b) the Reserve being part of the larger San Felasco Hammock; and (c) the relative isolation from cultural impacts that currently exists at the Reserve.

Warrens Cave has no vascular flora, but it does have a varied fauna. These include mammals, reptiles, amphibians, insects, spiders and cave crayfish. Bats were once abundant, but are now seen only infrequently in Warrens Cave. The cave has probably sheltered a small but steady population of mice living near the entrance since it was first opened. During past speleological expeditions, when waste food was available, a second group of mice nested more deeply within the cave. The second group no longer exists. The author knows of only one specimen of slimy salamander that has been observed or collected in

the cave. It is known to occur in the surrounding terrestrial environment, however, so it may be at least an occasional visitor. When ground water levels are relatively high [ $\geq 150$  feet msl], a pool of water is formed to the right (west) of the Crossroads. This pool is the type locality for the cave crayfish, *Procambarus pallidus* (Hobbs) 1940. The southern bullfrog and leopard frog have also been observed here. The pool is presently dry as the water table is relatively low ( $\approx 40$  feet msl). Cave crickets can usually be found in the twilight zone near the entrance. Other insects and spiders are more rarely observed. A yellow rat snake (several?) has been seen in the cave several times. During one very cold winter night, it was found-about 150 feet from the entrance, well within the dark zone. A young corn snake has also been found in the cave.

The land immediately surrounding the Warrens Cave Reserve is slated for low density residential development. This will have definite impacts on the terrestrial fauna of the Reserve. Mammal populations will be further reduced through a combination of habitat loss and predation from dogs and cats. Birds will also suffer from these conditions, but not as severely as mammals. The cave invertebrates may be least affected, since these organisms either do not leave the cave or do not wander far from the cave when they do leave it.

The management plan concerning the Warrens Cave Reserve (explained elsewhere) will essentially continue the past visitor rate. This should result in no additional impacts to cave organisms. The cave has a long history of often intensive use. This must have been harmful to much of the cave life. These impacts have been reduced under the present visitation rate. However, a current drought has severely reduced the amount of detritus ordinarily washed in by the rains and there is no standing water in the cave. Some animal populations seem low. There appears to have been no biological assessment of Warrens Cave since Peck (1970) surveyed the terrestrial invertebrates in 1965. Present and future impacts are therefore difficult to assess precisely.

## **Geological**

Warren Cave is a large network maze type cavern located along the west facing escarpment, between the Peninsular Highlands and the Limestone Sinkhole Plain, to the west. The cave was dissolved out of limestone and limey sandy clay at a time when the water table in the region was at or above the present level of the cave, possibly 30,000 years ago or even earlier. The cave is formed at and below the contact

between the 60 million year old Crystal River Limestone Formation and the overlying Hawthorne Formation, a marine offshore limey sandy clay, deposited over 12 million years ago. The Ocala-Uplift to the West fractured the rock in the area, giving the groundwater a multitude of cracks to dissolve out and form what is now Warren Cave. Where the impermeable Hawthorne caps the limestone in this area, it prevents water from aggressively dissolving away the limestone as has happened further West towards the towns of Newberry and Alachua. It is this "caprock" that has preserved the hill, and thus, the cave for us to see today.

There are three basic levels passable in the cave. The uppermost is formed in the semi soluble Hawthorne Formation and averages four feet high and five feet wide. The upper level is intermittent throughout the cave, is connected to the middle level at numerous places, and lies 6 feet directly above the middle level.

The middle level is the main and most extensive in the cavern network and is dissolved from the very soluble Crystal River Limestone. The ceiling of much of the middle level is chert, in many places several-feet thick. This chert was, at one time, sand on the bottom of the sea floor. In several places, large chert pendants can be seen hanging from the ceiling, artifacts from a period before the cave was formed. The middle level varies in cross section but is generally no greater than 6 feet wide and 10 feet high.

The third and lowermost level is an expression of the nearness to the surface of the middle level passageways and the resulting greater influx of surface water into the cave during its development. This influx of water produces greater solution in the fractures along which the cave passageways are formed. The entrance sink, drop-off areas, as well as the diggings, and in the extreme rear of the cave, "the pit", are the expressions of this phenomenon. The lower level is typically 5 feet wide and extends down as much as 40 feet below the middle level.

In general, Warren Cave is typical of most caves that have not had extensive flowing water present to carve out deep passageways. The passageway development is generally on a single level, consisting of many interconnected passageways. Putting specific times on the creation of the cave and its varied features is very difficult due to the uncertainty of the regional geology and its obvious role in the development of the cavern. Such data is now being collated and

correlated and will be disseminated as soon as reasonable theories are attained. Until that time the unpublished article "Warren Cave" by Albert Krause should be referred to with the understanding that ongoing research has already shed some light on many speculative aspects of the paper.

## **Preservation Objectives and Plans For Implementation**

- A. Protection - Objectives for protection of the Reserve concern preventing disruptive use of the land and its resources, and preventing unsupervised access to the cave.

Due to the intended uses of the Reserve, its perimeter will be posted, and will be marked to indicate ownership, management, and use restrictions.

Surveillance will be primarily passive, with the only active attention stemming from one adjacent property owner who is concerned with the security of his household and property, and by persons leading trips onto the property and into the cave.

Vehicular access at present is by an existing dirt road across private property. We propose using part of the property to form a small parking area near State Road S-232, and forming a nature trail / footpath to the cave entrance.

Visitation to the surface features will not be restricted as long as prior permission is requested, and traffic in the area is not detrimental to the Reserve. Our policy towards trespassers has been, and will be: Anyone found to be in simple trespass will be asked to show identification, at which time their name(s) will be recorded and they will be warned not to reenter the Reserve without prior permission. Anyone who is found a second time without permission, or damaging the property, or forcefully attempting to breach the cave gate, or who refuses to identify themselves, or who refuses to leave the premises, or who assaults anyone who is rightfully on the premises, will be prosecuted to the full extent of the law.

Visitation to the cave will be controlled by the Warrens Cave Reserve Trustees with the cooperation of the Florida Speleological Society (FSS). Anyone, or group, wishing to visit the cave, must make advance arrangements to do so. This procedure is not arbitrary or discriminatory,

but is done for the express purpose of safety. During the era of unrestricted access to Warrens Cave, there were numerous accidents, many of them requiring assistance to remove the victims. Since control of the cave moved into the hands of local cavers there have been no injuries, during literally thousands of visits by persons ranging from small children to grandmothers. The purpose of limiting access is to insure that persons entering the cave are properly equipped and supervised by skilled personnel.

- B. Trails and Facilities - With extensive development of surface trails and facilities for Educational and Scientific purposes nearby, our primary objectives in these fields relate most directly to the cave.

The cave will remain open to high school & college classes and special interest groups. All educational, scientific and other trips will be supervised by skilled personnel from the FSS. Whereas, scientific uses have concentrated both on biologic and geologic study, The emphasis on educational use has generally been as a geologic showcase.

The standing policy on the collection of specimens for research has been non-removal of biologic specimens and removal of geologic specimens only when necessary for identification.

All past research has been in cooperation with either the Florida State Museum staff or in connection with the Univ. of Florida Department of Geology.

- C. Recreation - Passive recreational uses will be as previously described in this Plan.
- D. Special issues - Special management considerations center around strengthening the gate, removing debris from the cave and surrounding area, and reversing the adverse impacts man has had on the area. A perimeter fence may eventually become necessary to control access by neighboring children and domestic animals.
- E. Timetable - As of the writing of this report, no timetable for implementation of objectives has been decided upon.

## Inventory

- A. Surveys - A Base Map showing the property boundaries in relation to the major features of the area is included in the Preserve files, as is a U.S.G.S. Topographic Map.

A description of the habitat is included within the Biologic Report. Since the land surrounding the reserve is currently being developed, it is not expected that additions to the area will be possible.

An aerial photograph of the area of and around Warrens Cave Reserve is included in the file, as is an enlargement of the photograph with the property boundaries added.

Inventories of the flora and fauna of the Reserve are appended to the Biologic Report. Geologic information and a soils inventory are to be found in the file.

The area's Cultural and Natural History are described in the Historic section.

- B. Property - The area now known as "Warren Cave Reserve", is owned wholly and in clear title by The National Speleological Society. Management of the Reserve is by a group chosen from the membership of the Florida Speleological Society, operating as the Trustees for the Reserve, and with the advice and cooperation of The National Speleological Society.

The only manmade structures on the property consist of two old barbed wire fences, crossing portions of the property, and a gate and gateway in the mouth of the cave.

There is no insurance coverage provided locally. All persons desiring to enter the cave are required to complete a liability release form.

There are no known conservation easements.

A survey plat of the property is included in the file (Tax Assessor's Map).

C. Region - The prevailing climate of the region can be briefly described as mild, semi-tropical.

Ground level photos are included in the files.

Since the Reserve is quite small, an aerial photo analysis has been eliminated by a complete ground level analysis in the Biologic Report.

There are no known Local Planning Documents concerning the area of the Reserve.

A copy of the local Tax Assessor's Map is included in the file.

## **Budget**

- A. Expenses - In seeking the objectives set forth in this Plan, the only items requiring an outlay of funds will be:
- strengthening of the gate;
  - providing a culvert at the point of access off S-232.

There will be no required expenses for scientific research, recreation, or education.

- B. Income - Income from the Reserve itself will come in the form of donations requested of those persons escorted through portions of the cave and donations from local cavers and the general public. Donation of material, equipment, and/or labor will be sought locally to meet the needs of the Reserve, whenever possible.

## **Staffing**

Personnel in connection with the Reserve fall into two overlapping categories: the group of trustees that will manage the Reserve, and those who will from time to time escort groups into the cave or make improvements in the surface features of the Reserve.