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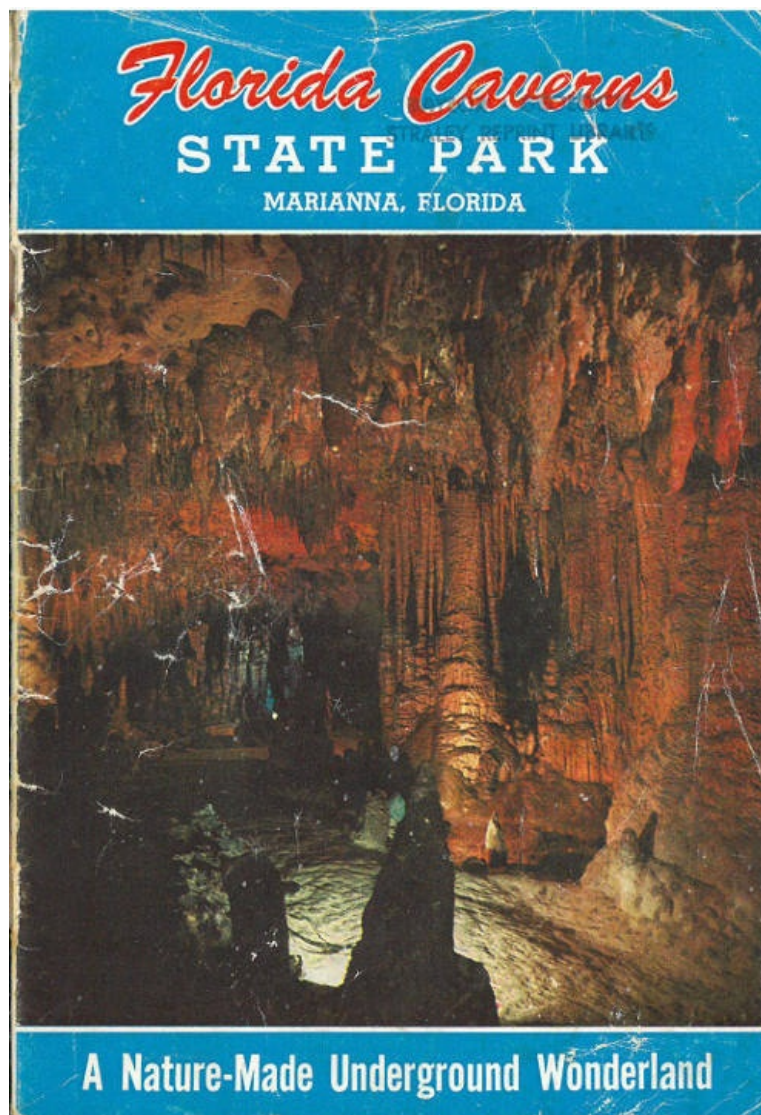
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*** START OF THE PROJECT GUTENBERG EBOOK FLORIDA CAVERNS STATE PARK ***





The stone administration building, which has been erected near the entrance to the caverns, was built by hand from the solid rock foundation to the hand-riven cypress shake roof. The walls are built of beautifully weathered native limestone and the shelter roof is supported by hand-hewn timbers prepared on the ground. Parties, who tour the caverns, join guides here and return after the tour.



FLORIDA CAVERNS

Here we behold most wondrous sights
No mortal understands,
Of stalactites and stalagmites,
A house not made with hands.

Here Nature set to work her hands
In ages long since gone,
That man might quit his work on lands
To see and ponder on.

What means these fluted columns tall,—
These pendants from the dome?
These sculptured figures large and small,
Excelling Greece and Rome?

This drapery striped with Nature's hues,
In regular spaces wrought?
These scenes man's pride at once subdued—
They are beyond his thought.

The brute would look and turn away
To seek his fill of food;
'Tis ours to seek while here we stay,
The Great Creative Good.

The Architect within whose mind
The wonders of the sea,
The land, the sky, and all their kind,
Has wrought for you and me.

That we may look upon His deeds
And make our own expand,
For we alone best serve all needs
As tools within His hand.

—*Charles Cottingham*
Marianna, Florida



The stalagmite on the right is almost joined with a stalactite. If it does, it will make a column. The grape-like clusters in the upper foreground result when the flow of water is so slow that all of it evaporates from the ceilings and deposits its mineral load there.

FLORIDA CAVERNS

A NATURE-MADE WONDERLAND

By ROBERT O. VERNON
Assistant Director, Florida Geological Survey

Florida is truly a child of the sea, since all the rocks composing its land were formed directly on the ocean bottoms or by streams emptying along the shores. From the record of these rocks we know that Florida has been alternately above and below the sea many times in the geologic past. In fact, the rocks visible in the park area at Florida Caverns, near Marianna, Florida, and in the caves were formed from the hard shells of animals that lived in one of these seas. As the animals died, their shells accumulated on the sea bottoms, where they were covered by other shells and hardened into lime rock.

These shells, called "fossils" by the geologist, are remains representing cemeteries of the past. Along most of our coastal areas and sea bottoms these shells are accumulating and forming limestone today. Such limestone has formed also in the areas many miles removed from the present seas, as in Iowa and other middle western states, telling us where seas have been in the past.



As visitors explore the well-lighted trails and passageways, they notice the icicle-like formations that hang from the ceilings and the heavier ones that project from the floor. They study the columns that seem to help support the rock above and the small passages that extend in many directions. They notice sea shells imbedded in walls and ceilings.

How do we know that these limestones were formed in the sea? The next time you go through the caves at Florida Caverns look closely at the walls and you will be able to find the shells of *Scollops* and other clams. These animals lived only in shallow seas. The most common shell that you will notice will be many small coiled flat shells about the size of barley seed and flat thin disks about the size of dimes and quarters. The animals that formed these shells are known as *Foraminifera* and have the fancy names of *Operculinoides* and *Lepidocyclina*. They are one celled animals (our most primitive) and are related to some of the parasites that cause disease. These particular animals are extinct and are known only from these rocks. From their association with other shells they are known to have lived in shallow salt-water seas, and by means of them the geologist is able to recognize this particular limestone, even when it has been taken from a well drilled many feet below the ground surface, for these small shells are recognizable even when the limestone has been broken into fine fragments.

The limestone in which the caves of Florida Caverns were carved is known from geologic studies made throughout the state to have been raised from the sea by land movements after being formed and to have been extensively eroded, following which it was again submerged under the sea and other limestones deposited over the eroded surface. These limestones were subsequently raised out of the sea to be eroded. Over this second eroded surface a delta deposit of sand, clay and gravel was formed by streams that emptied into the Gulf of Mexico.

The limestone that you will see in the caves is known as the Ocala limestone, named from deposits near Ocala, Florida. In the region about the Florida Caverns, limestones named the Suwannee limestone and the Marianna limestone overlie the Ocala limestone. These limestones were named for deposits recognized along the Suwannee river and at Marianna, Florida. The sand, clay and gravel overlying all of these limestones are not named but are believed to be the same age as deposits of the geologic period popularly known as the "ice age."



The "duck" results from irregular resistance of the limestone to solution by ground water. These nodular masses were more resistant and the less-resistant, usually softer limestone has been removed from about them, leaving the form resembling a duck. Several stalagmites are in the background. These are younger than the "duck."

Since emerging from the sea for the last time, this part of Florida about the state park area has been undergoing changes constantly. The rocks have been continuously attacked by elements of the weather, and disintegrated where exposed. Running streams carry away much of these products of weathering, but the work of water under the ground is the major factor in the creation of these caves and the deposits in them. This underground water, running through the pores in the limestone, has been and is now wearing away portions of the land. These water channels are isolated along fractures, bedding planes and other structural weaknesses, or along poorly consolidated rock. The water dissolves the limestone and carries it out into surface streams and on to the sea, and as this material is carried away the rock, through which the water flowed to the surface, is being worn away an equal amount. The amount of this material being carried away is illustrated at Silver Springs, one of our larger springs, where each day about 450 tons of rock is carried away dissolved in water. When it is realized that this is only one of thousands of

springs in Florida, you can readily see what a large amount of rock is being dissolved from beneath the ground and just how cavernous the rock must be.

All forms of wildlife are protected in Florida's State Parks. Hunting, trapping, or shooting are not permitted. These State Parks belong to you. Help protect them.

For further information on specific parks and historic memorials write: Director, Florida Board of Parks and Historic Memorials, Tallahassee, Florida.



Ground water cascading down a gentle limestone face was ponded irregularly and the evaporation of the water along the outer edges formed small terraces.

SOLUTION OF LIMESTONE

The rocks in which the caves of the Florida Caverns State Park were formed are limestone. This rock is made of the mineral calcite, calcium carbonate, and it is soluble in pure water under conditions of favorable structure, a continuous supply of moving water and time. However, in the water of Florida this limestone is readily dissolved, because the humid climate and prolific vegetation contribute organic and mineral acids to water and make it a highly potent solvent that is capable of dissolving large amounts of this rock.

Limestone is as a rule jointed vertically and bedded horizontally. Openings along these joints and beds provide easy avenues of travel for water. The ultimate source of all of Florida's ground water is from the rain and precipitates from the air. As this rain water falls through the air it becomes charged with carbon dioxide gas which combines with water to form carbonic acid. On the ground humic acids from rotting vegetation is added. These are the common natural solvents of limestone. A good portion of this acid charged water soaks into the ground, and as it descends through lime rock small portions of the rock are dissolved. However, relatively little solution occurs until sufficient water enters the rock to fill completely all the available pores. In this portion of the rock, saturated with water and bathed with weak acids, solution is most active. Because of the pressure of water entering the rock, ground water tends to move horizontally along bedding planes which offer the easiest exit. Thus, cave systems generally are

developed horizontally and one system may lie over another and they may be connected by vertical tubes and rooms.



Weird vistas and eerie silhouettes meet the eyes of visitors who explore the amazing networks of trails in Florida Caverns. Droplets of mineral water, dripping through the ages, formed these underground caves into a natural, but highly artistic wonderland.

Any rain water entering the rock from the surface makes its way downward to fill completely all the pores of the rock at some depth. As it moves downward and then into the saturated rock through pores and open spaces it acts as a slow solvent to increase the size of the openings and to connect them to form a continuous system of channels through which streams filling the cavities may run.

As large caverns are formed, solution cavities of irregular shape are gradually cut out and enlarged. Some of these may be expanded to a point near the surface where surface deposits (largely sand in Florida) will collapse into the cavern and a sink is formed. The larger part of Florida's natural lakes, sinks, depressions and ponds are the result of solution of the underlying limestone. These features range from small pits a few feet in diameter to large depressions several miles broad. Many are perfectly round, others are highly irregular. Some are cone-shaped with rocky bottoms, some have broadly developed flat bottoms and are known as prairies. Still others are vertical tubes, only a few inches in diameter in some cases, that extend as much as one hundred feet down into the limestones. These are "natural wells."

Florida's State Parks include miles of white sand beaches, fine streams, beautiful springs, excellent fishing waters, floral displays, wooded ravines and outstanding recreational areas. It is the Florida in which the Indians hunted, fished and lived in original surroundings of great natural charm and wildlife profusion ... where yet remains the memory and imprint of Spanish conquistadores, French crusaders and Anglo-Saxon colonizers. Phenomena such as disappearing rivers, vanishing lakes, historic shrines, virgin country, strange subterranean landscapes are all to be seen inside the parks.



"Fresh crisp bacon" formed by water flowing originally from a crack or elongate hole and cascading down the face of the limestone. The deposit formed as a small ridge that then acted as the course of subsequent water which added additional deposits. The dark bands contain some impurity to give a color to the ordinarily white calcite.

LAND MOVEMENTS IN FLORIDA

If these caves, we see in the Florida Caverns Park area, were formed under water, how is it possible to walk through them today? This is an obvious question which requires an answer. If rocks formed under marine waters are exposed on the land surface today it is obvious that the land has been raised out of the sea, or the sea has lowered. From geologic evidence it is known that Florida has been rising since late geologic time. This elevation is believed to be caused by downwarping at the mouth of the Mississippi River, where many thousands of box car loads of sediment are dumped each day, accompanied by adjustments in the earth's crust and the elevation of land areas surrounding the delta of the Mississippi River.

Then there is a second cause by which these caves are made dry. Everyone has heard that ice caps the North and South poles of the earth, but few people realize that, if all this ice melted, the level of the sea as it is known today would be higher by about 110 feet. If all polar ice melted, the Chipola River at Florida Caverns, would become a salt bay, Marianna a seaport town, and a bay beach would be located near the park area. However, do not sell your present beach property too quickly since this polar ice is known to be melting only a few inches a century.



Well-lighted, underground trails make accessible Florida's amazing network of underground passageways. The temperature remains at about 63 degrees, F. throughout the year. In addition, natural rock gardens, wildlife, historical values and recreational facilities make Florida Caverns one of the South's outstanding State Parks.

Considering the sub-tropical climate of Florida, isn't it peculiar that ice had so much to do in shaping our land surface? As a matter of record all of the surficial deposits making up the large part of the land surface of Florida were created and shaped during the geologic past (one to ten million years ago) when ice piled up on the poles and moved down over lower latitudes or when this ice was being melted. In the United States as this ice piled up on the North Pole and moved down over most of the middle western states, the water forming this ice came from ocean basins and the water in them was lowered as much as three to four hundred feet. At this time much of the Gulf and Atlantic bottoms was uncovered, land streams cut their valleys much deeper, ground water circulated much more vigorously and rocks through which it passed were dissolved faster. Later as this ice was melted the lower parts of stream valleys were filled with salt water and the streams became sluggish and deposited sediment in their valleys to make their flood-plains. Ground-water circulation was retarded and the bottoms of the Gulf and Atlantic were again covered. This uncovering of the bottoms of the Gulf and Atlantic followed by covering constitutes a cycle. Five of these cycles have been recognized in Florida, and the red sands, clay and gravel that make up the surface of most of Florida represent former bottoms of the Gulf and Atlantic, now raised out of these seas by land movements.

Today we are living in a period following a time the northern and southern extremes of the earth were covered by ice, and this ice is still melting off of these areas.

In 71,000 acres of parks, valued at approximately \$50,000,000, Florida offers the vacationer a natural wonderland he can explore. Within these park areas the visitor can discover for himself the "true" Florida by car, along foot trails, navigating tropical rivers and streams—or by following elevated boardwalks through hauntingly beautiful swamps.



Stalagmites resulting from varied origins. The center one was formed from the intergrowth of several stalagmites. The deposit on the left was developed as a series of flat basin-like parts, over which water splashed and cascaded to the floor, the basins being inclined in various directions. The right stalagmite began as did the left one but the basins were soon eliminated and the growth was made more regularly.

DEPOSITS IN CAVE

We have seen then in the preceding discussion how caves are formed largely in rocks saturated with water, and how by land movements and changes of sea level the caves and pores formed in this rock are moved above permanent water levels and exposed to air. It then becomes possible to deposit rock in the pores and caves rather than to increase their size by solution. As you go through the caves you will notice that the walls are wet and that water is oozing out of the pores of the rock.

This water has just passed through limestone and has dissolved parts of the rock. The reader undoubtedly knows that water will dissolve a substance in large quantities and more rapidly if it is hot, and that it can hold more gases to make stronger acids if it is under pressure. So, having been released from a relatively warm rock in which it was under some pressure and where there was little air circulating, into a large cave where rapidly circulating air cools the cave and evaporates the water, this water can no longer hold all the limestone it has dissolved and it releases part of it.

Small drops of water emerging from the lime rock on cave walls are evaporated and calcite and other rock minerals are deposited along these walls. Where these drops cascade along the walls a continuous elongated ridge is deposited. If the water oozes out in an extremely fine coating of water, the entire ceiling, walls and floor may be paved with calcite.



These deposits combine a rather even and general flow of water and possible intergrowth of the stalactites to make the thickened deposit. The ground water issued more rapidly and was concentrated at one point to make the long tubular deposits, the tube being made by rapid evaporation along the outer margins of the drops of water as they hang on the stalactite before the large part of the water falls to the floor.

Where individual drops collect on the cave ceilings, a thin deposit may be formed on the ceiling after which the remaining water may drop to the cave floor where more calcite is deposited. Continuous dripping results in paired deposits extending down from the ceiling and up from the floor. The deposit on the floor is commonly thicker and more columnar, whereas that on the ceiling is thin and tapering much like an icicle. Those hanging from the ceiling are called *stalactites* and those on the floor are *stalagmites*. Where these two deposits are joined they are known as a *column*.

These cave formations are all composed of the mineral calcite, which forms all lime rock. If you will notice in the cave this mineral is crystalline, and it is remarkable that as calcite crystallizes from the many individual drops of water it is arranged always in a particular pattern. These crystal faces reflect light and form the many unusual and beautiful arrangements which you will see in a visit to the caves.

EARLY HISTORY

Since early time, Florida Caverns have had interest. They were first mentioned in writings by Friar Barreda, who was with the first overland expedition made by the Spaniards to Pensacola Bay. The following paragraph is in the Friar's own words, written 256 years ago:

"On June 12 (1693) we continued northwest and after we had journeyed a little more than three leagues ... we reached an abandoned village of the Choctaw tribe called San Nicholas where I came to preach the holy gospel in the year 1674. Here we spent the night in the hollow of such a beautiful and unusual rock that I can state positively that more than 200 men could be lodged most comfortably in it. Inside, there is a brook which gushes from the living rock."



This form is the result of the irregular etching of the limestone by ground water at the time the caves were formed, combined with the later development of stalagmites and a pavement of calcite "drip-stone" upon the irregular surface. Dust and small debris have been incorporated in the crystals of calcite which form the stalagmites. Visitors like to make a game of finding formations in the cave that resemble animals and other things. Note the wolf head to the right and the Dachshund head to the left center of the photograph.

Experts, who know how to read stories told in the designs on Indian pottery, state that the caves were known to the Indians of this section long before the coming of the Spaniards. There is considerable evidence that Indians, even prior to 1693, had been in the habit of using Florida Caverns and caves in the vicinity for shelter during their hunting trips into the region and for refuge from their enemies. In some of the smaller and dry caves there have been found potsherds, or small broken pieces of Indian pottery. According to the archaeologist, all of the sherds so far discovered are of a late post-Columbian type. Ashes from fires, dead for many years, flint arrowheads, and animal bones have also been found.

Several times in history, Florida Caverns—a nature-made shelter—was used as a refuge from armed forces. During Andrew Jackson's punitive expedition against the Indians in 1818, a large band of Indians escaped from his soldiers by concealing themselves within the underground caves. Again, during the War Between the States, an outfit of Union soldiers en route to Pensacola was resisted by a home guard unit from Marianna, composed of men too young or too old to fight in the armies of the Confederacy. While the battle was raging, women, children and slaves took refuge in Florida Caverns.



Nestled 'midst hundreds of pines, hickories, sweetgum and oak trees, Florida Caverns golf course is one of the most scenic in the United States. It was laid out after the design of the famous St. Andrews Golf Course of Scotland.

A clear spring, which in reality is a subterranean river, rising out of the lime rock, sends its lovely azure stream down through the park over a mile before it enters the Chipola River. The Chipola Natural Bridge, located in the park, is a fourth-mile long and has been restored to its original interesting geological condition with the removal of logs and lumber which had jammed into it in bygone days when the river was used to float them down to a mill.

Open the year round, Florida Caverns State Park is comparable in interest to Carlsbad Caverns, N. M., Mammoth Caves, Ky., and Luray Caverns, Va.

In addition to its geological attractions, the area in which Florida Caverns is located is of peculiar interest biologically. In it are found many species of both plants and animals that are not expected so far south, as well as a large number of typically southern forms.

The State Park system of Florida has been developed as a coordinated group of Parks, each one of which stands upon its own merits and each one possessing as many as possible of the following values: Outstanding historic, scenic and scientific attractions. Florida Caverns is richly endowed with them all.

I hope that you have found this discussion of the creation of lime rock, the formation of caves under water, the elevation of these caves above permanent water levels and the subsequent deposition in them, of interest.... We of the Florida Geological Survey and Florida Park Service hope that you enjoy your visit to the Florida Caverns State Park.

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Overhanging rock projection caused by erosion of ancient river. Note large tree growing in rock behind upper visitor. This feature may be all that remains of a large cave, the surrounding limestone having been removed. If the overhanging portion were connected to land a perfect natural bridge would be formed.



Who would expect to find this cavern scene in Florida? Icicle-like formations and a mirror pool are features of one of the state's most unexpected attractions at Florida Caverns State Park.

MARIANNA, FLORIDA

The Home of Florida Caverns

Marianna is located in the northwest section of Florida, approximately twenty miles from both the Georgia and the Alabama state lines. The Gulf of Mexico lies forty-five miles to the south, the Apalachicola River fifteen miles to the east, and Port St. Joe only seventy miles southeast of Marianna. It is relatively easy to travel to the various population centers of the southeast because of Marianna's centralized location.

AIRLINE SERVICE—The city is served by National Airlines, with three flights daily, with direct service to Mobile, New Orleans, and Jacksonville, and good connections to all major cities. Also available is charter service through local flying agencies.

BUS SERVICE—Marianna is a terminal station for Greyhound and Trailway Bus Lines, and approximately 2,000 passengers daily are handled through this station. Thirty-six regular bus schedules serve the city each twenty-four hours. Lee's Coach Lines, a Jackson County bus system, regularly serves surrounding communities.

RAIL TRANSPORTATION—Marianna is served by the Louisville and Nashville Railroad, and by the Marianna and Blountstown Railroad. The Atlanta and St. Andrews Railroad traverses Jackson County, serving Cottontale, nine miles west of Marianna, and gives direct connections from Panama City and the Gulf of Mexico to Atlanta and other points.

HOTELS, MOTELS AND RESTAURANTS—Marianna is a first-class hotel and motel city, boasting three hotels, the largest of which has 125 rooms, as well as a number of outstanding modern, air-conditioned motels. A number of restaurants and dining rooms serve the traveling and working public. Also rating first-class are several tourist homes along U. S. Highway 90.

HIGHWAYS—Marianna is served by U. S. Highway 90, and by State Highways 276, 73, 167, and 71. U. S. Highway 231 connects with U. S. 90 only a few miles outside Marianna. An excellent system of hard surfaced highways and roads serve the county.

For further or definite information write Marianna-Jackson County Chamber of Commerce, Marianna, Florida.



Map showing principal highways leading to Marianna, home of Florida Caverns State Park.

SCENIC AND HISTORIC FLORIDA

Year Around Attractions

Whether you are a visitor or a resident, you will want to know more about Florida's State Park System which preserves the tropic lure of primitive Florida and perpetuates memorials of Florida's absorbing history.

This system of parks and historic memorials, in areas ranging from a few hundred to 26,000 acres, embraces more than 71,000 acres of the most wonderful land in Florida.

These parks in their varied appeals offer recreation possibilities extending from a few hours diversion to extended vacations.

STATE PARKS IN OPERATION *(Acreage shown in parentheses)*

Hugh Taylor Birch (180)	Ft. Lauderdale
Florida Caverns (1,131)	Marianna
Fort Clinch (1,086)	Fernandina
Gold Head Branch (1,338)	Keystone Heights
Highlands Hammock (3,800)	Sebring
Hillsborough River (2,777)	Zephyrhills
Little Talbot Island (2,500)	Jacksonville
Myakka River (26,747)	Sarasota
O'Leno (1,388)	High Springs
Killearn Gardens (306)	Tallahassee

SCIENTIFIC AREA

John F. Rollins Bird and Plant Sanctuary (120)	Ft. George Island
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STATE PARKS PARTIALLY DEVELOPED

Fort Pickens (1,659)	Pensacola
Manatee Springs (1,381)	Chiefland
Collier-Seminole (6,423)	Royal Palm Hammock
Tomoka (712)	Ormond
Torreya (1,138)	Rock Bluff

UNDEVELOPED STATE PARKS

Anastasia (852)	St. Augustine
DeSoto (216)	Titusville
Jonathan Dickinson (11,124)	Hobe Sound
Lake Griffin (726)	Leesburg
Pellicer Creek (729)	St. Augustine
Ribaut Refuge (139)	Flagler Beach
St. Andrews (1,000)	Panama City
Santa Rosa (1,339)	Pensacola
Suwannee River (1,831)	Ellaville

HISTORIC MEMORIALS

Olustee Battlefield (5)	Olustee
Battle of Marianna	Marianna
Constitution Convention (12)	Port St. Joe
Dade Memorial Park (40)	Bushnell
Battle of Natural Bridge (6)	Woodville
Confederate Monument	DeFuniak Springs
Madira Bickel Mound (10)	Terra Ceia Island
Yellow Bluff (2)	Jacksonville
Gorrie State Park	Apalachicola
Bulow Ruins and Plantation (109)	Bunnell
Ormond Tomb (9.3)	Korona
Addison Blockhouse (5)	Ormond
Turtle Mound (10)	Coronado Beach
Historic Sugar Mill (17)	New Smyrna Beach
Green Mound (6)	Wilbur-by-the-Sea
Yulee Sugar Mill	Homosassa

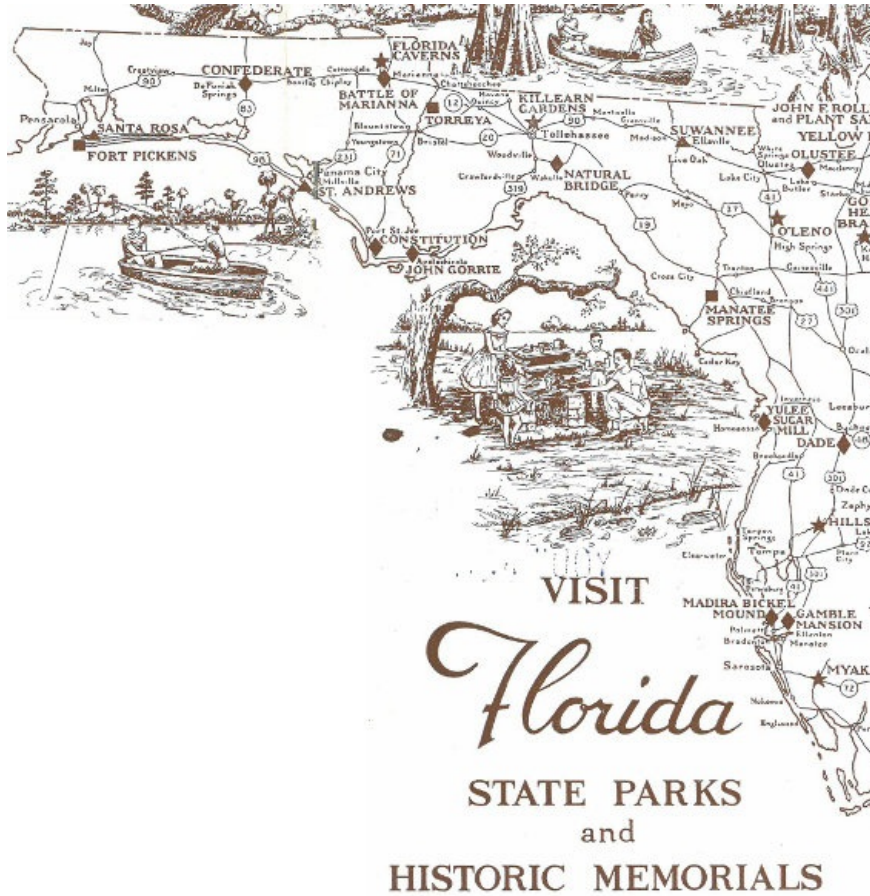
PARKWAY

Florida Overseas Parkway

(Internal Improvement Fund Lands)

Monroe County

VISIT
Florida
STATE PARKS and HISTORIC MEMORIALS





Transcriber's Notes

- Original publication information was retained, although this book is public-domain in the country of publication.
- Some obvious typos were silently corrected.
- Moved the information about other Florida state parks from the centerfold to the end of the text.

*** END OF THE PROJECT GUTENBERG EBOOK FLORIDA CAVERNS STATE PARK ***

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