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THE PAGE-LADSON SITE IN THE AUCILLA RIVER**

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# First Floridians and Last Mastodons: The Page-Ladson Site in the Aucilla River

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Battering and abrading lithic artifacts; hammerstone sandpaper-like heavily worn abrader stone, photographs by Jim Dunbar.

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The series editors also welcome any comments or suggestions for future volumes;

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*To all of those who helped explore the river*

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## Prologue

The old bull elephant halted his swinging gait. His ears moved to catch the throbbing sub-sonics from a far off female mastodon in estrus – a sound that called to him urgently. But he was puzzled, and he lifted his trunk high above his flattened forehead. Increasingly an acrid and unfamiliar scent had come to him, borne on the moist breeze from a nearby watering hole. The mastodon wheeled and began moving down the dusty path that led to the dry bed of an old river, now only a strip of vegetation surrounding a few pools of water.

At the water's edge crouched a strangely twisted animal, the origin of the unfamiliar smell. With the appearance of the mastodon, the animal rose and in bizarre fashion remained balanced on its hind legs . . .

## Foreword

Over the last 20 years the Aucilla River Prehistory Project has been one of the most fascinating stories unfolding in Florida. This project, uncovering the remains of plants and animals from the end of the last Ice Age and the beginning of Florida's human occupation, is answering questions important to the entire western hemisphere. Questions such as when did people first arrive in the Americas? Were these newcomer scavengers or skillful hunters? Could they have contributed to the extinction of the great Ice Age beasts – animals such as elephants – that were creatures native to Florida for the previous million or so years? And how did these first Florida people survive 12,000 years ago at a time when sea level was so low that this peninsula was double its present size, sprawling hugely into the warm waters of the Caribbean? Much of Florida at that time was almost desert. Fresh water – for both man and beast – was hard to find.

The lower reaches of today's Aucilla River are spellbinding. Under canopies of oak and cypress, the tea-colored water moves slowly toward the Gulf of Mexico, sometimes sinking out of sight into ancient drowned caves and then welling up again a few feet or a few miles downstream. Along the river bottom, the remains of long extinct animals and Florida's earliest people lie entombed in orderly layers of peat, sand, and clay.

Fifty years ago the Aucilla's treasure trove of ancient history was discovered by scuba divers. They found, washing out of the bottom sediments, the bones of mastodon and mammoth together with stone points and objects of carved bone and ivory. A few adventurous divers traced the ancient remains into the layers of bottom peat. These underwater explorers eventually convinced two scientists, archaeologist Jim Dunbar and paleontologist David Webb, that the Aucilla held a story of Florida history unobtainable from any other site. And so the Aucilla River Prehistory project was born.

For 20 years this remarkable joint venture has continued: divers learning archaeology and paleontology, and scientists learning underwater river bottom exploration. The techniques developed by this pioneering project will serve as a model and set standards for river bottom archaeology elsewhere in North America.

This book tells what they found.

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## Preface

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### 1 Introduction

This book presents the essential results of two decades of work in a remarkable underwater site in north Florida. The Aucilla River winds slowly southward from Georgia through a hauntingly beautiful and sparsely inhabited part of Florida to the Gulf of Mexico (Balfour, 2002). The swampy river bottom harbors rich records of life spanning the end of the Ice Ages. Stratigraphically these prehistoric resources bracket the first appearances of human cultural remains and the final evidence of mastodons and other megafauna. And these data are closely associated with a rich floristic record of changing environments (see Figs. 1 and 2).

The Aucilla River Prehistory Project (ARPP) devised unique methods to conduct reconnaissance and then properly to excavate the most promising underwater sites. In several instances ARPP was able to demonstrate the availability of nearly continuous accumulations of fine-grained sediments through the late Pleistocene and into the early Holocene. Thus their team of researchers could trace changing natural environments from before, during, and after the appearance of human cultures in the region.

### 2 Site Genesis and Chronology

Two decades of exploration by ARPP showed that the productive sites in the Aucilla River consisted of nearly circular sinkholes that had filled slowly with clays, silts, and fine sands. Each such site contained a sequence of rich organic sediments that had accumulated during an interval of several thousand years. By the time ARPP had

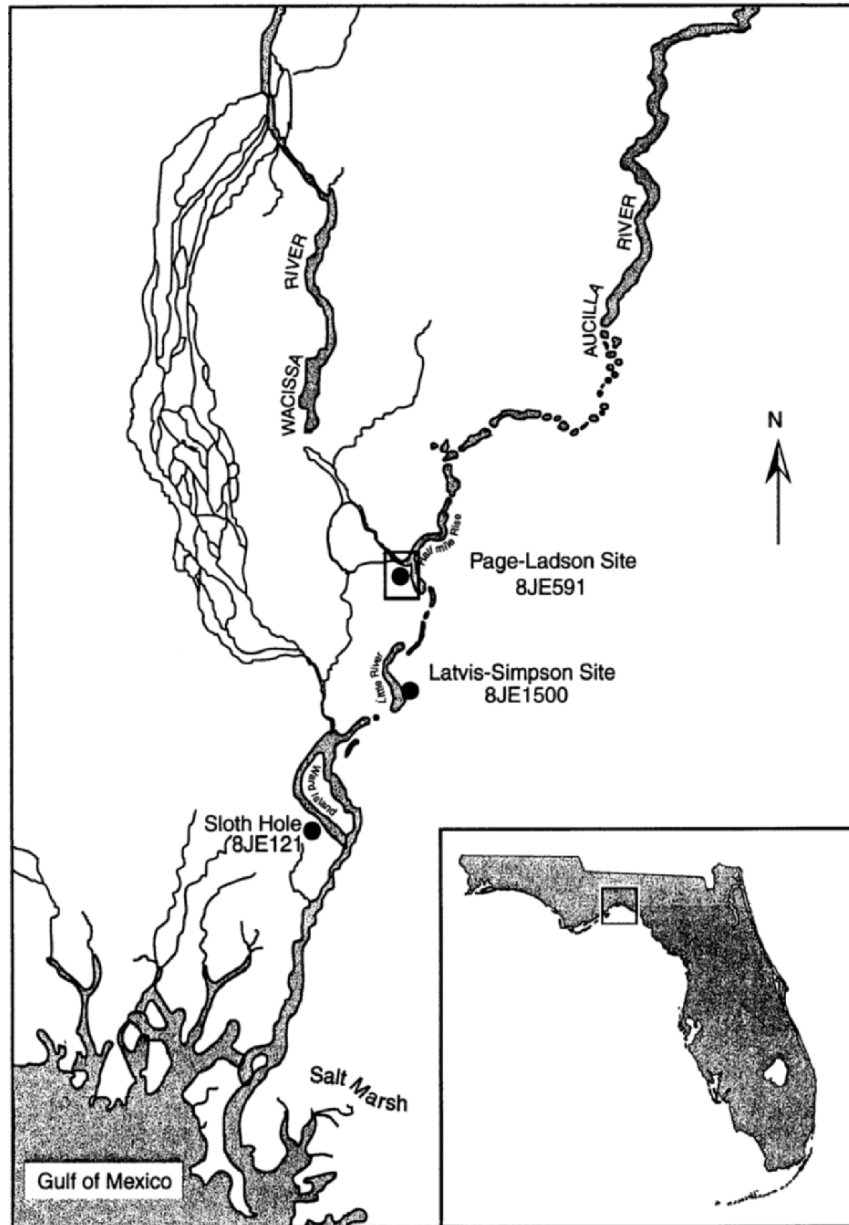


Figure 1 Location map showing Aucilla and Wacissa Rivers in relation to the Gulf of Mexico and the state of Florida. The Page-Ladson site is located in the center of the detailed map on the Aucilla River just below confluence with a branch of the Wacissa River.



Figure 2 Aerial view of operations at the Page-Ladson site, June 1988. Field camp, dive platform, and support boats are located along the west bank. The Aucilla River flows toward the upper left. Two floating screens and airlift pumps are operating. The 4-in. line nearer the center of the river is used for controlled excavations. The 6-in. line to its west is used for bulk removal. Note buoys marking various test pits. Another screen and airlift is partly visible at lower right adjacent to the east bank.

Photo credit: Sandy Young.

sampled and dated some three dozen sites, it became evident that the genesis of these sediments was keyed to lowland water tables and thus indirectly to regional rainfall and eustatic sea level change. When sea level dropped and/or rainfall was reduced, surface drainage became predominantly subterranean. Such a pattern of karst geomorphology is expected in a coastal region in which the surficial geology is dominated by limestone. When the sea transgressed and/or rainfall and runoff raised the water table, surface sinkholes gradually filled with locally derived sediments.

After ARPP had acquired nearly 100 carbon dates from some three dozen inundated sinkhole sites, an interesting pattern emerged. Two times of sediment filling were evident in the middle and lower reaches of the Aucilla River, one lesser cluster of dates around 30,000 years ago and another greater cluster around 12,000 years ago. These clusters of dated sediment accumulation evidently correspond to the last two times of late Pleistocene sea level rise, known to Quaternary stratigraphers as marine isotope stages 3 and 2. In lowland parts of peninsular Florida these interglacial episodes of sedimentation were not confounded by any important tectonic events.



ARPP concentrated most of its efforts on the younger of these two cycles of sink-hole filling, the ultimate eustatic sea level rise of the late Pleistocene and early Holocene. It should be noted, however, that sites corresponding to the older of these two cycles, the penultimate cycle of sedimentation, provide an important control study, representing environmental history of the same region before human influences had appeared.

ARPP devoted its most extensive efforts to the Page-Ladson site for two reasons. First, it yielded an intact stratigraphic column some 8 m long. Secondly, preliminary assays showed it to have outstanding preservation of a great diversity of fossils and artifacts. Ultimately it provided a nearly continuous record from 16,000 radiocarbon years ago ( $^{14}\text{C}$  BP) to less than 8,000  $^{14}\text{C}$  BP. It yields the richest continuous record of well-dated sediments producing rich faunal, floral, and cultural data in the region. For these reasons the Page-Ladson site complex is the focus of this book.

### **3 Organization of this Volume**

This volume represents the best efforts of a dozen scholars to analyze one site complex in the Aucilla River. The subsequent chapters in this book are grouped into six sections. The Preface sets forth the field methods developed over two decades to recover the rich records hidden in dark underwater sites of the Aucilla River. Secondly four chapters cover the geological aspects of the Page-Ladson site complex. In a third very important section the paleobotanical data, divided into micro- and macrobotanical contributions, are set forth along with their environmental significance.

Most of the remaining chapters are grouped into two multidisciplinary sets on a chronological basis. The late Pleistocene evidence, sampled in the deeper (= earlier) reaches of the site, includes abundant remains of terrestrial and freshwater mollusks and vertebrates including American Mastodons and other extinct megafauna. Along with this native fauna one sees more subtly the first vestiges of early Paleoindian cultures, representing the first Floridians. The early Holocene evidence, sampled in a relatively shallow set of strata in the upper part of the site, lacked extinct megafauna but revealed relatively rich samples of early Archaic cultures and a distinctive set of warmer and more humid environments.

### **4 A Rich Record of Changing Environments**

In peninsular Florida minor changes of topography often signal major changes in habitat, especially where well-drained soils and porous limestones stand above regional water tables (piezometric surfaces). This present observation helps explain why, according to evidence presented in this book, late Pleistocene and early Holocene landscapes experienced very dramatic changes. The overall pattern was a shift from extensive open landscapes with little surface water during the last glacial interval to increasingly closed landscapes with much surface water during the early Holocene and recent. There are, however, many subtle variations on this general theme. The evidence

from the Page-Ladson site accords well with data from other studies in Florida during comparable intervals of time. Such sites include pollen profiles from Sheelar Lake 130 miles to the southeast and Camel Pond 60 miles northwest, as well as archaeological and pollen samples from Windover near Titusville and Little Salt Springs from North Port, Florida. The long record of environmental changes at Page-Ladson site, based on various proxy data including pollen, macrobotanical samples, terrestrial and freshwater fauna, sediments, and water table cycles, establishes the longest multidisciplinary record of environmental change in Florida's late Quaternary history.

## 5 Coincidence versus Consilience

The few bits of hard evidence that come to prehistorians, while digging through a dozen millenia, convey only tantalizing bits of the full complexity of human cultures. They see only dark adumbrations of the environmental interactions that they are seeking. Like detectives at a remote crime scene they patiently accumulate every clue. Twenty years of improving the ARPP's underwater recovery and data-keeping methods have helped. And the greatly increased precision of carbon-dating has profoundly improved correlation from local events to regional and global patterns of climate change. Here we attempt to interrelate all the hard-won evidence we can, and thus paint a broader picture of faunal, floral, and cultural evolution.

But the questions we seek to answer are exceedingly complex. Previous generations, it now seems, rushed too quickly to give answers about the peopling of the Americas and the extinction of the megafauna. The prehistorian must now rework the old evidence and add as much new as possible. And that evidence, both old and new, must be carefully constrained by rules of evidence and logic. For example, when two events occur together in time, within, say, two standard errors of the same carbon dated interval, such correlations must still be regarded as *coincidence*, not as cause and effect. We would not propose that the last appearance of *Mammut* and the first appearance of Bolen points are causally related merely because the former occurs in Unit 4 and the latter in Unit 5. A much stronger bond of evidence comes from *consilience*, that is when two or more independent approaches lead to the same conclusion. The appearance of abundant charcoal in pollen profiles, along with the recovery of burned wood and hearths on the Bolen surface, all at a time when the mesic forests had pulled back somewhat from the site, gives strongly convergent evidence that humans were burning and cutting the forests. That is why we are pleased to bring together a team of specialists to analyze such diverse data as charcoal, pollen, lithics, and fauna, all from the same series of replicate samples.

## 6 Regional versus International Perspectives

During the same two decades that the ARPP was investigating the faunal, floral, and cultural history of this remote part of north Florida, an intellectual revolution was overturning the textbook accounts of how the Americas were peopled. It is still true,

of course, that people reached the New World shortly before the end of the Pleistocene Period, but now the exact schedule and direction of colonization of North and South America by *Homo sapiens* have become increasingly uncertain. We are now in the midst of an exciting scramble for new paradigms (e.g. Haynes, 2002; Meltzer, 2004).

Likewise, in this new millenium, we see intensified debate on the impacts of the first Americans on the last of the Pleistocene megafauna. The time of overlap between humans and megafauna in the New World is critical to our understanding of how humans and other fauna interacted. The Paleoindian/megafauna zone (PIM zone) may have been as short as a thousand years, as suggested by Martin and Klein (1984). In this volume, however, we present data indicating a PIM zone that more than doubles that estimate. Indeed it may be triple, if one recalibrates the radiocarbon dates bracketing the PIM zone into calendar years. These are important data, for the duration of the PIM zone tends to be seen as inversely proportional to the intensity (destructiveness) of the interactions with the first Americans. A considerably milder impression of such interactions would come to mind if one accepted dates as early as 33,000 <sup>14</sup>C BP for the establishment of human cultures in South America (Dillehay, 2000). It is also clear, as in all studies of prehistory or paleontology, that the available dates surely underestimate the true overlapping range zone due to sampling errors and inadequacies of the record.

Reliable chronologies and tightly controlled excavations will provide the building blocks for new paradigms about peopling the Americas and extinctions of megafauna. At the moment these topics seem to engender contentious debate rather than simple consensus. It is an excellent time to procure new data in regions that provide crucial tests of new hypotheses. In that spirit this book presents its new set of data, exhumed from the Aucilla River, as a regional cornerstone for whatever new edifice is going to be built.

## 7 Acknowledgments

The ARPP thanks its two host institutions, the Florida Museum of Natural History in Gainesville and the Division of Historical Resources in Tallahassee, for supporting and sustaining the activities of key personnel in the ARPP and for housing and conserving the resulting collections and archives. The ARPP gratefully acknowledges major support in the form of Special Category grants from the State of Florida Division of Historical Resources, Florida Department of State, Tallahassee, Florida during more than a decade. The ARPP also received critical funding from National Geographic Society, Committee on Research and Exploration during its first five seasons. None of these funding organizations are responsible for opinions or interpretations derived from the archaeological and paleontological research conducted under these grants. The Florida Museum of Natural History generously subsidized production of the color figures in this volume. And the National Geographic Society gave special permission to reproduce its two-page color restoration of a scene at the Page-Ladson Site 14,000 years ago.

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