Understanding and Closing the Gaps:
A GAP Audit Approach Linking Archaeology and Land Acquisition Strategies in Florida

by

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“Note to Reader”

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The original dissertation is on file with the USF library in Tampa, Florida.
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Understanding and Closing the Gaps:  
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Lori D. Collins

ABSTRACT

The population in Florida is projected to double over the next 50 years. Large land areas now in rural settings will become residential and urban areas. More than seven million acres of agriculture and open space will convert to housing developments, shopping malls, and business space. At stake are natural and cultural resources, which are lost or fragmented in this growth process. New planning measures are called for in order to grow in ways that minimize and least impact resources.

Archaeological value in preservation projects is often examined after priorities for natural resources have been set, relegating archaeology to a role of added-on value in acquisition targeting. Decisions are made daily by planners, cultural resource managers, and agencies, about what resources get saved and what get destroyed. These decisions are based on subjective evaluations such as archaeological significance, without a clear understanding for what resources exist and what resources have already been protected.

In this dissertation, I use a GAP audit approach, more commonly used in natural resource planning and management, to look at what the record of protection is for archaeology. I examine the region of the Big Hammock in North-central Florida, where agricultural land holdings are shown to be critical to archaeology, with nearly 65 percent of the recorded sites there, found on agriculture crop and pasturelands. In the Pasco County portion of the region, more than 63 percent of agricultural lands have been
converted to residential land over the last decade. Agricultural lands are often purposefully overlooked in land acquisition prioritization, with planners sometimes not looking at the long range land use changes that can occur and cause cumulative impacts to resources. The reality is that every year, nearly 150,000 acres of Florida farmland statewide is developed into new subdivisions and strip malls. This GAP audit, applied to the archaeological resources in one region in Florida, shows that lands holding the most archaeological diversity and potential, may not coincide with lands targeted for other resource acquisition priorities. Treating archaeology as an added-on value in the land preservation process is therefore, not an adequate means of resource conservation.
Preface

I owe my love for learning and passion for all things Florida to my Father. He retired to the Sunshine State after a career as an officer in the United States Air Force. He brought his five children with him, I being the baby. My Mother, who couldn’t wait to water ski and play tennis and golf as so many retirees even today envision, was the first to point out how fast Florida would change as more and more people flocked here for the warm weather and to live out their dreams. We moved to a new way of life in a subdivision, which at the time was something completely new, but that today has changed the face of Florida forever, and are in part a topic of this dissertation.

My Father loved roadside attractions. From the giant pink dinosaurs and miniature golfing, to the Flagler Mansion, Marine Land, Weeki Wachee, Silver Springs, and the Fountain of Youth. I was four when we moved here, and we went to all the state parks and attractions, stopped at numerous free orange juice stands, and visited archaeological sites like Crystal River and the Castillo de San Marcos in Saint Augustine. My Father loved history and Tebeau’s History of Florida along with my wildlife encyclopedias had me spouting Florida historical trivia and leaving me to imagine that I was encountering duck billed platypus’ in the Florida lakes we lived and played on. My Dad had a part time job after his retirement from the service, owning a motel supply company that had him traveling all over the state. He took me with him on what for me were adventures, and I soon knew all the back roads of Florida. It was a time before the construction of the interstates and rampant development. It was during these trips that I began to see and appreciate the beauty and fragility of the landscape.
I owe to my Mother the idea that as a woman, you can still accomplish anything you set your mind to do. She made me promise to go to college and I never forgot her strength and courage, which have contributed to who I am today. I know she would be proud to have her youngest daughter be the family’s first Ph.D. In the book *The Five People You Meet in Heaven*, by Mitch Albom, he says “…parents rarely let go of their children, so children let go of them. They move on. They move away. The moments that used to define them – a mother’s approval, a father’s nod – are covered by moments of their own accomplishments. It is not until much later, as the skin sags and the heart weakens, that children understand; their stories, and all their accomplishments, sit atop the stories of their mothers and fathers, stones upon stones, beneath the waters of their lives”.

My Mother first, and then my Father taught me lessons about love, life, and death, and I am a better person because of them and their accomplishments. This dissertation and my Ph.D. was something they both wanted and for which my Father hung on to life in order to see. I am grateful I was able to tell him of this dissertation completion and share its dedication that is to him, before his death three days after my successful defense. My family, brothers Tom and Ed, and sisters, Peg and especially Vicki Rae and Judy, also provided the support and love that was needed through these times, and have shown me the true value of family.

My love for Florida also is owed to my studies in environmental science and my earlier career with the Florida Department for Environmental Protection. I came to DEP at a time when ecosystem management principles, integrating disciplines, were being experimented with as the way to consider natural resources in Florida. Environmental
specialists at DEP, Allen Burdett, Rose Poynor, Ken Huntington, Jemy Hinton, Don DePra, and Dianne McCommons-Beck, trained me in so many ways, and their friendship and direction were crucial to my personal and professional development. Also along the way, I met two people who would introduce me to archaeology, Barry Wharton, an Instructor at the time at Saint Leo College, and archaeologist, Dr. Robert Austin. Both sparked new interests and kept me busy learning and reading everything I could about Florida archaeology, and both have become lifelong friends and mentors. At Barry’s insistence, I was told to take a class with Brent Weisman at USF, and this would forever change my life’s ambition. I wanted to be an archaeologist, but one who saw things from the perspective of relationships to the environment and to the present-day landscape.

Along the course of this dissertation, many others helped me and should be thanked. Dr. Jeffrey Mitchem, George Luer, Bob Carr, Chip Birdsong, and Dr. Ryan Wheeler are among those whose feedback was invaluable. My Ph.D. Committee was also incredible, with comments, suggestions, and directions that always were for my best interest. Karla Davis-Salazar provided a shared interest and enthusiasm in regard to environmental perspectives, Christian Wells lent his diverse knowledge and command of archaeological literature and theory, and Dr. Paul Zandbergen, who taught me how GIS can help examine and answer questions and how archaeology is not so dissimilar from other resource management interests. Graham Tobin, who would serve as the Chair of my defense, always helped in pushing me along. Elizabeth Bird was always there with encouragement and has been the best ‘boss’ imaginable. Linda Whiteford, David Himmelgreen and Nancy Romera-Daza also were always supportive to this process and shared their own stories with me. Debbie Roberson has always been my friend, in good
and bad times, and always believed in me even when I did not. Daisy Matos helped with all the logistics and communications during my travels and in the completion of the document and requirements.

My students also played a special role in that they were always interested in hearing about my research and allowed me to share my work with them. I hope that along the way I also learnt to their development and growth and helped these future graduate students in the process. Fellow grad students Luca Lai and Sharon Watson also proved invaluable in their support and confidence building, as we shared our processes and experiences. Chris Bell and Toni Carrier, also fellow and former students, were there through this experience and have proven to be true friends.

Deep appreciation goes to Travis Doering, who shared in it all. This included listening to my rants, reading, and revising run-on sentences, and making me rethink and appreciate what I was accomplishing. He inspired belief in me as a person. Without his support and his care, I would not have been able to see this through.

Dr. Brent Weisman, my major professor and mentor for many years, has shaped not only the academic professional I am today, but has helped teach me lessons such as handling adversity and perseverance. He has always shown me he has my best interest at heart. You could not ask for more from a mentor and he will always remain the person who taught me to think beyond boundaries, a concept so prevalent in this work. His own passion for Florida archaeology is something that inspires me, and I hope I pass the same enthusiasm to my own students, because he taught me the importance of being a mentor and a teacher, and to pass on what we learn.
At the end of this process, it was the last lessons learned from my Dad that have had the biggest impact. As I finished this dissertation in his absence, I remember some of his last bits of wisdom. Although mostly sports cliché they have helped me in this time of grief. “Lori, never quit because quitters never win,” and “…the game has to go on”. Thank you, Dad.
Chapter 1. The Role of GAP Analysis in Landscape and Archaeological Conservation in Florida

“One basic weakness in a conservation system based wholly on economic motives is that most members of the land community have no economic value” (Leopold 1949: 246).

Introduction

Florida is in a time of unprecedented growth and development and, along with pressures on natural resources, archaeological resources are being impacted and lost. Florida’s rich cultural heritage is facing an assortment of threats for which current conservation measures cannot keep pace. Decisions concerning heritage management and protection are made daily, in part by permitting agencies, local governments, developers, and cultural resource management firms. These decisions range from choices in research designs, sampling strategies, and field testing methods in compliance situations, to determination of site significance and value, which can equate to which sites get protected and conserved and what resources are lost. Yet, despite the daily occurrence of these decisions, few widely used tools are available to assist in the overview and understanding of the implications of these choices. As Aldo Leopold so eloquently states in the quote above, valuation of land resources and, in this case, archaeological resources, should not be driven only by economic considerations.

A Gap Analysis Program (GAP) is a scientific assessment and methodology to identify the degree to which cultural resources, here defined as archaeological sites, are
represented by current public land holdings for conservation. The types of resources not represented constitute a conservation gap. The Gap Analysis Program, as conceived by the United States Geological Survey was implemented to examine the level of protection and diversity of plant and animal species as afforded by natural landscape conservation. I apply the GAP concept to the diversity and level of protection to archaeological landscapes and sites based on an examination of land use patterns in relation to the archaeology of a defined region. The methodology proposed in this dissertation will move toward the operationalization of landscape theory and valuation systems to better assess archaeological phenomena. A spatial analysis or audit of the current knowledge and understanding is investigated as a framework for identifying under-represented resources in terms of functional type and geographical and temporal contexts.

The goal of my dissertation research is to show the effectiveness of a GAP approach for archaeological planning and stewardship. I will examine the known archaeological record as demonstrated in the Florida Master Site File in relation to land use and preservation in an area that is facing rapid landscape changes. Through this case study application of a GAP audit for archaeology, several key questions and issues will be considered, including: (1) given increasing rates of impacts to cultural resources and the limited financial means to effect in situ preservation, how can we better target land acquisitions and more effectively manage resources; (2) how can historic contexts, which are overviews of prehistory that inform archaeological research questions, be improved and refined through the systematic incorporation of environmental modeling to more effectively guide archaeological site preservation and acquisition; (3) how can a landscape perspective and scale of analysis improve the application of the National
Register of Historic Places significance concept as a preservation tool? and, (4) are current efforts of archaeological preservation successfully protecting and reflecting the diversity and range of cultural resources?

These concepts and issues are examined using a GAP audit approach to view how and where archaeological sites occur in combination with conservation land areas. This scale of understanding ensures that critical areas of concern facing environmental and resource pressures are comprehensively considered. This type of an audit also ensures the diversity of cultural resources, defined here as the variety of types, temporal, and cultural affiliations of archaeological sites, are represented and understood more evenly across regions with more effective conservation priorities. Although this dissertation includes a case study on one selected area in Florida, this project has statewide relevance and perhaps national level implications for developing an effective methodology for the operationalization of less subjective archaeological significance determinations based on available data. The approach I present provides researchers, cultural resource managers, and planners, a more fluid framework for significance assessment, responsive to a broader range of archaeological temporal and cultural representation and a more inclusive range of the heritage values of public importance, that facilitate conservation.

Without an understanding of what types of archaeological resources there are, in what number, what threats exist, and what impacts or level of protection are present for those resources, archaeological sites are lost without a view of the overall implication of their loss. Are these site types scarce? Do many (or any) occur on public lands? Are the time period and cultural affiliation of the resources adequately represented on lands under public ownership? Should lands containing these types of sites be targeted for
acquisition? Many of these questions may appear separate from the archaeological discipline and more from a land planning and resource perspective, but in fact a land perspective is intertwined with archaeological concerns. Consequences of Florida’s growth and development and its changing landscapes occur differentially, with some regions under more pressure and some resources more imperiled. Yet an audit of archaeological resources, which includes the spatial location and relation to land use pressures, especially for areas of critical concern due to rapid land use changes, has not been undertaken in Florida. The development of criteria for recognizing these regions, examining resources and their archaeological value, and assessing the gaps in archaeological preservation has not occurred. This dissertation is a pilot study for how this analysis can be undertaken for Florida archaeology.

Preservation programs for archaeological resources act more opportunistically, acquiring resources largely as added value during environmental conservation, rather than proactively examining where resources are likely to be pressured by development or even quantifiably understanding what kinds and types of resources are protected on lands owned or targeted by the public for acquisition. I propose that archaeological resource protection and investigation should occur differentially in response to development pressures, and I will use a GAP audit, to be described in the preceding section, across an area in Florida that is facing many land decision pressures. Using this case study region, I will show gaps that exist in archaeological preservation in relation to land use and acquisition strategies. I will demonstrate how this GAP audit analysis, inclusive of stewardship mapping that considers the degree and likelihood for preservation and conservation of land and the ownership and management of land, can be a useful tool for
planners, land managers, policy makers, and cultural resource practitioners, and allow for better-informed assessments for archaeological preservation and acquisition.

**A GAP Analysis for Florida Archaeology**

GAP analysis techniques are commonly used with natural systems resource planning (Scott et al. 1996; Stoms 1991). For example, a GAP might be conducted by an agency to assess the ecological representation of a species, and used by conservation planners to protect and acquire critical habitat areas important for that species. This analysis involves the prediction of where that species distribution is likely to occur in relation to certain variables, such as land cover vegetation or certain landform types (Iacobelli et al. 2003). GAP analysis emerged from the realization that a species-by-species approach to conservation was not effective and that regional landscape protection of species habitat was needed, as was an audit approach to identify what was being protected and what was potentially being lost (USGS 2007). When applied to archaeological resource management, this type of analysis offers a scientific means for assessing the extent to which archaeological sites are being considered and protected in current acquisition strategies. The analysis provides a formal method of reducing subjective decisions concerning significance determination and preservation.

The goal of a GAP analysis or model for archaeology is to identify culture periods and affiliations, and site types, that are not adequately represented in conservation areas and to examine areas where archaeological resources occur, in order to develop conservation priorities. The way in which I use the term “model” here, as in many other social science endeavors, is to provide a picture of what would happen if certain
conditions were met. The model is used as a device that shows what a simplified version of reality may look like. For example, if we know that proximity to non-ephemeral or permanent water sources along with the elevation are useful for determining areas of high likelihood for archaeological site location, then those criteria would be examined in a GIS to show zones of archaeological probability (Austin et al. 2001; Horvath 1986; Jones 1981; Scurry 2003; Stone 1984; Weisman and Collins 2004; Wescott and Brandon 2000). In this way, sensitivity or predictive modeling can be a follow-up to a GAP audit.

Although I will demonstrate a simplistic version of this second step to a GAP audit by using existing known archaeological and environmental correlates for a particular region, the sensitivity model can be used as a basis for examining deviations from the predictions (Barber 1994), thus refining a GAP audit. The predicted areas along with the recorded archaeological site location data can be examined in relation to publicly owned land boundaries or lands that are targeted for acquisition, to see where gaps exist in preservation strategies. The GAP analysis presented here utilizes the recorded archaeological data from the Florida Master Site file, and also demonstrates, in a simplistic way, how archaeological sensitivity areas can be considered using predictive factors. I have used known environmental variables of archaeological association with the predictive modeling addition to my GAP analysis, and this predictive modeling is shown as a direction for future refinement and consideration, with more comprehensive model development beyond the scope of this dissertation.

Primary advantages of a GAP audit are that it would allow for an improved knowledge of spatial and temporal distributions of cultural resources in relation to landscape variables, and it would bring Florida archaeology into a consistent
management and preservation frame of reference as that used for environmental planning. This tool of analysis applied to Florida archaeology would provide a means for assessing to what extent cultural resources are being protected. A GAP analysis can be done at a variety of temporal and spatial scales. This type of strategy overcomes deficiencies of culture area studies and arbitrary boundary assignation (Marquardt and Crumley 1987).

The goals of a GAP analysis for Florida archaeology are to assist researchers in identifying areas of investigative questions and to look at site representativeness on public lands, including temporal and cultural affiliations, and formal and functional site types that are not adequately represented in public land holdings or land acquisition priority targets. By identifying not only cultural resources but the environment in which they are found, a GAP analysis provides land managers, planners, scientists, and policy makers the information they need to make better-informed decisions when identifying priority areas for conservation and protection. In this way, land acquisition priorities would be balanced between environmental and cultural resources, and the archaeological potential of preservation under programs such as Florida Forever could be more easily examined in relation to developed priorities for natural resource conservation. Currently, the archaeological value of projects is examined after natural resource priorities have been developed (Wisenbaker 2006). A GAP audit applied to Florida archaeology would allow priorities to be developed and used as a separate assessment or in conjunction with land acquisition goals for natural system protection.

Decisions over land use changes often occur at the local level, such as counties (Theobald et al. 2000). A GAP audit of archaeological resources can support conservation decisions at these local scales, with regional and sub-regional analysis
commonly used for biodiversity GAP models (Iacobelli et al. 2003; Jennings 2000; Opdam et al. 2002; Scott et al. 1996). A GAP audit allows for a view of how and where archaeological sites occur in relation to conservation strategies, ensuring that regions are viewed comprehensively and that the diversity of cultural resources is represented and understood more evenly.

A GAP is performed in an attempt to identify cultural and land gaps that should be conserved and managed to allow for the long-term viability of key components of Florida’s cultural heritage. The analysis assists with the establishment of conservation and acquisition priorities based on both the known archaeological setting and the expectations for defined archaeological areas. This analysis is accomplished in part through the identification of areas critical to the protection of both significant and under-represented types of cultural resources as defined by previous archaeological surveys and developed from models for archaeological potential within a landscape context. A further consideration are differential impact potentials on cultural resources within the defined landscape area. For example, a GAP study for cultural and natural resources could be linked with future land use planning and made applicable to an administrative boundary such as a district, county, or project corridor (Nizeyimana et al. 2002). Archaeological GIS predictability models and significance matrix models have been approached in similar ways, with counties and state agencies showing interest in long range management strategies and resource audits done in conjunction with land use and development planning (Austin et al. 2001; Hudak et al. 2000; Weisman and Collins 2003, 2004; Weisman 2002b).
One way to accomplish this type of audit analysis for Florida archaeology is through the use of a Geographic Information System (GIS). A GIS allows for the examination of the interactions between environmental variables and cultural site occurrences. A GIS has a spatial component that allows the capture, manipulation, analysis, mapping, and storage of information. By storing separate thematic map layers containing values for environmental variables like land cover types, a GIS allows for multiple variables to be considered across a landscape (Wansleeben 1988). Following a GAP audit, or inventory of archaeology in relation to conservation lands, environmentally based predictive models can be developed that work by correlating the location of known archaeological sites with the ecological landscapes within which they are found. It can also be predicted, for example, where unknown sites should be present in areas of the same or similar sets of characteristics (BRW 1996). Defining the landscape characteristics that influence or have correlation with archaeological site distribution becomes the goal. Because environmental variables are regionally specific for particular models, the understanding of the ecological and physical nature of an area under investigation is of paramount concern. An understanding of alterations and changes to an area also is critical in the adaptation of a predictability model.

In this dissertation, I make use of existing predictive models that have been developed for my case study area (see Austin 1991; Austin et al. 2001; Horvath 1986; Jones 1981; Weisman and Collins 2004; Wharton 1984). These archaeological predictive variables are the currently accepted associative variables and are used to demonstrate how predictive modeling can work in conjunction with a GAP audit approach. The GAP audit remains the goal of this research, with policy statement in regard to Florida
archaeology, preservation, and land acquisition strategy that will emerge from this work. As part of this Florida archaeological policy and program dimension, issues such as archaeological significance determination, boundary and scale considerations, and their conceptual meanings, will be explored.

A GAP analysis will assist in significance determination by developing a prioritization strategy for conservation, considering multiple ideas and meanings imbued on the landscape from perspectives beyond the criteria in the National Historic Preservation Act (Scott et al. 1996; Stoms 1991). In this way, significance can be not only a legal federal designation, but a local or regional construct for land managers, planners, scientists and policy makers. The strengthening of significance understanding blends also with conservation strategies and acquisition prioritization. Site-by-site focused approaches to heritage management and conservation are not effective ways of examining the loss and fragmentation of natural and cultural landscapes. It is through the protection of regions rich in representation of site types and ranges, and having suitable areas for cultural resources, that we can improve our understandings of culture regions and contexts with reliable decisions emerging from understanding the relationship between the landscape and archaeology. This method allows for examination of strategies for research question development, and the conservation and acquisition of important cultural and natural resources.

Once gaps are recognized and identified, they can be filled through acquisition, significance determinations can be strengthened or bolstered, and changes can be made in development, land use, or management practices. Understanding archaeological diversity and natural systems connections and interconnections on and across the landscape is a
proactive planning approach. Consideration of archaeology ahead of impacts and land use changes also can mean our conservation dollars are better spent as opposed to reactionary and emergency acquisition approaches. A GAP allows a baseline to be developed, which can be used to compare changes and determine trends (Stoms 1991). The relationship of archaeological site diversity can also be linked to natural resource, environmental information and land use designation, to forecast predicted effects of change and to see where cultural resources are at greatest risk.

GAP analyses are not without problems. A GAP is a powerful first step in setting land management priorities and is a common tool in conservation planning (Burley 1988), but it is not a panacea. In natural resource applications, GAP analyses have been criticized because they rely on GIS data that can be incomplete, outdated, performed at too coarse of a scale, or lack accuracy assessments (Maxwell 2005; Schmidt 1996). As applied to archaeology, concerns exist over scale of study, use of culture chronologies, and the historic contexts that are used within the GAP design. GIS data that are utilized to examine unprotected areas and determine gaps in the archaeological preservation record, come from multiple sources and are collected using a variety of accuracy standards. Not only can there be problems inherent with the GIS data that serve as the foundation for the analysis, but incomplete and differential understandings of the archaeological record, also exist across regions.

These limitations should be addressed through the refinement of archaeological contexts, chronologies, and culture regions, in a way that allows the GAP analysis to be more effective and reliable at recognizing unprotected or underrepresented archaeological resources. The analysis should also be supplemented with ground-truthing and should not
be performed in a vacuum without knowledge of current land use conditions. Predictive model development, examining where archaeological resources are likely to exist, can also be a useful follow-up consideration for GAP audit planning, allowing for future preservation targets to be refined.

It is clear that new frameworks merging information about physiographic unit areas and cultural landscapes are needed to be able to document the range and diversity of cultural resources and ecological processes in ways that will have meaningful implications for conservation, planning and management. A GAP audit is one such way to improve these frameworks (historic context developments and ecological, and cultural characterizations), and in so doing has the potential to be used by archaeologists and other research and planning interests to develop, direct, and answer overarching questions and to evaluate the subjective concept of significance in valuation assessments and determinations.

Decisions concerning value, significance, and preservation of archaeological resources remain largely subjective. In this dissertation, I propose a way of viewing archaeological remains as part of the larger environmental landscape. I begin by making several observations about the current way of understanding archaeology in Florida, and then examine ways we can develop a methodological framework to help assess threats and prioritize concerns. The foundational ideas for this dissertation came from the time I served as the Coordinator for the Department of Environmental Protection overseeing planning for large-scale developmental and state and federal projects in the southwest portion of Florida. From this perspective, as a participant observer, I have noted that
many resource planners and land managers do not fully understand how and why archaeological resource management relates to other resource planning strategies.

In Chapter 2, I will grapple with issues of long-standing debate in cultural resource management (CRM) and public archaeology, including site significance and boundary and scale determination. Geographic units of archaeological analysis have been an area of disagreement in Florida archaeology, with culture regions carved out that rely primarily on ceramic pottery type distribution and do not necessarily reflect environmental landscape considerations. Further complicating the situation is that differing scales of analysis and consideration are used by natural resource managers as compared to archaeologists, making communication and the linking of goals difficult. Differing frames of reference, such as ecoregions, watersheds, culture regions, historic contexts, and political boundaries all muddy the dialog. Policy makers, the public, and even cultural and natural resource managers themselves, are left uncertain of basic spatial definitions and criteria.

Moving beyond and across boundaries, I examine concepts of representativeness and underrepresentation of cultural resources. These concepts are considered in terms of temporal and cultural site diversity that are protected on public lands, looking at whether or not there is diversity of those sites on preserved lands or protected for future research. I define representativeness as having a diversity of archaeological sites that accurately reflect the range of cultures and activities within a region, a concept tied to archaeological significance and value (Briuer and Mathers 1996). I further address the critical call for archaeological audits at a regional scale (Mathers, et al. 2005), examining significance of archaeological resources with similar approaches used for other valued
natural phenomena, such as endangered and threatened plant and animal species (Mathers, et al. 2005:184).

In Chapter 3, I discuss the current programs, agencies, and processes that are in place for archaeological planning and conservation in Florida, and examine existing strategies for acquisition and protection at local, regional, and state levels. This overview of the current system shows how cultural resources are considered in existing planning processes, and examines limitations and constraints of those processes. An integrative stewardship approach that considers archaeology in terms of present and future land use is presented as a way to better facilitate the linking of environmental and archaeological planning. A conservation strategy of prioritization, with protection, preservation, and land use planning for cultural and natural areas, is proposed.

In Chapter 4, I examine and explore issues of regional archaeological and environmental dynamics. I have selected a case study area of defined critical concern to demonstrate the GAP analysis application for Florida archaeology. An overview of this region’s archaeology and the environmental setting is presented, allowing for a more timely consideration of pending threats to resources that will assist in the development of better archaeological and environmental land planning for conservation and protection of natural and cultural resources.

In Chapter 5, I demonstrate a GAP audit approach in the pilot case study area selected, looking at archaeological site diversity and significance determination in relation to land use planning, through the kinds and types of sites occurring in the defined area that are protected on public lands. The GAP approach is proposed to provide a more systematic, objective, and precise way of dealing with intangible issues such as value and
significance in archaeology and is demonstrated as a way of moving away from individual site treatments. The GAP archaeological audit is shown to promote comparative and regional analysis and understanding in relation to stewardship, which includes aspects of land use, ownership, acquisition potential, and management. The approach establishes a more objective way of considering archaeological value in project planning and acquisition strategies, using the Big Hammock region of Pasco, Hernando, and Citrus Counties as a demonstrative region for analysis.

Linking land use with archaeology is the theme of Chapter 6. Looking at a defined sub area within the Big Hammock, I demonstrate how rapid development pressure and land use changes are impacting cultural resources. Using sensitivity maps that use currently accepted predictive variables for archaeological and environmental association, areas of archaeologically sensitive zones are displayed based on the recorded archaeological record. I show how archaeologists can be proactive in planning for preservation. Analysis of parcel level detail, including economic feasibility for purchase versus other forms of set-aside, such as conservation easements and the purchase of development rights, allow for an audit of resource potential and preservation considerations.

In the concluding chapter, I examine the potential benefits and wider use for GAP audit analyses in Florida archaeology, and explore this method as a future direction of historic preservation. Concepts of varying scales of analysis and landscape ecology are integrated with archaeology to promote stewardship beyond boundaries and to proactively approach and plan for preservation. I look at potential mechanisms for management and preservation that take advantage of existing infrastructure and
organization, and show how archaeology in Florida can benefit from being more inclusive of the public and other resource planners and policy makers concerned with natural resource protection.

**Background**

Currently, archaeological sites are recorded and their significance determined largely on a case-by-case basis. Consideration is given to a regional setting in the state’s historic contexts (FDHR 1993), which are essentially a framework and overview of the prehistoric and historic periods in Florida’s history and serve as justification for evaluations of significance of cultural resources. These contexts, however, are often skewed toward coastal environments and incomplete in more interior portions of the state. The context construct itself is viewed largely in terms of the known or recorded archaeology of a region, often without a thorough understanding of the environmental setting. The contexts were not meant to be static, and should be constantly revised and updated to reflect new data, knowledge, methods, and theories (Milanich and Payne 1993; Yates 2002). The reality in Florida is that decisions are made without regard to cumulative impacts to archaeological resources and other regionalized concerns, with no tool for easily assessing archaeological site protection across landscapes.

An understanding of resources cannot be accomplished by viewing sites in isolation. The landscape, at a regional scale of analysis, must be considered to allow sites to be viewed in relation to one another and to the environmental context. Modern realities of politics, land use changes, and planning also must be taken into account if a realistic conservation ethos and resource management policy is to emerge. Landscapes have been
used as frameworks for understanding heritage resources in many European regions (Crumley and Marquardt 1990; Deebe et al. 1999; Groenewoudt and Bloemers 1997). But although much discussed, landscapes have not been adequately recognized in decision making processes or readily applied to management strategies whose purpose is to assess archaeological value and significance.

A New Direction

A GAP audit is performed as a way to improve knowledge of spatial and temporal distributions of cultural resources in relation to landscape variables and to bring Florida archaeology into a consistent management and preservation frame of reference with other environmental and resource planning. A GAP audit of Florida archaeology provides a means for assessing to what extent cultural resources are being protected. Although I here restrict the analysis to a defined area of critical concern from an impact standpoint, this analysis can be done at a state, local, regional, or national level. This type of strategy overcomes deficiencies of culture area studies and arbitrary boundary assignation (Marquardt and Crumley 1987), and can consider different time periods and different cultural affiliations across environmental regions. The goals of this analysis for Florida archaeology are to identify research questions, temporal and cultural affiliations, and functional site types that are not adequately preserved. By identifying not only the cultural resources but the landscape in which they are found, a GAP analysis provides land managers, planners, scientists, and policy makers the information they need to make better-informed decisions when identifying priority areas for conservation and protection.
Landscape variables and human adaptations to local ecosystems are often overlooked concepts when considering regional cultural boundary distinctions. Although historic and archaeological planning contexts are meant to provide us with a framework for preservation goals, they largely do not take into account spatial relationships and the effects of environmental variables in a way that allows for a more complete, landscape level of understanding. In Florida, a shift from static cultural boundaries to one that examines the archaeological record for a defined environmental region is proposed to provide better context for the management of archaeological resources. This type of boundary understanding can be useful in dovetailing with the ecosystem-based approaches used by many state and local agencies and can be useful in understanding cultural resources throughout the state. More effective communication of archaeological resources will assist with the development of more user-friendly historic context planning documents between agencies and land planners. Stronger contexts can prove beneficial in lessening criticisms of Section 106 of the National Historic Preservation Act, which requires that all federal planning, decision-making, and project execution take into account the effects of their actions on historic properties. Criticisms of other permitting and compliance issues will also lessen as archaeology moves away from an emphasis on a site-by-site approach. Evaluation decisions concerning archaeological significance and impacts will also be dramatically improved with a more complete understanding of a given context (King 2000).

In a rapidly developing state like Florida, where multi-agency consideration for environmental protection is central to the role of most archaeological investigations that take place, linking environmental and archaeological resource strategies is crucial, and
has been pointed out to be important in other similar areas (Crumley and Marquardt 1990; Lipe 1995). Regional consistency in the issues related to the common good of archaeological understanding and environmental protection is needed. A more consistent level of organization will ultimately result in a better understanding of archaeology, and should lead to a greater protection for archaeology as a result of increased understanding and involvement with other agencies and land managers. Future policies, regulations, or actions for different types of lands can be decided from a cultural as well as an environmental and ecological context. Areas of responsibility encompassing cultural resources can then be better linked with state, regional, and local preservation planning.

The Statewide Comprehensive Historic Preservation plan (FDHR 1993), which is designed, in part, to look at available programs that can be used to achieve preservation goals, can utilize this approach to better integrate cultural and environmental resource protection issues, thereby better achieving its preservation goals. Fundamental to this approach is the understanding of the role of archaeology in the preservation planning process and the ability to move beyond static cultural boundary imposition to unify archaeology with environmental protection processes.

At the center of this research are issues of boundary definition and determination, scale, archaeological significance, and conservation value, that will be examined and related to their use and adaptation in Florida archaeology. Although these key concepts provide a framework for understanding archaeological resources, they ultimately place dynamic and adaptive cultural systems within a static constraint, with valuation determined largely in a subjective and case-by-case manner (Butzer 1982, 1990).
Cultural resource management archaeologists are at the forefront of many of the significance determinations made in Florida, while working under the often conflicting values of development and conservation. Issues of value and significance must be examined critically as they are the basis for ongoing selective preservation (Mathers, et al. 2005a; Schiffer and Gumerman 1977). What happens to archaeological sites that are not regarded as important? Since not all cultural resources can be treated equally nor can they all be preserved, so selective processes including prioritization and planning strategies have to be utilized.

It is our inability to effectively communicate priorities and planning for cultural resources to the public and agencies that is weakening heritage preservation, and will lead to archaeologists being ineffectual partners in conservation processes unless we begin to examine archaeology as part of a larger picture (Deeben et al. 1999; Mathers, et al. 2005b). A GAP audit will provide a method of focus for future archaeological research and be an impetus for conservation planning that includes archaeology as a primary resource of consideration. Through the understanding of the gaps in our knowledge and broadening of our consideration of place to a landscape level, we encourage preservation of diversity of site types, geographical contexts represented, and even the publics involved in the conservation process.

A spatial analysis or audit of the current archaeological knowledge and understanding is investigated as a framework for examining significance and value across larger areas. Appropriate scale for significance assessment has been an issue of debate among researchers (Mathers, et al. 2005: 159). The identification of underrepresented resources, in terms of functional type, geographical, and temporal contexts that are
currently preserved across defined areas of critical environmental concern, will allow a more operational view of archaeological significance and value to emerge, and the analytical framework for significance determination to be expanded beyond the site. As Florida continues to face growth and development impact concerns and areas continue to experience those impacts differentially, I look to what the future of cultural resource preservation and management could become, and I question if we are doing a reasonable and responsible job of stewardship and conservation.
Chapter 2. The Use of Boundaries, Scale Dependence, and Significance Determination in Florida Archaeology

“The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land. It is not only the boundaries that disappear, but also the thought of being bounded” (Leopold 1949: 239).

Conceptual Meanings

Central to my dissertation are concepts of boundaries, value, significance, and conservation strategies as they relate to cultural resource management. In archaeology, we use boundaries to define spatial extents of sites, to delimit culture areas or regions, and to create manageable units of analysis and political jurisdiction in which cultural phenomena can be described and evaluated. But culture is dynamic, as reflected in the material remains at archaeological sites, known as the archaeological record. Therefore, the stewardship of archaeological sites is also subject to dynamic influences. As naturalist Aldo Leopold states in the opening quote, a land ethic moves within, between, and outside implied boundaries. The rigidity and fluidity of boundaries and their multiple, sometimes conflicting meanings and applications in anthropology and archaeology need to be examined first if we are to move beyond their spatial constraints.

Types of Boundaries

Early in the discipline’s history, anthropologists were interested in boundaries as defining edges of culture and as a means to define and study socially and culturally
discrete populations through the examination of practices and beliefs within a given bounded locale. In defining boundaries, field work areas could be distinguished, allowing a classificatory process for anthropological understanding of culture within a spatial construct (Willey and Sabloff 1980). Thus, cultural boundaries were seen as a way in which to study how social relations were ordered and served as separators of worlds of meaning and as a way to study a population or subject matter (Barth 1969; Donnan 1999).

But these boundaries did not have to be of physical construction. Barth (1969) points to the idea of social construction and meaning of ethnic identity, and how ideas and identity are still nonetheless associated with boundary formation. Social boundary studies continue to show how boundaries extend beyond spatial concerns and that a boundary of any kind implies two sides, at once steadfast, moveable, and permeable depending on the circumstances (Dietler and Herbich 1998; Donnan and Wilson 1999; Kowalewski et al. 1983; Okely 1983; Stark 1998). Just as cultures are not concrete, neither are boundaries, further complicating the understanding of boundary constructs.

Boundaries can also be a way of marking political spaces, such as is seen with present day counties, states, territories, countries, and nations, for example. Territorial boundaries and borders are often thought of as more real or tangible with a spatial connotation implicit. But it is important to note, that while these boundaries can be mapped, viewed, and considered, this tangibility does not imply or suggest that they are somehow more important than symbolic boundaries of a cultural realm, which perhaps lack such clearly defined demarcation, but are no less real in the construction of identity (Cohen 1986).
Theoretical perspectives within anthropology, such as diffusionist and acculturation theories, brought consideration of interactions across boundaries and the influence of one area on another (Bohannan 1967). In today’s increasingly globalized world, boundaries become even less clear, seemingly losing their constraining and defining characteristics. Travel, communication, and other facets of modernity have opened boundaries or made them more porous, with physical space becoming less a dimension of consideration. Yet, even in modern settings, boundaries of all sorts exist, be they physical, mental, or symbolic, or social and cultural. It is the movement between and within boundaries, and the methods of boundary shifting that have changed rather than the phenomenon (Donnan 1999), and this way of examining boundaries is an area of increasing interest to anthropologists and social scientists alike. Focus is being placed on the relationships between social and symbolic boundaries and on how boundaries are created and classified (Lamont and Molnar 2002), to examine issues of identity, inequalities, borders, and community dynamics.

Archaeology often examines material culture, technology, and spatial patterning as a proxy for understanding social boundaries. In fact, archaeologists often use stylistic attributes in the material record as a way to distinguish where social groupings start and stop (Stark 1998:2). But do artifact patterns and stylistic attributes actually reflect social boundaries? Using middle-range theory and ethnoarchaeological techniques, anthropologists have examined this debate and have looked at social boundary formation in the past based on present analogies (Stark 1998; Welsch and Terrell 1998).

Understanding how to see boundaries archaeologically has led a number of researchers to examine the question of scale, regional diversity, and cultural units
(Willey and Sabloff 1980:172-182). The spatial and temporal distribution of artifacts has been used by archaeologists as a means of exploring cultural boundaries. Stylistic attributes, for example with lithic or ceramic assemblages, have been examined as a way to understand cultural sources of variation and distribution. The object becomes a way to arrive at the social process and the social context, which, in turn, are involved in social boundary creation and maintenance (Cohen 2000; Parkinson 2002).

Boundaries examined through material culture patterning, artifact types, and trait distributions are often seen through the lens of a ‘culture area’ or other regional construct. Cross-cultural ethnographic research has led some to note that archaeological boundaries often exceed the scale of social boundaries. Work in the southwestern United States, for example, has shown how stylistic attributes alone are not reflective of social boundaries. Work here has concentrated on technological traditions and styles, more resistant to change than stylistic variation (Rice 1987), as one method of extracting more information about localized, prehistoric social boundaries (Stark et al. 1998). Ceramicists have long noted that cultural choices are encoded in pottery (Rice 1996), and decorative variability has been the focus of much archaeological inquiry in regard to boundary definition with somewhat less attention paid to technological attributes. Technologies are sometimes considered only in light of environmental constraints, reflecting resource availability. An examination of technical behaviors and aspects of material culture can assist in looking for social boundaries (Gosselain 1998:79; Hegmon 1998:267; Sassaman 1995).

Archaeologists examine and try to develop an understanding of the ways in which material culture affects social process and the role of material culture in identity and
expression. In this way, material culture can be useful in examining social groupings and boundaries, examining how technological choices reflect social boundaries (Stark 1998), and how these reflections occur as part of applied social processes (Dietler 1998). But social boundaries are not just material constructs and, as previously mentioned, have an ideological dimension. Boundaries are recognized differently by different people and in this way are elusive of any one definition and add to the complexity of an archaeological understanding (Goodby 1998:162-163).

Still, boundaries are often viewed as ‘lines’ that divide territories, set limits and demark social groupings, and allow categorization (Barth 2000). When considered as a linear concept or tangible natural boundary, the distinction of areas seems attainable, yet even natural boundaries are elusive and fuzzy in construct when a temporal consideration is added. For example, a shoreline, where the land meets the Gulf of Mexico in Florida, might be thought of as a boundary, yet the shoreline and water levels have changed many times in the past. Boundaries for wetland delineations are another contentious example, with conflicting interests such as state regulatory agencies and developers, often at odds over how wetland areas are recognized and conserved, and what legislation prescribed as the policy (USGS 2007).

Individual differences in boundary comprehension may also vary based upon one’s sense of place. Differences in the meaning of boundaries between sedentary and nomadic societies, for example, may be significant. Boundaries may be fluid and transitory to one group and more permanent and affixed to another. Meanings imbued on places can vary from individual to individual and culture to culture. What is defined as an amorphous hinterland for one group may be an area of distinct place to another. In this
way, cultural images and conceptual constructs of place may supersede the idea of definable boundary (Barth 2000).

Boundaries should also not be thought of only as demarking separation, but can represent areas where groups merge or come together. The concept of borders in anthropology is an area of growing research, as is the concern with boundaries between nation-states for political scientists and geographers (see Donnan 1999; Kowalewski et al. 1983; Lamont and Molnar 2002; Stark 1998). The area of interface, where one system meets another brings with it an identity component, with individuals identifying with one group or another, or in some cases both groups. Thus, boundaries are not clear-cut with an ‘us’ and ‘them’ inclusion or exclusion, but also are areas of blurred social identity, with a degree of permeability, porosity, and social interface often seen (Donnan 1999:23).

Anthropologists are interested in boundaries as a way of looking at social processes, helping to answer larger research questions involving ethnic groups, linguistics, migration, economics, and state formation (Hensler 1998; Kowalewski et al. 1983; Low and Lawrence-Zuniga 2003; Marcus 1993; Stark 1998). But, because boundaries are not always visible or circumscribed, this area of research is not an easy undertaking. Synthesizing approaches, which pull together the North American archaeological tradition of examining stylistic variability with that of the European emphasis on cognition and technical choice, are allowing a new view of social boundaries at different scales (see Dietler 1998; Goodby 1998; Hegmon 1998; Stark et al. 2000; Stark et al. 1998).
In these examples, a multi-faceted approach that incorporated artifact compositional analysis and ethnoarchaeological perspectives allowed social boundaries to become more visible, with technical choices, styles and systems found to mirror social boundaries and provide fresh insights into the relationship that exists between these boundaries and material culture patterning (Stark et al. 2000:8-9). This type of compositional and quantitative approach is useful not only with ceramics and material applications, but in areas of activity where artifacts may not readily be encountered. Researchers can examine soils and clays for example, to help determine activity areas, site structure, and function. This type of analysis can allow for an examination of social processes and boundaries at a variety of shifting scales from household, to community, to region. The variety of scales provides insight into the behaviors and practices affecting societal boundary formation and how those natural and artificial boundaries and landscapes are understood at a community level, including perceptions of identity and community (Cowgill 1993:565; Davis-Salazar 2003:280).

Understanding the meaning of boundaries drawn on maps by archaeologists to indicate site areas or even culture regions is another challenge for the discipline. It is often the distribution of a particular type of artifact or material that shapes the idea of cultural boundaries and is used as a proxy for understanding the existence and maintenance of a social boundary. The material culture is reflective of the past and the examination of spatial distributions, stylistic, and chronological variations are seen as a way to examine the social processes associated with the material record (Deetz 1965, 1968). This reliance on stylistic examination and type distribution is not only used in prehistoric contexts, but has been applied to historic artifacts and structural space
analysis, where a documentary record allows elaboration and advancement of social
dynamic understanding (Deetz 1963; Glassie 1975).

Boundary modeling approaches that focus on centeredness and non-centeredness
have used stylistic variables and distribution of artifact types as a way to examine
boundary maintenance through time and as a way to define and view a study area
(Hodder and Orton 1979; Parkinson 2002). These approaches have even included
dimensions of analyzing stylistic variability for design elements indicative of personal
identity, function, and interaction, with some designs argued to better reflect social group
interaction and affiliations than others, and as capable of being seen as delineators of
regions (see Voss 1995). Relative visibility and distribution of the stylistic variable are
thus often used by archaeologists to model the changing nature of boundaries
through time and across space (Carr 1995; Janusek 2002; Parkinson 2002).

Social boundaries are often modeled using archaeological data obtained from
stylistic and technological attributes, and archaeological sites can be distinguished from
surrounding areas with boundaries often viewed in terms of physical features and artifact
densities. But in this sense, boundaries are actually a compromise between what we see
today in the way of physical remains, and what types of activities and beliefs constitute a
site or place. Activities in places can differ through time, although use of space can be
consistent, resulting in landscapes that persist through time (Schlanger 1992: 92). There
is also a genre of literature and theory concerning non-sites, negative survey data, and the
places in-between, that further complicates and muddies our interpretations of boundaries
and how best to model them (Crumley and Marquardt 1987; Ebert 1992; Hudak et al.
2000; Wells et al. 2004).
Boundaries can be physical, cultural, social, and artificial distinctions and can be hard to denote, but they are still worthy of study and investigation. Boundaries offer a way to spatially understand cultural processes. A boundary is not all about centers and distinctions, but can also be about edges and peripheries and areas that shift, blend and merge together, changing or being changed through time. Shifts in boundaries can exemplify a shift in priority and even reveal changing conceptions in regard to the environment (Crumley and Marquardt 1990).

Cultural processes can run along lines of boundary demarcation and sometimes even cross-cut the separation; therefore, boundaries may simultaneously serve as both centers and edges (Savage 1990:336). Problems in examining boundaries include reliance on macro scales of analysis, not examining boundaries in terms of porosity, interface, and two-way behavior, and expectations for sharp demarcations rather than blended areas of unclear distinction (Lightfoot and Martinez 1995). It is precisely because of the ephemeral nature of boundaries that archaeological research be pursued at a variety of scales, both spatial and temporally, as what may appear to be a center at one scale may be a boundary at another (Crumley and Marquardt 1987; Madry and Crumley 1990:73-79).

So, how do we decide where to draw the lines and call it a boundary? It depends on the scale of the question being asked.

**Boundaries and Archaeological Signatures**

The concept of an archaeological signature is defined here as a discernable artifact residue pattern that can be used to distinguish location, land use, or settlement patterns for temporal and cultural affiliation. Archaeological signatures are used in
boundary determinations, and need to be discussed in terms of how archaeologists
delineate and interpret space and place through the use of these signatures. For example,
areas of discrete artifact concentration, dateable and diagnostic artifacts, spatial
arrangements and configurations, site plans and relation and interaction with other areas
and sites, can all be used to discern an archaeological signature. These signatures, such as
house form and spatial layout, can be useful in examining social identity and diversity
and represent a type of social boundary (Aldenderfer and Maschner 1996; Bawden 1993;
Janusek 2002). Archaeological signatures can more broadly be viewed as landscape
signatures when the material remains from human activity are considered across
landforms in a given region and at a particular time, the result of the relationship between
people and the environment (Marquardt and Crumley 1987). In this way, social
boundaries and natural environmental boundaries come together archaeologically. These
boundary overlaps occur at a variety of spatial and temporal scales.

To effectively see these boundaries and the landscape signature, scalar or spatial
approaches should be multidimensional. The approach can be taken from a small,
localized or household view, to large areas, perhaps delineated by natural features such as
watersheds, ecosystems, or ecotonal interfaces. Landscape signatures are not static
entities, but are complex systems that can vary temporally as well as spatially. Shifts in
these signatures can occur, sometimes abruptly, and have been documented in a variety
of environmental zones (Wilkinson 2003).

To examine culture change and how it is manifested spatially, any scale in which
recognizable, discernable patterns emerge can be a useful scale of analysis (Amerlinck
1998; Ashmore and Knapp 1999; Boyden 1979; Crumley et al. 2001; Marquardt and
Archaeologists are often able to correlate natural and material features at different scales, with associated boundaries often co-occurring with cultural residues. For example, in Florida, known Paleo-Indian period (ca. 13,000 B.C. to 7,900 B.C) sites have been found to correlate with karstic areas where chert limestone outcrops are numerous. This area ranges from northern Hillsborough County to Alachua County and in the Panhandle portions of the state (Dunbar 1983). Additional karstic areas can be delineated by the occurrence of first magnitude springs, sinkholes, and surface water availability. These features reflect a natural boundary evident during this period, namely a sea level much lower than present and inland fresh water sources scarce.

Models that examine archaeological boundary patterns in relation to natural boundaries are useful, with the caveat that it is understood that they consider the known archaeological record and may not be reflective of the actual settlement pattern in all instances. Paleo-Indian sites in Florida may also be found most often in karstic areas, because these are areas that have subsurface expression that can be readily seen in areas such as river cuts and sinkholes. These areas also tend to be where we look for these types of sites. However, Paleo-Indian sites can also be found offshore in Tampa Bay or in deeply-buried terrestrial settings where it is not as easy to look for sites. Therefore, ease of survey and expectations of site locations in certain areas need to be considered as factors affecting our perception of settlement patterns from this period (Goodyear et al. 1983; Milanich and Payne 1993:17). For this reason, models of life ways, such as the Paleo-Indian example, should be viewed at multiple scales, considering such factors as paleoclimate, vegetation, subsistence and raw material resource potential, physiography,
and other location evaluative factors like slope, relative elevation, and hydrography (FDHR 1990; Sassaman and Anderson 1996).

Archaeological examples of natural boundaries and social boundaries intersecting are numerous and have been used in predictability modeling effectively in a variety of settings. Yet, it should also be noted that in many cases, distinctions between natural and social boundaries are vague and ephemeral, sometimes symbolic and intangible (Lamont and Molnar 2002:167). Mountain ranges, riverine corridors, lacaustrine and wetland areas, and other areas of ecotone difference, can function as natural boundaries where the archaeological record reflects distinctly different life ways and material differences and stylistic variability. For example, Milanich (1978) developed a model for the Cades Pond culture in north central Florida based on settlement and subsistence strategies bounded by wetland and aquatic habitats. The environmental setting was shown to play an important role in the cultural development and material culture expression of Cades Pond people (Milanich 1978).

Catchment zones surrounding archaeological sites, sometimes based on arbitrary distances or radiuses around sites, can also be based on natural boundaries. Site catchments consider potential or actual resources in relation to travel distance, bringing in an economic dimension and examined through least-cost analysis (Savage 1990). While this method of analysis has its merits, there are problems inherent to presupposing these types of boundaries. For example, is distance to a resource the limiting factor, or is travel time more important? If a resource is located uphill versus downhill, then travel time might very well be more important than distance.
Examination of social processes and behaviors, settlement patterns, artifact distributions, stylistic variations, subsistence models, and boundaries come under the broad heading of landscape archaeology. When a Geographical Information Systems (GIS), which is hardware and software that allows the viewing, layering, and analysis of spatial or geographical data, is used to examine the landscape, these multiple layers of spatial and contextual consideration are able to be viewed together or separately, in a horizontal or heterarchical way, as opposed to a vertical or hierarchical examination that can often overlook complex relationships that may exist among variables of analysis. The term heterarchy is defined here as a way of organizing the landscape into an area that has variables of consideration that are all or in large part unranked. In this way, boundaries that project beyond lines and are salient can be examined in terms of multiple characteristics that simultaneously reflect the whole. Use of a GIS as a tool that allows for this type of multi-layered analysis, helps in examining cultural landscapes (Crumley and Marquardt 1987; Green 1990:358; Madry and Crumley 1990:367; Marquardt and Crumley 1987; Savage 1990:331). Thus, a landscape archaeology approach should encompass multiple scales from differing temporal and cultural considerations. The ability to visualize multiple layers and levels of information in a GIS enables a view of the landscape as an aggregate, providing a broader perspective of the patterning of human activity that is occurring across space. An examination of the physical structures, site functions, locations, natural system associations, soils and landforms, social and administrative boundaries, and the spaces in between and surrounding known archaeological sites, can be examined collectively. The synthesis of these data facilitate a

Choice of spatial extent should be at an effective scale that demonstrates pattern in a recognizable way so that inferences can be made (Marquardt and Crumley 1987). A GIS can help integrate several layers of information collected at different scales, including archaeological, ecological, and land use data. Examining these layers of data at varying spatial and temporal scales, affords decision makers the ability to interpret information, recognize patterns that emerge, and determine how to best manage resources (Fahig 1992). One example would be from a landform, or physiographic unit perspective. A physiographic unit is defined as an area that possesses internal homogeneous natural characteristics while exhibiting degrees of contrast with adjacent areas (Frye and Schoewe 1953). The case study presented in this dissertation is one such unit area. A variability of scale is also needed so that we do not emphasize boundaries in their relative importance while potentially concealing a boundary that may mean much more. A multiscalar, landscape orientation does not impose or delineate boundaries arbitrarily in advance and integrates social theory with natural systems in a multi-perspective archaeological investigation (Marquardt and Crumley 1987). A landscape orientation may be thought of as a heterogeneous assemblage or a mosaic of internally uniform elements or patches (Fahig 1992). Meaningful patterns of cultural activity combined with environmental regions can occur across variable scales. For example, it may make sense from a modern day political perspective to examine archaeology within a circumscribed county boundary, yet still be able to understand and look for patterns as part of a larger regional cultural and environmental setting.
Boundaries as Used in Florida Archaeology

The idea of archaeological regions in Florida, as proposed by Goggin (1947), was the relationship of prehistoric cultures to the geographical environment through time. Prior to Goggin’s preliminary work and dissertation on the topic, early attempts at defining regions were made by Holmes (1903), Stirling (1935), Kroeber (1916) and Wissler (Kroeber 1931).

Goggin’s classifications gave consideration to space, time, and tradition, changing the dimensions of archaeology. Tradition is the persistence of traits or elements of culture that persist through time. This concept of tradition, as put forward by Willey (1945), was broadened by Goggin to encompass whole culture areas in Florida (space) and to include a temporal depth (Goggin 1948a, 1949; Willey and Sabloff 1980). Goggin relied heavily on natural geographical features in his application of the “culture area” concept to archaeologically defined cultures (Goggin 1948a:37; 1948b, 1949). His proposed archaeological areas and regions originally included Florida’s East Coast, West Coast and southern tip. He then subdivided the West Coast in two, and added four intermediate regions that he explained helped account for cultural interplay and interaction (Goggin 1948b) (Figure 2.1).

Goggin pointed to the concept of cultural hearths, which served as main centers of development. These hearth areas were the Northern St. Johns, the Northwest Gulf Coast and the Glades area (Goggin 1947b). His dissertation work at Yale led to a statewide archaeological perspective development (Goggin 1948a). In the conception of this perspective, Goggin had access to several space-time archaeological framework
As Goggin was quick to note, however, these archaeological areas and regions were not of permanent value and should be viewed only as a starting point or a tool for further research. Early on, he recognized that these classifications were merely a way to organize available data and should be subject to refinement and change. These ideas were born out of two dominating schools of thought: geographical determinism and human adaptation to the environment, which held the environment as the limiting factor. To Goggin, the environment presented broader interpretive opportunities. He made it clear that he did not subscribe to the idea of environmental determinism, stating that he viewed constructs through his contact and exposure to the works of Gordon Willey and John Griffin (Weisman 2002a).
the environment as permissive in the underlying consideration of Florida prehistory, especially as it relates to issues of subsistence and availability of natural resources (Goggin 1948a:17-18). Goggin’s attention to variable landscape scales was present even in this early synthesis. He was heavily influenced by his mentor Donald Brand, a cultural geographer that he studied under at the University of New Mexico (Weisman 2002a). His ideas had elements of landscape understanding and were framed in terms of environmental possibilism, a concept that has come full-circle and is a prevailing theme in landscape ecology today (Sanderson and Harris 2000).

Goggin also focused on material culture, in areas of seriation and chronology development, but always tied anthropological theory into reconstructing the culture and life ways of those who left the artifact record (Weisman 2002a). His ideas regarding archaeological areas and regions have served as the foundation for today’s refinement of archaeological regions, which are based largely on distinctive pottery styles and show some correlation to geographical and environmental zones (Milanich 1994) (Figure 2.2). These regions admittedly do not fit all cases, but serve as a framework for understanding the known archaeological record. Because there remains uneven archaeological information across the state, some regions are better known than others. As we continue to learn about areas and gather more archaeological data, refinements then, should be made. But we should remember, as Goggin stated early on, that these boundaries are subareal units and should be considered as arbitrary and reflective only of the present knowledge (Goggin 1948a:68).
The idea of culture areas and regions were and continue to be influential to our understanding of Florida archaeology, and have served as the foundation in the development of the state historic contexts. These broad overviews of traits across time and space are used to infuse cultural meaning to the landscape. Historic contexts are essentially an overview of the prehistoric and historic periods, and are extremely important because of their link to the significance determination process, where the contexts are used as justification for eligibility for listing of sites on the National Register of Historic Places (NRHP). The Florida Comprehensive Historic Preservation Plan considers archaeological sites in the state by these categories, or contexts, with units
consisting of definable time periods or archaeological cultures (Weisman 1999).

Preservation planning needs historic contexts, as they are foundational to the organizing of information into a form that assists with understanding the significance of resources. These contexts are also used to analyze cultural change through time in given areas. It is through the development of historic contexts that issues are identified, goals are developed, and preservation priorities are to be established (FDHR 1990). Historical contexts bridge between the archaeological record and the National Register criteria for archaeological significance determination, and understanding of these context is therefore crucial to the discussion of significance as an archaeological concept (Weisman 2002b).

Archaeology addresses such broad themes as the reconstruction of past life ways, the discovery of processes that underlie human behavior and the construction of cultural chronologies (Renfrew and Bahn 2000). Historical contexts are bounded by cultural chronology, geographical settings and cultural themes and attributes. The general organization in the historical context descriptions includes information on setting, material culture, subsistence practices, and settlement patterns. Each context also includes information such as significant and diagnostic sites, potential research questions and preservation goals.

Data from numerous sites and time periods across a defined region are needed to construct cultural chronologies, which are an integral part of the contexts. These chronologies have to also consider information from new archaeological surveys and excavation, which will continue to modify and augment our understandings. Because contexts use existing knowledge they require evaluation and re-evaluation. Researchers
have called for regional approaches and use of new technologies and methodologies, such as computer assisted analyses, to refine and update the contexts (Milanich and Payne 1993).

Ideally, information sources used to develop archaeological contexts should include survey and excavation reports, archaeological literature, environmental impact assessments, land use plans, and ethnographic research. Sources such as the Florida Master Site File location data, county, state and federal agency plans, registers and landmark inventories, Section 106 assessments and compliance reports, information from local historians, groups and organizations can all be used to augment the regional understanding and provide specific information regarding the history and prehistory of the region (Milanich and Payne 1993). Realistically, some of these ‘gray’ literature sources are hard to obtain and to synthesize into a spatial construct. Additionally, archaeology has been criticized for being disconnected from other fields of inquiry, performing investigations and critically examining research questions of value only to archaeology. The presented results and interpretations are often done in ways that are not formatted for use by others, such as environmental resource planners, policy makers, and the public (Klein 1999). The historic contexts themselves are representative of this criticism, with boundaries and nomenclature specific to archaeological understanding but they are not easily integrated with regional considerations of environmental management plans and policies in Florida.

As previously mentioned, contexts are, in concept, supposed to be living documents that are continuously developing and added upon. As more is learned about the archaeology and environmental attributes in a region, modifications to the contexts
and culture regions should be made. The development of historic contexts are said to be accomplished by identifying the concept, time period, and geographical limits for the context; synthesizing information about the historic context in a written narrative, supplemented with maps and graphics; identifying research goals that will fill gaps in our knowledge of the context; identifying preservation goals that will help to protect the range of site types known and expected for the context; listing general references which are important to the context; and listing sites which are recorded for the context along with their National Register status, and their known and expected distribution (FDHR 1990, 1993).

Historic contexts organize this information into three components: a cultural theme, the geographical limit, and the chronological limit. These big picture overviews in theory should assist the understanding of the resource and aid in evaluating issues such as significance determination. Historic contexts sometimes cause confusion for researchers when they are incomplete or define areas without evenness in knowledge across regions. Many archaeological sites or areas can represent several contexts, with archaeologists sometimes not recognizing all of the possibilities. Historic contexts have also been criticized for their lack of planning, mostly presenting what is known rather than relating archaeology to management plans or policies (King 1998:234). The reality of the historic contexts in Florida is that although they are very descriptive of geographical and chronological extents, there has been no holistic, bridging approach to understanding these constructs in spatial relationship to the environment, nor has there been an integration of GIS for spatial understanding of these cultural phenomena, that remain essentially verbally described. Maps, when used, are primarily for visualization purposes
rather than analysis. Although visualizing data has merits for general pattern display, analytical tools and modeling that a GIS affords would create stronger contexts on which to make planning decisions, including both proactive and reactive elements (King 1998:235).

Historic and archaeological planning contexts are meant to provide us with a framework for preservation goals, but they largely do not take into account spatial relationships and influencing environmental variables in a way that allows for a more complete, multiple scale and larger regional level of understanding. In Florida, a shift from hard-to-define cultural boundaries to a more multiple scale environmental setting approach is proposed as providing a more effective and efficient framework for the management of archaeological resources. This type of a multi-level view of understanding cultural resources in the state will prove beneficial in lessening criticisms of Section 106 of the National Historic Preservation Act, which requires that all federal planning, decision-making, and project execution take into account the effects of their actions on historic properties. Understanding how archaeology and cultural resources are part of the landscape, and how the landscape is part of the cultural resources, will assist in preservation prioritization and impact assessments, especially as the latter often involves natural and cultural resource considerations. Criticisms of other permitting and compliance issues will also lessen as archaeology moves away from an emphasis on a site-by-site approach. Evaluation decisions concerning archaeological significance and impacts will also be dramatically improved with a more complete understanding of a given context (King 2002).
The Significance Debate

Significance evaluation plays a pivotally important role in archaeological investigation, protection strategy development, and resource management. The idea of significance in archaeology is at once clarifying and confounding. Significance is a subjective judgment and it may be at once a concept, a quality, and a designation. Significance in archaeology means that a site is capable of providing scientific or humanistic understandings of past human behavior, cultural adaptation, and related topics through the application of scientific or scholarly techniques such as controlled observation, contextual measurement, controlled collection, analysis, interpretation and explanation (FDHR 1993). Significance refers to meeting the requirements for eligibility for listing in the National Register of Historic Places (NRHP) in archaeology in the United States. The NRHP is a national listing of cultural resources that are deemed worthy of preservation as authorized by the National Historical Preservation Act (NHPA) of 1966. The list is coordinated to identify, evaluate and protect historic and archaeological resources and is formally administered by the National Park Service. According to King (1998:75) “[a]rchaeological properties do not have to be large, impressive, or rich in artifacts or data to qualify for the NRHP, nor do they have to be suitable for public interpretation. Any archaeological resource is potentially eligible if one can legitimately argue that it is likely to be associated with a cultural pattern, process, or activity important to the history or prehistory of its locality, the United States, or humanity as a whole, provided its study can contribute to an understanding of that pattern, process, or activity.”
Subjectivity, intended to allow flexibility, has instead created problems with the definition of significance and complicated the significance determination process. For example, just as you can say that a resource may be eligible for listing, you can also say that another resource is not eligible, and therefore not ‘significant’ based on a yes or no answer. These judgments in value are made all the time in archaeology and cultural resource management as a way to prioritize and preserve, but these judgments should be tempered with caution and use the best available information (King 1998:90).

The solution to making good judgments is having localized and area specific information that can assist with resource identification and definition that will allow a more informed analysis of significance as a concept. Essentially, historic contexts and their use in significance determination relates to how much we know; about a site, a region and the archaeological research issues for that region. This information is then combined with how much of an effort we want to take in making a case or argument for significance (Glassow 1985).

There is also the problem of conveying the meaning of archaeological significance to those outside of archaeology with a vested interest, namely planners, policy makers, and the public. The divide within archaeology between how research and academia and cultural resource management interpret archaeological significance has also been pointed to as problematic (Darvill 2005; Klein 1999). The challenge is to make significance determination meaningful to non-archaeologists (Deeben et al. 1999).

Under the current system, the focus is centered largely on single sites and the significance determination is more a reflection of the research agendas of the archaeologists performing the assessments. In the present system, the familiar sites are
out competing the unfamiliar or unknown sites whose value as resources are not clearly understood. Therefore, only existing frames of knowledge are being protected, with diversity being unrecognized and eventually lost (Glassow 1985; Weisman 2002b). The value ultimately assigned to the resource can be more an interpretation and value of the evaluator than anything intrinsic to the archaeological record (Moratto and Kelly 1978). Whole categories of sites can be summarily dismissed as not significant, before they are ever understood or considered on anything but a site-level basis. This loss of knowledge often happens with sites that are considered by some to be unspectacular with few artifacts, or that are hard to categorize. The problem extends beyond sites and types to entire regions, where there is unevenness in the archaeological understanding. For example, many interior portions of Florida are less archaeologically understood than coastal areas. Without developed reference and comparison information, sites and settings are sometimes blurred and compartmentalized into familiar categories with values assigned based on the known rather than new categories of understanding developing from the evidence. Significance can only be interpreted through the use of an explicit frame of reference (Schiffer and Gumerman 1977:239), showing once again the basic need for developed historic contexts for use at multiple, landscape levels of analysis.

As part of the significance evaluation and to be eligible for listing on the NRHP, the site also must have integrity as well. Integrity is defined as having seven aspects: location, design, setting, materials, workmanship, feeling and association. Integrity then, is the ability of a property or site to convey its significance in this manner (National Park Service 1991). Integrity must be determined by understanding the context and research
potential and knowing when, where, and why the property is significant (Little et al. 2000).

There are four evaluating criteria that are used in the significance determination process (Table 2.1). For archaeological resources, it is the Criterion D that is of primary application to sites that are 50 years of age or older. But while research potential is the most commonly used, it may not adequately address such concepts as whether an archaeological site or district has traditional, social, or religious significance to a particular group or community (Seibert 2002). The criteria are very broad based by design and able to incorporate new information and techniques. The generality of the determination criteria can be a confounding too, as the criteria are so broad that a defined threshold for significance is not always developed. This generality was intentional, so

Table 2.1. National Register of Historic Places evaluation criteria used for significance determination

<table>
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<th>Criteria for evaluation:</th>
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<tr>
<td>The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and;</td>
</tr>
<tr>
<td>(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or</td>
</tr>
<tr>
<td>(b) that are associated with the lives of persons significant in our past; or</td>
</tr>
<tr>
<td>(c) that embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or</td>
</tr>
<tr>
<td>(d) that have yielded, or may be likely to yield, information important in prehistory or history.</td>
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</table>

Source: http://www.cr.nps.gov/nr/listing.htm
that a ‘one-size-fits-all’ procedure for determination was not mandated, making the
development of regional contexts and multiple other scales of analysis and research
problem orientation even more important in the process (Glassow 1985).

How these criteria are implemented by CRM firms, evaluators, and agencies can
vary widely, with determinations incumbent upon informed cases able to be made by
evaluators, who work to make the criteria meaningful with problem-oriented research
(Raab and Klinger 1977; 1979:329). Oftentimes, it is the field archaeologist’s initial
assessment that attests to the archaeological value and is crucial to the significance
determination chain of events. This step in the process is where decisions with
implications are made. For example, if significance determination is part of a Federal
undertaking, then adverse impacts to significant sites must be avoided, minimized or
mitigated. Sites that are not deemed significant are often lost to the bulldozer or
otherwise destroyed (Austin and Hoffman 2002; Miller 2002). In the case of Florida, the
master site file database shows that a majority of sites have not been evaluated for
significance by the State Historic Preservation Officer (SHPO), and it is the survey
evaluation and the assessment of the evaluator that most often stands as the site valuation
record (Florida Master Site File, 2006)(see also Austin et al. 2001).

Criticisms and challenges continue to resonate from within the field of
archaeology and call for an examination of archaeological site significance not only
under the Criterion D determination, but from the aspect of ‘societal value.’ Contribution
to overall management and planning should also be considered in the significance
determination, and in promoting a land or conservation ethic (Darvill 1995; Deeben et al.
Archaeologists and officials are not alone in this determination process. The Native American Graves Protection and Repatriation Act (NAGPRA), along with state-level acts such as Florida’s state statute Chapter 872 (Offenses Concerning Dead Bodies and Graves), underrepresented new voices are emerging in the process. Native Americans, African Americans, and stakeholders are helping to shape the discourse on significance and the ideas of value and importance in archaeology (Mathers, Darvill et al. 2005a). More vocal public debate and input has been central to this process with one result being a look inward.

Archaeologists and the public are beginning to again examine hierarchal ranking and value beyond the compliance setting of significance determination. Renewed focus on the significance topic follows nearly a decade of reflection after much attention and debate was given to the issue largely from the CRM point of view in the late 1970s and 80s (Glassow 1977; King 1977; Lipe 1984; Lynott 1980; McGimsey 1972; Raab and Klinger 1977, 1979; Sharrock 1979; Tainter and Lucas 1983). Significance is, after all, intrinsically linked to a valuation or value system, and plurality and inclusion of opinions and voices can only broaden appreciation for the complexity of the decision process.

Despite this opportunity for public inclusion from the legal processes now in place, it is still largely the Cultural Resource Management professionals who are dealing with compliance projects on a daily basis and are examining concepts of significance regularly. In particular, they are looking for and assessing sites significant to American history that could be impacted by federal undertakings or federally-assisted projects.
under the Section 106 review process of the National Historic Preservation Act (NHPA). There are processes outside of the federal system for cultural resource preservation, and Florida has many examples of archaeological acquisition (Florida Department of State, 2002). Florida, for example, emphasizes historic preservation with state and local mandates and ordinances that exist to encourage preservation, stewardship and acquisition, and establish protection laws especially relating to state owned or controlled lands and for offenses concerning dead bodies and graves (see Chapter 872 Florida Statute relating to Dead Bodies and Graves, Chapter 253 of the Florida Statutes concerning emergency acquisition, and Chapter 267 Florida Statute concerning state or state-assisted undertakings and state permits).

Significance is essentially a way of underpinning value. As significance is applied to cultural resources, the context, who is evaluating the resource, and qualities inherent to the resource, are all factors. The attributes and values used by archaeologists in examining the concepts of significance have ranged from scientific, historical, ethnic, legal and monetary (Mathers et al. 2005b). With the inclusion of native peoples in the significance consultation process, symbolic and sacred values across larger areas are now more often being considered on a national basis. Cultural resources offer a way to view human use of a landscape, tying activities and people to a place. The legal aspect of significance determination means that the utmost care needs to be afforded to the process. As well, archaeological contexts need to be understandable to non-archaeologists in order for the concept to play a relevant role in heritage and resource management, protection, and planning (Briuer and Mathers 1996; Darvill 1995; Deeben et al. 1999; Glassow 1985).
Although a site-focused mentality prevails in archaeological significance determination and recordation, there is an example of a landscape dimension of consideration in the National Register process. Traditional Cultural Properties (TCPs) deemed significant to Native American cultures, exemplify how a landscape can be viewed from a variety of perspectives, but this designation is under-utilized by cultural resource managers in Florida (Robert Austin personal communication, November 2006). TCPs may include such things as trail systems, sacred areas, and site clusters. Evidence for these areas can come from both scientific and survey based data, and from oral histories, ethnography, and from religious and traditional practices (Seibert 2002). TCPs could be examined under different criteria, but the imposition of these criteria to the sometimes ephemeral nature of these sites can be problematic, as significance conveyance required under criteria A, B, and C is more rigid than the site integrity requirement under criteria D. The significance of a TCP is from the perspective of those who value the property rather than those who evaluate the property.

Significance can also be considered outside of the realm of the National Register. Archaeological resources which reflect culture, society, and even the individual are no less significant if viewed outside the federal arena. Archaeological investigations in other countries still have a subjective consideration toward the significance of archaeological sites; examining merit, value, information potential, size, structure, symbolism, inter and intra-site relationships and other factors. Public investment and cultivation of a tie to the past, a sense of place, and a relevance of archaeology to the present is possible. Yet, in the United States the fact that we have a federal register list establishes some degree of heritage promotion and has been demonstrated as a way of bringing archaeology more
easily into the public sphere (Little 2002). The National Register and the compliance processes previously discussed offer a legal role for archaeology. In this manner, significance is also a concept tied to research, stewardship, and preservation planning (Seibert 2002).

Representativeness and Significance

The concept of representativeness is used in archaeology and CRM to mean that a sample of sites from a given geographic area accurately reflects the range of human cultures and activities that have occurred there through time (Mathers et al. 2005). Although the concept remains an arbitrary and often ill-defined pretense, the idea of a representative sample for both research consideration and for planning and preservation issues is important. Both representativeness and significance convey the idea of value, with representativeness reflective of the accurate depiction of the range of human culture and activity within a geographical context (Briuer and Mathers 1996; Glassow 1977). Still, questions concerning archaeological knowledge in a region and significance determination remain: How much is enough? How much do we need to know before we know? And, what is it that is lost if we are wrong (Weisman 2002b)?

The reality in Florida is that decisions regarding representativeness of resources, cumulative impacts, and other regionalized concerns are oftentimes not made. The ‘yes’ or ‘no’ answers to significance determination in the NRHP process can lead to the preservation of sites reflecting more the research agendas created by the archaeological community than the value of the cultural resource. Difficult topics to be sure, but
significance and representativeness need to be considered if we are going to protect archaeological diversity and heritage (Mathers et al. 2005a).

Lacking an audit of this diversity, we could be differentially protecting some types of archaeological phenomena, while perhaps poorly representing site types reflective of a diversity in ethnicity, site function, class, overall site size, chronology and numerous other overlooked variables that make our ultimately preserved record unrepresentative (Mathers et al. 2005a). This lack of protection is often seen with the ephemeral and inconspicuous site types, like lithic and artifact scatters, with assessments being made arguably based on the wrong criteria; material expression over behavioral (Tainter and Bagley 2005:63-69). Sites can be summarily dismissed as not significant whose value as a resource is not understood. In this example, the NRHP process is establishing a procedure for more familiar types of archaeological sites out-competing the unfamiliar or unknown site types, with only existing frames of knowledge protected (Austin and Hoffman 2002; Mathers et al. 2005a; Weisman 2002b).

To avoid this problem, some have called for a labeling of ‘more’ or ‘less’ significant rather than giving a ‘yes’ or ‘no’ answer to significance that could change through time (Mathers et al. 2005:172). In this sliding scale approach, labels such as lithic scatters would be downplayed and more specific characterizations such as site size, location, and functional terms would be applied so that sites, non-sites, and distributions, which could all be represented in the process (Goodyear et al. 1978) rather than narrowed research interests reflecting what is considered as significant (Sharrock 1979). Still, subjective terminology such as ‘more’ or ‘less’ come with value judgments
an beliefs that can ultimately skew the preservation record toward what is more understood.

A way to address preservation planning and the issue of representativeness and of formal and functional site diversity would be through a multiple-scale settlement pattern analysis. For example, the Florida Master Site File (FMSF) has information available as GIS data layers with more than 26,932 archaeological sites recorded (Florida Master Site File 2006b). For each of these sites, spatial location or general vicinity is given, as are the size (when determined), site type, cultural affiliation and time period. Other databases exist for diagnostic artifacts by site number, allowing the spatial analysis to extend to the material culture record. Utilizing this information in a GIS format where spatial queries and attribute information can be examined, analyses can be made at a variety of scales (administrative, culture region, ecosystem-level, archaeological landscape level, watershed, etc.) to see what kind of meaningful patterns emerge.

Settlement pattern analysis can enable archaeologists to reconstruct past life ways, examining where people lived and why they might have lived there. Many factors come into consideration in this analysis including an environmental characterization, resource availability, economic practices (trade and exchange), and technologies. The next part of the analysis examines patterning and clustering of settlements and sites by type, size, function, and temporal and spatial configuration over a defined area. These areas of inquiry afford an understanding of social dimension, specialization, stratification and political organization (FDHR 1990). Ideally, these factors can be combined with suitability concepts across a landscape, examining resource proximity and availability, and distance to other settlement clusters.
Site types reflect both the spatial pattern and the presumed behavior arising from things like the artifact type. Collectively over an area, site types have been classified into social patterns (Willey and Sabloff 1980). An archaeological site does not exist in isolation. For the same reason that an object’s meaning is diminished if it is taken from its original provenience, archaeological sites should not be considered out of the context of their larger cultural, geographic, or environmental scale (Mathers et al. 2005:165).

The Landscape Scale and Archaeology

The GAP analysis I conduct in this dissertation is applied to a physiographic unit scale that is used as a case study. This case study area is one that is facing pressures from development and land use changes, and will use an approach that considers environmental and land use issues and will relate these to archaeological planning and policy. The Big Hammock physiographic area is defined in part by restricted topography and environmental variables. I have considered the scale as a landscape study as well, using the definition that a landscape-scale study is one that looks at the effect of landscape context on a response variable, in this case archaeology (Fahrig 1992). I consider the archaeology in terms of the geographical context, leaving room for comparisons to other defined landscapes in future studies. The term landscape can be vague and its meaning sometimes confusing and nebulous, with researchers often setting it aside as too problematic. Nonetheless, as Hirsch (1995:2) states “[t]he black box of landscape requires ‘opening’ and its contents themselves brought into view.” In anthropology, the definition of landscape is used in two ways; the first is as a framing mechanism to bring people into view, and the second as a way of getting at the meaning
with which people imbue meaning to their surroundings. The landscape concept can then be viewed as a social construction of place, infusing the natural environment with social meaning and identity (Low and Lawrence-Zuniga 2003:16).

Regional approaches emphasizing settlement pattern analysis have been central to archaeology for decades. This concept of a larger than the archaeological site level examination, came largely after the efforts of Gordon Willey and James Ford in the Viru Valley Program (Willey 1953), which was the first settlement pattern study conducted in the Americas (Billman 1999). As archaeologists moved beyond cultural historical approaches and began to consider more social and cultural processes, regional settlement pattern analysis came into focus. In recent years, landscape approaches in archaeology have become more popular in part because of quantitative and spatial analysis applications with GIS (Ashmore and Knapp 1999; Bender 1993; Fisher 1999; Harris 2002; Kvamme 1989; Llobera 2001). These applications make it easier to study larger-scale areas, with remotely sensed data, such as aerial and satellite imagery assisting in studying landscape structural variables (Fahrig 1992).

Landscapes are the spatial manifestation of the relations between humans and their environment (Marquardt and Crumley 1987). Landscape archaeology examines issues such as how people have purposely or unintentionally shaped their environs and how they have organized space for reasons of economics, environment, subsistence, social aspects, politics and religion (Fisher et al. 2005; Ucko and Layton 1999). Landscapes are therefore not only natural but cultural constructs as well (Ashmore and Knapp 1999; Bender 1993; Deetz 1990). When combined with a multiple scale approach,
landscape archaeology affords greater insight into these relationships and factors than does a site-specific approach (Wells et al. 2004).

In geography, the emphasis in landscape study is traditionally the interaction of humans with the physical landscape; anthropology adds the dimension of culture to landscape. There are numerous areas of congruency and overlap between geography, archaeology, and anthropology, and many applied projects have involved integrative approaches to understanding landscape-level cultural issues and responses (Tobin and Whiteford 2004). Geography’s perspective, like anthropology’s, is broad, critically addressing issues of human manipulation and transformation of the environment.

Geography is concerned with location and place-oriented viewpoints, and landscape perspectives are part of this dimension. Spatial organization and built environment are issues dealt with at this and other scales of analysis, as are physical processes occurring in the natural environment, including cultural dimensions of human interaction. Regions and places are studied through the examination of physical processes and human relationships across space, including a variety of scales from ecological units, such as watersheds, to landscapes or political or administrative areas, such as nations, states, and counties. Cultural landscapes as defined in geography are ubiquitous and act as repositories and collections of evidence of societal information (Cosgrove 1989; Knox and Marston 1998). Landscapes are viewed as interacting with culture. Geography looks at landscapes from the perspective of those who create, construct and modify, as well as from the view of those who consume the meanings, perceptions, values and behaviors communicated by and through landscapes (Knox and Marston 1998). Landscapes can be
viewed from a variety of scales, both individual and as interconnected linkages to other landscapes (Mitchell 2002).

Landscapes are also viewed in terms of conflict and struggle and other meanings imbibed by society. Concerns of power, identity, and control over the meaning of landscapes are questions revealed through landscape analysis. These underlying landscape meanings and issues are as relevant today as in the past (Mitchell 2000). A landscape scale of analysis may not be appropriate for all inquires. Arguments have been made for example that show how a landscape scale analysis can conceal power relations and may not be an appropriate scale for considering certain types of research questions addressing power concerns (Daniels 1989).

The concept of landscape has its roots in Flemish landscape paintings and rendering of nature and panoramic vistas and views, and so the word often is used to connote nature. But landscape terminology is now often used as meaning more than topography and the viewable landscape. It is used as a metaphor meaning to grasp the whole of a subject matter. Landscapes are a way of seeing geography and are often dealt with in a cartographic way, but because of the dual nature of landscapes that both presupposes a viewer as well as being an observable phenomena, some have called for caution to be exercised in mapping these entities (Cosgrove 1985; Wood 1992). Caution is necessary when mapping landscapes because there are different ways of knowing and seeing the landscape. These different ways of perception can have negative consequences when conservation and environmental management considers landscape and maps it in a geographic, natural sense, leaving out social and cultural resource dynamics as separate domains. The mapping of resources without reference to the activities and practices of
Native peoples is often a criticism of developed management strategies, and has been blamed in part for political separation of Native peoples from the land (Braun and Wainwright 2001:54).

There are also examples of geographers working in conjunction with archaeologists and anthropologists to produce landscape views. These views took into account more than natural resources. Oral histories help to infuse the landscape with meaning and intent and can be an inclusive part of visualizing and mapping the landscape (Braun and Wainwright 2001).

In ecology, landscape approaches are often thought of in terms of watershed and ecosystem level studies. Landscapes in fact are defined as two or more ecosystems with an ecotone (Forman and Godron 1986). An ecosystem is subjective in that it is a bounded unit of analysis inclusive of all the biotic and abiotic and interacting pieces at various scales. Ecosystems are also sometimes delineated by natural boundaries, such as a river, lake, watershed, vegetative association or other naturally delineated border. This organizational level emphasizes interaction and, when brought together to include cultural interactions, can be provide one type of unit of analysis that shows physical processes in relation to the cultural, environmental, and temporal setting. An ecosystem perspective is integrative and allows for the consideration of multiple and interacting dynamics.

Emerging patterns and processes allow ecologists to study landscapes. These processes include both geographical and ecological approaches to understanding spatial issues and biotic processes on and within a landscape. Ecological landscape studies are conducted to examine multiscalar and temporal models, depending on the research
questions and problem orientation (Opdam et al. 2002). In this way, landscape patterns and interactions between systems can be considered at varying levels. The interaction between ecosystems has the propensity to impact ecological processes and for this reason a landscape approach that brings this system complexity into view is warranted (Opdam et al. 2002). In ecology, a landscape perspective broadens from a species focused approach to include spatial and temporal dynamics of interaction and exchange (Bridgewater 1993; Forman and Godron 1986).

Landscape ecology and the landscape approach put forth, have been adopted as a meaningful ways of organizing land management. It has brought a broader, more inclusive perspective to ecosystem management guidelines in policies, particularly in the United States National Park Service (Grumbine, E. R. 1994), and in Europe where large-scale working landscapes are managed both in terms of biodiversity and sustainable use (Miller 1996).

This idea of landscape as a scale of analysis is not new to archaeologists, but consideration of landscapes has often been limited to discussions of viewsheds. My intention here is to use the term from an ecological perspective, emphasizing the interaction between archaeological spatial patterning and ecological and environmental processes (Crumley and Marquardt 1990; Crumley et al. 2001; Marquardt and Crumley 1987). As philosophies such as Ecosystem Management become intrinsically part of land management and public policies, archaeological studies should respond by focusing on the interrelationships between culture and the environment. Thus, a landscape perspective gives a more integrated view of natural and human processes (Winthrop 1999). It also
affords more involvement from diverse groups representing a variety of publics and opinions, allowing for different voices to be heard in the development process (Krech 2005).

In Florida archaeology, a landscape scale of analysis has not been widely used. The definition and identification of regional archaeological boundaries in Florida has largely relied on ceramic types and styles. The addition of a landscape perspective allows for refinement of these regions to include a relationship to the environment. Rather than a paradigm shift, it is an outgrowth of regional-scale archaeological research that focuses on interconnections (Crumley and Marquardt 1987). The current Florida model uses ceramic area boundary definitions, that are cultural historical in approach and do not easily fit with environmental management and conservation needs. The proposed organizational framework will define smaller scale ecological models, in which archaeology is then considered. This approach is particularly effective for the interior regions where there is an incomplete understanding of the archaeological record.

As with archaeology and geography, issues of scale in landscape analysis are important in ecology and environmental sciences as well. How we see the landscape may be different than the utilization of the landscape by organisms, especially in areas of patches and corridors which may have complex species relationships (Urban et al. 1987). Ecological systems are scale dependent and understanding their spatial relationships is crucial in understanding landscape ecologies (Forman 1995).

The definitions of landscapes between the different fields of archaeology, geography, ecology and environmental sciences are fairly congruent. It is the associated processes and interacting phenomena that differ slightly, yet are perceived and can be
seen through similar methodological approaches to landscape dynamics. A GIS can be used to explore multiple scales of variation, both spatial and temporal ranges, and spatial and process heterogeneity, providing a synthesizing approach for resource management, impact assessment, and conservation of natural and cultural resources (Bridgewater 1993; Crumley and Marquardt 1990).

Using a landscape approach considering multiple spatial and temporal scales, we are better able to study interconnections and examine representative examples of site types and culture affiliations, size, and other factors. Examination of temporal periods at different scales is necessary to see landscape settlement patterns, which can be heterogeneous at one scale and homogeneous at another (Marquardt and Crumley 1987). People can move across a landscape at different times for different reasons. Archaeology on a sliding level of analysis can focus on archaeological contexts in relation with the environment and other defined variables (Whitley 2000) to examine patterns.

Through the implementation of these broader analyses that examine the settlement pattern across variable spatial and temporal scales, an enhancement in the understanding of archaeological significance is possible. Implications for research and preservation planning and management will emerge from using this variable scale perspective (Mathers et al. 2005b). The understanding of what kinds of archaeological sites are present across multiple scales, and analysis in terms of representativeness, function, and form, can assist in linking state, regional, and local conservation and preservation plans for environmental and cultural resource management strategies. It is increasingly important to close these cultural and environmental knowledge gaps in this era of intensification and changing land use.
A further consideration for representativeness is the relationship between preservation strategies for archaeological resources based on significance evaluation versus input of archaeological site valuation by native and minority communities. In this way, developing evenness in our understanding and our conservation strategies with a methodology that is inclusive of archaeological representativeness allows for better management of a collective and inclusive heritage (Mathers, Schelberg et al. 2005:161-165).

In practice, especially in the realm of Cultural Resource Management (CRM) and compliance archaeology, the approach to archaeological resources continues to be primarily a site-by-site assessment, often with focus applied to areas of potential effect rather than a landscape or multiple scale position. Significance determination and listing on the NRHP shows an overwhelming majority of National Register properties (80 percent) are historic structures, calling some to wonder whether archaeological sites themselves are underrepresented on the National Register and are in fact reflecting a gap in the national memory. Archaeologists in this way have the chance to add many silenced voices to the public memory (Little 2005).

These percentages continue to trend toward prehistoric site under-representation in the NRHP significance determination when results from eligibility criterion application are reviewed over large-scale surveys. In Florida, for example, one gas pipeline survey that cross-cut the state resulted in the CRM firm considering only six of the 118 archaeological sites encountered as being eligible or potentially eligible for listing on the NRHP (Federal Energy Regulatory Commission 2001; Miller 2002).
As a way to combat the loss of site diversity and of the familiar sites ‘out-competing’ the unfamiliar, a GAP audit of Florida archaeology can decrease the subjectivity of significance determination through the use of a formal procedure that examines sites within larger contexts. Emerging patterns of sites across time and space can be evaluated in the process, using a GIS platform to consider acquisition, protection, and management strategies. Others have posited matrixes and keys for significance evaluative procedures (see Darvill 2005; Weisman 2002b). These matrixes trend toward ‘yes’ and ‘no’ answers, or have ranked numbering systems based on questions involving significance evaluation determinations. Matrix evaluations have largely lacked specific spatial orientations or have been conducted at scales too coarse for local application, and have proven difficult to use in CRM practice (Robert Austin, personal communication, November 2006). A GAP for archaeological resources provides a more spatially oriented way of handling the matrix concepts and demonstrates the levels of threats and protection by including a public and conservation lands component. In this way, landscape level archaeological theories (Cosgrove 1985; Crumley and Marquardt 1990; Marquardt and Crumley 1987) can be operationalized. A GAP analysis dovetails with watershed management and natural systems concepts as well as the significance evaluation process of the NRHP and responds to criticisms of selective preservation and the subjective nature of significance determination and archaeological value assignation (Hardesty and Little 2000; Lipe 1995; Mathers et al. 2005a). In this way, boundaries become less constrictive, as we are able to consider issues such as stewardship and preservation of resources within, across, and between boundaries and borders using landscape principles.
In the next chapter, I discuss the evolution of Florida’s archaeological and land use planning agencies, programs, and practices, and provide an overview of the current setting. I discuss cultural and land acquisition and preservation in the State, and the interconnectedness with environmental programs. Linking together archaeological strategies for preservation with land management and environmental resource planning, I will focus on the merits and role for a GAP methodology as a way to allow more informed decisions and analysis of regional dynamics.
Chapter 3. Planning for Preservation in Florida Archaeology: Resource Protection and Preservation Strategies Past, Present and Future Directions

“The laws and policies which govern historic preservation challenge archaeologists to engage in regional planning, participate in agency decisions, and emphasize conservation over excavation, develop explicit statements of research potential and perform in a businesslike and professional manner. Particularism on the part of archaeologists, and procedural fossilization on the part of agencies, may hamper the development of balanced programs of preservation and scientific research” (King and Lyneis 1978: 1).

Introduction

In the quote above, King and Lyneis called for inclusiveness on the part of archaeologists in land use planning and resource management processes. This appeal was made in order to prevent archaeology from becoming irrelevant in the preservation process. Yet, after nearly three decades, archaeology continues to remain on the periphery of planning strategies. Archaeological scale, both spatial and temporal, are sometimes seen as incongruent with environmental planning, and decisions regarding cultural resources are frequently made only after planning for environmental and natural resources has taken place (Barnes 1981; Hardin 2002; Weisman 1994; Weisman 2002; Yates 2002).

The lack of proactive planning for cultural resources and the need for coordination with other evaluative strategies is a result of what King and Lyneis (1978:1) referred to as “particularism,” or a constricted focus. For example, in Florida,
Developments of Regional Impact (DRI) are large-scale projects that may have cross-jurisdictional impacts to economic, environmental, and cultural resources. These projects are cooperatively reviewed by agencies and regional planners to determine and reduce their effects. Cultural resource assessments occur subsequent to the environmental review and are segregated from other considerations. Further, the review for impacts to cultural resources is often concerned only with site-level issues (Barnes 1981). Even when archaeologists actively participate in acquisition and planning processes along with environmental and natural resource specialists at the state level, cultural resources are commonly regarded only as added value benefit (Michael Wisenbaker, personal communication, 2006; Weisman 1994, Weisman 2002b). Thus, the process continues to target the well-developed environmental priorities, while archaeology often remains a secondary consideration.

Significance, as an archaeological concept discussed in the last chapter, remains largely defined on a site by site basis rather than by studying the site in relation to a larger, regional perspective Barnes 1981; Miller 2002). American archaeology continues to need regional and theoretical perspectives that can be incorporated more readily into ecosystem and environmental management land use and planning strategies. As King and others have indicated, well-developed regional contexts are needed for significance determinations and a whole range of values to be reasonably and responsibly considered and represented (Comptroller General 1981; Darvill 1995; Glassow 1977; Goodyear et al. 1978; King and Lyneis 1978; Lipe 1974; Lynott and Wylie 2000; Mathers et al. 2005a).

In order to develop a direction for preservation planning in American archaeology, we first need to understand the evolution of the processes and policy
development. Examination of the interconnectedness of legislation, agencies, and policies relating to archaeology and the environment is also of paramount concern. As we move toward a more inclusive strategy for protection and conservation of resources, consideration of both the cultural and natural elements should lead to the enhancement and benefit of each.

Often, at the local and regional levels, there is an apparent disconnect between the cultural and environmental resource planning. For example, developed regional ecosystem management plans consider only natural resources despite the coexistence of archaeological resources (SWFWMD 2002a, b). In this chapter, I examine the evolution of policy and planning for preservation strategies in Florida. I also illustrate that connections between cultural resource planning and policy are frequently overlooked. Understanding areas of resource planning congruency and overlap, and also where environmental and cultural concerns have or should be considered separately, will allow the development of frames of flexible reference that can incorporate both archaeology and environmental variables. This inclusive resource planning will help shape new directions for preservation and for the examination of archaeological value and importance, operationalizing more regional theoretical approaches in archaeology (Mathers et al. 2005a:6).

The Rise of Florida Resource Management

The roots of resource management are deep in this nation, and an understanding of the broader sense of the American management ethos is essential to the concepts of significance and valuation of resource conservation planning development in Florida.
Much of the cultural resource management foundation is interwoven with the American environmental movement of the late 19th and early 20th centuries, with laws, legislation and programs developing in Florida in direct correlation with broader environmental concerns. Nature had previously been seen as something to be tamed, utilized, and exploited (Castree and Braun 2001). Why, after all, should anything be preserved? This question was initially addressed in environmental writings that called for a new ethic (Leopold 1949), one that went beyond purely economic considerations. The intrinsic value of nature itself fed into the rising consciousness that examined actions in regard to environmental consequences.

In Florida, the failure to understand the consequences of actions that were taken primarily to facilitate and accommodate growth in the Sunshine State led directly to environmental crises. Catlin (1997:1) states that “by the late 1960s it became clear that Florida’s postwar growth was creating serious and possibly irreversible problems.” From the Everglades drainage and alteration projects that were drying up the River of Grass to the resulting muck fires, the major surge in large-scale development projects threatened to forever change the face of Florida. Projects such as the Cross Florida Barge Canal and the Miami jetport made Florida face growth problems that had dire consequences to the environment and also to cultural resources. Ditching, dredging, and draining became the methods of choice for taming wetlands across the state.

These crises had been recognized long before bulldozers and dredgers were on the scene, however, were ignored by most. Awareness of unbridled development and attempts at conquering nature were noted as early as the late 1800s and into the 1900s with writings, drawings, and photographs by several explorers and naturalists illustrating
the extensive alterations to the landscape and damage to ecosystems and cultural
resources that were occurring.

By the late 19th century, Florida was not the same ‘primitive and unmodified’ land
landscape changes were occurring as a result of the push for development. Hamilton
Disston began purchasing what would be more than four million acres of Florida swamp
lands shortly after the Civil War, starting a large-scale dredging and filling campaign.
Florida millionaire and railroad baron Henry Flagler, was beginning to penetrate the
peninsula with his rail system (Derr 1989). Winter visitors were flocking to the sunshine
for their health, with resorts, spas, and sanitariums springing up to cater to the sick and
infirmed tourist (Brinton 1869). Traders and hunters were also attracted to Florida, often
described and depicted as gluttonously exploiting natural resources. Commercial hunters
nearly wiped out several bird species during this time despite legislation in the 1890s, all
in quest of plumes for women’s hats. Bears, panthers, alligators, and other large game
species were also taken in great numbers, with Florida providing an affordable African-
like safari experience (Derr 1989:136-142). As early as the 1870s, writers and
advertisements created a lure to bring more people to ‘primitive’ and ‘undeveloped’
Florida (Rembert 1964:xii), and Florida had thousands of tourists coming to the state via
the new rails and steamships.

The changes evident in Florida’s natural and cultural resources did not go
unnoticed. Several conservationists, scientists, and writers would tell the tale of witnessed
destruction, and would lay the foundations for environmental consciousness and
ultimately protective legislation efforts. For example, in From Eden to Sahara: Florida’s
Tragedy, botanist John Kunkle Small (1929), showed before and after scenes depicting devastation caused by land boom development. Small’s interests extended beyond plants to include archaeology, and his photographs and descriptions stand as the only record of many of Florida’s ‘shell heaps and middens’ that were utilized for road fill or treated as an impediment to progress. From his first-hand witnessing of destruction and devastation to natural and cultural resources across the state, Small (1929:114) calls for steps to be taken by the state and federal government to begin a preservation program to protect important features while it was “[n]ot yet too late to act’.

John Mann Goggin, whose ideas were critical to the foundation and development of Florida archaeology as a discipline, was also a naturalist of similar persuasions. His dissertation had shown the critical linkages that existed between the environment and cultural resources (Goggin 1948a), but it was his time in the wilds of South Florida that in part helped shape his understanding of the natural and cultural past (Weisman 2002a:5). Several like-minded writers and researchers during this period influenced each other’s work. Goggin, for instance, knew of Small’s work and of other naturalists and conservationists, such as Marjory Stoneman Douglas, to whom he would provide background materials and correspondence for use in her environmental landmark piece on the Florida Everglades (Douglas 1947).

Florida writers, scientists, academics, students, and the public, were also being influenced by the development of ideas relating to ecology, conservation, and environmental protection that was happening on the national stage. John Muir was one such influential writer and naturalist who transformed the idea of wilderness into a popular movement with far-reaching influence. He is perhaps best known for his walks
all over the country in the late 19th and early 20th century, and for helping to establish the
Sierra Club. He was highly influenced by Henry David Thoreau’s (1854) *Walden*, and by
the early North America explorations of the botanist William Bartram, whose travels he
followed into Florida among other places. Muir espoused the intrinsic value of
wilderness. These ideas were radically different from the tangible understanding that
science offered. His writings pushed for the setting aside in perpetuity, pure and un-
despoiled land for public ownership. Wilderness and nature for Muir were tantamount to
a religious experience (Oelschlaeger 1991:176).

Aldo Leopold furthered the wilderness intellectual framework put forth in
America by Thoreau, Muir, and others who preceded him, by changing our human-
centered views of natural resources through his writing. The idea of humans at the center
of the universe, more important that all other living things, had shaped the cultural
context of the early 20th century (Leopold 1949; Oelschlaeger 1991). Unlike Muir,
Leopold came from a science tradition. He held a Ph.D. in Wildlife Management and
Forestry. Rather than a religious connotation for nature as put forward by Muir, Leopold
had a secular notion that was based on science and tied to ethics. It was from that context
that he saw things in different perspective than those pushing anthropocentric resource
management philosophies of the time (Oelschlaeger 1991:235).

Leopold saw the land as a community of living organisms acting together. He felt
a moral and ethical value existed for land conservation. He saw the incompatibilities that
existed between Judeo-Christian beliefs and land conservation and pointed to problems
with land use and economical consideration (Oelschlaeger 1991:236). Perhaps his most
influential writing was *A Sand County Almanac* (Leopold 1949). Here, Leopold, unlike
Muir, looked not to a divine power but to individual awareness as the spark for ecological change of conscience. He argued that humans should only act in ways that are beneficial to all ecosystems, an idea that would later resonate with the biocentrism of deep ecologist philosophies. His proposed aesthetic bridged the divide that science created between culture and nature, while his land ethic remained rooted in the discourse of management and tended to cling to the familiar separation of science and nature.

Although both Muir and Leopold’s ideas originated from different inspiration and thought, taken together, their views served to bring about a new awareness and environmental consciousness in America. Not only were their ideas important in this transitory time, but they were instrumental in founding environmental organizations whose reach and influence continue even today. Both men campaigned for federal wilderness preservation, and it is largely through their legacy and impact that the Wilderness Preservation Act was passed in 1964, initiating preservation at the national scale. Following the growth of the American environmental consciousness, which traces its origins to writings of Emerson, Thoreau, Muir, and Leopold, the American perspective of the environmental movement focused on preservation of wilderness areas for recreational benefit. This benefit, however, tended to be exclusionary, promoting enjoyment for an elite populous of predominately white males, at the expense of females and non-whites (Oelschlaeger 1991). This recreational focus for preservation lead to a gendered construction of nature (Moeckli and Braun 2001:113).

Rachel Carson’s (1962) *Silent Spring* showed that understanding and appreciation for nature is not gender or culture specific. Carson put forward the Thoreau-like idea that human beings were not in control of nature, but were a part of it. She further connected
humans and nature by saying that the survival of one actually depended on the survival of the other (Carson 1962). She was at once attacked and labeled as hysteric, an alarmist. Her arguments were criticized for being too romantically portrayed and not written using science jargon that was peer-reviewed and testable. She lacked credentials in that she was outside the scientific community, without a Ph.D., and female (Moeckli and Braun 2001:112-113). Still, the American public was listening to her arguments.

Carson’s central idea was that nature is not only of a natural dimension but is also a social construct. She considered words such as wilderness and nature in terms of imagined connotations and by culturally based knowledge. She thought that to deny the social dimensions of nature was to ignore the impact of perspective on reality and to avoid the linkages between power struggles, domination, and the environment.

The social nature discourse is tightly bound to politics, management, and preservation concerns, with perhaps the central question relating to understanding the kind of natures we envision for the kind of future we want (Braun and Wainwright 2001:42; Castree and Braun 2001; Demeritt 2001; Proctor 1998). This discourse became a prominent focus in Florida. State and federal legislation emerged that would shape environmental and cultural preservation and stewardship, and would continue in dynamic discussions to form Florida’s rules and strategies for the future.

**Growth and Development Laws and Land Acquisition**

Florida was not alone in realizing there were environmental and cultural resource consequences to growth. Other states had, in fact, spearheaded environmental movements
as a result of witnessing similar problems, and resulting federal legislation had huge impacts for state archaeological and cultural resource management planning and policy (Table 3.1). One such reflection led to the materialization of the National Environmental Policy Act (NEPA), which was signed into law in 1969. The act, with its section 106, was of crucial importance to both natural and cultural resource protection. This section required that all major projects that used federal dollars, support, or permits, must consider impacts to resources, usually through an assessment of impact study. This federal law set the stage for policy development in the rapid growth state of Florida (Tesar 1990).

The earlier National Historic Preservation Act (NHPA) of 1966 was of crucial importance for Florida archaeology, including today’s cultural resource management efforts and preservation programs involving cultural resources. Among other things, the NHPA gave authority to the National Park Service to expand and maintain a National

Table 3.1. List of major foundational U.S. federal laws concerned with natural and cultural heritage (Mathers, et al. 2005a:3).

<table>
<thead>
<tr>
<th>Federal Law</th>
<th>Year Enacted</th>
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<tbody>
<tr>
<td>Wilderness Act</td>
<td>1964</td>
</tr>
<tr>
<td>National Historic Preservation Act</td>
<td>1966</td>
</tr>
<tr>
<td>National Wildlife Refuge System Administration Act</td>
<td>1969</td>
</tr>
<tr>
<td>Clean Water Act</td>
<td>1972</td>
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<tr>
<td>Endangered Species Act</td>
<td>1973</td>
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<tr>
<td>Archaeological and Historic Preservation Act</td>
<td>1974</td>
</tr>
<tr>
<td>Federal Land Policy and Management Act</td>
<td>1976</td>
</tr>
<tr>
<td>Archaeological Resources Protection Act</td>
<td>1979</td>
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Register of Historic Places that includes properties of local, state, and national historical, cultural, and architectural significance (King and Lyneis 1978). An Advisory Council on Historic Preservation was also established as part of the NHPA, with input at the state level coming from what would later be known as the State Historic Preservation Officer (SHPO). Additionally, states were required to conduct surveys to find and record sites eligible for the list and were encouraged to acquire and protect significant properties using federal funds that were made available for such purposes (King 1998:15-16).

The NHPA in Florida led to the establishment of the Division of Archives, History and Records Management, which in 1986 would become the Division of Historical Resources (DHR) now within the Department of State. And while the NHPA provided for the establishment of the SHPO, the Historic Resources Act, chapter 267 of the Florida Statutes, broadened the SHPO’s responsibilities to include state and federal lands, including even the poorly defined sovereign submerged lands of the state (F.S. 267.061 [1][b]). This vested ownership of historical resources on state lands, provides DHR with input into land conservation processes, management of state lands, and permitting and regulatory control involving cultural resources on state owned or controlled lands.

The Florida Division of Historical Resources is divided into four units that work together as the primary historic preservation agency in the state: the Bureau of Archaeological Research (BAR), the Bureau of Historic Preservation, the Florida Folklife Program and the Museum of Florida History. Along with the Bureau of Historic Preservation, the BAR assists with compliance review activities and has land acquisition and management roles of interest in Florida. The BAR program is charged with
administering the Florida Master Site File, the Shipwreck Salvage Program and permits for archaeological research on state owned or controlled lands and sovereign submerged lands. The Bureau Chief functions as the State Archaeologist. The Bureau of Historic Preservation serves as staff for the SHPO. This position is an important link between state level archaeology and the national historic preservation program through the National Park Service. The office includes staff dealing with survey and registration of National Register properties, which examine, evaluate, and nominate properties to the register. The SHPO office also maintains data on historic properties that have been identified but not yet nominated to the national register, and they conduct consultations with Federal agencies as part of the Section 106 process. The Bureau also has the Grants and Education Section, the Architectural Preservation Services Section, and the Historic Preservation Compliance Review Section. The Compliance Review Section works to provide local governments with planning and permit review assistance, develops responses for environmental reviews involving cultural resource consideration, and address issues relating to cultural resources in the state land acquisition and management programs (Tesar 1990).

The Florida Master Site File is the state’s archive of information about recorded archaeological sites and historic structures. The file was started in the late 1940s as part of the Florida Park Service under the direction of John W. Griffin, and then became part of the Florida State Museum, now known as the Florida Museum of Natural History, archives in Gainesville. The site file at that time consisted of catalog cards and notes of hundreds of sites visited by early archaeologist pioneers in Florida like John Goggin, Hale Smith, John Griffin, Ripley Bullen, Charles Fairbanks, and Gordon Willey. The
development of the Division of Historical Resources in the mid 1960s as part of the NHPA federal legislation would formalize the site registration process and centralize the archive in Tallahassee (Milanich 1994). Today, in addition to paper files and tabular datasets, GIS data with spatial locations are available to researchers through the FMSF. More than 7,000 new sites are added to the FMSF annually (FMSF 2006).

Other important federal legislation with involvement for land acquisition, management and cultural preservation included the Federal Land Policy Management Act (FLPMA) of 1976 and the Archaeological Resources Protection Act (ARPA) of 1979, both of which were essential for clarifying management responsibilities of archaeological sites, features and objects on federal and tribal lands. The ARPA required agencies with land holdings to identify and evaluate the National Register of Historic Places nomination potential or significance. The ARPA also established the Advisory Council on Historic Preservation, with reviews and recommendations on issues involving historic activities of all agencies reported directly to the President (King 1998).

At the state level, the Environmental Land and Water Management Act of 1972 defined regulations that dealt with areas of critical concern and with Developments of Regional Impact (DRI). These regulations led to the Land Conservation Act, which provided millions of dollars for the purchase of environmentally sensitive lands. In Florida, areas of critical concern were, in part, defined as those areas containing or having significant impact upon environmental, historical, natural, or archaeological resources of statewide importance. This act set a mandate that emerged from a push from Florida citizens that environmental concerns were important and that the state now should purchase sensitive lands instead of just creating regulations regarding them. Management
of those lands would be a large task and presently involves numerous agencies and programs. The provision of the act relating to the DRI was included to contend with large-scale, regional projects that, because of their size, character, and location, could have substantial effects on the citizens of Florida (Catlin 1997).

The Water Resources Act of 1972 established five regional Water Management Districts in Florida, along with local and county level water management boards examining impacts from consumptive use of water. Today, the Water Management Districts are proactive players in land conservation and preservation, with the linkage between ground water and land use and development prompting a push for land acquisition and stewardship. Lands throughout Florida that are purchased and managed for water resources also are important from other natural and cultural resource functions (Catlin 1997).

The Florida Comprehensive Planning Act eventually allowed for the development of a State Plan in 1985. The plan examines goals, objectives, and policies relating to growth management and is utilized as a litmus test for consistency by local governments developing their own plans for such purposes. These local comprehensive plans were important because the DRI criteria stipulate that development must be consistent with the local plan provisions. Impacts to cultural resources are considered in the DRI process, and the Division of Historical Resources has input into the review (Stiftel 1999).

The Division of State Lands oversees the primary lands acquisition program. The program is now called Florida Forever, which evolved in 1999 as the Florida Forever Act. It is the world’s largest conservation program with more than one million acres acquired in the past five years alone (Wisenbaker 2006). The Florida Forever program is
a continuance of land acquisition initiatives in the state that included the Save Our Rivers, Preservation 2000, and the Conservation and Recreational Lands (CARL) acquisition programs.

The CARL program, enacted in 1979, specifically mentioned the preservation of significant archaeological and historical sites. Dedicated staff and the Division Director at DHR began working on land acquisition issues and serving on advisory panels in 1983 to help develop and rank priority projects for CARL. The CARL program was replaced by the Preservation 2000 program, with a mandate in the 1990s to use new funding to buy conservation lands, including matching dollar programs from local governments. In 1998, the Florida Forever Act brought about today’s Florida Forever Program, which expanded on the Preservation 2000 program and included aspects of restoration, conservation and recreation, as well as water resource development, historical preservation and capital improvement projects (Wisenbaker 2006). The strong focus on water resources has led to heavy involvement in the land acquisition arena by the state’s five water management districts. Priorities for purchase are developed based on factors such as strategic habitat for threatened, rare and endangered species, water management and groundwater recharge, coastline protection, recreation, greenways and trails, and historic and archaeological preservation.

The Acquisition and Restoration Council (ARC) is a five-member interagency group with four of the members being Governor appointees. The focus of the ARC is selecting and ranking Florida Forever acquisition projects. The ARC also has responsibilities of reviewing management plans for state-owned lands. Biological significance is largely examined through use of the Florida Natural Areas Inventory
(FNAI), a database of conservation lands, targets of interest, and occurrences of rare and endangered plant and animal species in the state. These data are available in a GIS format, which allows for proactive planning concerning species preservation. Input on historical and archaeological preservation is sought primarily from the Division of Historical Resources representative and through nomination of proposed lands from archaeologists participating with the program.

There is no FNAI analogous cultural resource planning tool, other than the Historic Contexts, which are written descriptions of ideal priorities that were last revised in 1993. Although GIS and spatial data are available from the Florida Master Site File, for reasons previously discussed in Chapter 2, the information is not readily available to researchers and planners. The FMSF GIS information also has not been analyzed in large detail or produced in a format that depicts archaeology in relation to managed lands with the idea of conservation priorities based on the acquisition of representative and significant resources.

As of 2006, Florida has purchased more than three million acres of land for conservation purposes (Wisenbaker 2006). Numerous cultural resources have been included in these state acquisitions, but these resource purchases have occurred primarily as an added-on, opportunistic value, without directives or prioritization developed for archaeological acquisition and preservation (Weisman 1994; Wisenbaker, personal communication 2006). More than 12,000 of Florida’s 26,932 recorded archaeological sites are located within managed lands statewide (Florida Master Site File 2006b), yet there remains the need for a basic audit as to what kinds and types of resources are
preserved, what is missing, and how that information can allow for a preservation strategy with priorities to be developed across a variety of scales.

Landscapes have largely not been utilized as an archaeological framework for contributing to policy making and planning in the United States despite a continuing call for action in reassessing how significance and valuation systems are viewed. There has additionally been strong criticisms of current archaeological significance determinations that are being done with the single site focus (Glassow 1977; Glassow 1985; Hardesty and Little 2000; Jameson 1997; Lipe 1978; Lipe 1984; Lipe, W. D. 1995; Mathers, et al. 2005a; McGlade 1999; McManamon and Hatton 1999; Redman and Kinzig 2003; Sharrock 1979; Tainter and Lucas 1983). The single site focus deters from the understanding of a larger cultural and geographic frame of reference, a criticism leveled by archaeologists who are calling for the significance concept to be explored at the landscape level (Mathers, et al. 2005b).

The case study landscape area I have chosen is one that is facing large-scale developmental pressures as a Tampa ‘bedroom’ community, meaning a residential area on the outskirts of a major city, where commuters tend to live. The Big Hammock area of Pasco, Hernando, and Citrus County is undergoing a land use transformation. Small and large-scale residential developments, and multiple planned use developments, are altering the rolling hills of this region that once were populated not by suburbanites, but by orange trees and cattle. It is because of this rapid growth in an area shown to be rich in cultural resources, that a GAP analysis is demonstrated as a way to plan for preservation and to look at where development best fits. In the next chapter, I will discuss the value of this case study from both a natural and cultural perspective.
Chapter 4. Case Study: The Big Hammock Region

“The significance of a particular site is seldom definable by study of the site itself; regional and theoretical perspectives are needed. Preservation, by motivating archaeologists to look beyond individual sites into regional studies and anthropological theory as sources for evaluation, may thus make a substantial contribution to archaeology's theoretical depth” (King and Lyneis 1978:880).

Environmental Setting

The Big Hammock area of Pasco, Hernando, and Citrus counties, is a naturally bounded area due to physiographic and environmental variables that are highly contrastive to surrounding regions. The area is discussed here both in terms of its unique physiography, which includes topography, soils, climate and vegetation, and as an archaeological landscape. The region is distinctive from surrounding areas, with high rolling topography, karstic features, clay-lined lakes, fertile soils, and other ecological contrasts (Figure 4.1). These types of unique locales on the natural landscape, which are readily distinguishable from areas around them, can be viewed as a physiographical unit. The distinctive environmental features, species, and vegetative cover that can be analogous to island ecologies can also lead to an increase in species diversity. This richness of resources can correspond to an increase in cultural settlement, with people literally mapping themselves onto areas of diversity and exploiting the available resources (Osborn and Kornfeld 2003).
Figure 4.1. The Big Hammock region of Florida, with boundary reflecting environmental features (after Wharton and Dooris 1987).
The diversity of environmental resources and distinctive habitat settings of the Big Hammock area can be examined in relation to known cultural settlement patterns and site locational expectations for the area. Presently, the Big Hammock is split into two separate archaeological regions (to be discussed in a later section), the North and Central Peninsular Gulf Coast. Neither of these regions characterizes nor reflects accurately the archaeological record.

The name Big Hammock comes from early accounts of state geographer Roland Harper (1911). The region lies between the Withlacoochee River and the Gulf Coast and includes the physiographic provinces referred to as the Hernando Hammock and the Brooksville Ridge. The Big Hammock was originally considered to be an outlier of the Middle Florida hammock belt near present-day Alachua County (Harper 1911). Earlier characterizations of the region also alluded to striking similarities with areas to the north (Smith 1881) (Figure 4.2). Based on its substantial locales of distinctive upland hardwood hammocks, Harper later defined the region as a separate geological feature (Harper 1921).

The Big Hammock is the most southerly body of extensive hammock land within peninsular Florida and is comprised of three named hammock bodies: Chocochatti, Annuteliga, and Toachudka. The Annuteliga Hammock, located in the northern half of the Big Hammock, has been the target of state acquisition due to land use activity, which threatens and has fragmented the hammock system (SWFWMD 1992)(Figure 4.3). The Chocochatti Hammock is located in the area southeast of Brooksville, and is comprised of a mix of hammock, scrub and xeric pine forest. The rolling topography includes areas
Figure 4.2. Historic hammocks of North-Central Florida. Map produced by Barry Wharton.
Figure 4.3. The three hammocks of the Big Hammock (after Dooris et al. 1999:60), with the bounded area indicating how Harper (1921) defined this region.
of high hills and valleys, where lakes are frequently encountered. The Toachudka Hammock begins near the present-day Hernando County line and continues south into eastern Pasco County.

Hydrologically, lake-prairie basins similar to that of Paynes Prairie in North Florida occur throughout the Big Hammock. These basins are especially prevalent in the Annettela and Chocochatti areas. The karst geology of the region is manifest here by numerous vertical-walled sink holes. One of these was listed in early tourist books as a state attraction, but has since been obliterated by rock mining operations. The Devil’s Punch Bowl, as it was called, was of the same magnitude as the 230 feet deep and 500 feet wide Devil’s Millhopper, a geological State Park in Alachua County (Dooris et al. 1999).

Other natural features of the hammock include hillside seeps and springs, fertile loamy and clayey upland soils, and widespread chert and coral outcrops. In addition to the previously mentioned sink features and prairie basins, the Big Hammock also has numerous clay lined permanent lakes (Wharton and Dooris 1987). The soils are similar to those occurring in the hammock bodies found in the North-Central region of the state, and differentiate the Big Hammock from the more coastal and riverine settings to the east and west.

Soils are classified into 12 soil orders taxonomically, and the Big Hammock region has two of these 12 defined soil orders present. Entisols are a class of soil in the Big Hammock region that can support a variety of vegetation and are found to occur on steep slope areas. Spodosols are also found in this region of Florida and are found to be poorly to very poorly drained (IFAS 2007). The fertile, loamy and rich hammock soils
along with the striking elevation in this area are a defining feature in the region. Historic settlements took advantage of the agriculturally productive soils and the striking vistas and views afforded by the rolling topography. The Big Hammock is mantled with clay rich soils, which may in part have slowed the weathering process of the underlying limestone compared to surrounding areas, creating the high areas of what is today called the Brooksville Ridge (SWFWMD 2002a). These soils, considered with hydrography, help to define the extent of the natural boundary of the region.

The Big Hammock covers roughly 200 square miles, which is essentially bisected relative to regional archaeological boundaries, part in the North Peninsular Gulf Coast and part in the Central Peninsular Gulf Coast. Geologically, environmentally, and archaeologically, however, the area is similar to the North-Central archaeological region described by Goggin (1947b). In particular, the Alachua tradition settlement pattern with lakeside clustering centering on exploitation of upland habitats, fertile soils, and karstic features (Milanich 1971) is seen in both the North-Central region and in the Big Hammock area. Also present in both locales is Alachua Plain, cob-marked, and cord-marked ceramic varieties, which are diagnostically important indicators of the Alachua tradition (Milanich 1971). Although not as well documented in the Big Hammock area possibly due to a lack of professional survey and controlled excavations, work conducted at lake sites in Pasco and Hernando Counties has shown these varieties to occur in similar environmental settings (Mitchem 1989a; Toni Carrier, personal communication, November 2006; Wharton 1990; Whitney 1985).

The lithic raw materials in the Big Hammock are of two primary material types, silicified limestone or chert and silicified coral, both of which formed during Miocene and
Silicified coral has a distinctive look, with coral polyps appearing like stars in the silicification process. Coral is more difficult to flake than chert, and so is often thermally altered or heat treated. Thermal alteration brings out lustrous colors of pink and red iron oxides, and can also cause crazing or potlid fracturing (Upchurch 1980; Upchurch et al. 1982).

There are two quarry clusters in the Big Hammock vicinity, the Upper Withlacoochee Quarry and the Hillsborough River Quarry. Hillsborough River cherts contain few diagnostic fossils, and vary widely from translucent to opaque and dark grey and black to red and brown in color (Upchurch 1980). The Withlacoochee Quarry Cluster has been called "probably the most significant source of silicified coral in peninsular Florida" (Upchurch et al. 1982:132). Numerous coral outcroppings associated with this cluster occur in the Wesley Chapel and Buddy and Pasadena Lake portions of the southern Big Hammock. Coral outcrops can be found anywhere in the Tampa or Suwannee Limestone formations. There are massive silicified boundstones found in the Wesley Chapel and Buddy Lake vicinity of present-day Pasco County that make excellent material for flake tool production (Robert Austin, personal communication, 2006). These areas of chert and coral outcrops are within the Hillsborough and Upper Withlacoochee quarry clusters (Figure 4.4).

**Archaeological Setting**

The Big Hammock area is currently divided into two archaeological regions, which are basically an overview of the sequence of archaeological cultures through time.
Figure 4.4. Quarry clusters in Florida (after Austin and Estabrook 2000:116).
Important to the relationship of these culture areas are the geographical and environmental settings. As previously discussed, these regions were developed first by Goggin (1947b) and later refined by Milanich and Fairbanks (1980), and then Milanich (1994) again.

The Central Peninsular Gulf Coast stretches from Pasco County to Charlotte Harbor and is considered the region of the Manasota culture. The Manasota culture had a coastal orientation although inland sites are known (Luer and Almy 1982; Luer and Almy 1979). In very broad and general terms, the characteristics of the Manasota culture include a pottery described as being primarily that of undecorated wares with quartz inclusions with flattened-globular bowls and pots common. Their subsistence was based on fishing, hunting and shellfish-gathering, and shell and bone tool assemblages (FDHR 1990). Historical planning contexts describe this region largely in terms of coastal and riverine settings, with soils not well suited for agriculture. This is strikingly different from the Big Hammock interior setting, which has fertile, rich, loamy soils that are conducive for agriculture.

The North Peninsular Gulf Coast is a region that lacks environmental and cultural homogeneity through both space and time, and resists definition as a single archaeological area. It stretches from the Aucilla River in Taylor County south to include part of Pasco County. The region includes the Crystal River Mound complex and numerous large shell middens and mounds (FDHR 1990). To the north, within the vicinity of the Big Hammock, is the Cove of the Withlacoochee. Archaeological research in the Cove region included a strong focus on environmental resources (Weisman and Marquardt 1988; Weisman 1986). But, while the historic planning contexts go into great
detail describing the coastal and riverine settings of this region, the interior areas are not well characterized. The contexts point to the need for consideration of sub areas within the North Peninsular Gulf Coast region due to its heterogeneous nature.

The North-Central region, unlike the Peninsular Gulf Coast regions, has well defined archaeological boundaries. The area extends from the Sante Fe River east to portions of Putnam and Marion Counties and west to the coastal flatlands line, with the Middle Florida Hammock Belt being a prominent and defining feature of the region (FDHR 1990). Settlement patterns in relation to the environment were used to define this area. This illustrates the unevenness of scale in the current historical planning contexts.

Like the Big Hammock, the North-Central region is also characterized by its karst topography, numerous lakes and wetlands and fertile loamy soils. The cultural sequence is well defined, ranging from Deptford to Cades Pond and Alachua traditions to the later Potano I and II periods. Similarities in archaeological settlement between this area and the Big Hammock exist. For example, the Cades Pond settlement pattern is said to center around aquatic resources and often contain mound sites (Cumbaa 1972). This is similar to settlement occurring in portions of the Big Hammock, especially around lake areas in eastern Pasco and Hernando Counties. The North-Central region’s Alachua tradition is noted for site clusters with villages often found on higher ground next to lakes, ponds and sinkholes with nearby streams, again showing similar settlement as occurs in the Big Hammock. Ceramics for the Cades Pond culture consist of largely undecorated wares with quartz inclusions (sand-tempered plain) or St. Johns paste, while the Alachua tradition exhibits prairie cord marked, Alachua cob marked and plain varieties. The Alachua tradition culture took advantage of sinks, which offered chert outcrops and water
resources, and also extensively exploited the resources of the hardwood hammocks and lakes (Milanich 1994).

The Big Hammock region is characterized by striking elevations and rolling topography. The area has extensive permanent, or non-ephemeral, wetland and aquatic areas, sinks and karst features, fertile soils, and numerous outcrops of coral and chert resources. The richness of resources in this physiographical area was a factor in the settlement pattern, with recorded site locales relating to a variety of environmental resources.

The Big Hammock encompasses 247,701 acres. As of October, 2006, which is the date for the GIS data used in this dissertation, a total of 302 archaeological sites are recorded in the Florida Master Site File (FMSF) within this region. Prior to further analysis, it should be noted that there are a number of limitations to the Master Site File data and care and caution are required in its evaluation. There are discrepancies in recording techniques and interpretative differences between individual surveyors, which can affect assignation of site function and temporal period. As well, varying levels of survey coverage, disparities in the spatial extent of the investigation, and the accuracy of stated site locations must be considered. These factors can lead to problems in the determination of significance, impact assessment, and in answering research questions of archaeological interest. It is therefore important not only to understand the limitations and coarseness of the FMSF data, but also to include other sources of information in the development of a spatial understanding of the region. Possible sources of additional information include the documentation of local informant material and collections, and field-truthing with spatial control when called for (e.g., a site listed as general vicinity or
in need of location, attribute or condition assessment clarification). Additionally, the site file is not representative of all archaeological sites in the region, but rather only those that have been recorded. Use of these known data, along with the environmental setting, can allow the development of predictions for areas where archaeological sites are likely to occur.

Temporally, sites in the Big Hammock span periods from the Archaic to Safety Harbor and post-contact Seminole and Historic periods. The known archaeological record in the Big Hammock area includes a number of earthen mounds and features, many of which are associated with lakes and sinks. The distinctive adaptations to the landscape and the similarity in the environment appear to more accurately fit the description of the North-Central Florida region than either the North or Central Peninsular Gulf regions.

Although further systematic survey is needed to evaluate this claim, analysis of existing data suggests other similarities to the North-Central Florida region. The ceramic assemblages from many of the Big Hammock sites are similar to those of the Alachua Tradition. Prairie cord-marked, Alachua plain, St. Johns paste types, along with sand tempered plain are present in many assemblages from both regions. Also present is the limestone-tempered Pasco series, which is ubiquitous in adjacent coastal and riverine settings. Its presence in the Big Hammock demonstrates the ecotonal nature of the region’s position as an edge area between coastal and riverine settings. Ecologically, edge areas are often used by a number of mammals and birds. White-tailed deer, which were an important prehistoric subsistence resource in this region, would have preferentially been drawn to edges and transitional boundaries between ecological communities. These edge and transitional areas also offer model development potential for understanding the
archaeology, subsistence, and settlement strategies at this regional scale (Osborn and Kornfeld 2003).

In contrast to the North-Central region however, later Safety Harbor wares are known from both surveys and from private collections. Additionally, Weeden Island period vessels curated at the Florida Museum of Natural History in Gainesville are attributed to this area. A strong Seminole influence is evident from the ceramics and other artifacts from private collections and surveys of the Big Hammock. The Nicholson Grove site (8PA114), for example, is located west of Lake Pasadena in Pasco County on agricultural land that is quickly being converted to residential housing developments (Figure 4.5). This site had a large quantity of European glass beads (Figure 4.6), tablewares, and earthenwares, as well as native pottery with examples of Chattahoochee Brushed and sand-tempered wares (Dayton 1998; Weisman 1989), and could be important in understanding Seminole settlement and life ways in this area (Carr and Steele 1993; Weisman 1989). Archaeological and historical data show occupation by the Chukochati Seminole in the Annutelliga Hammock in the northern reaches of the Big Hammock region, likely another important settlement area of the Seminole (Wharton and Dooris 1987).

Lithic assemblages from the Big Hammock, including much of which is in private collections, range from Paleo-Indian to Early and Middle Archaic stemmed and side-notched stone tool varieties, to later types of hafted knives and scrapping tools and Pinellas points. Areas in the eastern Pasco portion of the Big Hammock are long known to collectors as rich havens for Florida Archaic, Newnan and Pinellas projectile points.
Figure 4.5. Map of Nicholson Grove (8PA114) site area, Pasco County, showing closeness of new housing development. Exact locale intentionally not provided.

Figure 4.6. Seminole period glass beads in private collection, reportedly from the Nicholson Grove site (8PA114) (Frank Hoff private collection, photos by Travis Doering, August, 2006).
made from distinctive coral outcrops around the Lake Buddy and Lake Pasadena areas near present day Dade City (Figures 4.7 and 4.8).

Archaeological Survey in the Big Hammock

According to the FMSF data, there have been 109 cultural resource assessment surveys conducted in the Big Hammock area (Figure 4.9). The spatial extent of these surveys as depicted in the GIS data can be misleading. For example, on first analysis of areas surveyed in the Big Hammock, it appears that a large percentage of the region has been surveyed, but an understanding of the limitations of coverage and methodologies is required. Many surveys appear circular in extent. These are performed for cellular tower impact analysis and methodologies involve primarily historic structure and viewshed impact consideration. In other instances, boundaries for surveys can appear quite large, but may reflect more a property extent rather than intensity or level of survey conducted.

As indicated in Appendix A, the majority of these surveys have been completed in fulfillment of federal and state regulations and in response to county and municipal preservation ordinances. An additional series of assessments and regional syntheses of portions of the Big Hammock area have also been conducted and were used in this dissertation along with the FMSF data. These supplementary projects included evaluative surveys conducted for the Southwest Florida Water Management District (SWFWMD), which was performed to assist with land management and acquisition strategy development (SWFWMD 1992; Wharton and Dooris 1987). Mitchem’s (1989a) doctoral dissertation on the Safety Harbor period overviewed findings, including private collections, from sites in and around the Big Hammock. A Florida Department of
Figure 4.7. Stone tools made from coral and chert that came from the Buddy Lake area of eastern Pasco County. (Top): Possible Bolen variant, small lanceolate (Paleo or Dalton) and a Putnam point. (Bottom): Marion, Citrus and Culbreath thermally altered coral points (Frank Hoff private collection, photos by Travis Doering, August, 2006).
Figure 4.8. Stone tools made from coral and chert that came from the Lake Pasadena area of eastern Pasco County. (Top): Possible Bradford or Ocala variant and a Marion point. (Bottom): Pinellas points and drill, all thermally altered coral (Frank Hoff collection, photos by Travis Doering, August 2006).
Figure 4.9. Cultural resource assessment surveys that have been conducted in the Big Hammock (n = 109).
Transportation right-of-way significance evaluation project was conducted for multiple districts in the Big Hammock region (Weisman 1999) and resulted in two Masters theses (East 1999; Hopper 1998). A summary of known cultural resources occurring on lands belonging to the SWFWMD as of 1988 was prepared (Weisman and Marquardt 1988), and a review of the archaeological data relating to the Seminole period sites throughout Central Florida was compiled (Carr and Steele 1993). Additionally, a book documenting the culture history of the Seminole in Florida and containing information on sites occurring in the Big Hammock was written by Weisman (1989). There were also a number of large-scale surveys conducted for land managing agencies and other research purposes that covered areas adjacent to the Big Hammock region that improve the understanding of the transitional environments and culture areas (Weisman 1986; Wharton 1979).

Various other documents, field notebooks, and unpublished surveys reports, provide important information about the archaeology of the region. Private collection documentation, especially collections where some level of provenience has been recorded, help in the development of the archaeological understanding of the Big Hammock. I studied the field notebooks of archaeologist John Goggin(1947a), which are held in Special Collections at the University of Florida in Gainesville. I also located the field notes and artifact collections of Charles and Alice Hunt (Hunt and Hunt 1957). The Hunts worked for the United States Geological Survey in the 1940s and 50s and had an avid interest in archaeology as well as geology. Their collections and field notes were discovered while searching through boxes and card files at the Museum of Natural History in Gainesville. I also utilized private collections of the Hernando County
Goggin was the first professional archaeologist to record site locations in the Lake Pasadena area in the 1930s and 1940s. He was urged by locals, including church representatives from Saint Leo Abbey, to investigate several low sand mounds containing burials. Collections from these visits include sherds of St. Johns check stamped and plain wares, grit tempered and scored wares and sand tempered brushed wares. Additionally collected were a few lithic flakes and *Busycon* fragments that are often found in mortuary contexts (Goggin 1947a).

The Pottery Hill site (8PA172) is within this rapidly changing area around Lake Pasadena, and is said by local informants to be associated with a platform mound structure that is now largely destroyed (Dayton 1998). Pottery from the site includes examples of sand tempered plain, St. Johns plain and check stamped, prairie cord marked and Safety Harbor incised. Projectile points from this site, in the possession of local collectors, include Pinellas, Tampa, Hernando, Bolen, Lafayette, Newnan and Florida Archaic Stemmed point types (Mitchem 1989a). This lake setting has a clustering of contemporaneous sites, which could be important in the understanding of Safety Harbor inland variations. Additionally, many Seminole occupation sites are known in this same vicinity (Weisman 1989), as are trails and travel corridors which might have ties to European contact including the de Soto entrada (Milanich and Hudson 1993).
Sub areas Defined and Relations to Other Landscape Areas Explored

Analysis of existing land management boundaries and strategies in the Big Hammock region indicates that, although the hammock can be shown as a distinct physiographic unit, it has been largely overlooked as such in ecosystem management strategies. Ecosystem management is done by watershed delineation, based on the use of surficial water expression to demarcate boundaries. Under this boundary decision process, the region does not quite fit with the ecosystem boundaries as defined by the Southwest Florida Water Management District, which purchases, owns, and manages much of the conservation lands in the southwest district of the state. The Big Hammock is again cut into two parts, splitting it north to south with the western side falling into the Springs Coast Comprehensive Watershed Management area (CWM) and the eastern half falling into the Withlacoochee CWM. This watershed natural boundary choice does not accurately reflect this physiographical area, as it looks only at surface waters without making a distinction for the internally drained, karstic area of the Big Hammock.

This error is further brought to light when examining the boundary definitions for the CWMs, which show overlap in discussion for the Brooksville Ridge area, which represents the Big Hammock. The Springs Coast CWM is defined as having the eastern and central portions of the watershed dominated by the Brooksville Ridge, a sandy remnant of previous higher sea levels, characterized by its karst geology with scattered sinkhole lakes and depressional wetlands (SWFWMD 2002a). Meanwhile, the Withlacoochee CWM’s primary physiographic features are also defined as the Brooksville Ridge, but additionally include the Tsala-Apopka Plain, Coastal Lowlands,
Webster Limestone Plain, and the Dade City Hills (SWFWMD 2002b), which are actually part of the Big Hammock area in eastern Pasco County (Figure 4.10).

In sum, although the Big Hammock area can be characterized in terms of its archaeological landscape and in terms of a naturally bounded physiographic unit area, it has not been treated as such by either archaeologists or by state agency and land managers. Boundaries, despite all the detractors and limitations previously discussed that result from their imposition, are necessary for management and resource considerations. Various agencies and entities in Florida involved with both archaeological and environmental resource management have made their assessments of the Big Hammock region using different scales of analysis and different boundary scales of analysis shows the problems inherent in the imposition of boundaries and the difficulties in developing synthetic perceptions that take into account cultural and natural features.

Archaeology must function within the realm of natural resource management, not apart from it or on the fringes of natural system consideration. Archaeology needs to be strongly linked to land management and more comprehensible to non-archaeologists, if we are to be effective players in planning for the future of preservation in Florida. A variable scale analysis, cross-cutting boundaries and tailored to region-specific research questions, can provide a useful framework for understanding that links cultural and natural systems. The challenge is to develop a system readily understandable to archaeologists, land managers, policy makers and the public. Examination of concepts such as archaeological significance, value and importance should be viewed from not
Figure 4.10. Comprehensive Watershed Management (CWM) boundaries in the Southwest District area of Florida (after SWFWMD 2002a, b).
only a site’s research potential as prescribed under the NRPH criterion (d), but under a
more general value system and contribution to overall management, planning, and land
ethic consideration (Darvill 2005:39; Deeben et al. 1999; Lipe 1984).

Site by site approaches to conservation are not effective and do not address the
continual loss and fragmentation of landscapes (Jochim 1990). Only by protecting
regions rich in archaeology and natural resources can we protect more than just the sites
themselves. If we are only concerned with what is worth protecting because of a
subjective determination of significance, and not concerned with the larger scope of the
area in between, then fragmentation and islands of unconnected conservation areas will
result (Clark 2005:318).
Chapter 5. Closing the Gaps

"The most unhappy thing about conservation is that it is never permanent. If we save a priceless woodland today, it is threatened from another quarter tomorrow" (Stoneman-Douglas 1990).

The Archaeological Inventory of the Big Hammock

As previously discussed, because the historic contexts in many cases fail to adequately represent the archaeology of regions, especially non-coastal regions, I have chosen to use a landscape approach for archaeology applied to the case study area of the Big Hammock. I examine a methodology for conserving critical locations of archaeological value, while also considering such issues as archaeological diversity, natural systems linkages, and economic feasibility. In this way, regional planning principles and archaeological information specific to areas of critical concern can be developed and viewed from a contextual and spatial reference.

The first step in the inventory process involves the basic need to evaluate the state of cultural resources. Examinations are made that specifically evaluate the risks that archaeological and natural resources are facing in order to allow informed decisions to be made that affect policy considerations and prioritization strategies. The audit, or GAP, conducted here on a landscape level, can be combined with other analyses to complete the picture of where the State of Florida is in terms of archaeological resource preservation and planning. This audit demonstrates the operationalization of landscape
archaeological theory, which can be used to refine and improve historic contexts and significance evaluation procedures.

This GAP audit approach is a way to empirically assess the extent to which archaeological sites are being protected, by using available data from the Florida Master Site File in conjunction with locations of publicly owned lands or lands targeted for acquisition. In this way, an inventory audit can be conducted to determine the kinds and types of archaeology that we are preserving or are targeting for preservation. Identifying where sites are in relation to the type of conservation and level of stewardship can then enable land managers, planners, policy makers, and archaeologists to make better informed decisions concerning acquisition and protection prioritization. By examining the archaeology in regions at risk from stressors such as development and land use change (Noss and Cooperrider 1994), this analysis can be used as a forecast, predicting where conservation should be directed and where sustainable development and use are appropriate (Scott et al. 1996).

I have combined archaeological site distribution maps with land stewardship and ownership information, and used this to examine the degree and likelihood for conservation and preservation of land areas and to assess the state of archaeological representation on public land holdings. The degree to which archaeological sites are represented in the present mix of conservation lands was also examined in this GAP audit approach. Those archaeological site types, cultural affiliations, and temporal ranges not represented where there is likelihood for occurrence, constitute conservation gaps on public land holdings. The purpose of this GAP audit, as applied to archaeology, is to
provide broad geographic information on the status of archaeological preservation as depicted through management and acquisition strategies in a region.

Archaeological diversity is defined here as the number of different site functional types, cultural affiliations, and temporal periods represented. This diversity can occur across any scale from a localized to a regional or larger analytical scale (Culpepper 1997). Diversity is stressed here as a critical consideration, so that the preservation record is more reflective of the range of site types and cultural affiliations that exist, rather than a reflection of a particular researcher’s interest, or the understanding of the taxonomy of site types and their subjective determination of importance (Mathers et al. 2005:172). Diversity also holds potential for more representative stakeholder values to emerge, involving not just the archaeologist making the NRHP significance determination, but local communities, interested people, and the land resource managers in the process (Clark 2005:321).

One issue addressed in this dissertation is where are the locations of where the highest archaeological diversity for sites exists in the Big Hammock and how this diversity relates to conservation lands and their management. Comparison of the recorded archaeological site distributions using GIS data from the Florida Master Site File, along with Big Hammock region stewardship areas that I have defined using GIS data from the Florida Natural Areas Inventory, is examined to see what the representation of archaeological diversity is, and in what way gaps in that representation can be filled through targeted acquisition strategies. The known record of archaeological site locations is useful here to show what is actually preserved versus those with a potential for preservation. Archaeological sites preserved are found on lands owned or presently
targeted for acquisition, while potential acquisition targets can be examined by looking for areas that show high levels of recorded archaeological sites of diverse types and cultural affiliations. Archaeological potential, or likelihood for archaeological site occurrence as shown through predictive modeling for example, can then be developed and discussed in relation to the audit performed here, as a means for strengthening arguments and targets for future preservation goals. It is the known archaeological site locations that are used here as the primary information tool as a first point of reference for GAP development. Fully-developed archaeological predictive models for the region are beyond the scope of this dissertation. Here, I focus on the GAP audit as the critical first means of developing archaeological and land use understanding for the Big Hammock case study region.

A GAP audit also can include an aspect of predictive modeling to examine where unknown sites are likely to be located or discovered, and what type and cultural affiliation is likely to be represented across a given space. Various types of data from the Florida Master Site File were collected and entered into a GIS, and a sensitivity model, albeit simplistic, was developed to demonstrate the usefulness for archaeological preservation planning. Categories considered in this model came from previously developed criterion of environmental associative importance for this region from previous CRM surveys. These criteria considered came from the FMSF GIS data and included archaeological site locations, archaeological survey information, and chronologically diagnostic artifacts that were used to examine the location of sites by temporal and culture affiliation. As well, the level of inquiry, purpose of the survey, and types of artifacts recovered (when provided) were examined. Environmental layers, such
as lakes and non-ephemeral wetlands, elevation and terrain models, and soils, were evaluated in a GIS, as these have been demonstrated as factors of archaeological location association. Examination of soil drainage, elevation, and distance to water or wetland resources, are important aspects in the regional prehistoric settlement pattern of this area (Almy 1978; Austin et al. 2001; Horvath 1986; Jones 1981). Land use layers, including land cover, land use (past, present, and future), conservation and public land holdings, and development and infrastructure planning layers, were also utilized to consider the natural and cultural environments in relation to land use planning and management strategies in the Big Hammock. Using this approach, issues of archaeological significance and value, scale, threat, representation and rarity, research potential, preservation planning, and management were examined for the Big Hammock region. The GAP audit, which is the primary focus of this dissertation, was used to identify areas critical to the protection of both significant and under-represented types of cultural resources as defined by previous archaeological surveys and developed models for archaeological potential within a defined area. Also considered are differential impact potentials on cultural resources, such as looting and vandalism, development pressures, and land use and zoning changes.

Particular focus on a distinct sub area of the region was given to a portion of Pasco County, in the southeast portion of the Big Hammock. Here, developmental pressure and land use change are evident, conservation and public land gaps exist, and the case for archaeological and environmental preservation considerations can be made. Using a GAP audit approach for the Big Hammock and the Pasco County sub area, potential areas of archaeological richness, defined here as areas containing or likely
containing sites representative of multiple temporal and cultural affiliations representative for the region, are identified. This analysis, conducted for demonstration purposes to show the usefulness of region-specific predictive modeling, is performed here to identify cultural gaps and lands that should be conserved and managed to allow for the long-term viability of key components of Florida’s cultural heritage. It is conducted to assist with the establishment of conservation and acquisition priorities based on both the known archaeological setting and the expectations for defined archaeological phenomena. This protocol for identifying potential habitat has been demonstrated in conjunction with plant and animal species location audits as a way to protect full ranges of biodiversity and communities (Scott et al. 1987; Scott et al. 1996). Here, I apply the diversity concept to archaeological richness rather than biological richness, which is the more familiar application of GAP audits. I also show, that while archaeology certainly benefits from land acquisition strategies primarily focused on environmental variables, the ability to create archaeological priorities and plans for acquisition development can change conceptions of the land acquisition. For example, lands targeted for acquisition for habitat value may not reflect the highest archaeological potential.

In this dissertation, I rely on multiple varieties of data from state, county, and local levels (Appendix B). The accuracy of data and the scale of analysis can be problematic when receiving data input from multiple sources. Often, these data are in different projections, which is a mathematical formula that allows a three-dimensional spherical object to be displayed in two dimensions (Environmental Systems Research Institute 2006c), or the projections are not defined resulting in the inability to line up layers for viewing in a GIS. These data sometimes lack complete metadata, which is
detailed information about these data such as coordinate system used, projection, scale, and other details about their limitations and use. To address this problem and facilitate area calculations, I have created a geodatabase for these datasets. A geodatabase requires the same projection or spatial scale, so all data are brought into a consistent southwest Florida State Plane projection, with feet as the standard unit of scale. The geodatabase created is a data management tool in ArcGIS software that defines how data are stored, accessed, and managed and affords ease in modeling of spatial relationships between different types of data (Environmental Systems Research Institute 2006a).

**GAP Analysis Development Methods**

After aligning all the layers of analysis into a consistent frame of spatial reference projection and using them to create a geodatabase, layers of inquiry were then clipped using the ArcToolbox clip function, to match their extents to the defined perimeter of the Big Hammock. As discussed in Chapter 4, the Big Hammock has been defined as a physiographic unit based primarily on environmental variables of elevation, soil association, drainage, and surface water characteristics (Dooris et al. 1999; SWFWMD 1992; Wharton and Dooris 1987). The Big Hammock extent was georeferenced, scaling an image to match a particular size and position with a spatial location assigned (Environmental Systems Research Institute 2006b). In this case, georeferencing was based on a paper map produced by Wharton (n.d.), with the information digitized and projected to southwest Florida State Plane West. The area total for the Big Hammock is 233,477 acres. All environmental and cultural layers used in the analysis, with the exception of the County outline that was used as a base map, were then clipped to this
Big Hammock outline extent, to allow analysis of the resources in the region. Inquiries were performed to the alliance level, meaning a natural assemblage of resources were explored for emerging or known associated patterns, displayed in relation to the occurrence of archaeological resources (Iacobelli et al. 2003; Jennings 2000; National Biological Information Infrastructure 2006; Scott et al. 1996)(Figure 5.1). Environmental and natural systems data layers were examined along with archaeological layers to determine how they relate to the landscape of the Big Hammock. Associated environmental variables examined included vegetative landcover, soils and soil drainage characteristics, proximity to water and wetlands, elevation and slope, and proximity to resources such as chert and coral outcroppings.

Next, the distribution of archaeological resources was examined within the Big Hammock range. These archaeological range maps were produced for each of the cultural and temporal affiliations and functional site types to illustrate their location within the Big Hammock area. Predicted distributions within a sub area of the Pasco County portion of the Big Hammock were based on the best available environmental data layers with previously-developed and known correlation to archaeological settlement in this area (Austin 2000; Horvath 1986; Weisman and Collins 2004; Wharton and Dooris 1987). These were combined with recorded location information from the FMSF and from primary contact with local informants and documentation of private collections, so that an archaeological sensitivity map could be developed.
Figure 5.1. The Big Hammock delineated boundary with recorded archaeological sites (n=302).
Stewardship includes examining lands currently in public holdings and those that are targeted for future acquisition, and evaluates management and acquisition aspects on those lands. Land stewardship and ownership were delineated using the Florida Managed Lands data layer and the Florida Acquisition Priorities data layer from the Florida Natural Areas Inventory (FNAI). These data layers depict parcel polygons of public land holdings and priorities for conservation land purchase in Florida. These polygons were clipped to depict lands in public ownership within the Big Hammock boundary, with the lands in public holdings found to total 17,010 acres, representing 7.3 percent of the Big Hammock (Figure 5.2). Ownership is defined as lands currently owned and managed in some form of public holding. In the Big Hammock, lands are owned by the Division of Forestry, the Southwest Florida Water Management District, Hernando County, the Nature Conservancy, and the State of Florida Trustees. Metadata for the Managed Lands data layer states that local and county-level holdings may not be indicated. A cross-check of other available GIS data sources was made, but there was no indication of other public land holdings in the Big Hammock other than those depicted in this layer.

Lands in conservation holdings were targeted for their high quality resources, and protect large areas of sandhills, long-leaf pine and flatwood areas, upland mixed forested systems and areas of high surface and ground water recharge potential. Only one management plan, for the Annuetteliga Hammock conservation area in the northern portion of the Big Hammock, was found to mention cultural resource importance. The CARL and SWFWMD project reports for this area also discuss cultural resource benefit for this acquisition (SWFWMD 1992).
Figure 5.2. Conservation lands in the Big Hammock region of Florida, totaling 17,010 acres.
A differentiation can be made between land that is already acquired and land that is targeted for acquisition or has stewardship value. Additionally, it is important to examine this value from a risk standpoint of land use changes that can occur if the land is not acquired or ranked with priority. For example, in the Pasco County portion of the Big Hammock, large tracts of lands held currently for agricultural production, such as orange groves, are being rapidly converted to residential use. These lands should be viewed as having a guarded stewardship valuation because of this potential for alteration to the land use designation in the future. Stewardship levels can be examined over large areas, and are especially important for archaeological conservation in the Big Hammock or other rapidly developing areas, where current land use and zoning are likely to change. Examination of stewardship based on permanence of protection, such as low conversion of land cover or land use alterations through time, can be made.

In the Big Hammock analysis, the developed stewardship index was derived from GIS data provided by the Florida Natural Areas Inventory (FNAI). The FNAI provides support for the Florida Forever land acquisition program. Their data and models are used to develop resource conservation priorities in the state and to assess Florida Forever projects (Florida Natural Areas Inventory 2007). Using the data that the FNAI provide on acquisition priority and ownership information, a stewardship value was developed that ranged from values of one to six. Lands currently managed as conservation areas were assigned the stewardship value of one and lands with no priority for acquisition or protection were assigned a value of six. Although some of this land does have a current degree of protection as agricultural area (Table 5.2), zoning and land use changes can
Table 5.2. Stewardship Level Representation in the Big Hammock

<table>
<thead>
<tr>
<th>Level</th>
<th>Type</th>
<th>Acreage</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Conservation Lands</td>
<td>17,010</td>
<td>7.3</td>
</tr>
<tr>
<td>2</td>
<td>FNAI 1</td>
<td>5,288</td>
<td>2.2</td>
</tr>
<tr>
<td>3</td>
<td>FNAI 2</td>
<td>260</td>
<td>0.1</td>
</tr>
<tr>
<td>4</td>
<td>FNAI 3</td>
<td>16,491</td>
<td>7.1</td>
</tr>
<tr>
<td>5</td>
<td>FNAI 4</td>
<td>70,844</td>
<td>30.3</td>
</tr>
<tr>
<td>Low</td>
<td>FNAI 5 and 6</td>
<td>110,205</td>
<td>47.2</td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td>13,379</td>
<td>5.8</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>233,477</td>
<td>100.0</td>
</tr>
</tbody>
</table>

rapidly occur, therefore the stewardship value in the Big Hammock area is actually low.

Areas of permanent sources of water were not assigned a value and were delineated from
the land area of consideration. Land ruled out for preservation by the FNAI was not
assigned a stewardship level, but is designated as lowest priority with land area
calculated. Figure 5.3 details the cartographic model outlining the steps in the GIS
stewardship mapping.

Other considerations when exploring stewardship are the level of protection.
Protection here means what factor or factors the land primarily used for, and to what
Figure 5.3. Cartographic model for the GIS land stewardship mapping GAP audit of the Big Hammock.
degree, intent, and authority the land is managed (National Biological Information Infrastructure 2006). Consideration was also given to where the highest archaeological diversity was located. Also of importance was the location of NRHP eligible or potentially eligible, significant sites, or where sites that could be argued as significant exist. Ownership and use of the land both presently and in the foreseeable future is also considered using past and present land use GIS data.

Using the Managed Lands data layer shown for the Big Hammock area, I explored how the archaeological record compares to publicly owned lands. I used the recorded archaeological site data from the FMSF, as these site locations are known to occur on these conservation properties and provide a set of measurable data. Using the recorded locations, I examined the representation of cultural affiliations, functional site types and temporal periods on publicly owned lands in the Big Hammock. These site locations were also examined according to managing entity and management status, as depicted in the stewardship map (Figure 5.4). How does the site distribution on public lands in the Big Hammock compare to other areas of the Big Hammock that are not publicly owned and managed? Are the sites that are currently protected representative of the diversity of functional site types, cultural affiliations, and temporal ranges that exist across the area? To understand diversity and representation, a complete audit of the known archaeological record must first be conducted and then compared to the known archaeological record on publicly owned lands and to varying stewardship levels (Table 5.3). How might archaeologists better direct acquisition strategies to correlate with environmental resources acquisition? An understanding for what the archaeological record is within the Big Hammock region is a necessary first step, just as understanding
Figure 5.4. Stewardship levels and archaeology in the Big Hammock.
Table 5.3. Big Hammock recorded archaeological site percentages by stewardship level.

<table>
<thead>
<tr>
<th>Land Stewardship Level</th>
<th>Number of Archaeological Sites</th>
<th>Pct. of Total under Stewardship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stewardship Level 1</td>
<td>19</td>
<td>3.8</td>
</tr>
<tr>
<td>Stewardship Level 2</td>
<td>22</td>
<td>4.4</td>
</tr>
<tr>
<td>Stewardship Level 3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Stewardship Level 4</td>
<td>53</td>
<td>11.0</td>
</tr>
<tr>
<td>Stewardship Level 5</td>
<td>198</td>
<td>39.7</td>
</tr>
<tr>
<td>Low Stewardship Potential</td>
<td>206</td>
<td>41.1</td>
</tr>
<tr>
<td>Totals:</td>
<td>498</td>
<td>100.0</td>
</tr>
</tbody>
</table>

biodiversity is a first step in environmental conservation strategies (National Biological Information Infrastructure 2006; Orians 1993; Scott et al. 1996).

**Analysis of Archaeological Site Types in the Big Hammock Region**

The Florida Master Site File of the Division of Historical Resources is the central repository for documentation, including spatial location information concerning archaeological sites and historical structures in Florida. The FMSF has converted survey reports into readily accessible PDF files for research review purposes. Along with site file paper forms, the FMSF has created GIS data layers by digitizing paper map site locations that are provided by the recorders of the archaeological sites on 1:24,000 scale topographic maps.

The GIS datasets from the FMSF depicting recorded archaeological site locations, statewide archaeological surveys conducted, and National Register data layers were clipped to the extent of the Big Hammock using the ArcToolbox™ clip feature. These data reveal a diversity of site types, temporal ranges, and cultural affiliations across the area. The frequency and percentages of types are discussed, with maps depicting this diversity shown by site type and cultural affiliation.
There are a total of 302 recorded archaeological sites in the Big Hammock as of October 2006 (Florida Master Site File 2006b)(Appendix C). Several of these contain multi-temporal and multi-functional components. For example, a site may be recorded as both an artifact scatter and a campsite and may also show cultural affiliations with Archaic and Weeden Island periods. Multi-components at sites explain what appear to be excessive values of recorded locations, but are instead duplicate numbers of site types and designations counted under several categories. Taxonomic decisions are complicated by similar site functional types being split into separate classifications in the FMSF. For example, prehistoric mounds, platform mounds, and burial mounds are distinguished depending on how the recorder coded the site. The splitting of categories and classifications in the FMSF and allowing numerous categorical choices on site file forms increases the difficulty in the differentiation between what are often ephemeral and subjective site function categories. I have combined some of these comparable categories in my queries, which are explained for each of the maps produced. One such combination would be the mound type example. Mounds are recorded as prehistoric, burial, temple, and middens. I have grouped the locations into a single category. However, I make a distinction for those mounds that are known to contain human remains, as these locations are crucial for management and preservation concerns. Further compounding the nomenclature confusion with the site file data is the fact that data are accepted from a number of sources, including avocational and professional archaeologists. There are also no requirements for method of collection or accuracy of spatial locations for archaeological sites, other than the site boundary must be hand-drawn on a 1:24,000 scale.
topographic map. Examination of the level of survey, purpose of survey, and methods of recording is necessary, as survey intensity and accuracy varies widely.

The way in which the archaeologist determines the functional category and cultural affiliation of the site can influence issues such as significance determination and ultimately site preservation and mitigation of impacts. For example, a site determined to be a lithic scatter as opposed to a lithic quarry, which can be a difficult determination depending on the sampling and survey strategy used, could be summarily dismissed and not preserved. This dismissal of lithic scatters is potentially due to a lack of understanding of site function coupled with the lack of research interest on the part of the survey archaeologist, rather than a reflection of true significance arguments under NRHP criteria (Robert Austin, personal communication, November 2006; Robert Carr, personal communication, February 2007; Miller 2002). For this reason, a discussion of site functional categories and cultural affiliations in the Big Hammock is provided with an overview for depicting how surveys and archaeological site recorders document site function and cultural affiliation. Examination of spatial patterns for some of these functional site types and affiliations is meaningful, while in other instances, the disproportionate numbers could reflect biases in the system and in recorder interpretation. To examine those biases, the assignation and distribution of recorded sites in the Big Hammock by functional category and cultural affiliation is discussed and the spatial distribution shown. Each category is considered in terms of its numerical and spatial representation in the Big Hammock area with inherent problems in the current recording methodologies discussed.
Artifact Scatters

Artifact scatters are listed with the FMSF in several different ways, such as by the determination of artifact density by the recorder. For purposes of this analysis, I have collapsed the category to reflect scatterings of variable density of ceramic sherds and lithic tools as well as manufacturing debris. Most archaeologists would associate artifact scatters with campsites for hunting and fishing activities, however, it should be noted that these sites may also reflect more permanent village or habitation settings. For this reason, I have chosen to consider the FMSF functional categories of campsites and prehistoric habitation areas as separate from artifact scatters, even though they may be one in the same. In the Big Hammock region there are 64 artifact scatters (Figure 5.5).

Lithic Scatters

Lithic scatters are a subset of artifact scatters but are comprised solely of stone tools and waste flakes. These scatters may or may not be from a pre-ceramic time origin. In the Big Hammock, the FMSF records indicate 105 lithic scatters although some of these sites may have been misidentified by field recorders, and may actually function as quarry or specialized extraction sites (Figure 5.6). Incorrect functional assignments are common with this type of site due not only to recorder judgment errors, but to the confusion created by distinctive categories that are combined on site file forms (e.g., lithic scatters/ quarries and lithic scatters or quarries as opposed to prehistoric lithic
Figure 5.5. FMSF recorded artifact scatters in the Big Hammock (n=64).
Figure 5.6. FMSF Recorded lithic scatters in the Big Hammock (n=105).
scatters and prehistoric quarries). Although this lumping together of dissimilar site types gives the site recorder a way to specify a functional category without differentiation of function or type, this procedure has led to the lumping of lithic scatters with the lithic quarry category. The system does not provide a way to easily distinguish between the two without referring back to the original survey notes and artifact analysis (Robert Austin, personal communication, October 2006). Lithic scatters are the most numerous site functional type in the Big Hammock, representing 28 percent of the total recorded sites.

*Prehistoric Quarries*

Prehistoric quarries represent areas for the extraction of chert and coral from natural outcrops, where native peoples would reduce the pieces into a transportable size. Field recorders distinguish quarry sites as areas with abundant lithic waste, or debitage, but with very few to no finished tools present. This presence of few finished tools is a feature that distinguishes quarries from lithic tool manufacturing sites. Most of the quarry sites in the Big Hammock are located in the southeastern portion of Pasco County, where there is correspondence with abundant chert and coral outcrops. Field truthing and evaluation of this site functional assignation is warranted when possible, and accurate GPS spatial location of outcrop areas could assist in archaeological suitability and predictability modeling for the region. There are 10 sites recorded as quarries in the Big Hammock region (Figure 5.7).
Figure 5.7. FMSF listed locations for prehistoric quarries in the Big Hammock (n=10).
**Mounds**

Mound sites in the Big Hammock region include several types that may or may not contain human skeletal materials. A number of these sites have been completely or near completely destroyed by amateur excavators and looters in quest of artifacts. Some of these sites were recorded decades ago and their exact location is listed as general vicinity or is unclear, calling for field-truthing with GPS when possible to correct inaccurate site locations. Mounds are sensitive resources due to the potential for encountering human remains, and knowing their exact locations is needed for effective land use planning, avoidance, and preservation. There are a total of seven sites listed in this functional component with the FMSF for the Big Hammock region (Figure 5.8), four having been identified as containing human remains (Figure 5.9).

**Historic**

The historic site functional category is used here to subsume a number of post-contact, European occupational sites and features. The category includes turpentine camps, stills, historic refuse or scatter areas, lumber camps, forts, burials, earthworks, towns, cisterns, mills, and pioneer homesteads. In the Big Hammock, many of the sites listed in this functional category are from a Seminole period historic context, although recorders of sites do not always make this observation. For this reason, further analysis of diagnostic artifacts from these sites compared with historical documents and maps would be helpful in securing the context determination. There are 42 sites in the Big Hammock with a historic site functional component (Figure 5.10).
Figure 5.8. FMSF recorded mound site locations in the Big Hammock (n=7).
Figure 5.9. FMSF recorded mound locations in the Big Hammock with human remains identified (n=4).
Figure 5.10. FMSF recorded historic site locations in the Big Hammock (n=42).
Campsites

The campsite functional category is assigned by the archaeological recorder to represent sites thought to be temporary use locations. This category often is given to areas of low density and variable density artifact and lithic scatters, with density of artifacts recovered correlating to the field determination despite the fact that most identifications are made with limited survey data. Although the subjectivity of assignation makes this category almost meaningless, it is listed and described here to demonstrate the bias that can exist in the functional determination process. Campsites are a large functional category in the Big Hammock, with 100 sites recorded in the FMSF with this description, making it the second largest functional category after lithic scatters (Figure 5.11).

Prehistoric Habitation

Habitation sites are suggestive of longer-term occupation compared with the aforementioned campsite functional designation. Most archaeologists recording sites in the FMSF use artifact densities and diversity as an indicator of this identification, along with the presence of structural elements and features, like post holes, hearths, and faunal remains. But with prehistoric sites that are being discovered through shovel testing rather than block area excavation, it is not likely that this functional category can be accurately determined. These data suggest that this bias, or inability to identify these types of sites based on standard testing methodologies, may be reflected in the low number of recorded
Figure 5.11. FMSF recorded locations of prehistoric campsites in the Big Hammock (n=100).
sites with habitation components in the Big Hammock. There are 19 recorded prehistoric habitation sites in this category as compared to the 100 campsites (Figure 5.12).

*Other and Indeterminate*

Site functional classifications that are not commonly encountered are often lumped into the ‘other’ or ‘indeterminate’ functional category in the FMSF, and could include components such as habitation sites that are not easily distinguished using standard testing procedures. In the Big Hammock, the other functional category is primarily used in the case of general vicinity locales of historic towns. This category in the Big Hammock is also used as a secondary component for lithic and artifact scatter sites that are not distinguishable by the site recorder. A total of 16 sites in the Big Hammock have a category of ‘other’ or ‘indeterminate’ as a functional component (Figure 5.13).

*Unspecified or Unknown*

A total of nine sites in the Big Hammock region have no site-type designation assigned in at least one site functional category. These categories are assigned when no verifiable method of assigning a site function was possible in the field, or was used in instances where the site was not able to be spatially located. Some of the sites with these designations were not recorded through professional archaeological survey, or were recorded prior to CRM survey requirements (Figure 5.14).
Figure 5.12. FMSF recorded habitation site locations in the Big Hammock (n=19).
Figure 5.13. FMSF recorded locations in the Big Hammock of the other and indeterminate category sites (n=16).
Figure 5.14. FMSF recorded site locations in the Big Hammock for unknown or unspecified category sites (n=9).
Additional site type designations in the FMSF exist, such as canoe, land-terrestrial, and underwater categories. However, these are less functional types than they are descriptive of the feature or environmental setting, and are another area of problem in the FMSF data sorting for GIS analysis. Canoe locations are sensitive due to the high level of disturbance from looting that can occur with these fragile resources that are often left *in situ* after documentation due to preservation problems created upon removal. An overview of the archaeological functional types, as I have outlined for the region with the addition of the one recorded canoe in eastern Pasco County, shows the functional site type range in this region (Figure 5.15). The percentage of representation is compared to the 373 recorded functional designations considered in this evaluation. The functional designation number is larger than the overall site number of 302 because of the multi-functional possibilities at locations.

![Site Type Identification](image)

*Figure 5.15. FMSF site functional types by condensed categories for the Big Hammock Area.*
Culture Periods in the Big Hammock

The FMSF gives a number of broad temporal unit designations for culture affiliation or phases, which are discussed below. Many of these periods are temporally specific and are assigned based on the presence of diagnostic artifacts collected or documented during a survey. Other designations provided by the FMSF are designed to be vague to provide flexibility in the recording of sites that lack diagnostically dateable materials, but can be determined to be, for example, prehistoric or historic. For the purposes of this analysis, I have chosen to examine definable temporal periods in the Big Hammock, but acknowledge that many sites recorded as prehistoric could alter numbers derived in several categorical areas considered. Culture periods examined within the hammock as part of this audit are: Paleo-Indian (c. 12,000 B.C. – 7,500 B.C.); Archaic including Early, Middle, and Late periods (c. 7,500 B.C. – 500 B.C.); Ceramic Period (post 500 B.C.) including Weeden Island (A.D. 300 - 900) and Safety Harbor (c. A.D. 900 - 1725); and the Seminole Period (c. 1720s). The historic aboriginal culture is Seminole, and again, some sites recorded temporally only as historic could actually belong in the Seminole component designation.

*Paleo-Indian Period (c. 12,000 – 7,500 B.C.)*

Paleo-Indian sites in Florida are thought to range from roughly 12,000 to 7,500 B.C (Milanich 1994), and are the earliest recorded culture period represented in the Big Hammock. There are four Paleo-Indian sites within the Big Hammock area as listed in the FMSF, each having at least one of their cultural components assigned to this period
As with the site functional categories, there are up to eight culture period entries allowed for each site recorded to account for sites with multiple components. Site locations in the Big Hammock with this component recorded include three from Hernando County (8HE241, 8HE463 and 8HE520) and one site from the Pasco County portion of the hammock (8PA2060). Most site culture periods are determined based on the presence of diagnostic artifacts. In the case of the Paleo-Indian locations, finds of projectile points such as Clovis, Suwannee, and Simpson are often associated with this period (Milanich 1994:49). The presence of these lithic tools were used to secure culture period determinations by archaeological survey recorders in the Big Hammock (ACI 2002; Stokes 2005; Watters 2005).

Local collectors report many more Paleo-Indian site finds in the Big Hammock. These sites are likely deeply buried and not found through standard testing methods such as one-meter shovel testing (Albert Goodyear, personal communication 2000). Goodyear, along with soil specialist, John Foss, and archaeologists Robert Austin and Barry Wharton, accompanied me on site visits to several locales within the Big Hammock area in early 2000. We looked specifically at the likelihood for deeply buried site occurrences and examined the general geology at areas of interest (Figure 5.17). Sites visited included several exposed deep strata areas along the construction path of the North Suncoast Expressway Project, in the northern Hernando County portion of the Big Hammock, as well as several locales in eastern Pasco County in the Dade City vicinity.
Figure 5.16. FMSF Recorded in the Big Hammock of Paleo-Indian site locations (n=4).
On-site soil examination by Foss showed that in the Big Hammock, a well developed soil accumulation zone suggests long-term stability in the landscape. A fragipan horizon, which is a dense subsurface layer of hard soil containing a high level of iron and concretions and hard to penetrate, was encountered in the soil stratigraphy from approximately 96 to 150 cmbs. The archaeological potential for Paleo-Indian period site locations is found below this zone and could bias sampling because many surveyors may not attempt to dig below this concretion level (John Foss, personal communication, 2000).

Outside the Big Hammock area in Hernando County, Paleo-Indian materials have been found in a number of karst settings, such as Hospital Hole on the Weeki Wachee
River, the Bayport area where the Weeki Wachee meets the bay, and a number of other sites along the Weeki Wachee and Chassahowitzka Rivers (Robinson 1979:82,100). Several other sites have been found along riverine corridors and karstic settings, such as the Withlacoochee River and spring sites north of the Big Hammock in Marion County (Hemmings 1975; Neill 1958, 1964).

There are less than 198 Paleo-Indian sites recorded in all of Florida (Florida Master Site File 2006b). Researchers believe that many more of these sites possibly exist, found offshore, along wetland interior resources, deeply buried. Finding these sites, both in the Big Hammock area and statewide, raise new challenges to old survey methods and research techniques, which in the past may have biased our understanding of settlement locations and life ways of Paleo-Indian culture (Daniel and Wisenbaker 1981; FDHR 1993:14; Goodyear et al. 1978; Goodyear et al. 1983).

Archaic Period (c. 7,500 – 500 B.C.)

Archaic period sites are numerous in the Big Hammock, with 82 sites in the area having one or more cultural components recorded for this period (Florida Master Site File 2006b)(Figure 5.18). The Archaic period (7,500 - 500 B.C.) has been divided into three periods that are based primarily on differences in lithic tool production. The Early Archaic (3,000- 500 B.C.), is characterized by projectile points of the Dalton, Bolen, and Kirk varieties. The Middle Archaic (5,000 – 3,000 B.C.) has projectile points that are large and triangular in shape, with stemmed ends for hafting. The Newnan, Marion, Citrus, Hillsborough, Levy, Putnam and Alachua variety types are classic for this period.
Figure 5.18. FMSF recorded Archaic period sites in the Big Hammock (n=82).
The third division is the Late Archaic (3000-500 B.C.), when regional differences begin to emerge along with the presence of pottery (Bullen 1954, 1959; Milanich 1994). Bullen (1954) further delineates the Late Archaic into Orange and Transitional periods, showing the beginning of regional variations with the emergence of ceramics. Although still referred to in the literature, the transitional construct that differentiates between Late Archaic and the emergence of regional ceramic tradition cultures are no longer considered viable (Austin 2000).

Transitional period sites are still denoted in the FMSF and have been recorded in the Big Hammock. These sites have semi-fiber and semi-sand tempered pottery and Late Archaic lithic assemblages. The Blackwater Pond Site (8HE66) near Brooksville (Whitney 1985) and the Canyon Swallow Site (8HE247) located along the North Suncoast Expressway (Wharton and Dooris 1987:36) are identified with this cultural component.

The post-Archaic in the Big Hammock area has Deptford and Weeden Island-related periods that date from 500 B.C. to A.D. 900. The distinctive linear, stamped and checked patterns on Deptford pottery are characteristics period markers, made through the use of wooden paddles pressed into the wet clay before firing (Milanich 1994:111). Soils better suited for agriculture and cultivation may play a role in the interior Deptford settlement pattern (Kohler 1991). Interior sites also are thought to represent small, seasonal-use hunting and butchering activity sites (Tesar 1980). There are no recorded sites with Deptford cultural components identified in the FMSF, although local collections without specific provenience suggest a presence of this culture period in the western Hernando County portion of the Big Hammock.
**Weeden Island Period (A.D. 300-900)**

The Weeden Island cultures evolved from the Deptford period cultures, with ceremonialism evidenced in part through complex burial mounds and ornate and elaborate ceramics and burial goods. Many sites from this period consist of village complexes with associated mounds. Well-fired ceramics are sometimes highly decorated with stylized animal effigies, punctations, and other surface decorations, and are often slipped or incised (Milanich 1994:185). Inland Weeden Island sites have been noted as being in proximity to well-drained agricultural-type soils (Kohler and Johnson 1986). The Pasco County portion of the Big Hammock has six sites listed as having a Weeden Island cultural affiliation, based on diagnostic artifact evidence from pottery (Florida Master Site File 2006a). These sites (8PA172, PA222, PA191A, B, and C, and PA199) all are found to cluster around lake settings in the southeast portion of the Big Hammock, with use likely extending into the later Safety Harbor period, even when not recorded as such (Jeffrey Mitchem, personal communication, November 2006).

The Pottery Hill site (8PA172) was recorded by avocational archaeologist and attorney William Dayton in 1984. Numerous findings of Archaic stemmed projectile points, Pinellas projectile points, and sand-tempered and check-stamped ceramics were made, as Dayton’s drawing in the FMSF depicts (Figure 5.19). Several sites in this vicinity were revisited by archaeologists Brent Weisman and Jeffrey Mitchem in 1985. Researchers believe the area to be a probable settlement site area during the late Weeden Island and subsequent Safety Harbor period (Jeffrey Mitchem, personal communication, November 2006) (Mitchem 1989a:46).
In the Hernando County portion of the Big Hammock where there are an additional seven sites with recorded Weeden Island components, including one burial mound location (8HE13). The Hart Pond site (8HE251) is a recorded multi-component site with Weeden Island and Seminole cultural affiliations based on surface finds. The location of the site is just outside the investigated impact corridor of the North Suncoast Expressway. The site was recorded based on a cursory examination and find of lithic debitage and three ceramic sherds, two diagnostic for the Weeden Island period and one Seminole (Wharton 1990:104). Other recorded sites with Weeden Island components in the Hernando County portion of the Big Hammock include 8HE489, HE527, HE511, HE529 and HE507.
Additional Weeden Island period artifacts lacking exact provenience are in the curation of the Florida Museum of Natural History in Gainesville. Vessels with ornate Weeden Island designs with large basal holes are said to have come from a mortuary context from a burial mound in the Trilby-Lacoochee area in the eastern portion of the Big Hammock. Vessel A-3233 (Figure 5.20), is described as a St. Johns Plain ware with basal kill hole and lacking a neck portion. Vessel A-3234 is a Weeden Island highly incised ware with a prominent basal hole (Figure 5.21). Vessel A-3235 is listed in the museum accession file as a Weeden Island Plain ware with a basal hole present. Examination of the vessel revealed three lines of punctations that encircle the piece (Figure 5.22). Vessel A-3236 is a square, four-lobed punctuated piece with prominent basal hole (Figure 5.23). All were donated by a private individual and said to come from the same mound location (Florida Museum of Natural History n.d.).

Figure 5.20. Vessel A 3233 from the vicinity of Trilby-Lacoochee, Pasco County, Florida. Black and White photo (left) taken by Ripley Bullen, on file Florida Museum of Natural History, Gainesville.
Figure 5.21. Vessel A 3234 from the vicinity of Trilby-Lacoochee, Pasco County, Florida. Black and White photo (left) taken by Ripley Bullen, on file Florida Museum of Natural History, Gainesville.

Figure 5.22. Vessel A 3235 from the vicinity of Trilby-Lacoochee, Pasco County, Florida. Black and White photo (left) taken by Ripley Bullen, on file Florida Museum of Natural History, Gainesville.
North of the Big Hammock in the Alachua and Marion County area, Milanich (1978) relates that the earlier Deptford culture evolved into the Cades Pond regional culture, followed by the Alachua culture tradition (Milanich 1971). Cades Pond people were highly adapted to extensive wetland resources in the area, and through extensive excavation and environmental and faunal dietary analysis, a boundary for this region was able to be delineated (Milanich 1978; Smith 1971). Whether this regionalism is seen in the Big Hammock, with the noted environmental similarities to the Alachua hammock areas, including extensive interior wetlands and village mound clusters present in eastern Pasco County, awaits further field investigation. For now, the areas that could hold
archaeological information about this possible regional variant remain on private land holdings which are not available for excavation or more detailed analysis, and include agricultural land holdings in jeopardy of land use change to residential zoning.

_Safety Harbor Period (A.D. 900-1725)_

The Safety Harbor culture is named for the type site in Pinellas County. Originally defined by Willey (1949:475-488), and later redefined by Mitchem (1989a), this culture period has distinctive pottery from mortuary contexts with Mississippian motifs and often have dateable European artifacts (Milanich 1994:389). Archaeologists believe that the Weeden Island-related cultures evolved into Safety Harbor, with the period divided into four phases: Englewood (A.D. 900-1000), Pinellas (A.D. 1000-1500) which are pre-contact, and Tatham (A.D. 1500-1567), and Bayview (A.D. 1567-1725) in the post contact era (Mitchem 1988, 1989a). The inland habitation manifestation of Safety Harbor is not well understood, with burial mounds often found isolated from living contexts (Mitchem 1988; 1989a:557-565; 1989b).

Functional hypotheses for the interior region north of Tampa Bay depicts the burial mound structures as largely isolated spots for interment, possibly used by specific kin-based groups or clans, or by residents from surrounding areas (Mitchem 1988). Future investigation of Safety Harbor period habitation and burial sites in the Big Hammock could provide important insight into the life ways and settlement patterns of people from this period. A clustering of sites with artifacts diagnostic for this period, exist in the southeast portion of the Big Hammock (Figure 5.24). In 1946, several low burial mounds were destroyed in this area while clearing land for orange groves. The
Figure 5.24. FMSF locations for Safety Harbor period sites and those sites with recorded artifact assemblages that likely relate to this period. The eastern Pasco County site clustering area is denoted, with locations for 8PA7 and 8PA8 not shown as these sites are not recorded in the FMSF GIS data (n=6 in the cluster, and n=10 in the Big Hammock including the PA7 and PA8).
location is listed in the FMSF as general vicinity, and was investigated by John and
Robert Goggin in 1934 and recorded as 8PA9. Many of these sites recorded lack assigned
cultural affiliation on the FMSF data, and it is only through a reexamination of field notes
and artifact collections that temporal components can be assigned to these settlement
areas.

Goggin collected several artifacts from the surface of the 8PA9 site, described in
his field notes as a sand mound and a burial mound two miles southeast of Saint Leo,
Pasco County. The low sand mounds that contained burials were described by Goggin as
being impacted slightly by orange grove preparation and scraping, but that he felt the
burials themselves remained intact (Goggin 1947a). The PA9 site is said to be in the same
general vicinity as the PA6 and PA7 sites, and a note in the paper file of the FMSF
indicated that all three sites may actually be the same location. However, careful review
of Goggin’s field notes held in Special Collections at the University of Florida reveals
that Goggin lists the site locations as separate, located on a hilltop in the Lake Pasadena
vicinity. He visited all these sites twice, in 1934 and again in 1946 (Goggin 1947a).
Goggin lists a collection of seven plain and decorated potsherds, a basal portion of a
spearhead, a drill and a heavily patinated shell bead. The collections in the possession of
the Florida Museum of Natural History (accession #99658 and 104902) do not include
the shell bead, but do contain several chert flakes and *busycon* shell fragments, a St.
Johns Check Stamped and Pasco Plain sherd, and a partially reconstructed sand tempered
vessel with a brushed surface exterior which is likely from a later Seminole occupation
(Figure 5.25). Interestingly, this reconstructed vessel is not noted in Goggin’s field book
Figure 5.25. Brushed sherd (above) from the 8PA9 site, investigated by Goggin (1947a). This large rim piece from a Seminole period vessel was found in the vicinity of Lake Pasadena, Saint Leo, in Pasco County. (Collection #104902), Florida Museum of Natural History, Gainesville.

as coming from the 8PA9 location, but rather from a nearby multiple temporal component site (8PA172) that was visited the same day (Goggin 1947a). Numerous ceramics from these visits also were sent to the University of Michigan ceramics repository according to notes in the site file and notebooks, however no record of these collections exists today. The Pasco Plain and St. Johns wares recovered from the 8PA9 location are consistent with the Safety Harbor period, and the proximity of these mounds and burial mounds to the 8PA172 Pottery Hill habitation area are suggestive of Safety Harbor period settlement around the Lake Pasadena and Buddy Lake area of eastern Pasco County (Jeffrey Mitchem, personal communication, August 2006) (Mitchem 1989a:46). Artifacts recovered from orange groves in this area and in private collections
also suggest Safety Harbor period association, with numerous Pinellas projectile points, Pasco Plain wares, Prairie Cord Marked and *Busycon* shell fragments found in this area (Mitchem 1989a:48).

A number of sites with probable Safety Harbor components and containing contact era beads are also in this southeastern portion of the Big Hammock. Based on this evidence, these sites could be associated with the de Soto expedition, which headed north from Tampa Bay and passed through areas near present day Dade City and Lacoochee in Pasco County, and Istachatta in Hernando County (Milanich 1995:77). A site known as Anderson’s Mound (8HE14) is listed in the FMSF as being destroyed by local treasure hunters. Local collectors who have allowed documentation of items reportedly from this site have numerous turquoise blue beads (Figure 5.26).

![Figure 5.26. Turquoise blue glass beads reportedly from the 8HE14, Anderson’s Mound site. (Frank Hoff private collection, photo by Travis Doering.)](image-url)
Other turquoise blue glass beads have shown up in sites in the Southeast as early as 1560 to 1570 (Mitchem 1989a:42), but could also be consistent with a later mission-period assemblage, similar to those in North Florida from sites dating to 1650-1704 (Jeffrey Mitchem, personal communication, August 2006). Early Englewood pottery consistent with the earliest phases of the Safety Harbor period (Mitchem 1989a:559) was also reported by local collectors as coming from this site (William Dayton, personal communication, June 2006). My field visit to the site, located on private property, detected only looter spoil holes and a densely overgrown and disturbed area that could not be explored.

The 8PA8 site is said to be located in the vicinity of Blanton, but is not shown on the FMSF GIS data layer. The site was recorded by an avocational archaeologist, Edgar Nelson, in 1915. Records from items donated to the Florida Museum of Natural History in Gainesville show that the site likely had a Safety Harbor and later Seminole of the artifacts that Nelson collected, along with descriptions. The artifacts themselves are component. Specimens listed in the accession card file at the museum include drawings largely not able to be located at the museum, and the card file records provide the primary detail of the site. One incised sherd remains in collections from the site, and shows tentative Weeden Island to Safety Harbor component (Figure 5.27). Based on the other artifact descriptions ceramic types include St. Johns Check Stamped, Carrabelle Incised, Chattahoochee Brushed, and St. Johns Linear Check Stamped wares.

The 8PA7 site, which was visited by Goggin in 1934 and 1946 (Goggin 1947a), is said to have been two low, sand burial mounds located near present-day Saint Leo University. Saint Leo students in the 1920s located the mounds and would later bring the
site to Goggin’s attention. Materials from the mounds were said to have been used for road fill when Prospect Road was paved. Collectors report caches of polished celts and pottery from the site (William Dayton, personal communication, December 2006). Examination of these unprovenienced collections by professionals shows a possible Safety Harbor period component (Barry Wharton, personal communication 1999). Other sites listed with the FMSF as having Safety Harbor components include 8HE14, HE511 and HE241C. The sites 8PA7 and 8PA8 discussed here have no known location and are not listed in the FMSF GIS data layer. Both sites have been confused in the FMSF with the general vicinity location of 8PA9, however PA7 and PA9 were listed by Goggin as discrete areas (Goggin 1947a) and PA8 was said to be in the Blanton area that is several miles to the north of the Saint Leo general area.
Seminole Period (post 1700)

By the end of the Bayview phase (A.D. 1567-1725) of the Safety Harbor period, indigenous populations were devastated by disease and European contact-related issues. Creek Indians and affiliated groups, forced from other areas to the north such as Alabama and Georgia were in North Central Florida by A.D. 1700, and are the likely descendents of the historic Seminoles of Florida. Alachua savanna areas were first settled, with Seminoles next locating along the Brooksville Ridge in the Big Hammock (Weisman 1989:4). There are three recorded sites in the FMSF that have a Seminole period component. Seminole sites are hard to detect due to their low artifact density and shallow deposition that is easily disturbed. Seminole component sites are often located near Alachua tradition or Safety Harbor component prehistoric settlements (Weisman 1989). Site locations are often based on the presence of diagnostic artifact items encountered during survey, such as brushed ceramic wares.

The sites with a recorded Seminole component located in the Big Hammock and listed on the FMSF are 8PA114 (Nicholson’s Grove), 8HE248 (Curlew South) and 8HE251 (Hart Pond). These sites were recorded by two surveyors, Brent Weisman and Barry Wharton, both with substantial experience in dealing with Seminole period archaeology. The use of a direct-historic approach, utilizing documents and maps in combination with archaeological survey, is necessary to locate the often ephemeral and remote Seminole locales (Weisman 1986, 1989; Wharton 1990). Artifacts in the possession of local collectors that are reported to be from locations within the Big Hammock area point to the possibility that this component is being largely underreported, and are not being found or recognized by archaeological surveys (Figure 5.28).
Figure 5.28. FMSF recorded Seminole component sites in the Big Hammock (n=3).
Eighteenth and 19th century documents and military maps show a Seminole occupancy in the Big Hammock with the Chocochatti Seminole group of Eufala Creeks located near present-day Brooksville from around 1767 to 1836 (Weisman 1989; Wharton 1990). The group was decimated by raids conducted by other bands of Creeks and by the Second Seminole War fought between 1835 and 1842, which eventually led to the demise of this once prosperous group (Wharton and Dooris 1987).

Maps also illustrate numerous trails and military fortifications were located within the Big Hammock and surrounding area. Historic trails and roads are considered an important factor in locating the route taken by Spanish conquistadors such as de Soto, as it is speculated they would not have wandered aimlessly but would likely follow established paths (Tesar 1980). Ancient indigenous pathways and trails were reused, maintained, and improved over extended periods of time (Trombold 1991); thus, many of these paths and trails may persist and are revealed on military and later survey maps such as the General Land Office Survey (GLOS) maps made of Florida in the early to mid-1800s. An example of these prominent trails in the area is the Fort King military road, which parallels present-day U.S. 301, and likely ran adjacent to the Lake Pasadena and Buddy Lake prehistoric settlement areas. Using environmental descriptions and township plat maps, these paths and trails can be digitized and shown with present-day locations (Figure 5.29). The scenario shows that bifurcating military roads came within close proximity to the Safety Harbor and later Seminole occupation areas near Lake Pasadena and Buddy Lake, and could explain the beads and other Spanish trade goods that have turned up in private collections from this area.
Figure 5.29. Military roads can be derived from General Land Office Maps to show present-day location. Shown here is the Lake Pasadena and Buddy Lake area of eastern Pasco County. Map produced by Barry Wharton.
There are four forts dating to the Second Seminole War located within the Big Hammock and the surrounding area: Fort Cross, Fort Annutteeliga, Fort Broom and Fort Dade near Lacoochee. Examination of General Land Office Survey Maps and military maps such as the Mackay and Blake map of 1839 (Figure 5.30) show Fort Cross to be located near present-day SR50 and the Suncoast Expressway. Additionally, Fort Annutteeliga is thought to be located near Stafford Lake, eight miles to the northwest of Brooksville in Hernando County (Wharton 1990, 2001). Fort Dade is located in the vicinity of Lacoochee just outside the Big Hammock and along the Withlacoochee River (Bell 2004). Fort Broom, named after a one-time Governor of Florida, is located near southeast of Dade City (Florida Master Site File 2006b). Local historians have indicated the site is on private property near Larkin Lake, but it is listed as general vicinity with the FMSF (Florida Master Site File 2006b). Several military camps and block houses, built to provide shelter for civilian settlers, are also likely located within the Big Hammock area.

There are a total of 101 FMSF listed European component sites in the Big Hammock area. These sites are dateable to the 18th through the 20th centuries with the majority being 19th and 20th century including three from the Spanish period that likely are Seminole sites. The European category makes up a large majority percentage of recorded sites, with 22.2 percent of all recorded site locations in the Big Hammock having this component.
Figure 5.30. Mackay and Blake Military Map of 1839 (above), with depiction of the Fort Cross location in the Big Hammock indicated and shown in closer detail in the enlarged image (below) (after Mackay and Blake 1839).
The largest cultural affiliation category of recorded sites in the Big Hammock is designated as prehistoric. The prehistoric category is used for site locations with and without ceramics being found, and is used by recorders when a cultural affiliation is not obvious or discernable. There are 220 prehistoric component sites recorded, or 48.5 percent of sites, within the Big Hammock. Another 23 sites, or 5.1 percent, have unknown or unspecified cultural affiliations. All FMSF recorded site cultural components in the Big Hammock and their percent of representation are presented in Table 5.4.

The National Register in the Big Hammock

National Register of Historic Places (NRHP) eligibility determination for recorded archaeological sites is performed by the archaeological surveyor and is determined by the State Historic Preservation Office and the Keeper of the National Register (King 1998:90). The surveyor consideration is not then, technically a formal determination, but often does stand as the only significance evaluation of the site. The

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SHPO often defers making any evaluation of significance unless deemed necessary from an impact, conflict or formal NRHP determination submission request. Surveyor recommendations are performed on nearly all sites, and offer the better assessment for significance determination, especially as it is rare for the SHPO to not concur with the surveyor recommendations when determinations are made. Categories of consideration include: National Register listed, eligible, potentially or likely eligible, ineligible, insufficient information, and no evaluation made. Selections of category choice are also provided to surveyors for more work recommended, preservation recommended, and for no further work recommended. These selections have been assigned to categories of likely, and potentially eligible for listing on the NRHP (Table 5.5).

SHPO review for the National Register is not as useful as the surveyor review. A large percentage of sites, both within the Big Hammock and statewide, are not evaluated by the SHPO for the National Register. When sites are evaluated by the SHPO, results from review of the Big Hammock area data indicate that there is a high degree of consistency between the field evaluation and the SHPO evaluation. Determinations were not made on site significance by the SHPO in many cases, with no evaluations on nearly

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57 percent of the archaeological sites recorded in the Big Hammock. The SHPO concurred with the field evaluation of ineligibility for listing on the National Register in all cases. When a SHPO significance determination for eligibility was actually made, there were only four instances when there was disagreement with the archaeological surveyor’s evaluation.

During a 2004 survey for the Ashley Groves Multiple Planned Unit Development (MPUD) Property, in Pasco County, a prehistoric lithic site, (8PA2140), was determined to be eligible for listing on the National Register by the surveyor (Austin 2004). The SHPO later determined the site was potentially eligible for listing, and not eligible outright, meaning that further archaeological work would be necessary to determine eligibility. This decision does not actually constitute a differing of opinion, with the SHPO recommendation of potentially eligible regarded by the Keeper of the NRHP as being actually eligible for the Register (King 1998:90).

In the second case of disagreement between the surveyor and the SHPO recommendation, a compliance archaeology project in Hernando County for a development project led to the discovery of a multiple component site with prehistoric and historic contexts. The site, 8HE271, was said by the archaeological surveyor to not have enough artifact density to be considered for listing on the National Register (ACI 2004). The SHPO determined that there was not enough information provided to render a decision in the case, with more work recommended.

The third case involved a possible Paleo-Indian and Early Archaic site that was discovered as part of a compliance project in Hernando County in 2005. The site, 8HE520, was recommended by the archaeological surveyor to be eligible for listing on
the National Register (Stokes 2005). The SHPO determined the site was potentially eligible for listing but not eligible outright for listing. Again, this decision does not actually constitute a reversal of recommendation, but requires more work to be conducted for a determination.

Lastly, the Canyon Swallow site, 8He247, does show a reversal in recommendation between surveyors and the SHPO. The site was originally recommended potentially eligible for the National Register during a Phase I assessment for the North Suncoast Expressway project (Wharton 1990). The site was large, covering nearly 150 plus acres in size, but had clusters of activity areas. One such area bordered a sink hole feature and was used in prehistoric times as a lithic procurement, but the overall site had multiple cultural components represented, extending through the 20th century (Wharton 1990). About 43 acres of the site were within the area of potential effect (APE) from the planned road corridor. Phase II investigators argued that the majority of the site lay outside the APE, and the portion within the corridor was less dense and did not demonstrate a potential to yield new research information (Almy et al. 1995:16-17).

The opinion of the original surveyor was reversed by the SHPO following the reevaluation study, with the site area within the corridor requiring no further investigation and cleared for impact. The SHPO did not concur with the surveyor’s determination and the site outside the impact corridor, and upheld the overall site recommendation. Canyon Swallow is now considered potentially eligible for listing on the National Register, and a recent field check revealed the property containing the majority of the site surrounding the sink hole has since been acquired by the Southwest Florida Water Management District.
There are no prehistoric sites in the Big Hammock that are actually listed in the National Register of Historic Places. Five potentially eligible sites as determined by the SHPO include three in Pasco County and two in Hernando County. Of these, one is in public ownership and the others are all on private lands and were discovered as part of compliance archaeological surveys for development or transportation impact projects. The sites include a Middle Archaic lithic scatter or quarry site (8PA2017), a prehistoric lithic site (8PA2140), a Late Archaic, multi-component site (8HE247), an historic 20th century site (8HE335) and a the possible Paleo-Indian site on the Gregg Mine tract near Brooksville.

These data show the importance of the archaeological surveyor determination in the significance process, with the decisions made in the field and by the investigators generally standing, in all but these exceptions, as the main line of evidence for site significance and therefore the potential for preservation or loss. The majority of archaeological sites in the Big Hammock have been determined to be ineligible for listing, largely using the previously discussed National Register Criterion D, research potential, in the recommendation (Figure 5.31).

In the next chapter, I illustrate the importance of other factors that serve to link archaeology to land use and environmental planning. This linkage is of vital importance to the future of archaeological preservation and conservation in Florida, where landscape change and loss of resources happens at a rapid pace. Part of this GAP audit process must also consider the unevenness of the archaeological record across regions. For this, I will examine issues such as level of survey conducted in order to better target areas for future survey and conservation priority. Environmental acquisition priorities in Florida are well-
Figure 5.31. FMSF locations of archaeological sites in the Big Hammock area with National Register Ineligible determinations made by the archaeological surveyor (n=195).
developed and archaeology must move toward a more inclusive evaluation process for archaeological acquisition prioritization, or archaeology will be perceived as a secondary and separate consideration.
Chapter 6. The Need for a Basic Inventory Understanding

“Archaeologists are no longer simply doing research on an accelerated schedule in advance of a construction project; now they are making crucial, selective decisions on behalf of the whole discipline about what will and will not be preserved, and what will or will not be salvaged” (King and Lyneis 1978:877).

Targeting Future Preservation Goals

In the above quote by King and Lyneis, it is implied that archaeologists are active participants in selective preservation planning and that they are aware that decisions they make can have impacts on what is preserved or not preserved. Although planning for preservation is happening in archaeology, it often occurs differentially with disparity between research, academics, policy planners, and cultural resource management dimensions. Often decisions that are made in the field by project archaeologists concerning sampling strategies and significance determinations have critical implications for future land use and management decisions. These determinations are made in isolation from other sources of input and other voices of inclusion, and can overlook social, aesthetic, community, economic, and environmental values, which all could strengthen significance determination and lead to stronger sustainable planning for cultural resource protection and more active participation from a variety of stakeholders (Clark 2005:328).
Differences in Archaeological Survey and Discovery

The level of archaeological survey conducted can be influential to the significance determinations made by the investigator (Darvill 2005; Hardin 2002). A Phase I shovel testing survey, for example, may miss features and ephemeral phenomena that might be detected through different methodologies or survey intensity. For this reason, it is important to consider the number, types, and location of surveys in the Big Hammock.

A total of 109 archaeological surveys have been conducted in the Big Hammock. Of these, 43, or 39.5 percent, were performed for compliance review of mixed use housing and large-scale regional developments. Another 28 cultural surveys, or 26 percent of projects, were conducted in response to proposed road impacts. Infrastructure projects such as gas, water, and sewer services accounted for another 13, or 12 percent of cultural surveys conducted. There were a total of 10 cell tower and communication projects comprising nine percent of the total surveys. Cell tower surveys are depicted as circular in dimension, as they are often concerned with viewshed impacts to historical resources and are required to perform an impact buffer analysis from the proposed location (Florida Master Site File 2006a). Projects for the mining of peat and limerock resources accounted for 4.5 percent, with five surveys conducted. Mining surveys examine the area of proposed impact and often include an on-site monitor to watch for unanticipated impacts during the mining process. Five surveys were also performed for historical and architectural planning purposes, and five conducted for modeling, predictability, and research projects representing 4.5 percent each of the total archaeological surveys in the Big Hammock.
These survey category percentages in the Big Hammock region illustrate that most surveys are Phase I, or cursory in nature. Methodologies used on these surveys consist primarily of shovel testing to one meter in depth. Impacts are considered largely on a site by site basis, with little to no emphasis on synthetic approaches that examine research questions, which should be driven by well-developed historic contexts. When viewing the spatial extent of the surveys as provided in the GIS datalayer with the FMSF (see Figure 4.9), the caveat must be given that these extents are often of the project property area and does not necessarily constitute complete archaeological survey coverage. The differences in level of survey across space also means that large areas considered as surveyed in the FMSF records, have in reality received little to no scrutiny or field testing.

**Comparison of the Big Hammock Archaeological Surveys to Statewide Data**

In Cultural Resource Management (CRM) in the United States, decisions are made daily, through the process of significance determination, about what kinds and types of sites get preserved, and what is allowed to be destroyed. Often, these assessments of significance are made based on insufficient evidence or inaccurate criteria, with archaeologists choosing to examine the material content of sites rather than the behavior that went into the making of the archaeological site (Tainter and Bagley 2005:63). The level of archaeological inquiry and survey can also directly impact this determination assessment, and has led to a perceptible division between compliance-based archaeological work and research driven academic archaeology.
A comparison of the previously discussed level of survey in the Big Hammock to that occurring statewide will help in the assessment of whether unevenness in the archaeological record is localized or wide-ranging. There have been 9,148 professional surveys conducted statewide as reported in the October 2006 GIS database for Field Surveys (Florida Master Site File 2006b). Reasons for the surveys range from compliance archaeology to academic research, with these differing levels of survey affording different results, especially in regard to significance determinations. Statewide there are 26,932 archaeological sites recorded in the FMSF, with 302 in the Big Hammock area (Florida Master Site File 2006b). The number of National Register recorded sites statewide is much less than the thousands of sites recorded overall. Including historic structures and sites with archaeological sites, there are 1,492 sites listed on the National Register. This number includes 104 archaeological sites with the remainder comprised of historic structures or sites (Florida Master Site File 2006b). There are no National Register archaeological sites recorded in the Big Hammock.

Of the 26,932 sites listed on the FMSF statewide, 19,032 have not been evaluated for National Register eligibility by the SHPO. Further examination shows 6,475 have been determined at the SHPO level as ineligible for listing, with 1,282 having insufficient information for determination and another 1,025 being deemed eligible for listing according to the SHPO (Florida Master Site File 2006b). The typing and consideration of site eligibility for the National Register is largely subjective and can vary from region to region. In the Big Hammock, eligibility recommendations by the surveyors are similar to statewide SHPO trends noted, with the majority of sites found ineligible for the National Register. In other counties, where the level of survey differs from the Big Hammock,
with surveys conducted for conservation land purchase or for large-scale research and modeling, regional differences are reflected in the surveyor and SHPO recommendations and evaluations. For example, Collier County has had a number of archaeological surveys conducted in support of land acquisition and cultural resource planning at a regional level. In this area, there are 663 recorded archaeological sites, with 336 being recommended by the surveyors as eligible for NRHP listing (Florida Master Site File 2006b). In this region, high preservation quality and obvious site expression in the form of mounds and middens, has made the use of Criterion D less subjective for surveyors (Robert Carr, personal communication, 2006).

**Linking Land Use and Archaeology**

In the examination of what kinds and types of archaeology are being protected and preserved for future research and appreciation, we cannot stop at just examining current conditions of protection such as is afforded by public land holdings and present open space such as agricultural land designation. Land use changes and so we must also consider the security of resources where existing conservation lands do not adequately protect or reflect the archaeological diversity of a region. By linking land use and the archaeological resource record, as is done in other resource protection planning (Kautz and Cox 2001), we can begin to identify areas on private lands that could best satisfy and enhance an archaeological preservation strategy.

Conservation lands in the Big Hammock are disproportionately located in the northern half of the region, with land acquisition targeting the Annutteliga Hammock in Hernando and Citrus counties. Here, the focus of preservation strategies has related to
ground water protection and recharge (SWFWMD 1992). The southern portion of the Big Hammock, and all of the portion of the Big Hammock that lies within Pasco County, is devoid of any current public land holdings.

There are a total of 19 recorded archaeological sites that are located on the 17,010 acres of conservation lands in the Big Hammock area (Figure 6.1)(Appendix D). Further analysis of these protected sites show there are 40 functional components recorded at this site locations, ranging from historic refuse, towns, farmsteads and homesteads, to prehistoric lithic and artifact scatters. There are 15 functional categories, or 38 percent, that relate to 19th and 20th century historic homestead and refuse and town sites on conservation lands. Another 40 percent of site functional categories relate to prehistoric sites, with 16 categories relating to raw material procurement sites, lithic and artifact scatters, and habitation sites. An additional eight functional components are listed as unknown, unspecified or other and one site is listed as a specialized rock shelter or cave site.

Culture affiliation representation on conservation lands includes 37 recorded temporal ranges. The majority of the cultural affiliations relate to historic 19th and 20th century sites, with 62 percent of sites on conservation lands relating to this era. Nine recorded archaeological sites are listed simply as prehistoric, with only one site relating specifically to the Middle Archaic period. Four other sites are listed in the FMSF as unspecified or indeterminate cultural affiliation.

Comparison of the cultural and temporal affiliations and functional site types that are represented on conservation lands with the diversity of site types and cultural affiliations found within the Big Hammock, show many areas of preservation gaps in
Figure 6.1. FMSF recorded archaeological sites on conservation lands in the Big Hammock (n=19).
relation to the archaeological record (Table 6.1). Additionally, sensitive archaeological features, such as canoe locations, sand mounds, and burial mounds, all remain on private lands. Field investigation should be conducted on conservation lands where sites are listed only as prehistoric or functional determination has not been provided. Some sites listed as historic could also relate to Seminole occupation in the Big Hammock, however, site representation is still lacking even assuming this incorrect assignment to be a possibility. Conservation lands are restricted to the northern half of the Big Hammock, with consideration only given to one of three hammock bodies comprising the overall physiographical unit. The Pasco County portion of the Big Hammock, with its diverse range of Safety Harbor and European-contact period sites, burial and sand mounds, lithic quarries, procurement sites, habitation areas, and scatters remains unrepresented and unprotected, with all of its cultural resources contained on private land holdings.

Table 6.1. Big Hammock recorded functional site types and percentages compared to those on conservation lands in the Big Hammock.

<table>
<thead>
<tr>
<th>Site Type</th>
<th>Big Hammock Number</th>
<th>Pct. Conservation Lands</th>
<th>Pct. Functional Site Types Preserved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artifact Scatters</td>
<td>64</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Lithic Scatters</td>
<td>105</td>
<td>28</td>
<td>6</td>
</tr>
<tr>
<td>Prehistoric Quarries</td>
<td>10</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Canoe</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Mounds</td>
<td>7</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Campsites</td>
<td>100</td>
<td>27</td>
<td>0</td>
</tr>
<tr>
<td>Prehistoric Habitation</td>
<td>19</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>16</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Unspecified/Unknown</td>
<td>9</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Historic</td>
<td>42</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Totals:</td>
<td>373</td>
<td>100.0</td>
<td>40</td>
</tr>
</tbody>
</table>
The Pasco County sub area portion of the Big Hammock contains 150 recorded archaeological site locations, but each site can fall within different stewardship categories based on boundary determinations. This sub area has a low stewardship value for a majority of the recorded archaeological site locations, with 138 or 43 percent, occurring on stewardship levels five lands. These categories of lands afford little to no long term protection strategy or acquisition potential as measured by the Florida Natural Areas Inventory. The FNAI provides the primary scientific support for the Florida Forever program in determining land acquisition priorities (Florida Natural Areas Inventory 2007). Another 93 recorded site locations, or 37 percent, fall on lands with no stewardship potential as indicated by the FNAI GIS data. There are 17 site locations with a level four stewardship value, representing seven percent of the recorded site locations in the Pasco County portion of the Big Hammock with this medium stewardship and acquisition potential.

The disparity that exists between lands deemed of value for natural habitat and corridor function as seen by the FNAI, and those of importance for cultural resource protection reasons is crucial to understand. The FNAI assessments of land resources are used in Florida Forever acquisition prioritization. In the Big Hammock, I found lands currently in private holding with little to no chance of acquisition based on FNAI targets and stewardship mapping, were the lands that often held the highest archaeological potential based on recorded site locations. Cultural resources are considered in FNAI decision support, but after single resource ranking is performed for all natural resource evaluative areas (Knight and Oetting 2005). A separate consideration is then done for cultural resources, performed by the Florida Division of Historical Resources because the
ranking criteria used for archaeological sites are subjective and not easily examined by non-archaeologists. Archaeological resource potential is also viewed in terms of proposed Florida Forever project areas, rather than proactively considering gaps in the conservation of the resource and targeting areas of priority for archaeological resource protection.

Another problem lies in the assumption of protection based on present land use. For example, a large percentage of land in the Pasco County portion of the Big Hammock falls under the agriculture land use category, which has been viewed by county planners and policy makers as affording a high degree of protection for resources contained on those lands (Pasco County 2006a). The Pasco County Environmental Lands Program differentiates between land that should be acquired in its Environmental Planning Unit analysis, and land that is in agriculture holdings and therefore viewed as potentially protected. When these areas are examined in conjunction with current development plans, another picture emerges, showing that crop and pasturelands are being converted to large-scale residential development. There are 11,342 acres that have been converted from crop and pasturelands to residential in Pasco County (Pasco County 2006b), and 9,794 acres are large-scale MPUD and DRI areas. These converted land areas contain 90 recorded archaeological sites totaling 281 acres of cultural resource locations (Florida Master Site File 2006b)(Figure 6.2). Unlike Hernando County, the Pasco County Environmental Lands Program does not use cultural resources as a measure of acquisition potential (Pasco County 2006a). The acquisition plan also fails to consider the rapid rate of agricultural land conversion, which cannot be relied upon as an effective stewardship mechanism for natural or cultural resource protection (Figure 6.3 and Figure 6.4).
Figure 6.2. Pasco County Environmental Lands Program map showing areas delineated for protection strategy development (EPU) and those thought to be protected in agricultural holdings. MPUD and DRI developments are overlain to depict the conversion of agricultural lands to residential property in this area.
Figure 6.3. Signs advertising the conversion of agriculture lands to residential use in eastern Pasco County.

Figure 6.4. Multiple Planned Use Developments (MPUDs) arise from previous pasturelands and orange groves, converting agricultural land use into residential development in eastern Pasco County.
Cropland and pasture land has historically provided a degree of protection for both cultural and natural resources, with large acreage areas in the Big Hammock comprised of land used for tree crops and cattle grazing. Recent land use trends are changing in the Big Hammock, as they are elsewhere in Florida, with agricultural lands being converted to residential areas. Crop and pasturelands are being converted to residential use at a rate of 11,934 acres between 1995 and 2004 (Figure 6.5 and 6.6). In 1995, the total crop and pastureland area in the Big Hammock was 72,395 acres, or 31 percent of the 233,477 acres in this area. In the 2004 land use data, that number had decreased to 60,461 acres or 26 percent of the overall land use. The majority of this conversion however, has occurred in the Pasco County sub area of the Big Hammock. Here more than 7,500 acres, or 63 percent of the agricultural to residential conversion in the Big Hammock has occurred. Examining the 2004 land use data, there are 195 recorded archaeological sites located on this land type within the Big Hammock area, and 114 of those site locations are in the Pasco County sub area (Figure 6.7).

**Archaeological Sensitivity Mapping in a Sub area**

I have chosen the Pasco County portion of the Big Hammock as a sub area to examine in greater detail based on the demonstrated factors of impending threats from land use conversion, the lack of conservation lands, the lack of representation of cultural resources in stewardship protection areas, and the rich diversity and range of functional site types and cultural affiliations which occur in this area. The sub area contains 150 recorded archaeological sites, but private collections I have documented from this area indicate the potential for many more unrecorded site locations. Additionally, FMSF
Figure 6.5. Cropland and Pasture land use in the Big Hammock in 1995, totaling 72,395 acres.
Figure 6.6. Cropland and Pasture land use in the Big Hammock in 2004, totaling 60,461 acres.
Figure 6.7. FMSF recorded archaeological site locations on cropland and pasture land use in the Big Hammock in 2004, totaling 195 sites.
recordings may not be reflective of the size and extent of archaeological site resources in this area, when private, albeit unprovenienced collections are examined. The recorded site locations in the FMSF may also represent biased differential survey by archaeologists, especially since the majority of surveys are conducted for compliance reasons in this area. Areas in the Big Hammock showing an absence of site locations more likely reflects an absence of surveys conducted. For this reason, I have used predictive model factors previously developed by CRM and academic researchers for this region (Austin et al. 1991; Austin et al. 2001; Horvath 1986; Jones 1981; Wharton 1984; Wharton 1990; Weisman and Collins 2004), and have applied these factors to the sub area. I have relied on known site location associative environmental variables from these previous works, and depicted areas where the current understanding of cultural resources is undervalued when based on the FMSF data.

As previously discussed, a fully-developed predictive model for archaeology is beyond the scope of this dissertation, which focuses on a GAP audit application for Florida archaeology. However, a simplistic Boolean model, using non-weighted known environmental variables of archaeological association is presented for the chosen sub area of the Big Hammock to show how models could be applied and developed for predictive purposes. My example model uses Boolean operations, meaning I have combined a series of input map layers into a single output layer through the use of ‘and’, ‘or’, and ‘not’ operators (Worboys 1997). Although this model is not sophisticated, I have utilized known environmental associative variables in the Central Florida area have been examined in previous research (Austin 1991; Austin 2000; Austin et al. 2001; Horvath
1986; Jones 1981; Wharton 1984), and are shown in this example for how a more robust model could be developed and refined in the future to correspond with a GAP study.

Examination of environmental factors such as soil and drainage characteristics, proximity to water and wetland resources, proximity to exposed chert and coral outcrop areas, and relative elevation were all examined using equal variable weighting. Chert and coral outcrop location data is not readily available, so Pasco County data locating water streams and sources was used, as this was found during field-truthing of site locales by the author to be a proxy for karstic-like areas that often have exposed limestone chert and coral areas in this region. These factors were then used to produce a simplified model of archaeological site sensitivity area, or an area where archaeological site locations are likely to be encountered. This type of associative modeling has proven useful in other regional testing strategies in Florida, and has been ground truth verified for effectiveness in predicting archaeological site locations (Austin et al. 1991; Austin et al. 2001; East 1999; Horvath 1986; Jones 1981; Weisman and Collins 2004).

The sensitivity maps produced utilized existing known environmental associative data such as types of soil, topography and elevation, and proximity to water, in relation to the recorded archaeological data from the FMSF. A cartographic model, depicting the steps in the GIS analysis procedure was created (Figure 6.8). The geoprocessing and overlay of these data layers allowed for the creation of sensitivity maps, which were produced to show areas of archaeological potential, and to demonstrate how sensitivity mapping can augment and strengthen GAP audit approaches.

The landcover of the past often is different than present-day conditions, but it is important to consider current environmental conditions in relation to archaeology for
Figure 6.8. Cartographic model for archaeological sensitivity mapping using existing frames of reference for environmental associations with archaeology in the Big Hammock sub area of Pasco County.

GAP analyses. Present and future land use, and knowing where archaeological sites are in relation to particular types of land use, such as grassland and pasture for example, is an important management consideration. Land cover mapping in the State of Florida has been performed using LANDSAT thematic mapping techniques, basically assigning values to color signatures that are evidenced by different vegetation classes seen in satellite imagery. This analysis was conducted by the Florida Fish and Wildlife Conservation Commission to verify plant habitat communities of importance to wildlife.
species (Gilbert 1998). There are 22 different plant classifications including upland, wetland, aquatic and disturbed communities. Using the land cover data clipped to the extent of the Big Hammock, an analysis was performed intersecting the archaeological site location data with the land cover values. This analysis shows that the 406 acres containing archaeological locations are found on grassland and pasture settings, which are an agricultural land use, and more than 211 acres of archaeological site locations in Pasco County occur on cleared agricultural lands. Another 78 acres of archaeological sites are found on former pineland and commercial tree planting areas. Archaeological site area calculations for the Pasco County Big Hammock area combine to total more than 882 acres, with nearly 79 percent of recorded site areas associated with agricultural lands (Figure 6.9). This factor, while not a predictor of where sites are likely located, is important for stewardship and future land use planning in regard to cultural resource protection.

Soils and soil drainage characteristics are useful in examining archaeological site location choices. Well-drained soils, today often associated with agricultural lands in the Big Hammock area, were important to prehistoric settlement pattern choice in this region as well (Austin et al. 2001; Horvath 1986; Jones 1981; Weisman and Collins 2004; Wharton and Dooris 1987).

In the Pasco County portion of the Big Hammock, a GIS analysis of soil types intersected with archaeological site locations show the dominant typologies to be Pomona fine sand (200 acres associated with recorded archaeological site locations), Sparr fine sand 0-5 percent slopes (154 acres), Millhopper fine sand 0-5 percent slopes (127 acres),
Figure 6.9. Agricultural land cover shown in association with recorded archaeological site locations in the sub area Pasco County portion of the Big Hammock.
and Kendrick fine sand 0-5 percent slopes (79 acres). The model provided for the sub area does not attempt to determine the strength of this association, and more rigorous analysis would be required to develop a region specific predictive model. These associations are pointed out using the intersect of the FMSF data with environmental data, and discussions of regional archaeological and environmental associations from archaeological survey have been used as a proxy for further verification. It should also be noted that, as with land cover types, areas of archaeological site locations can have more than one soil type association. These four soil typologies compose 63.5 percent of archaeological soil types for recorded locations in the Pasco portion of the Big Hammock (Figure 6.10).

The presence of permanent or semi-permanent (non-ephemeral) sources of water are known to be a settlement pattern factor in regional site location models, with a 200 meter distance often used in archaeological predictability modeling (Austin et al. 1991; Austin et al. 2001; Horvath 1986; Jones 1981; Weisman and Collins 2004). Stream locations in this portion of the Big Hammock sub area were found during field reconnaissance to highly correspond with karst features and areas where chert and coral outcroppings frequently occurred. Stream locations are considered in the final sub area archaeological sensitivity model, as are non-ephemeral water sources, which were distinguished from stream locales and consist primarily of lakes and ponds (Figure 6.11).

Elevation has been found to be another known predictor of archaeological site location. Both soil type and elevation are related to water drainage, with better drained soils located on sloping land elevated above surrounding areas found to be better suited
Figure 6.10. Dominant soil typologies associated with recorded archaeological site locations in the Pasco County sub area of the Big Hammock.
Figure 6.11. FMSF recorded archaeological site locations in the Pasco County sub area of the Big Hammock that are found within 100 meters of a non-ephemeral, or permanent, water sources, including stream location proxy data for karst expression, located on hilltops, ridges and knolls (Wharton 1984:78).
for prehistoric habitation (Almy 1976, 1978; Austin et al. 2001:51; Tesar 1980; Wharton 1984:72). Researchers in this region have also found that a large proportion of sites are archaeologically sensitive. Site locations can cover more than one elevation. Examining elevations in the sub area Pasco County portion that were greater than 75 feet amsl, it was determined that 468 site loci ranged from 180 to 240 feet amsl (Figure 6.12).

These sensitivity areas are combined to provide a map depicting areas of archaeological sensitivity for this sub area (Figure 6.13). Examination of areas was then compared with the land use parcel data layer information from the Pasco County Property Appraiser. Parcel examination of land use was conducted to investigate the feasibility for land acquisition from areas with similar land use designation. Market valuation in this portion of Pasco County is much higher than the assessed values, especially for agricultural lands, but this consideration demonstrates how cultural resources can be examined using similar conservation strategies employed in other resource acquisition modeling development (Knight and Oetting 2005; Knight 2007; Weisman 1994). The examination of land use in conjunction with the archaeological sensitivity mapping, show that this entire area constitutes a conservation gap, as no public land holdings exist. However, examination of the sensitivity map in conjunction with property parcel data from high archaeological value areas provides a way of operationalization landscape and cultural valuation, linking land use planning to archaeology (Figure 6.14).

Further examination at the sub area level in the Pasco County portion of the Big Hammock using land use data, shows the importance of agricultural land stewardship and conservation to preservation planning. The total land acreage in the sub area is 101,263
Figure 6.12. Elevation (180m – 240m) shown in association with recorded archaeological site locations in the Pasco County sub area of the Big Hammock.
Figure 6.13. Areas of archaeological sensitivity overlay shown for the Pasco County sub area of the Big Hammock.
Figure 6.14. Land use data combined with the archaeological sensitivity area of Pasco County.
acres, of which 66,204 acres are designated as agricultural lands, representing 65.4 percent of the land acreage in this portion of the Big Hammock. Within this sub area agricultural land portion, there are 9,794 acres of proposed and existing Multiple Planned Unit Developments and Developments of Regional Impact, represented by 17 MPUDs and four DRIs (Pasco County 2006b). A small portion of the sub area, consisting of 8,725 acres, has been targeted as environmentally sensitive by the Pasco County Environmental Lands program planners, but this land has not been acquired (Pasco County 2006a). Using the latest available planning data from the Tampa Bay Regional Planning Council, this targeted area of future acquisition already has 1,822 acres, or nearly 21 percent of the targeted acquisition properties that have been consumed by Multiple Planned Unit Developments (Pasco County 2006b)(Figure 6.15). Conversion of agricultural lands to residential areas is therefore outpacing any efforts of land acquisition in this portion of the Big Hammock.

Discussion of Results

The Big Hammock is a region that is not accurately described by the current archaeological historic contexts. These contexts, which are overviews of prehistory that inform research questions, show a boundary between two archaeological culture regions that divide the hammock in two sections (see Figure 2.2), neither of which captures the diversity nor range of archaeology or the similarity of the environmental setting that exists. The area is of critical concern to land and resource managers due to rapid development pressures and fragmentation of the hammock system (Dooris et al. 1999; Wharton 1990). Archaeologists have previously called for the need to identify significant
Figure 6.15. Agricultural lands in the Big Hammock Pasco County sub area are shown in relation to large-scale developments.
sites and important resources in areas facing rapid development and other pressures, ideally before acquisition and preservation become too costly to consider. These identified needs should be guided by informed, context-driven strategies, using the Florida Comprehensive Historic Preservation Plan for direction (Weisman 1994; Wisenbaker 2006).

In my GAP analysis of the Big Hammock area, I have shown how the archaeology of the region is not represented in current public land holdings, constituting a conservation gap. To perform this analysis, it was necessary to use recorded archaeological site location information to assess the potential for kinds and types of sites and temporal and cultural affiliations that were likely to exist in the area. The majority of functional site types in the Big Hammock are lithic scatters and campsites, together accounting for 55 percent of the site types recognized and recorded by archaeologists. Problems with bias and interpretation error could be a cause for over-representation of these types of sites in the FMSF data. Under-representation of site types such as lithic quarries and prehistoric habitation sites are also likely, given the level of survey, which was found to predominately be Phase I shovel testing. Shovel testing may not be able to distinguish the kinds and types of sites that are likely to occur in the Big Hammock area. In particular, research in the Big Hammock conducted by the author and affiliates of the Big Hammock Archaeological Foundation, has demonstrated that temporally older sites and extractive resource sites may be deeply buried and not encountered using standard field testing methodologies (John Foss, personal communication, 2000) (Goodyear et al.
1983). Documentation of private collections, although from uncontrolled and unprovenienced settings, reflects a wider diversity and density of archaeology in this region.

Temporally, sites range from Paleo-Indian to the Historic era (see Table 5.4). Undifferentiated prehistoric component sites compose nearly half of those sites recorded in the Big Hammock, with another 22 percent of sites recorded as European period. The FMSF undifferentiated prehistoric component site category is commonly a large, with recorders often unable to distinguish between cultural affiliations when finds are not diagnostic of a temporal period. The predominance of the Euro-American category sites in the Big Hammock is suggestive of a bias in the archaeological recorder’s ability to locate and document 18th through 20th Century sites more easily than many types of prehistoric component sites. There are a large amount of recorded Archaic period sites in the Big Hammock, with 19.6 percent of recorded cultural affiliations assigned to this period. Several factors could play a role in these numbers, including that there are a large percentage of Archaic sites in the Big Hammock area in correspondence to chert and coral outcrops common to the region and that archaeologists are likely better at assigning a time period with the specific types of diagnostic lithic tools that are differentially preserved in the material culture record.

Taken together, a review of the spatial, temporal, and functional site recording within the Big Hammock is important in the analysis not only of the archaeology of the region, but in the critique of survey methods and documentation procedures that exist in Florida archaeology. Examination of the record in relation to eligibility determination for listing on the National Register of Historic Places speaks to the effectiveness of
significance determination in the Big Hammock region and can be used in cross comparison to other regions and to the entire Florida record. Trends noted in the Big Hammock that were also consistent statewide were the importance of the field determination, with the SHPO not concurring with the field determination in only a small percentage of cases (see Table 5.5). In most instances (57 percent), the SHPO makes no determination of significance and the field determination stands as the only level of scrutiny for significance, which can often be equated with preservation versus destruction of archaeological sites (Miller 2002). Those same trends in SHPO concurrence and no determination were upheld in examination of the statewide archaeological data, with exceptions noted in counties such as Collier, where there are many more large-scale archaeological surveys conducted for purposes of research and acquisition assessment, as opposed to Phase I and II cultural compliance surveys (Florida Master Site File 2006b).

After synthesizing a complete picture of the archaeological possibilities in the Big Hammock, the record was reviewed in terms of conservation land holdings and stewardship. Stewardship mapping is a critical component in the understanding of conservation gaps, as it takes into account potential for acquisition, current ownership and land use factors in relation to the resource being considered (Knight and Oetting 2005; Knight 1998; Lynott and Wylie 2000). In the Big Hammock, there are 302 archaeological sites recorded in the Florida Master Site File. The Hammock covers 233,477 acres in a three county area, with 17,010 acres in public land holdings. All of these publicly owned and managed lands are located in the northern half of the Big Hammock area, with the Pasco County portion lacking any preservation planning
strategies for natural resource acquisition. All areas of identified acquisition targets in Pasco County lie outside the defined Big Hammock area (Pasco County 2006a).

The FMSF data, although problematic in terms of recorder error and bias, is the best record of data we have on spatial location of cultural resources in Florida. Using this data in conjunction with the location of conservation lands, we can assess the effectiveness of conservation land purchases for preserving and reflecting the archaeological value of a region. In the Big Hammock, it was found that less than 11 percent of the ranges of site types known in the region are located on public lands. Additionally, it is important to note that no NRHP listed sites are located on public lands in the Big Hammock. There are five sites in the Big Hammock that are potentially eligible for the NRHP, with only one protected on public lands. Only 19 out of 302 recorded site locations are found on public lands, showing the need for working with private landowners in the promotion and protection of cultural resources in the Big Hammock area.

When consideration is given to stewardship and land acquisition priorities, 77.5 percent of land area in the Big Hammock is designated in the lowest potential categories for acquisition based on the use of data provided to the Florida Forever program for acquisition priority development (Florida Natural Areas Inventory 2007)(see Table 5.2 and Figure 5.4). The Big Hammock area, especially the Pasco County portion, is facing rapid developmental pressure as indicated by the number of DRIs and MPUD projects occurring (Pasco County 2006a, b). Land use changes, especially agricultural land conversions to residential designations, are occurring with development and urban sprawl encroachment from Tampa and bordering Hillsborough County. Current strategies for
land preservation at the county level do not include cultural resource consideration; however, there is a compliance program that requires archaeology to be considered for county permitting of smaller scale development. Ultimately, this development project by project focus leads to archaeological sites perhaps being recorded, but not preserved.

In my GAP analysis, I found that agricultural land holdings in the Big Hammock were critical to archaeology, with nearly 65 percent of the recorded sites in the Big Hammock found on agriculture crop and pasturelands. In the Pasco County portion of the Big Hammock alone, there are 114 site locations on this current land use. Stewardship and linking our archaeological understanding and evaluation to land use is of vital importance for agricultural land categories, as these lands are rapidly disappearing, with a 63 percent conversion rate to residential land over the last decade seen in the Pasco County portion of the Big Hammock. Agricultural lands are often purposefully overlooked in land acquisition prioritization (Pasco County 2006a), with planners sometimes not looking at the long range land use changes that can occur and the impacts that are cumulative to an area’s resources (Fischel 1982; Maehr and Cox 1995). Yet, the reality is that every year, nearly 150,000 acres of Florida farmland is developed into new subdivisions and strip malls (Conservation Trust for Florida 2007).

Using methodologies such as sensitivity mapping for archaeological resources, which can be further enhanced and strengthened using statistical consideration and regression analysis in more developed and specific GIS predictive models for regions, we can examine where sites are or are likely to occur in relation to land use designations. These models, combined with a GAP audit for archaeology, will in the future of Florida archaeology, prove useful at more effectively targeting acquisition and incentive
programs such as conservation easements, tax credits, and the purchasing of development rights. In this way, archaeological land acquisition is not just as an added value on environmentally desirable lands, but is intentionally targeting landscape areas that are primarily of archaeological value but likely have a variety of environmental and natural resource value functions. The approach presented in this dissertation, of a GAP audit analysis of Florida archaeology as applied to a case study area, shows how knowing what and where resources are in relation to land use is an important first step in the process of preservation.
Chapter 7. Conclusions and Future Research

“While it will always be true that archaeologists need to communicate among themselves, it is now abundantly clear that unless they also communicate effectively with the general public...all else will be wasted effort” (Jameson 1997:9).

The Conservation Big Picture

As Jameson states in the opening quote, archaeologists cannot work in isolation if they wish their work to be relevant. What archaeologists do is only beneficial and worthwhile if they can communicate to a larger audience including other resource managers and planners. Detailed information concerning the temporal and cultural affiliation, site functional type and associated environmental variables in combination with information relating to landscape stewardship can help to prioritize and conserve cultural resources. We can determine the extent of threat in different places and use available data that link land use planning to cultural resource protection, so that we can better direct conservation strategies. Land acquisition programs in Florida do sometimes include cultural resources in evaluation schemes, but archaeology is often viewed as an added value benefit with modeling and proactive approaches to planning conducted primarily for water, wildlife and environmental protection (Knight and Oetting 2005; Weisman 1994; Wisenbaker 2006). By conducting a cultural resource GAP analysis at local and regional levels across Florida, we can improve historic context development, which serves as the foundation for significance determinations and National Register
eligibility. Knowing what resources are represented in the current mix of conservation lands as they relate to landscape areas of defined critical concern will help us better plan for conservation and will bring archaeology into the same resource evaluation matrix as other resource management planning in Florida. Conservation strategies can then be targeted for different types of archaeological sites, examining aspects of representation and diversity of archaeology on public and private lands across areas of interest. Understanding where the lack of representation and diversity of site types and cultural affiliations exist will assist with understanding the gaps in our cultural heritage protection strategy. This knowledge will enable us to target acquisitions to better include needed archaeological site acquisitions as part of a larger mix of resource management.

Stewardship is needed across boundaries, with counties, local governments, and regional entities working together in an integrated ecosystems management approach (Grumbine 1994; Jochim 1990:75; Knight 1998; Moran 1990:6), which includes archaeology as part of the land acquisition and management plan.

**Planning for Preservation**

Why should we care about archaeological diversity and developing better historic contexts? What benefits come from having diversity preserved? We need to have a framework in place to guide our decisions. This framework is the historic contexts, which now must include spatial and environmental dynamics at a variety of scales to be useful to more than archaeologists. We need a tool that can be utilized by other resource
management planners to examine archaeology in terms of stewardship and land use across regions.

The GAP analysis presented in this dissertation, which includes land use and stewardship information, is for one region that is facing critical pressure. Statewide considerations, along with other scales of analysis, are needed to dovetail with growth and management plans at local, regional, and state levels. Major weaknesses exist to the current historic contexts that should be the planning tool for archaeological understanding, research questions, and significance determinations. A lack of integrative spatial information in historic contexts and developed priorities leads to the inability of these data to be useful to anyone outside of archaeology. We need a clear and concise planning policy framework that inventories the current state of Florida archaeology. These regional frameworks must be updated at established intervals, due to the changing nature of our understanding of the archaeological record, and new availability of data on the number and types of resources discovered and encountered. Additionally, we must link the archaeological understanding to land management principles with integration of land use data with the archaeological record to better understand what resources are being lost and what resources are being protected. In this way we can target and prioritize acquisition and protection strategies and provide more quantitative consistency to better work with regional policy planners and land resource managers to foster a land ethic that is inclusive of archaeology.

A GAP audit, including a stewardship analysis as presented here for the Big Hammock area of Citrus, Hernando and Pasco County, can be implemented across a variety of scales. This ability to move between scales of analysis reduces the dependence
on boundary delineation in Florida archaeology and the subjectivity involved
archaeological significance determination. Boundaries, scale dependence, and
significance determination issues, shown in Chapter 2 as being problematic in Florida
archaeology, would to a large extent be mitigated against through the use of a GAP
analysis. Boundaries could be examined in terms of the research questions asked, the
management plans examined, and by the political jurisdiction that exists. All of these
ways of considering the archaeological record would then better reflect an applied setting
that could bring archaeology into the realm of other resource management and acquisition
strategies.

A landscape scale study approach, as presented here for one case study area, helps
to tell the story of an area by examining broader perspectives in human settlement and
activity (Fisher et al. 2005). This ability to examine the landscape, allows for variability
in not only the spatial scale, but in temporal scale. This variability is important, as
landscapes can be constructed to mean different things to different people through time
and across space (Ashmore and Knapp 1999; Bender 1993; Deetz 1990; Mitchell 2002).
Landscapes can also reflect a persistence of place, with consistency in use or occupation
of an area through time (Schlanger 1992:92). This landscape type approach that links
land use to the archaeological record, was applied to the Big Hammock region in Florida,
but could have applications anywhere for archaeological research, and provides a
framework for operationalizing landscape theory.

This type of analysis can also assist with evaluating archaeological acquisitions
in terms of how well they represent the archaeological contexts identified in the Florida
Comprehensive Historic Preservation Plan (Weisman 1994). This analysis can also
evaluate the level of protection for archaeological resources in terms of where land use and landscape changes are occurring and where archaeological sites are found or are likely to be found. We can examine which contexts or areas can most benefit from acquisition or management planning strategies.

Preservation of the past is important because the past holds learning experiences for the present. For example, issues such as environmental sustainability, development impacts, population, overuse of resources, and the consequences of human action might only be reflected upon and addressed through an understanding of the past. Archaeology is one part, one resource of consideration, of what I propose in this dissertation to be an integrative approach to land acquisition strategies in Florida. Through the active participation of archaeology with other land management strategies in a way that is understood and inclusive, not only will there be benefits to cultural resource preservation, interpretation, and education, but Florida’s land preservation programs will be strengthened and more reflective of the past. In a state such as Florida facing escalating growth and development demands, clear understandings are needed for direction as are integrated approaches toward environmental and cultural resource management. The GAP audit approach presented here for one case study region, provides an example of how we can better direct future land use through an understanding of knowing what resources are present and a spatial inventory of where those resources are in terms of current and future land use activities.
Focus and Implementation

A statewide assessment of publicly owned archaeological resources is needed to recognize, document, and appreciate important areas like the Big Hammock. A GAP-based approach that considers ownership and stewardship or level of protection, along with representation of site types and cultural and temporal affiliations, is a way in which we can quickly perform such an audit for cultural resources. In performing this audit, regions shown to be at risk, vulnerable, or fragile in regards to pressures from development and land use changes need to be identified. Boundaries become less important especially when cultural and natural considerations are merged. In our re-examination of historic context development in the state, archaeology should not focus on the delineations of culture regions, but rather on the examination of the environmental and cultural areas deemed at risk, so that we might better plan for the future of archaeological preservation. Otherwise there is the chance that we will ignore areas like the Big Hammock, where the fuzziness of culture region delineations is seen. There are rarely sharp boundaries between defined culture regions, but instead more of a blending effect at edges, phenomena often seen with environmental areas (Kasperson et al. 1995:24). Therefore, we must have variable scales of analysis and perspectives that reflect a variety research questions, identify critical resources, and are consistent with procedures and considerations of other resource planning activities in the state. Using the approach presented here in a case study, a GAP audit could be conducted statewide, with land use planning linked to archaeology. Regions of critical concern due to development and other pressures can be examined and the archaeological preservation picture can be understood. In this way, archaeologists can assist at both the statewide and local level
with planning measures that are able to show archaeology in quantifiable ways, rather than through intangible terms like archaeological significance.

In developing a larger statewide model for historic context improvement, case study selection protocol should include the use of regional approaches that are congruent with environmental and ecosystem management considerations so that we are able to effectively work with other resource management planning teams rather than separate from them. Otherwise, archaeology will continue to be considered an added value or afterthought in the planning process. Comparative analyses are needed at a variety of scales to provide a systematic approach to linking land use and archaeological understanding.

Another important factor for archaeologists to consider is the aggregate or the whole rather than using a project-to-project, site-by-site focused mentality. Clearer understanding at the regional level is needed to develop baseline planning information. Historic contexts that reflect spatial representation, or where archaeology is found, is needed in relation to land and environmental variables. Significance determinations must also be cross-comparative to these regional understandings, with known, quantifiable parameters of stewardship and preservation at scales available for comparison (Mathers, et al. 2005). Comparability will allow more informed determinations especially as significance is often equated with preservation or destruction of archaeological resources. The ability to evaluate land stewardship as well as land use pressure and trends across regions in relation to the archaeological record, and to examine areas where we have gaps in the archaeological understanding, will allow for prioritization planning and strengthen the significance determination process.
We need to examine how archaeology fits with other management criteria and programs and be participatory and not separate or apart from the process. Archaeological cultural regions and study areas may have boundaries established through archaeological interpretation, but we must be able to be dynamic in our approach to boundaries and spatial scales, so that we can work within the realities of the present-day environment, including political jurisdictions and authority. Major initiatives with a focus on issues of integrated management, resource acquisition prioritization, sensitivity and stewardship mapping, and GAP conservation analysis should be applied to cultural resources if archaeology is going to have a place at the management table and an effective input into the management and preservation of resources.

**Mechanisms for Linking Archaeology to Land Use Planning Strategies**

It has been shown that the more divergent a proposal for change is from the status quo, the less likely it is that the proposal will be considered and implemented (Stiftel and Boswell 1999). Linking archaeology more tightly to land use planning at regional landscape levels in a consistent framework as other resource management in Florida, requires a blending of current procedures and methodology with new ones. The existing infrastructure can be used so as not to place yet another layer of consideration into the decision making mix. New, updated historic context planning for archaeology in Florida, must be performed at defined intervals. These contexts must consider more than the archaeological record, and include an element of resource planning by area. This process would allow planners and other natural resource managers can utilize the information that includes archaeology in the preservation and conservation dialog. A GAP analysis,
inventorying and auditing by region and including areas of critical growth management concern, should be implemented at a statewide level. Aspects of land stewardship, including present and future land use, ownership and management, and potential for acquisition need to be an integral part of this planning consideration.

Florida has placed strong emphasis on land use planning, permitting and regulation, and land acquisition for more than three decades since the passage of the Environmental Land and Water Management Act of 1973 (380 Florida Statutes). If archaeology in Florida is to do more than respond to the crisis of growth, for example purchasing sites like the Miami Circle for a record $27 million dollars after uncovering the feature during the development of a condominium project, then we must plan for the future and deal with issues of prioritization of resource acquisition needs. Otherwise, as the Miami Circle example illustrates, it is costly to wait for archaeological sites to become endangered to purchase them and the sites sometimes can become islands in a sea of development making interpretation and understanding of such a preserved site potentially problematic (Collins and Doering 2006.). Because we cannot possibly buy all important archaeological sites that are unearthed, we need to plan for the best way to understand archaeology in Florida and work with other existing management entities. In this way, archaeology can merge with other natural resource management frameworks and work together for the protection and planning for preservation and conservation.

One such existing framework is the Comprehensive Watershed Management (CWM) planning at the State Water Management District level. The CWM concept brings together land and water resource planning to achieve a coordinated approach to watershed management through working teams using a science-based approach,
including the application of Geographic Information System technology and other modeling tools within each defined watershed (SWFWMD 2002a). The CWMs have representatives from local governments and other interested organizations along with citizens. Together, the groups work to develop plans to identify watershed improvements and protection. Watersheds, defined as the area that drains to a common waterway, such as a stream, lake, estuary, wetland, aquifer, or other water source, are potentially delineated differently than regions such as the Big Hammock area. Participation in the process by archaeologists may require working in more than one watershed area to capture a regional focus such as the one proposed here. Primary areas of concern for each CWM, while not directly targeting archaeology and cultural resources, do include natural systems. Through the linking of archaeology with land use using a natural systems management approach, archaeology could work within such a related infrastructure system.

In the Southwest District, plans for each defined watershed have been developed and will be updated and reviewed with continuing input from interested groups. A benefit noted by the SWFWMD to this type of group interaction and planning at a watershed level, has been the ability to focus on problems and solutions in smaller defined areas and target fiscal sources for management and implementation. The CWM process has allowed the development of long-term goals for large environmental areas. Participants have also noted that an interconnected approach to activities involving natural systems is more compatible with basic ecological principles (SWFWMD 2007). I served on two CWMs, the Withlacoochee and the Springs Coast, as the representative for the Florida
Department of Environmental Protection, and was able to observe how cultural resource consideration can be incorporated into this process.

The reality at the Florida Division of Historical Resources is that staffing limitations and travel restrictions do not allow for participation at local and regional level planning, and most FDHR participation occurs with groups in the Tallahassee capitol area. Inclusion of the newly founded Florida Public Archaeology Network (FPAN) as a partnering member in such managing strategies is one way in which archaeology can have a stronger voice at the land management table. The FPAN has regional locations similar to that of other resource management agencies, and travel and participation at the regional level is perhaps more feasible than the FDHR. In fact, two of the three FPAN organizational goals are consistent with such participation: (1) support local governments, and others whose actions may affect archaeological resources, in their efforts to protect and preserve the archaeological record in their areas as well as assistance and advising from professional archaeologists when desirable, and (2) provide assistance for the Division of Historical Resources through promotion of DHR programs, distribution of DHR literature, training opportunities and consideration of archaeological sites for the National Register of Historic Places (Florida Public Archaeology Network 2007). The FPAN can have a vital and important role in working with counties and local governments to assist with the development of historic preservation ordinances, update existing rules and land use regulations, and work to promote and educate officials and the general public alike concerning preservation and protection for cultural resources. The FPAN working in concert with other archaeological and environmental interest groups
can also further this educational mission. Assistance with grant writing and partnering with universities and researchers will assist in funding surveys and initiatives.

Recommendations for county-level archaeological surveys that target and focus areas with proposed and changing land use would help refine and direct archaeological research. These surveys should identify sensitive areas of archaeological potential, including GIS predictability modeling components followed by field-truthing. Additionally, publicly owned lands should receive similar levels of professional archaeological survey to thoroughly identify, record, and document cultural resources. These public land surveys will also promote more effective management of cultural resources, as well as provide new archaeological data about the region.

Land purchase can be expensive, especially in areas where there are high growth demand pressures such as in the Big Hammock. Private foundations and organizations, such as the Nature Conservancy, the Seminole Wars Foundation, Inc., the Archaeological Conservancy, the Trail of the Lost Tribes, and the Big Hammock Archaeological Foundation, Inc. could all play roles in the promotion and integration of archaeology in land acquisition and management strategies. The Conservancy foundational approach uses land acquisition as a strategy of protection. Local correlates to this approach can also be very effective in protecting sites of local and regional importance.

While we cannot purchase every archaeology site, we can take steps to represent and preserve archaeology in Florida in a way that reflects the diversity of site types and time periods important for various landscape areas. The development of historic contexts that reflect spatial understandings of cultural resources is needed and the understanding and delineation of boundaries brought into a framework that is consistent with other
resource management and planning units of analysis in Florida. As state dollars become more competitive and scarce, archaeology will need to be able to convey information and research questions in ways that are understandable to the public and to other resource planners and policy makers. Cultural Resource Managers, planners and academic researchers will need to be able to effectively show and communicate the need for cultural resource protection as part of a wider dialog on ecosystem management if archaeology is to be considered in preservation planning.
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Appendices
### Appendix A. Archaeological Surveys Conducted in the Big Hammock

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### Appendix C. Archaeological Sites Identified in the Big Hammock Area (Continued)

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## Appendix C. Archaeological Sites Identified in the Big Hammock Area (Continued)

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### Appendix D. Identified Archaeological Sites Located on Conservation Lands in the Big Hammock Area

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## Appendix D. Identified Archaeological Sites Located on Conservation Lands in the Big Hammock Area (Continued)

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Lori D. Collins is an Instructor in the Applied Anthropology Program at the University of South Florida, where she teaches a variety of archaeology courses. She received her Masters of Arts in August 2002 at USF. Her thesis research focused on Historical Archaeology at Indian Key Historic State Park. As a former environmental specialist and the Development of Regional Impact Coordinator for the Florida Department of Environmental Protection, Ms. Collins has an extensive background in Florida environmental legislation and rules. She is the Co-coordinator of the Alliance for Integrated Spatial Technologies at USF, with interest in non-invasive documentation techniques in archaeology and heritage management. She has experience with three-dimensional laser scanning, GPS, spatial technologies, and GIS software and extensions. Ms. Collins is an executive board member and a co-founder of the Big Hammock Archaeological Foundation, Inc., a non-profit corporation, devoted to education, outreach, and preservation of natural and cultural resources.