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# ARCHEOLOGY AND EVERGLADES RESTORATION


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## People in the Everglades

Archeological evidence indicates that the Everglades tree islands have been continually used by people for more than 5,000 years. Testing of the sites on the tree islands have resulted in identification of archeological materials extending from the surface to the limestone bedrock. On some sites there is no discernible break in occupation. Others do have sediment accumulations that do not contain cultural materials.

The earliest description we have of the Greater Everglades is Fontaneda's 1575 Memoir where he describes the Everglades as a fresh water lake with are many towns, of thirty or forty inhabitants each: and as many more places there in which people are not so numerous. By the middle of the 19th Century the Everglades became a place of refuge for the Seminoles.

Starting with the Spanish contact and extending to about 2,500 years ago the distinctive South Florida Glades culture is identified by sand tempered pottery. Decorations on less than 5% of the pottery provide additional refinement of dates within the Glades period.

The state wide Late Archaic period is associated with the stabilization of sea level about 5,000 years ago extending to the development of distinctive regional cultures like the Glades. This time is associated with population growth and construction of large mound features. Pottery manufacturing starts about 4000 years ago. This early pottery is typically fiber tempered; however in South Florida sand tempered pottery is often found in association with the fiber tempered. The fiber tempered pottery is not found in the later Glades period. In Everglades archeological sites pottery is typically recovered only from the upper half of the archeological deposits.

The Middle and Early Archaic periods (7,000-5,000 and 9,500-7,000 years B.P.) are identified by projectile point styles and carbon dating. However, the closest tool quality stone is in the Tampa Bay area, therefore stone tools are rare in South Florida archeological sites. Middle and Early Archaic sites have been identified in the Miami area as well as in Collier County. The lower components of the Everglades sites may date to the Middle and Early Archaic, however, very few sites have been tested to this depth and minimal datable material has been recovered.

## Existing Archeological Information

There are over 400 reported archeological sites in the Everglades National Park and Water Conservation Area 3. About half of these have were recorded in the 1980's without field verification based on aerial photographs. Most of the verified sites have had minimal archeological testing needed to verify the presence of cultural material. More detailed site excavations were undertaken in the Everglades National Park in the 1970's and 1980's with the focus on characterizing the "Glades" culture. These early excavations focused primarily on pottery styles. More recently a number of sites within Water Conservation Area 3 were tested to explore the distribution of the calcium carbonate cemented "clacrete" layers identified in ENP sites (Schwadron et. al. 2009). While the sites contained abundant faunal remains only small percentages of the remains have been analyzed. Often the faunal identification has been restricted to easily identifiable remains, such as deer, and general family level identification like: turtle, fish, snake, large, medium, and small mammal, etc.

A few Corps contract archeological site testing projects in Water Conservation Area 3, Broward County Water Preserve Area C-11 (adjacent to WCA-3), and in Picayune Strand (Collier County, north 10,000 Islands area) have included detailed faunal analysis of fine screen (<2mm) sub samples, as well as, recovery and identification of small samples of floral materials (Smith et.al. 2006, Loubser et.al 2007, and Gregory et.al. 2012).

People have been using and living in wetland environments for tens of thousands years. The remains left behind in archeological sites include plant and animal remains that can tell us about the past environments. In general archeologist are most often interested in knowing about what people in the past eat and how they lived, as well as the past environments that help explain earlier cultures. The remains in archeological sites include bones from animals hunted for food which reflect both the availability of the animals and their abundance. In addition the animals hunted and intently brought to the site other animals, like mice and voles, are attracted to the sites and become part of the archeological record. Plant remains can be recovered from silica plant remains) can also be recovered from the archeological soils or adhering to artifacts. archeological sites in the form of charcoal from fires along with carbonized food remains; all coming from the local environment. In some cases pollen and phytoliths (microscopic silica plant remains) can also be recovered from the archeological soils or adhering to artifacts. Archeological sites in the greater Everglades have been occupied for more than five thousand years. As such they have the potential to contain extensive information about the prehistoric Everglades environment.

The Jacksonville District of the U.S. Army Corps of Engineers has been conducting archeological investigations in wetlands across Florida in support of restoration projects for more than a decade. These have shown that South Florida wetland sites contain extensive environmental information. As part of assessing the potential effects to prehistoric sites from changes in water management associated with Everglades restoration the Corps is conducting detailed investigations of the environmental history of a representative sample of archeological sites across Water Conservation Area 3 and into the Everglades National Park. These investigations are designed to gather detailed prehistoric environmental information. This poster presents methods, types of information recovered and preliminary overview the results of these investigation.

### ISSUE

The "Everglades Restoration Transition Plan" (ERTP) resulted in changes in water levels across the Greater Everglades; specifically Water Conservation Area 3 and the Everglades National Park.

Past research has indicated that changing water levels most often has an adverse affects on Archeological Sites. However, since the Everglades is a naturally fluctuating system, are the ERTP changes an adverse effect?

1. Do projected fluctuations or changes within the hydrological pattern affect historic properties eligible for or already listed on the National Register of Historic Places and, if so, do they affect the characteristics that make these properties eligible for inclusion in the NRHP in a manner that would diminish the integrity of these properties' location, design, setting, materials, workmanship, feeling, or association?
2. Will sites or portions of sites be physically impacted (by, for example, degradation due to wetting and drying of the sites by water level fluctuations) by the ERTP operational plan? If so, to what extent? Are all materials, including cultural materials and other intra-site elements (e.g., soils), within impacted properties affected by fluctuations or changes in hydrology, or are some more tolerant than others?
3. How has the history of naturally occurring fluctuations over time affected properties eligible for or already listed on the NRHP?
4. The results of this study will serve as a base line for evaluating the effects of water level fluctuations for future Everglades projects.

## Current Research Strategy

- Cultural periods of occupation – All units will be excavated to sterile soil to obtain information relative to the cultural periods represented at the each site. This is to ensure that data is collected on both the more recent but also the earliest occupation periods with the Everglades.
- Site stratigraphy and elevations – Stratigraphy and associated elevations across the sites will be established so that cultural periods can be properly identified and that periods and stratigraphic layers can be properly matched throughout the sample. In addition, it will either show some commonality of cultural period as they relate to general elevation or that some cultural periods are typically deeper within site matrices.
- Artifact assemblage (to include micro- and macro-botanicals and faunal materials) – Artifact assemblages are to be analyzed. Analysis will provide standard type /frequency counts as well provide information to the stability and conditions of the materials present.
- Soil chemistry – The soils chemistry at each site will also be measured. It has been well documented that soils chemistry can affect preservation. Florida is known to have poor soils that are normally acidic in nature; this may not be the case for Everglades tree island sites. This analysis can assist in determining if there are other causative factors associated with any degradation or loss of archeological materials across a site.
- Site elevation and relation to water table – This information is to establish the current water table as it relates to archeological materials located on each site. It will also be used to demonstrate what types of materials and cultural periods may currently already exist at or below the current water table at the time of excavation. This will also allow for the linkage of stratigraphic layers and sites in general to current water gauges in the region.
- Pollen samples – Pollen samples will be taken on each site to establish if pollen is present and intact. Degraded pollen or lack thereof can be an indicator for sub-optimal conditions for preservation of archeological materials. In addition, pollen samples take directly from the sites have a better chance of representing pollen conditions on the sites as they relate to various cultural periods. The collection methods will be compatible with peer-reviewed, published or otherwise approved pollen collections done in the area of potential effect in order to contribute to the body of existing knowledge drawn from historic pollen sampling in this area.
- Diatom analysis – Diatoms can be analyzed to determine change in water quality as it relates to salinity vs. freshness. It can also be used to establish maximum water elevation on sites through their presence or absence. The collection methods will be compatible with peer-reviewed, published or otherwise approved pollen collections done in the area of potential effect in order to contribute to the body of existing knowledge drawn from historic pollen sampling in this area.
- Dating – If possible, a minimum of two samples of carbonized or other material for radiometric dating will be collected from each site to establish accurate chronological data in conjunction with relative chronological indicators, such as ceramics.
- Geomorphological analysis – This analysis can indicate land formation processes including water and wind born sediments. Water weathering of the grain can be indicative of long periods of exposure to hydric conditions.
- Paleoecologic investigations – Analyses of sediment cores from throughout the system can be utilized to determine water levels, emergence, and environmental conditions that would be conducive to habitation. The collection methods will be compatible with peer-reviewed, published or otherwise approved pollen collections done in the area of potential effect in order to contribute to the body of existing knowledge drawn from historic pollen sampling in this area.

## Faunal and Floral Remains from Everglades Associated Sites

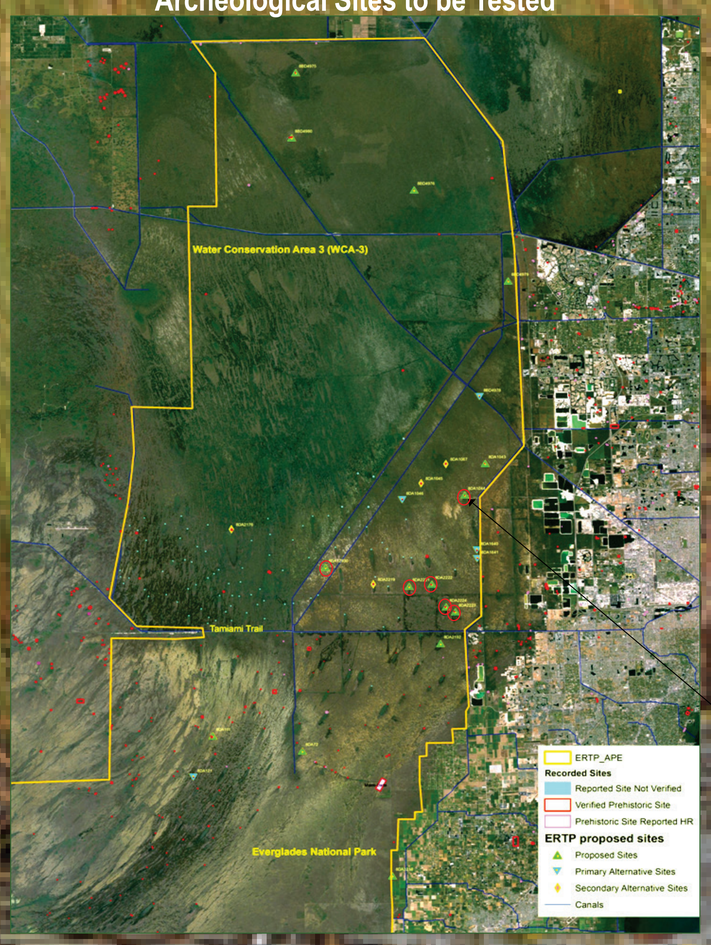
By weight turtle is the most abundant faunal remain, this is directly related to the large amount of recognizable bone per animal. By number of identifiable specimens fish is the most abundant faunal remain. Of the fish, Bowfin and Gar are the dominate species, followed by catfish, sunfish, and then basses. Drum is the most abundant salt water fish. Sharks are represented in the assemblage by their teeth which are used as tools. Siren is found in most sites, it is common enough that its absence from an assemblage is notable. Despite their abundance in the ecosystem, birds are the most unrepresented class of animals throughout South Florida.

| | | |
|---|---|---|
| Mammalia | *Didelphis marsupialis* | Opossum |
| | *Dasypus novemcinctus* | Nine-banded armadillo |
| | *Sylvilagus sp.* | Rabbit |
| | *Sylvilagus palustris* | Marsh rabbit |
| | *Sylvilagus floridanus* | Eastern cottontail |
| | *Sylvilagus aquaticus* | Swamp rabbit |
| | Rodentia | Rodent |
| | Sciuridae | Squirrel |
| | *Sciurus carolinensis* | Eastern gray squirrel |
| | *Sigmodon hispidus* | Hispid cotton rat |
| | *Neotoma floridana* | Eastern Woodrat |
| | *Neofiber alleni* | Round-tailed muskrat |
| | *Rattus rattus* | black rat |
| | Delphinidae | Dolphin |
| | Canidae | Canine |
| | *Canis latrans* | Coyote |
| | *Canis lupus* | Wolf |
| | *Canis familiarus* | Dog |
| | *Urcyon cinereoargenteus* | Gray fox |
| | *Procyon lotor* | Raccoon |
| | Mustelidae | Mustelid |
| | *Mustela sp.* | Ermines |
| | *Lynx rufus* | Bobcat |
| | *Odocoileus virginianus* | White-tailed deer |
| Aves | Ardeidae | Egret |
| | *Ardea herodias* | Great blue heron |
| | Anatidae | duck |
| | *Buteo sp.* | Buteonine hawk |
| | *Meleagris gallopavo* | Turkey |
| Reptilia | *Chelydra serpentina* | Snapping turtle |
| | *Kinosternon sp.* | mud turtle |
| | Emydidae | Pond Turtle/Terrapins |
| | *Terrapene carolina* | Eastern box turtle |
| | *Chrysemys sp.* | Painted turtle |
| | Trionychidae | Softshell turtle |
| | *Trachemys/Pseudemys* | slider/cooter |
| | *Trachemys script* | Slider |
| | *Pseudemys sp.* | cooter |
| | *Deirochelys reticularia* | Chicken Turtle |
| | *Alligator mississippiensis* | American alligator |
| | Squamata | Lizard |
| | *Nerodia sp.* | Water snake |
| | *Elaphe sp.* | Corn/Rat snake |
| | *Elaphne obsoleta* | Rat snake |
| | *Elaphe guttata* | Cornsnake |
| | *Lampopeltis getula getula* | Eastern kingsnake |
| | *Agkistrodon sp.* | Copperhead/Cottonmouth snake |
| | *Crotalus adamanteus* | Eastern diamondback rattlesnake |
| | *Agkistrodon piscivorus* | Cottonmouth |
| Amphibia | *Amphiuma means* | Two-toed amphiuma |
| | *Siren lacertina* | Siren |
| | Cryptobranchidae | Salamander |
| | Anura | Toad/Frog |
| | *Rana sp.* | True frogs |
| | *Rana catesbeiana* | Bullfrog |
| | *Rana sphenocephala* | Leopard frog |
| Osteichthyes | *Amia calva* | Bowfin |
| | *Lepisosteus sp.* | Gar |
| | *Megalops atlanticus* | Tarpon |
| | *Esox sp.* | Pickerel |
| | *Ictalurus punctatus* | Channel catfish |
| | *Ameiurus sp.* | Bullhead catfish |
| | *Ameiurus brunneus* | Snail bullhead |
| | *Ameiurus nebulosus* | Brown bullhead |
| | *Ictalurus sp.* | Catfish |
| | *Mugil sp.* | Mullet |
| | *Centropomus sp.* | Snook |
| | *Micropterus sp.* | Basses |
| | *Micropterus salmoides* | Largemouth bass |
| | *Chaenobryttus gulosus* | Warmouth |
| | *Lepomis punctatus* | Spotted sunfish |
| | *Lepomis microlophus* | Redear sunfish |
| | *Lepomis macrachirus* | Bluegill sunfish |
| | *Lepomis sp.* | Sunfish |
| | *Pomoxis nigromaculatus* | Black crappie |
| | *Pomoxis sp.* | Crappies |
| | *Perciformes* | Perch-like fish |
| | *Bagre marinus* | Gafftopsail |
| | *Ariopsis felis* | Hardhead catfish |
| | Ariidae | saltwater catfish |
| | Sciaenidae | Drum/Croaker |
| | *Sciaenops ocellatus* | Red Drum |
| | Serranidae | Grouper |
| | *Opsanus tau* | Oyster toadfish |
| | *Micropogon undulatus* | atlantic croaker |
| | *Haemulon plumierii* | White grunt |
| | *Archosargus probatocephalus* | Sheepshead |
| | *Pristis sp.* | sawfish |
| | *Caranx sp.* | Jack |
| Chondrichthys | *Alopias sp.* | Thresher Shark |
| | *Carcharodon carcharias* | Great white shark |
| | *Carcharhinus sp.* | Gray shark |
| | *Carcharhinus leucas* | Bull shark |
| | *Negaprion sp.* | Lemon shark |
| | *Rhizoprionodon terraenovae* | Atlantic sharpnose shark |
| | *Galeocerdo cuvier* | Tiger shark |
| | Carcharihinidae | Requiem shark |
| | Sphyrnidae | Hammerhead shark |
| | Carcharihinidae/ Sphyrnidae | Requiem/Hammerhead sharks |
| | *Dasyatis sp.* | Stingray |
| | *Aetobatus narinari* | Spotted eagle ray |
| Malacostraca | *Callinectes sapidus* | Blue Crab |
| | *Mennipe mercenaria* | Stone crab |
| Clypeasteroida | Clypeasteridae | Sand dollar |
| Bivalvia | *Dinocardium robustum* | Giant Cockle |
| | *Trachycardium sp.* | prickely cockle |
| | Cardiidae | Cockle |
| | *Anodontia alba* | Buttercup lucine |
| | *Lucinisca nassula* | Woven lucine |
| | Lucinidae | Lucine |
| | *Chione cancellata* | Cross-barred venus |
| | *Dosinia sp.* | Dosinia |
| | *Macrocallista maculata* | Calico Clam |
| | *Macrocallista nimbosa* | Sunray venus |
| | *Mercenaria sp.* | Quahog |
| | *Tellina sp.* | Tellin |
| | *Elliptio spp.* | freshwater mussel |
| | Arcidae | Ark |
| | *Crassostrea virginica* | Eastern oyster |
| | Ostreidae | Oyster |
| | Pectinidae | Scallop |
| Gastropoda | Patellogastropoda | Limpets |
| | *Busycon carica* | Knobbed Whelk |
| | *Busycon contrarium* | Lightning whelk |
| | *Busycotypus spiratus* | Pear Whelk |
| | Busycon | Busycon |
| | Buccinidae | Whelk |
| | *Melongena corona* | Florida crown conch |
| | *Pleuroploca gigantea* | Horse Conch |
| | *Strombus alatus* | Fighting Conch |
| | *Strombus gigas* | Queen Conch |
| | *Olive sp.* | olive shell |
| | *Littoraria scabra* | Angulate periwinkle |
| | *Euglandina rosea* | Rosy wolfsnail |
| | Polygyridae | Flatcoil |
| | *Pomacea sp.* | Florida applesnail |
| | *Planorbella scalaris* | Mesa ramshorn |
| | *Menetus alabamensis* | Marsh sprite |
| | *Menetus floridensis* | Penny sprite |
| | *Lyogyrus latus* | Cobble sprite |
| | *Tarebia granifera* | Quilted melania |
| Floral | *Quercus sp.* | Oak wood and acorn |
| | *Acer sp.* | Maple |
| | *Prunus sp.* | cherry |
| | *Pinus sp.* | pine |
| | *Celtis sp.* | hackberry |
| | *Rhus sp.* | Sumac |
| | *Serenoa sp* | Palmetto |
| | *Myrica sp.* | Bayberry |
| | *Ficus sp.* | fig |
| | *Acalypha sp.* | copperleaf |
| | *Viburnum sp.* | Arrow-wood, haw |
| | *Sambucus canadensis* | elderberry |
| | *Malvastrum sp.* | Falsemallow |
| | *Chenopodium sp.* | Goosefoot |
| | *Polygonum sp.* | Knotweed |
| | *Ambrosia sp.* | ragweed |
| | *Salvia sp.* | sage |
| | *Vitis sp.* | grape |
| | *Gaylussacia sp.* | huckleberry |
| | *Lepidium sp.* | Pepperweed |
| | *Phytolacca americana* | Pokeweed |
| | *Cirsium sp.* | thistle |
| | *Amaranthus sp.* | Pigweed |
| | Gramineae | grass |
| | *Galium sp.* | bedstraw |
| | *Opuntia sp.* | Prickly Pear Cactus |

## Field Work

Because of delays associated with additional consultation field work planned for early in the dry season was delayed. The excavations will be conducted in two field seasons, June and July 2014 and January-March 2015. Field work started late June 2014 in Water Conservation Area 3B, with the beginning of the rainy season with its associated rising water levels and thunderstorms the 2014 field season was ended July 16. The first field season included excavation on sites 8DA1044, 8DA2221, 8DA2222, 8DA2223, 8DA2224, and 8DA12830. Excavations were completed on all except 8DA2224. A culturally sterile marl layer was encountered at 40 cm in both of the 8DA2224 test units. After excavating 20 cm it was assumed to be the base of the tree island. During the geotechnical examination the marl was found to be 40 cm thick with a black earth midden under it. The excavations will be completed next field season. 8DA12830 is an inundated tree island a very small amount of faunal remains were recovered in initial identification, additional shovel testing during this investigation resulted in no archeological materials. Geomorphologic information will be used in comparison with the other sites that are part of this research. Initial lab processing has identified the recovery of small fish scales in addition to the other artifacts and faunal materials.

## Archeological Sites to be Tested



Right: Photo of one by one meter excavation unit in 8DA1043. Calcrete starts at 40 cm and continues to 85 cm. Limestone bedrock appears at 115 cm. the water intrusion is at 120 cm. Solid bedrock at 130 cm. Pottery extends 10 cm into the calcrete. Faunal remains constant throughout the excavation including being imbedded in the calcrete and extending into the solution holes in the bedrock. A number of sedimentary events (cultural and depositional) were identified. A second test unit about 10 meters away had similar deposition except the calcrete layer was less than 20 cm thick.

## Archeological Methods

The site selection criteria included: be verified archeological sites and not known to contain burials, represent different sizes and types of tree islands, and be distributed across the area of potential effect (at least north to south).

Testing to be at least one 1x1 meter test unit and no more than three test units per site. The test units could be expanded to 1x2 meters if needed because of depth. ALL material in the primary units to be screened through 1/8 inch mesh and analyzed with the exception of faunal <1/4 inch. One column sample from each site to be taken and all materials (including faunal) greater than 0.5 mm to be analyzed.

Geotechnical and paleo environmental samples will be taken from all levels within each sites.

The faunal assemblage is expected to exceed 450,000 elements. It is also expected to contain both subsistence remains, as well as, animal remains that are part of the local environment (voles, mice, etc.) that may be indicators of the local environment.

## Environmental Background Research

There has been extensive environmental research conducted as part of the Everglades Restoration efforts. In order to understand the past environmental setting for the archeological sites and to serve as a baseline for interpreting the results of the investigations an extensive historic and environmental history is being developed. This will integrate ecological, hydrological, and archeological data that currently exists within scientific literature in order to develop an environmental history of the region. Added to this will be oral histories, primary documents, and various historical accounts to obtain a clear understanding of the environmental history of the area. The primary goal of this first investigatory method is to gather data on previous water levels within the region and develop a context for and understanding of the natural seasonal variation that has occurred in the past to establish a base line of environmental conditions to which the archaeological sites within the ERTP impact area would have been naturally subjected. The draft of this report is expected to be completed by the end of July or first of August 2014.

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