The Wakulla Springs Sand Relocation Project, 1998 and 1999 Wakulla County, Florida

By
William Brian Yates, John P. Kilgo and Melanie Damour

Edited By
Michael K. Faught
Kathryn McClure

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1998 and 1999
Wakulla County, Florida

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Project Description

This report summarizes dredging operations carried out by students of ANT 4131, a hands-on methods class in underwater site research conducted by the Department of Anthropology and the Academic Diving Program at Florida State University. Work was conducted in Wakulla Springs State Park, Wakulla County, Florida approximately 11 miles south of Tallahassee, (Figure 1) in the spring of 1998 and 1999. The primary objective was to move sand from the spring basin to the immediate margins. Due to various factors described below, these activities were of limited success.

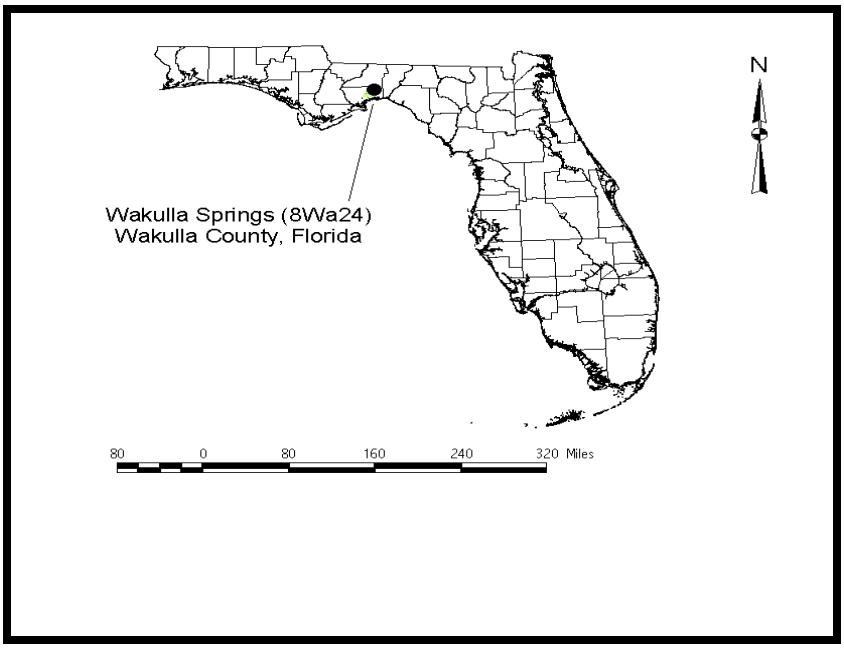

Figure 1. Location of Wakulla Springs State Park

For many decades, Wakulla Springs has operated a swimming area for visitors, in which sand was imported to maintain a non-muddy beach. Part of the beach's attraction is the white sand reminiscent of Florida's Gulf Coast beaches. Wakulla Springs has imported sand from quarries around the region. Much of this imported sand has washed into the stream channel adjacent to and downstream of the beach as a result of storms and high water flow. This erosion has been countered by replenishment of sand from external quarries. Consequently, there are now large quantities of sand and sediment forming sandbar shoals downstream. Many of these shoals contain historic and prehistoric artifacts, as well as modern detritus related to recreational activities at the park. These sand bars have primarily accumulated around and beneath the boat dock and boat slips, creating the need for constant upkeep by park personnel to maintain the boat slips for the Park's fleet of riverboats.

In 1997, Gregg Stanton of the Florida State University Academic Diving Program (ADP) and personnel of the Wakulla Springs State Park, agreed to have students from the FSU Department of Anthropology's *Techniques of Underwater Site Research* course (ANT 4131) conduct activities in the basin that would benefit the park and offer educational opportunities. Two projects resulted from this agreement: 1). removal of exotic plant growth, Hydrilla (*Hydrilla verticallata)*, and 2). replenishment of the beach with sand from the swimming area by use of induction dredges.

Graduate Teaching Assistants for the ANT 4131 class served as field directors and dive supervisors each year. William Brian Yates served as field director in 1998 with John P. Kilgo as diving supervisor. In 1999, Kilgo was field director and Melanie Damour served as diving supervisor. Dr. Michael Faught served as Principal Investigator and the FSU faculty member responsible for report writing and permit acquisition.

The concept of pumping sand with induction dredges from the sand bar accumulations in the river up to the beach area was a logical solution. It was decided by Park management and FSU staff that such a project would have several benefits including: 1) providing the park with a reduced cost for moving beach sand, 2) reducing the environmental impact of importing more sand from external sources, 3) providing University students with an opportunity to practice techniques of site research and archaeological investigation in an inundated environment, and 4) providing students with an opportunity to conduct independent research related to the Wakulla Springs environment.

The Wakulla Springs Sand Relocation Project was carried out within the previously established site boundaries of 8WA24A. This site is a submerged component affiliated with the terrestrial site 8WA329. The two different site numbers are used to distinguish between the underwater component and the terrestrial archaeological component. The Florida Master Site File (FMSF) Survey Log Sheets were submitted to the FMSF for review.

The project location was confined to the visitor swimming area at the Edward A. Ball Wakulla Springs State Park. The swimming area is delimited by a 1" thick twisted nylon rope and float. This swimming area is east of the Wakulla Spring outflow basin (Figure 3).

Permits to conduct the Sand Relocation Project were obtained from the Department of the Army, Jacksonville District Corps of Engineers, the Florida Department of Environmental Protection (Wetland Resource Permit DF65-0135499-001-1), and the Florida Division of Historical Resources. All required permits were granted and maintained in good standing throughout the duration of the project.

Historical Background and History of Previous Research

Wakulla Springs State Park encompasses 2,860 acres of land with several historic buildings on the property. These buildings include the Wakulla Springs Lodge and Conference center, which also houses park administrative offices. The park is bordered by State Road 267 to the north, State Road 61 to the southwest, and Highway 319 to the southeast (Figure 2).

Figure 2. Location of Wakulla Springs State Park.

Perhaps the earliest paleontological investigation of Wakulla Springs was conducted by George S. King and G.L. Brockenbrough in 1850. Fossilized megafaunal remains of a mastodon were recovered from the northeastern side of the spring (Bryan, 1989; Florida Sentinel).

In the 1890s, another almost complete mastodon skeleton was recovered. These remains were in transport to the Smithsonian Institute in Washington, D.C. when the ship was lost in a storm off the eastern coast of the U.S. The vessel has not been discovered to this date (Rupert and Spencer, 1988).

In 1930, George Christie, owner of Wakulla Springs, discovered a third nearly complete mastodon, subsequently recovered by Herman Gunter. Recovery was nearly complete, with the exception of several vertebrae, ribs, carpal and metacarpal bones. The preserved remains are on display in the Museum of Florida History in Tallahassee (Rupert and Spencer, 1988).

An important indicator of the site's archaeological potential and paleoenvironmental significance is the presence of abundant remains of Pleistocene megafauna found in the Wakulla Springs cave system. Projectile points of Bolen stylistic affinity and Early Archaic - Early Holocene age were found with the large megafaunal bone bed that lies several hundred feet within the mouth of the cave system (Dunbar, personal communication 1998; Jenkins, personal communication 2000).

From 1955 to 1956, Garry Salsman and Wally Jenkins, as well as other Florida State University students, initiated a cave exploration project and geological survey for the State of Florida (Olsen, 1958). The remains of large mammals such as mastodon, mammoth, bear, deer, giant ground sloth and camel were observed at a depth of over 200 feet. Traces of charcoal were observed possibly in association with these faunal remains although this claim has not been investigated archaeologically. Other faunal remains include horse, tapir, giant armadillo and bison (Bryan, 1988). Olsen reported on investigations conducted in 1958 that recovered approximately 600 bone spear points as well as Bolen Plain, Bolen Beveled and Bolen Side-Notched were also recovered from archaeological deposits (Olsen, 1958).

The U.S. Deep Cave Team, under Dr. Bill Stone, undertook deep cave exploration and mapping surveys of the various tunnel systems in 1987. During this survey, faunal remains were observed as far back as 1200 feet into the cave system. The precise depositional sequences have not been archaeologically investigated at this time.

In 1988, Stephen Bryne produced a report of a large-scale survey of cultural resources within the park boundaries. A rich archaeological assessment of the park's resources, *Archaeological Survey at the Edward Ball Wakulla Springs State Park*, addressed the various cultural periods, sites along the park boundary and the importance of these sites to our understanding of the overall significance of the spring basin, the Wakulla River and their roles throughout time. Bryne identified 54 archaeological sites. Cultures represented from the sites identified include the Early Archaic, Late Archaic, Weeden Island, Leon-Jefferson, Deptford, Swift Creek and historic components including Spanish and English diagnostic artifacts (Bryne 1988).

Staff and students of the Academic Diving Program at Florida State University conducted an underwater archaeological survey in 1989 (Gerrell 1989). These investigations were employed to identify any archaeological or paleontological remains that may exist within the swimming area and the spring basin. Coring activities during the survey recovered quantities of historic materials from the 1940s through the late 1980s. Additionally, some prehistoric artifacts were also recovered (Gerrell 1989).

In 1992, Brent Weisman and Christine Newman investigated six sites within the park to assist with the nomination procedures for the National Register of Historic Places Inventory. Testing at sites 8Wa310, 8Wa312, 8Wa358, 8Wa321, 8Wa323 and 8Wa330 revealed that artifacts within the park area could be separated chronologically through stratigraphic associations (Weisman and Newman 1992).

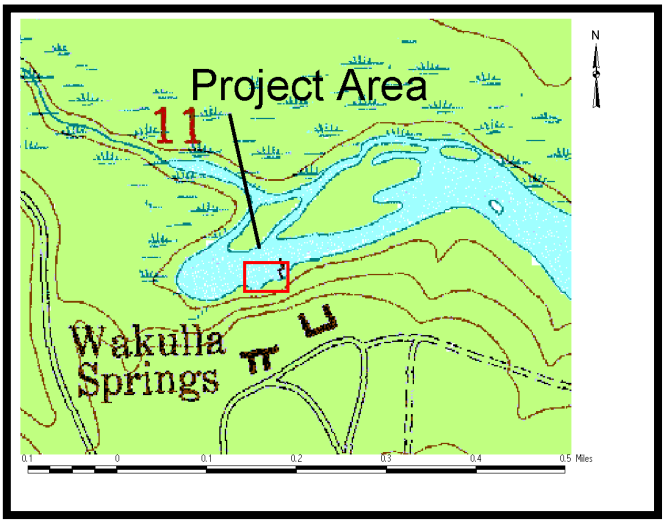

Figure 3. General location of the recreational swimming area.

Methodology

The beach replenishment project involved removal of sand from the swimming area and placement back on the beach by means of induction dredges (also known as water dredges or couple jets). This action served to counteract the constant erosion caused by strong currents generated by the spring. Sediment removed from the swimming area was passed through 1/4-inch screen mesh to separate archaeological materials from sediment.

In 1998, divers utilized a three-inch dredge from an 8hp water pump for excavation. This was inadequate to move the volume of sand necessary. Consequently, the 1999 excavations employed three-inch and four-inch induction-dredges powered by a 20hp water pump mounted on the cement boat dock (Figure 4). However, mechanical difficulties with the dredges themselves precluded adequate sediment removal. This methodology is consistent with current practices of shallow water work in the field of underwater archaeology. This method was chosen because dredge and screen systems have been shown to cause minimal damage to the artifacts and can move a significant amount of sediment over short distances, typically less than 25 feet.

Dredging was conducted by dive teams consisting of two divers operating the dredge intake for the removal of the sand overburden. Use of a survey transit positioned on a Florida Department of Natural Resources Survey marker (FHOT 001 154.5 1990), on the Northwest corner of the concrete boat pier (Figure 6), maintained artifact provenience. Sand was systematically removed and screened through half-inch and quarter-inch wire mesh located on the beach.

Retaining walls constructed by Park personnel built before the field session in 1998 and again in 1999 were intended to control run-off from the operations. In each case, the provided retaining wall proved inadequate. In 1998, sediment retention was attempted by means of a thick weave fabric wall staked at regular intervals. In 1999, the retention wall consisted of hay bales, which worked better than the cloth, but still failed to contain run-off at one location by the end of dredging operations.

Figure 4. From 1999, 20hp dredge pump apparatus.

Figure 5. The 1998 project area is to the right of the floating platform (center background). View is to the east. Note divers in the foreground

Cultural material remaining in the screen was bagged and assigned a unique field specimen number for identification and cataloging. Field specimen bags were labeled with the site number, date, recorder and excavators' initials, and the field specimen number. Upon completion of the project, all excavated artifacts were temporarily stored at the Florida State University Department of Anthropology for analysis. All artifacts have been turned over to the State of Florida Bureau of Archaeological Research (BAR) for curation. During the course of excavation the protocol for the discovery of human remains, or other *in situ* materials, mandated that all activities would be stopped and personnel at the BAR would be contacted.

Description of Fieldwork, 1998

The 1998 field season began in March and extended into April. Staff, students, and volunteers worked to initially remove Hydrilla (*Hydrilla verticallata*), a weed-like aquatic plant, and then move sand from the swimming area to the beach. Two couple jets, three- and four-inch diameter, moved sand from the designated area to screens on the beach. Once materials passed into the screen, the sand and water ran through sediment traps and hay bales placed down slope from the screens. Artifacts recovered provide a nearly complete sample of every occupational period at Wakulla Springs.

Research conducted during the 1998 fieldwork was limited to the previously identified site, 8Wa24. Boundaries of the work area were limited to the eastern edge of the swimming area (Figure 5). The 1998 project was conducted in two stages. The first stage included preliminary survey and probing of sediments to determine their depth within the swimming area. Brian Yates and John Kilgo conducted this first stage on December 11, 1997. After an agreement had been reached between Ron Weiss and graduate teaching assistants Yates and Kilgo, they made a preliminary dive survey with park ranger Lee Norris to examine the sediment bed within the swimming area. Using a metal rod, Yates and Kilgo probed at 50-foot intervals out towards the river channel from a base line set on the beach. Surveys at 50, 100 and 150 feet from the beach indicated a significant amount of sand existed above a harder, more compact bed.

The swimming area was surveyed and visually scanned for evidence of surface cultural or paleontological materials. The sand was probed with a 53" long steel probing rod used to determine sediment depths to bedrock or other consolidated beds (Table 1, Figure 6).

Probe Location	Sediment Depth
(#1)	21”
(#2)	51”
(#3)	51”
(#4)	21”

Table 1. Sediment Depths

Probing the sand produced several measurements of bedrock depth by which estimates of sediment amounts within the project area could be made. Estimates indicated a minimum of 127,500 cubic feet of sediment within the 150' x 200' swimming area, or a total of 4,722 cubic yards (3610.4 m^3).

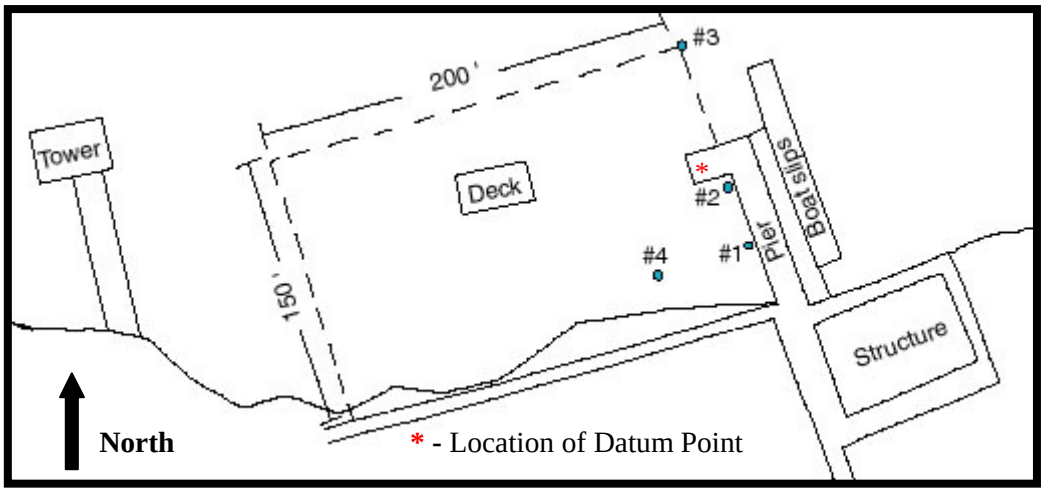

Figure 6. Location of sediment probes within the swimming area (looking North).

The relocation of sand was conducted by teaching assistants and students of ANT 4131 - *Techniques of Underwater Site Research*, an interdisciplinary course designed to introduce students to a variety of techniques for conducting scientific research underwater. Divers made use of a diesel-powered, surface-supplied HOOKAH unit as a breathing apparatus, with scuba cylinders as backup in anticipation of emergency procedures as mandated by the Florida State University Academic Diving Program (FSU-ADP) Standard Operating Procedures. Teaching assistants and students served in all roles during the project, acting as dive supervisors, timekeepers, safety divers, excavators and screeners.

The project was conducted over successive weekends through the months of March and April in 1998. The project proceeded with team members dredging sand, screening all material through a ¼" hardware cloth, removing cultural materials, bagging with provenience information and finally depositing the sand behind temporary sediment traps.

Methods were altered because the retaining wall intended for retaining sand and sediments was not constructed, as expected, before commencement of the ANT 4131 course's involvement in the project. Instead of using the concrete wall to retain sediment and slow downstream sand loss, a temporary sediment retaining wall was constructed with hay bales and material lining the inside of the bale wall. Upon completion of the project, this temporary wall was removed by park personnel.

The reworked nature of the sand bed makes the primary context of the artifacts unlikely, and unacceptable for any behavioral interpretation, save those items found as recreational debris such as coins, rings, and beverage caps. Temporally diagnostic artifacts found during dredging reflect what is already known about the prehistory of the Park. Because of this disturbance and intermixing of materials with original local sediments, only limited provenience data were recorded. Probabilities of bioturbation, mechanical disturbance of the swim area by maintenance equipment, and heavy visitor traffic to the swimming area also influenced this decision to record general provenience data.

The project was limited by mechanical malfunctions, more specifically, the effective working distance of the pumping equipment. Due to these constraints, only a limited portion of the swimming area was dredged.

Results of the 1998 Investigations

Due to extreme bioturbation, site integrity within the project area was believed to be minimal, if not nonexistent. The sand bed is significantly reworked. However, the clay bed below is a potentially significant deposit with possibilities for paleoenvironmental data as well as embedded archaeological materials. These sediments are probably older than middle Holocene age and should be protected or evaluated prior to any additional sediment moving activities.

A total of 904 artifacts were collected in 1998. This figure does not include the multitude of modern refuse objects discarded although recorded in the Field Specimen Log. Even though many of the artifacts were of 20th century origin, several significant prehistoric artifacts including bone, stone, and ceramic materials were recovered. No structures or features were documented during the 1998 activities. General provenience of the artifacts was restricted to a small portion of the swimming area. Artifacts, in general, exhibited some attrition wear, some faunal material was mineralized, chipped stone consisted mostly of debitage, and historic materials were largely non-diagnostic. Condition and attributes of all artifacts were recorded in the artifact analysis table (Appendix A).

Prehistoric Cultural Material

Faunal Remains and Bone Pins

All samples recovered in 1998 were in good condition. Samples were slowly air dried before digital scanning for documentation. A considerable amount of unmodified faunal bone was recovered from the swimming area. Although some remains are mineralized, this can be expected in a depositional environment such as the Wakulla River.

Faunal materials included *Testudines* (turtle, n=159) and a significant amount of *Osteichthyes* (fish, n=26). The remaining samples were classified as *Alligator mississippiensis* (n=2), *Artiodactyla* (n=2), *Aves* (n=9), *Bos taurus* (n=2), *Reptilia* (n=2), and *Rodentia* (n=2). Less distinguishable elements recovered were classified as Mammalia (n=13), and Animalia (n=167).

Several examples of prehistoric culturally modified bone pins of probable Middle Archaic age were recovered during the 1998 field season (Figures 7, 8, and 9). These tools are known to have been abundant in the swimming area as early as the 1930s when bone pins were recovered by lodge employees of Edward Ball and sold in the gift shop. As supplies were depleted, staff members would wade in to the shallows and dig around until a sufficient quantity of bone pins were found to restock the gift shop display (Park Staff, personal communication 1998).

Figure 7. Culturally modified bone pin (FS#1)

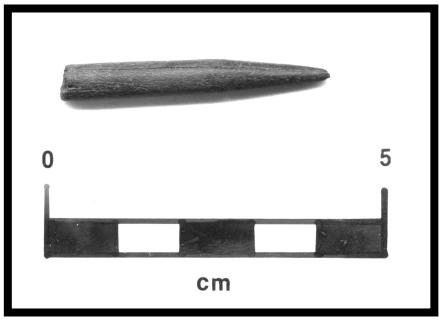

Figure 8. Culturally modified bone pin (FS#34).

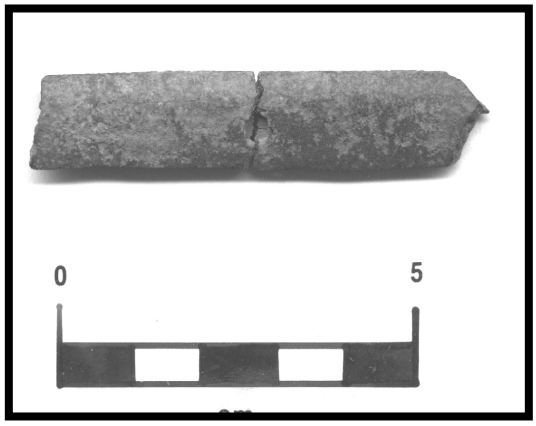

Figure 9. Culturally modified bone pin (FS#31).

Chipped Stone

A total of 29 identified lithic fragments were recovered during the project. Of these, 25 were identified as having a prehistoric origin. Fifteen were flakes and four (4) showed evidence of manufacture. Only one lithic demonstrated any diagnostic characteristics: a probable base of a late Archaic projectile point of light gray chert. This chipped stone artifact exhibits even bifacial pressure flaking (Figure 10).

Figure 10. Stem base of a Late Archaic stemmed projectile point (FS#6).

Ceramics

A few prehistoric ceramic sherds were recovered. A total of nine sherds were identified from the artifact assemblage. Of these, eight were body sherds and one was identified as a fragment of a foot or lug handle (FS#1, Figure 11- far right). Identifiable diagnostic ceramics consisted of one Wakulla Check Stamped (FS#34, Figure 12) and one possible limestone-tempered and brushed sherd (FS#4, Figure 13).

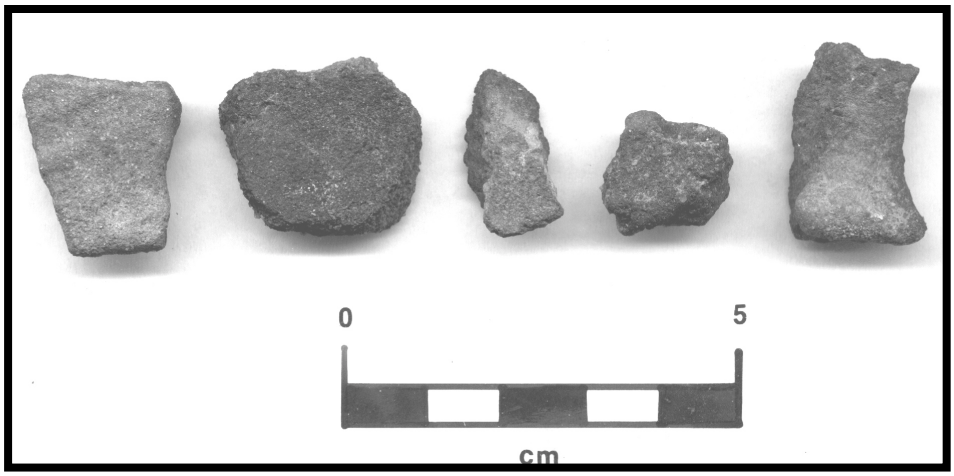

Figure 11. Prehistoric ceramics (FS#1).

Figure 12. Wakulla Check Stamped (FS#34).

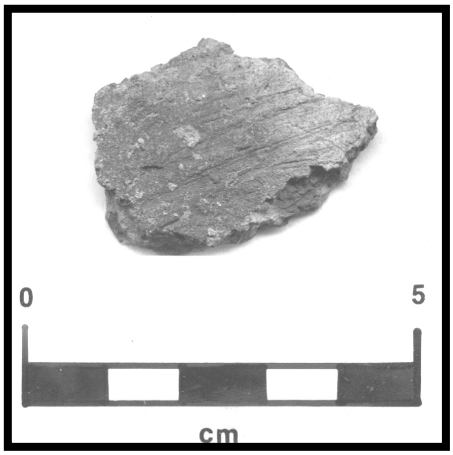

Figure 13. Possible Limestone tempered sherd. Some brushing is evident on the interior surface (FS#4).

Historic Artifacts

The majority of artifacts recovered were of historic age (more than 50 years old) and technology. Diagnostic historic artifacts of metal, glass, and ceramic material were counted, weighed and bagged for curation. It was determined that many of the recovered metal materials were of modern origin and need not be curated. All modern recreation- related refuse was discarded. Discarded items were cataloged and their disposal is indicated in the artifact database (Appendix A).

Metal and Coins

Most metals recovered were modern construction debris including nails, screws, bolts, washers, pins and other iron fasteners. No significant diagnostic metals were recovered although numerous U.S. coins were encountered (n=135).

Glass

Numerous examples of container glass in the form of broken beverage bottles was recovered from the swimming area (n=24). Probably the greatest value in recovering these materials comes from removing them as health hazards within the swimming area.

Some windowpane glass was also recovered (n=55). Detailed analysis of these materials was not conducted, as a thorough historical account of the historic structures in the park area has been previously undertaken.

Ceramics

Modern ceramics recovered include only one porcelain rim decorated in the 'Phoenix' pattern. Several fragments of modern clay, brick and roof tile were also found, most likely from the roof of the Guest Lodge.

Description of Fieldwork, 1999

In October of 1998, graduate teaching assistants John Kilgo and Melanie Damour met with Sandy Cook, Park Manager, and Ron Weiss, Assistant Manager, to discuss another attempt to relocate sand from the swimming area. Both FSU graduate teaching assistants and Wakulla Springs staff wished to continue the beach replenishment project. The focus of the 1999 season was the removal of sand from between the floating platform and the concrete pier structure on the east end of the swimming area. A Chapter 1A-32 permit was obtained from the BAR before fieldwork began.

The objective of the 1999 field season continued the work begun in 1998 to replenish sand in the waterfront area. As in 1998, the eastern portion of the swimming area along the boat pier became the target area of excavation. The first priority was the installation of a collection grid of three by three meter units to establish control over artifact location. PVC rods and wooden stakes were placed in the shallower waters near shore to delineate this grid, based upon a datum with coordinates of 500N/ 500E (located on the sea wall further inshore) and with units defined by the South West corner. Unit corners were defined by transit, with a datum located on shore from which measuring tapes extended. Once constructed, the first grid measured 9 by 12 meters (Figures 14, 15). It encompassed Northings from 516 to 525 meters and Eastings from 500 to 512 meters. A second, near shore grid was also constructed adjacent to the floating dock The second grid area, measuring 9 by 12 meters, encompassed Northings from 532 to 541 meters and Eastings from 500 to 512 meters. Divers were instructed to systematically remove sediment to quarter-inch screens on the beach area by dredging with three and four-inch couple jet induction-dredges.

Figure 14. Setting up the 9 x 12m grid consisting of 3m squares.

From sediment cores retrieved from Wakulla Springs in 1998, sediment beds were known to lie in the following pattern: a top bed of loose unconsolidated sand followed by a bed of more consolidated organic material. Below this consolidated bed lies a bed of intact river bottom or a hard packed calcitic mud. Artifacts located in the calcitic mud bed may be in primary context.

Originally, efforts were concentrated on the movement of sediment from the northern grid from docks to the western beach area. However, two factors made this impossible. The first was the inability of the three-inch dredge to move sufficient sediment due to decreased efficiency over long distances. Second, the four-inch dredge proved inadequate to move quantities of sediment due to poor maintenance. Subsequent repair of this dredge showed it to be lacking vital internal parts not indicated by visual inspection before the field experience.

Both dredges were reassembled for tandem use and this aided movement of more sediment, but still not at the volume or rate deemed adequate to complete the entire area. Eventually it proved more efficient to transport sediments a shorter distance from the southern grid to the eastern beach area. Artifacts found at the screen were bagged for later interpretation and recording. As in 1998, areas for sediment removal were selected based upon accessibility of the dredges. Hose lengths and working pressures imposed serious constraints on the extent of investigation.

Results of the 1999 Investigations

During this field operation, six 3x3 meter units were excavated, covering an area of six by nine meters (54 square meters). Total sediment removal from this area is estimated at 15.3 cubic meters. The only sediments screened were the reworked sand and the underlying organic layer. No consolidated clay-mud was disturbed in 1998 or 1999. No structural remains or features were located in the area investigated. Excavations located some prehistoric materials in the form of chipped stone debitage and some indeterminate faunal remains. Historic artifacts were identified and consisted mostly of modern debris mixed with historic ceramics.

It was determined during artifact analysis that the deposits examined were not archaeologically significant. The majority of recovered artifacts reflect a modern use of the park as a swimming area. In 1999, a total of 504 artifacts were recovered. This figure does not include modern refuse recorded in the Field Specimen Log but later discarded. Table 2 illustrates the artifacts recovered from the excavated units during the 1999 field season.

Inventory of Artifacts

Artifacts recovered during both the 1998 and 1999 field projects were kept wet in sealed plastic bags and transported back to the George R. Fischer Laboratory of Underwater Archaeology at the FSU Department of Anthropology, where the artifacts were examined for type, age, condition, and state of preservation. Upon completion of the analysis, artifacts were turned over to the BAR curation facilities at the R.A. Gray Building in Tallahassee.

Nearly all artifacts were determined to be in good condition. They were slowly air-dried and no consolidants were added. The artifacts were then counted, weighed, and recorded in an Excel ® based inventory sheet (Appendix A). Counts listed as "present" indicate substantial quantities of artifacts too numerous (> 100) to count or modern materials not determined to be diagnostic.

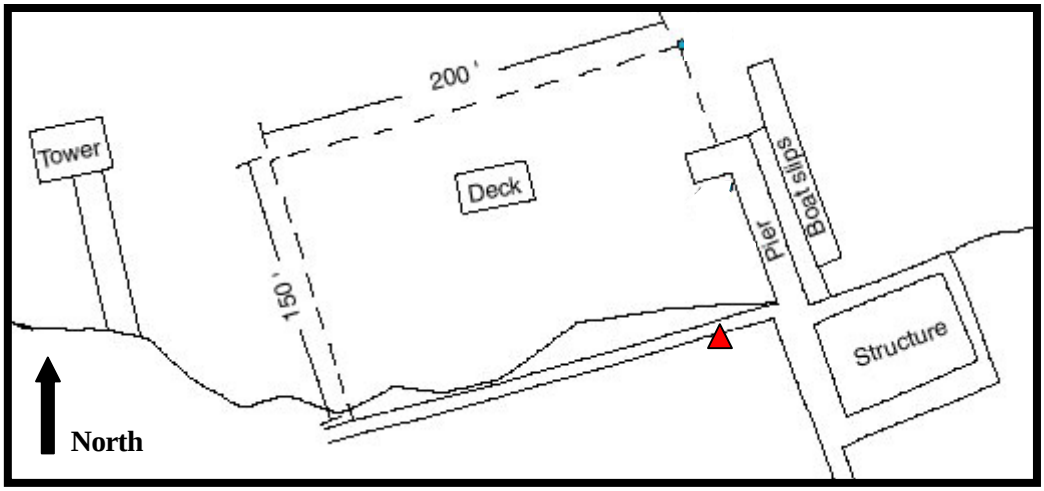

Figure 15. Location of datum on shore for 500N, 500E grid origin.

EXCAVATION UNIT (Northing, Easting)	ARTIFACT TYPE	COUNT
(538, 500)	Modern Material	Present
	Brick	2
	Faunal	207
	Charcoal	Present
(522, 509)	Modern Material	Present
	Chipped Stone	1
	Prehistoric Ceramic	1
	Faunal	19
(519, 506)	Modern Material	Present
	Prehistoric Ceramic	2
	Brick	1
	Faunal	31
(519, 509)	Modern Material	Present
	Faunal	6
(516, 506)	Modern Material	Present
	Faunal	162
	Prehistoric Ceramic	2
	Historic Ceramic	1
(516, 509)	Modern Material	Present
	Charcoal	Present
	Tile	1
	Historic Ceramic	1
	Brick	4
	Faunal	40
	Chipped Stone	3

Table 2. Preliminary Artifact Analysis from the 1999 Season.

This inventory does not provide any new information not already available concerning the archaeological history of the site. Refer to Bryne (1988) for an extensive detail of the archaeological history of the park area.

Conclusions and Recommendations

Sediment beds in the dredged areas revealed the following stratigraphic sequence: a bed of loose unconsolidated sand covering a more consolidated organic material followed by a consolidated bed of calcitic mud of unknown depth. There was no apparent stratigraphic delineation within the sand bed. The area examined has been heavily disturbed by foreign sand brought in from outside sources. Artifacts contained within the sand bed reflect the known history of the spring basin, but are not in primary context, and some may have been introduced in the foreign sand sources from elsewhere.

The same is not true for the calcitic mud bed below the sand and organic beds which should be protected from any future disturbance. Any artifacts located in the calcitic mud bed may be in primary, or at least correct stratigraphic context, but additional studies should be made to date the deposit and to determine if there is a paleo-environmental record contained within that would be useful for Park displays and research interests. Any future investigations that might intrude upon potentially intact sediments should be monitored by professional archaeologists.

The archaeological value of the sand bed is low, but the artifacts should be screened from any sediments moved in the future. Visitors should be encouraged to leave any artifacts or faunal remains in situ. Despite the lack of controlled provenience for artifacts recovered during this project, the prehistoric cultural associations and historic periods indicated by these artifacts confirm occupation of the area from at least Middle to Late

Archaic age (as indicated by diagnostic chipped stone base) to the 20th century. There may be items of interest or of value for display in the Lodge buildings. Previous excavations along the terrestrial component of the site indicate significantly earlier prehistoric occupations in the area, as evident by cultural remains diagnostic of the Paleoindian culture (Jones 1993).

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The problem of sand and sediment migration in the upper Wakulla Springs basin and swim area will continue as long as the area is used for recreation and as long as sediment is replaced in the upper beach areas above the water line of the swimming area. Further damage to cultural resources will be incurred if other alternatives are not adopted. While the attempt to cut costs and offer training operations for students was an honorable goal, it was not effective for the task of stabilizing the basin fill. Park personnel should consider acquiring sufficient funding to build a proper retaining wall or other such system, and then move the sediments using six-inch dredges in good working order and powerful water pumps.

Although extensive terrestrial archaeological survey and testing have been conducted within the park, only limited underwater testing and sampling have been conducted within the swimming area and headspring basin. It is recommended that more testing by means of coring be performed along other submerged sections of the park with minimal site impact. Sites can be best protected when their locations are discovered and recorded.

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Appendix A: Field Specimen Log – Artifacts Recovered during 1998 Field Season

Wakulla Springs Artifact Inventory - 1998 Season

FS	Date	Recovered By	Material	Class	Type	Element	Count	Weight (g)
FS#1	3/28/1998	Crew	Bone	Testudines	undetermined	Carapice/Plastron	12	34.75
FS#1	3/28/1998	Crew	Bone	Osteichtyes	undetermined	Cleithrum	1	0.45
FS#1	3/28/1998	Crew	Bone	Alligator mississippiensis	Enamel	Tooth	1	1.20
FS#1	3/28/1998	Crew	Bone	Animalia	undetermined	undetermined	7	10.05
FS#1	3/28/1998	Crew	Clay	Prehistoric	Ceramic	Body Sherd	4	12.60
FS#1	3/28/1998	Crew	Clay	Prehistoric	Ceramic	Vessel Foot or Lug	1	4.30
FS#1	3/28/1998	Crew	Metal	undetermined	undetermined	Tubing	1	24.55
FS#1	3/28/1998	Crew	Bone	Prehistoric	Worked	Pin	0	5.30
FS#1	3/28/1998	Crew	Bone	Prehistoric	Worked	Pin	1	2.00
FS#2	3/28/1998	Crew	Metal	Jewelry	Man's	Finger Ring	1	9.80
FS#2	3/28/1998	Crew	Metal	Jewelry	Lady's	Finger Ring	1	0.85
FS#2	3/28/1998	Crew	Metal	Coin	US Quarter	undetermined	2	NA
FS#2	3/28/1998	Crew	Metal	Coin	US Nickel	undetermined	2	NA
FS#2	3/28/1998	Crew	Metal	Coin	US Penny	undetermined	8	NA
FS#2	3/28/1998	Crew	Bone	Testudines	undetermined	Carapice/Plastron	11	30.65
FS#2	3/28/1998	Crew	Bone	Mammalia	undetermined	undetermined	3	11.60
FS#2	3/28/1998	Crew	Bone	Animalia	undetermined	undetermined	7	14.45
FS#2	3/28/1998	Crew	Bone	Osteichtyes	undetermined	Vertebrae	1	0.90
FS#2	3/28/1998	Crew	Flora	undetermined	Nut	Shell	1	0.15
FS#2	3/28/1998	Crew	Clay	Prehistoric	Sherd	Body	1	2.55
FS#3	3/28/1998	Crew	Metal	undetermined	Iron	undetermined	1	36.70
FS#3	3/28/1998	Crew	Metal	Coin	US Quarter	undetermined	1	NA
FS#3	3/28/1998	Crew	Metal	Coin	US Nickel	undetermined	1	NA
FS#3	3/28/1998	Crew	Metal	Coin	US Dime	undetermined	1	NA
FS#3	3/28/1998	Crew	Metal	Coin	US Penny	undetermined	6	NA
FS#3	3/28/1998	Crew	Bone	Testudines	undetermined	Carapice/Plastron	7	12.85
FS#3	3/28/1998	Crew	Bone	Animalia	undetermined	undetermined	8	19.75
FS#3	3/28/1998	Crew	Bone	Testudines	undetermined	Long Bone	1	3.00
FS#3	3/28/1998	Crew	UID	undetermined	undetermined	undetermined	1	2.45
FS#3	3/28/1998	Crew	Lithic	undetermined	undetermined	Cinder	1	1.10
FS#4	3/29/1999	Crew	Clay	Prehistoric	Ceramic	Body Sherd	1	7.45
FS#4	3/29/1999	Crew	Metal	Coin	US Quarter	undetermined	3	NA
FS#4	3/29/1999	Crew	Metal	Coin	US Penny	undetermined	5	NA
FS#4	3/29/1999	Crew	Bone	Testudines	undetermined	Carapice/Plastron	10	20.05
FS#4	3/29/1999	Crew	Bone	Osteichtyes	undetermined	Vertebrae	1	1.15
FS#4	3/29/1999	Crew	Bone	Animalia	undetermined	undetermined	3	7.50
FS#4	3/29/1999	Crew	Lithic	Unmodified	Stone	undetermined	1	29.80
FS#4	3/29/1999	Crew	Metal	Fastener	Bolt	undetermined	1	9.10
FS#5	3/29/1998	Crew	Bone	Animalia	undetermined	undetermined	3	4.15
FS#5	3/29/1998	Crew	Bone	Testudines	undetermined	Carapice/Plastron	3	4.45
FS#5	3/29/1998	Crew	Clay	Historic	Fired	Brick	3	7.45
FS#5	3/29/1998	Crew	Mineral	undetermined	undetermined	Coal	1	1.25
FS#5	3/29/1998	Crew	Metal	Coin	US Penny	undetermined	2	NA
FS#6	3/29/1998	Crew	Bone	Aves	undetermined	undetermined	2	3.00
FS#6	3/29/1998	Crew	Bone	Bos taurus	undetermined	Rib	2	7.15
FS#6	3/29/1998	Crew	Bone	Osteichtyes	undetermined	Vertebrae	1	0.75
FS#6	3/29/1998	Crew	Bone	Osteichtyes	undetermined	Pharyngial Grinder	1	0.50

Description	Notes
none	none
none	none
none	none
none	none
Plain	none
Molded vessel foot or lug	none
Oxidized	Discard
Sharped Distal end	none
Midshaft	none
Decorated w/ faux gem (loose)	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
Undeterminate	none
Oxidized	Discard
none	none
none	none
none	none
none	none
none	none
none	none
none	none
Possible mineralized turtle bone	none
none	none
Plain, Some brushing evident on the interior	none
none	none
none	none
none	none
none	none
none	none
Stone, possibly Granite	none
Oxidized	Discard
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none

FS#6	3/29/1998	Crew	Bone	Rodentia	undetermined	Sacrum	1	0.30
FS#6	3/29/1998	Crew	Bone	Mammalia	undetermined	undetermined	1	7.95
FS#6	3/29/1998	Crew	Bone	Testudines	undetermined	Plastron/Carapice	9	20.30
FS#6	3/29/1998	Crew	Bone	Anamalia	undetermined	undetermined	4	3.95
FS#6	3/29/1998	Crew	Wood	Mineralized	Charcoal	undetermined	1	1.65
FS#6	3/29/1998	Crew	Flora	undetermined	Peach	Pit	1	0.70
FS#6	3/29/1998	Crew	Clay	Historic	Fired Clay	Brick	2	12.55
FS#6	3/29/1998	Crew	Clay	Historic	Porcelain	Rim	1	2.10
FS#6	3/29/1998	Crew	Lithic	Flake	Recortified	Flake	1	0.75
FS#6	3/29/1998	Crew	Bone	Anamalia	undetermined	Cranial Fragment	1	9.80
FS#6	3/29/1998	Crew	Bone	Artiodactyla	undetermined	Phalange	1	1.35
FS#6	3/29/1998	Crew	Bone	Artiodactyla	undetermined	Tarsal	1	2.70
FS#6	3/29/1998	Crew	Bone	Mammalia	Longbone	Epiphises	1	0.60
FS#6	3/29/1998	Crew	Metal	Coin	US Dime	undetermined	1	NA
FS#6	3/29/1998	Crew	Metal	undetermined	undetermined	Tag	1	3.90
FS#6	3/29/1998	Crew	Lithic	Late Archaic	Stemmed	Base	1	1.60
FS#7	3/29/1998	Crew	Metal	Coin	US Dime	undetermined	1	NA
FS#7	3/29/1998	Crew	Metal	Coin	US Nickel	undetermined	2	NA
FS#7	3/29/1998	Crew	Metal	Coin	US Penny	undetermined	5	NA
FS#7	3/29/1998	Crew	Lithic	Flake	Primary Decorticle	undetermined	1	10.00
FS#7	3/29/1998	Crew	Bone	undetermined	undetermined	Pin	4	5.40
FS#7	3/29/1998	Crew	Bone	Testudines	undetermined	Plastron/Carapice	20	56.55
FS#7	3/29/1998	Crew	Bone	Osteichtyes	undetermined	Pharyngial Grinders	1	0.55
FS#7	3/29/1998	Crew	Bone	Animalia	undetermined	undetermined	7	8.90
FS#7	3/29/1998	Crew	Clay	Historic	Fired Clay	Brick	2	3.70
FS#7	3/29/1998	Crew	Plastic	Coin	Game Token	undetermined	1	4.45
FS#7	3/29/1998	Crew	Fabric	Historic	Woven	Webbing	1	<0.05
FS#10	4/4/1998	Crew	Clay	Historic	Fired	Brick	1	7.45
FS#10	4/4/1998	Crew	Bone	Animalia	undetermined	undetermined	1	5.10
FS#11	4/4/1998	Crew	Bone	Animalia	undetermined	undetermined	6	2.80
FS#12	4/4/1998	Crew	Bone	Testudines	undetermined	Carapice/Plastron	2	15.20
FS#12	4/4/1998	Crew	Bone	Animalia	undetermined	undetermined	7	5.95
FS#12	4/4/1998	Crew	Bone	Aves	undetermined	Longbone	1	0.15
FS#12	4/4/1998	Crew	Bone	Osteichthyes	undetermined	Vertebrae	1	0.35
FS#12	4/4/1998	Crew	Clay	Historic	Fired	Brick	1	3.40
FS#12	4/4/1998	Crew	Clay	Historic	Fired	Tile	2	6.30
FS#12	4/4/1998	Crew	Metal	Coin	US Dime	undetermined	1	NA
FS#12	4/4/1998	Crew	Metal	Coin	US Nickel	undetermined	1	NA
FS#12	4/4/1998	Crew	Metal	Coin	US Penny	undetermined	9	NA
FS#13	4/4/1998	Crew	Metal	Coin	US Penny	undetermined	7	NA
FS#13	4/4/1998	Crew	Bone	Osteichthyes	undetermined	Vertebrae	1	0.95
FS#13	4/4/1998	Crew	Bone	Testudines	undetermined	Carapice/Plastron	2	7.40
FS#13	4/4/1998	Crew	Metal	undetermined	Iron	UID	1	5.25
FS#14	4/5/1998	Crew	Bone	Aves	undetermined	Longbone	1	3.40
FS#14	4/5/1998	Crew	Bone	Testudines	undetermined	Carapice/Plastron	1	7.90
FS#14	4/5/1998	Crew	Bone	Animalia	undetermined	undetermined	1	1.70
FS#14	4/5/1998	Crew	Metal	Coin	US Penny	undetermined	2	NA
FS#14	4/5/1998	Crew	Lithic	undetermined	undetermined	Flake	1	3.95
FS#15	3/29/1998	Crew	Shell	Bi-valve	Oyster	Shell Half	1	40.50

none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
"91" inscribed on one side, "6" on the other	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
Glazed	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
Oxidized	Discard
none	none
none	none
none	none
none	none
none	none
none	none

FS#15	3/29/1998	Crew	Coral	Mineralized	undetermined	Head	1	25.45
FS#15	3/29/1998	Crew	Bone	Animalia	undetermined	undetermined	1	2.00
FS#15	3/29/1998	Crew	Bone	Testudines	undetermined	Carapice/Plastron	3	4.20
FS#15	3/29/1998	Crew	Bone	Osteichthyes	undetermined	Vertebrae	2	2.10
FS#15	3/29/1998	Crew	Bone	Aves	undetermined	Metatarsal	1	0.20
FS#16	3/28/1998	Crew	Lithic	Decorative Fixture	Limestone	Corner Piece	1	2.80
FS#16	3/28/1998	Crew	Bone	Testudines	undetermined	Carapice/Plastron	4	5.20
FS#16	3/28/1998	Crew	Bone	Animalia	undetermined	undetermined	3	5.85
FS#21	4/4/1998	Crew	Metal	undetermined	undetermined	Washer	1	39.25
FS#21	4/4/1998	Crew	Bone	Testudines	undetermined	Carapice/Plastron	1	2.00
FS#21	4/4/1998	Crew	Clay	Prehistoric	Ceramic	Body Sherd	1	1.70
FS#22	4/4/1998	Crew	Metal	Coin	US Penny	undetermined	6	NA
FS#22	4/4/1998	Crew	Metal	Coin	US Dime	undetermined	1	NA
FS#22	4/4/1998	Crew	Bone	Aves	undetermined	Longbone	1	4.10
FS#23	4/5/1998	Crew	Clay	Historic	Fired	Tile	1	296.90
FS#23	4/5/1998	Crew	Metal	Fastener	Wire	Nail	1	4.30
FS#23	4/5/1998	Crew	Lithic	undetermined	Vitrified	UID	1	4.20
FS#23	4/5/1998	Crew	Bone	Aves	undetermined	Longbone	1	1.05
FS#23	4/5/1998	Crew	Bone	Animalia	undetermined	undetermined	2	2.90
FS#23	4/5/1998	Crew	Bone	Reptilia	undetermined	Vertebrae	1	1.70
FS#24	4/5/1998	Damour/Howe	Coral	Mineralized	undetermined	Head	1	50.40
FS#24	4/5/1998	Damour/Howe	Bone	Mammalia	undetermined	Metatarsal	1	1.10
FS#24	4/5/1998	Damour/Howe	Bone	Animalia	undetermined	undetermined	1	1.85
FS#24	4/5/1998	Damour/Howe	Shell	Oyster	Bivalve	Shell	1	9.60
FS#24	4/5/1998	Damour/Howe	Metal	Coin	US Penny	undetermined	1	NA
FS#24	4/5/1998	Damour/Howe	Metal	Fastener	Hex	Bolt	1	25.35
FS#25	4/5/1998	Crew	Bone	Aves	undetermined	Longbone	1	0.55
FS#25	4/5/1998	Crew	Bone	Animalia	undetermined	undetermined	2	4.35
FS#25	4/5/1998	Crew	Bone	Testudines	undetermined	Carapice/Plastron	1	0.80
FS#25	4/5/1998	Crew	Metal	Coin	US Quarter	undetermined	1	NA
FS#25	4/5/1998	Crew	Metal	Coin	US Penny	undetermined	5	NA
FS#31	4/17/1998	Crew	Metal	undetermined	undetermined	Washer	3	34.75
FS#31	4/17/1998	Crew	Metal	Fastener	undetermined	Spike	1	18.90
FS#31	4/17/1998	Crew	Metal	Fastener	Shear	Pin	1	3.55
FS#31	4/17/1998	Crew	Metal	Jewelry	undetermined	Finger Ring	1	2.20
FS#31	4/17/1998	Crew	Wood	Fragment	undetermined	undetermined	1	2.95
FS#31	4/17/1998	Crew	Metal	Coin	US Dime	undetermined	2	NA
FS#31	4/17/1998	Crew	Metal	Coin	US Nickel	undetermined	2	NA
FS#31	4/17/1998	Crew	Metal	Coin	US Penny	undetermined	10	NA
FS#31	4/17/1998	Crew	Glass	Flat	Clear	undetermined	5	9.95
FS#31	4/17/1998	Crew	Clay	Historic	Fired Clay	Brick	1	6.40
FS#31	4/17/1998	Crew	Clay	Historic	Ceramic	Body Sherd	1	1.50
FS#31	4/17/1998	Crew	Bone	Animalia	undetermined	undetermined	14	33.50
FS#31	4/17/1998	Crew	Bone	Testudines	undetermined	Plastron/Carapice	22	52.25
FS#31	4/17/1998	Crew	Bone	Rodentia	undetermined	Sacrum	1	0.85
FS#31	4/17/1998	Crew	Bone	Aves	undetermined	Metacarpal	1	0.45
FS#31	4/17/1998	Crew	Bone	Alligator mississippiensis	undetermined	Vertebrae	1	2.70
FS#31	4/17/1998	Crew	Bone	Osteichtyes	undetermined	Vertebrae	2	0.35
FS#31	4/17/1998	Crew	Wood	Mineralized	undetermined	undetermined	2	8.80

Waterworn	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	Discard
none	none
none	none
none	none
none	none
none	none
Glazed	none
none	Discard
Recortified	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
Oxidized	Discard
none	none
none	none
none	none
none	none
none	none
Oxidized	Discard
Oxidized	Discard
Oxidized	Discard
none	none
Sharpened at one end, possibly burned	none
none	none
none	none
none	none
none	none
none	none
Whiteware, evidence of green decoration	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none

FS#31	4/17/1998	Crew	Lithic	Chert	Recortified	Unmodified Flake	1	2.55
FS#31	4/17/1998	Crew	Bone	Odocoileus virginianus	undetermined	Tarsal	1	1.45
FS#31	4/17/1998	Crew	Clay	Prehistoric	undetermined	Body Sherd	1	4.50
FS#31	4/17/1998	Crew	Lithic	undetermined	Tool	Flake	1	6.30
FS#31	4/17/1998	Crew	Lithic	undetermined	Chunky	Fragment	1	4.30
FS#31	4/17/1998	Crew	Lithic	Unmodified	undetermined	undetermined	1	6.30
FS#32	4/17/1998	Faught/McClean	Glass	Flat	Clear	undetermined	21	32.50
FS#32	4/17/1998	Faught/McClean	Glass	Flat	Blue	undetermined	1	1.70
FS#32	4/17/1998	Faught/McClean	Glass	Container	Clear	undetermined	14	22.90
FS#32	4/17/1998	Faught/McClean	Clay	Historic	Brick	undetermined	1	3.85
FS#32	4/17/1998	Faught/McClean	Clay	Historic	Tile	undetermined	1	3.25
FS#32	4/17/1998	Faught/McClean	Metal	Coin	US Quarter	undetermined	1	NA
FS#32	4/17/1998	Faught/McClean	Metal	Coin	US Dime	undetermined	7	NA
FS#32	4/17/1998	Faught/McClean	Metal	Coin	US Nickel	undetermined	3	NA
FS#32	4/17/1998	Faught/McClean	Metal	Coin	US Penny	undetermined	14	NA
FS#32	4/17/1998	Faught/McClean	Bone	Testudines	undetermined	Carapice/Plastron	25	89.50
FS#32	4/17/1998	Faught/McClean	Bone	Animalia	undetermined	undetermined	50	124.55
FS#32	4/17/1998	Faught/McClean	Bone	Osteichtyes	undetermined	Vertebrae	9	7.70
FS#32	4/17/1998	Faught/McClean	Bone	Mammalia	undetermined	Metatarsal	1	2.75
FS#32	4/17/1998	Faught/McClean	Bone	Mammalia	undetermined	undetermined	1	3.95
FS#32	4/17/1998	Faught/McClean	Bone	Mammalia	Odocoileus virginianus	Tooth	1	1.25
FS#32	4/17/1998	Faught/McClean	Bone	Reptilia	Alligator mississippiensis	Tooth	1	0.90
FS#32	4/17/1998	Faught/McClean	Bone	Pin	undetermined	undetermined	2	4.50
FS#32	4/17/1998	Faught/McClean	Metal	Tubing	Copper	undetermined	1	12.65
FS#32	4/17/1998	Faught/McClean	Metal	Faster	Hex Head	Bolt	1	27.45
FS#32	4/17/1998	Faught/McClean	Metal	Fastener	Flat Head	Screw	1	3.15
FS#32	4/17/1998	Faught/McClean	Metal	undetermined	Bobby Pin	undetermined	1	0.65
FS#32	4/17/1998	Faught/McClean	Metal	Fastener	Panel	Nail	1	1.05
FS#32	4/17/1998	Faught/McClean	Metal	Fastener	Wire	Nail	3	18.35
FS#32	4/17/1998	Faught/McClean	Metal	undetermined	Hex	Nuts	4	46.70
FS#32	4/17/1998	Faught/McClean	Metal	undetermined	undetermined	Washer	1	3.20
FS#32	4/17/1998	Faught/McClean	Metal	undetermined	Lock	Washer	1	4.75
FS#32	4/17/1998	Faught/McClean	Metal	undetermined	Light Bulb	Base	1	4.90
FS#32	4/17/1998	Crew	Lithic	undetermined	undetermined	undetermined	1	2.05
FS#32	4/17/1998	Crew	Lithic	undetermined	Chunky	Fragment	1	0.35
FS#32	4/17/1998	Crew	Lithic	undetermined	Tool	Flake	1	2.50
FS#32	4/17/1998	Crew	Lithic	undetermined	Tool	Flake	1	1.95
FS#32	4/17/1998	Crew	Lithic	Unmodified	undetermined	undetermined	1	2.40
FS#32	4/17/1998	Crew	Lithic	Unmodified	undetermined	undetermined	1	5.00
FS#33	4/17/1998	Kilgo/Yates	Glass	Flat	Clear	undetermined	10	12.55
FS#33	4/17/1998	Kilgo/Yates	Glass	Container	Clear	undetermined	5	10.35
FS#33	4/17/1998	Kilgo/Yates	Glass	Flat	Blue	undetermined	3	3.55
FS#33	4/17/1998	Kilgo/Yates	Glass	Flat	Green	undetermined	2	1.45
FS#33	4/17/1998	Kilgo/Yates	Clay	Historic	Brick	undetermined	1	0.45
FS#33	4/17/1998	Kilgo/Yates	Metal	Coin	US Quarter	undetermined	1	NA
FS#33	4/17/1998	Kilgo/Yates	Metal	Coin	US Nickel	undetermined	2	NA
FS#33	4/17/1998	Kilgo/Yates	Metal	Coin	US Penny	undetermined	7	NA
FS#33	4/17/1998	Kilgo/Yates	Bone	Testudines	undetermined	Carapice/Plastron	19	41.35
FS#33	4/17/1998	Kilgo/Yates	Bone	Osteichtyes	undetermined	Vertebrae	3	2.55

none	none
none	none
none	none
Corticle Flake	none
none	none
Possible volcanic origin	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
Distal end of a Long Bone	none
none	none
none	none
Pointed distal end (1), Shaft (1)	none
none	none
Oxidized	Disgard
none	Disgard
Oxidized	Disgard
Oxidized	Disgard
Oxidized	Disgard
Oxidized	Disgard
Oxidized	Disgard
Oxidized	Disgard
none	Disgard
Modified?	none
none	none
none	none
Waterworn, recortified	none
none	none
Waterworn	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none

Wakulla Springs Artifact Inventory - 1998 Season

FS#33	4/17/1998	Kilgo/Yates	Bone	Mammalia	Odocoileus virginianus	Tooth	2	1.80
FS#33	4/17/1998	Kilgo/Yates	Bone	Animalia	undetermined	undetermined	27	68.80
FS#33	4/17/1998	Kilgo/Yates	Bone	Mammalia	undetermined	Tarsal	2	3.85
FS#33	4/17/1998	Kilgo/Yates	Shell	undetermined	undetermined	undetermined	1	1.50
FS#33	4/17/1998	Kilgo/Yates	Lithic	undetermined	Chert	undetermined	1	1.90
FS#33	4/17/1998	Kilgo/Yates	Metal	Fastener	Hex Head	Bolt	1	8.70
FS#33	4/17/1998	Kilgo/Yates	Metal	undetermined	undetermined	Washer	1	17.35
FS#33	4/17/1998	Crew	Lithic	Primary	Thinning	Flake	1	17.25
FS#33	4/17/1998	Crew	Lithic	undetermined	Chunky	Flake	1	4.10
FS#33	4/17/1998	Crew	Lithic	Unmodified	undetermined	undetermined	3	6.60
FS#34	4/18/1998	Fritz/Howe	Glass	Flat	Clear	undetermined	12	22.00
FS#34	4/18/1998	Fritz/Howe	Glass	Flat	Blue	undetermined	1	1.25
FS#34	4/18/1998	Fritz/Howe	Glass	Container	Amber	undetermined	1	1.65
FS#34	4/18/1998	Fritz/Howe	Glass	Container	Clear	undetermined	4	6.25
FS#34	4/18/1998	Fritz/Howe	Clay	Historic	Tile	undetermined	1	0.85
FS#34	4/18/1998	Fritz/Howe	Clay	Historic	Brick	undetermined	3	3.05
FS#34	4/18/1998	Fritz/Howe	Clay	Prehistoric	Ceramic	Body sherd	1	7.30
FS#34	4/18/1998	Fritz/Howe	Metal	Coin	US Quarter	undetermined	1	NA
FS#34	4/18/1998	Fritz/Howe	Metal	Coin	US Nickel	undetermined	1	NA
FS#34	4/18/1998	Fritz/Howe	Metal	Coin	US Penny	undetermined	4	NA
FS#34	4/18/1998	Fritz/Howe	Bone	Testudines	undetermined	Carapice/Plastron	7	21.35
FS#34	4/18/1998	Fritz/Howe	Bone	Animalia	undetermined	UID	11	15.65
FS#34	4/18/1998	Fritz/Howe	Bone	Osteichtyes	undetermined	Vertebrae	1	0.30
FS#34	4/18/1998	Fritz/Howe	Bone	Osteichtyes	undetermined	Pharyngial Grinder	1	1.70
FS#34	4/18/1998	Fritz/Howe	Shell	undetermined	undetermined	undetermined	1	1.70
FS#34	4/18/1998	Fritz/Howe	Lithic	undetermined	Chert	undetermined	2	2.80
FS#34	4/18/1998	Crew	Lithic	Primary	Thinning	Flake	1	23.60
FS#34	4/18/1998	Crew	Lithic	Secondary	Thinning	Flake	1	3.60
FS#34	4/18/1998	Crew	Shell	Unmodified	undetermined	undetermined	1	1.70
Surface	4/1/1998	Yates	Lithic	Unmodified	undetermined	undetermined	1	7.40

none	none
none	none
none	none
none	none
Recortified Flake	none
Oxidized	Disgard
none	Disgard
Heavy Corticle	none
Heavy Corticle	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
Wakulla Check Stamped	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
none	none
Recortified Flake	none
Heavy Corticle	none
none	none
none	none
Heavy Corticle, from beach area	none

Appendix B: Field Specimen Log -- Artifacts Recovered during 1999 Field Season

Wakulla Springs Artifact Inventory - 1999 Season

FS	Date	North	East	Recovered By	Material	Class	Type	Element	Count
FS# 35	3/6/1999	538N	500E	Charles Lawson	Clay	Ceramic	Historic	undetermined	2
FS# 35	3/6/1999	538N	500E	Charles Lawson	Bone	undetermined	undetermined	undetermined	207
FS# 35	3/6/1999	538N	500E	Charles Lawson	Modern Refuse	undetermined	undetermined	undetermined	>20
FS# 36	3/7/1999	522N	509E		Clay	Ceramic	Historic	undetermined	1
FS# 36	3/7/1999	522N	509E		Lithic	undetermined	undetermined	undetermined	1
FS# 36	3/7/1999	522N	509E		Bone	undetermined	undetermined	undetermined	18
FS# 36	3/7/1999	522N	509E		Modern Refuse	undetermined	undetermined	undetermined	6
FS# 37	3/7/1999	516N	506E		Bone	undetermined	undetermined	undetermined	98
FS# 37	3/7/1999	516N	506E		Modern Refuse	undetermined	undetermined	undetermined	>35
FS# 38	3/7/1999	519N	506E	Robert Francis	Clay	Ceramic	Historic	undetermined	3
FS# 38	3/7/1999	519N	506E	Robert Francis	Bone	undetermined	undetermined	undetermined	31
FS# 38	3/7/1999	519N	506E	Robert Francis	Modern Refuse	undetermined	undetermined	undetermined	16
FS# 39	3/7/1999	519N	509E	John Kilgo	Bone	undetermined	undetermined	undetermined	7
FS# 39	3/7/1999	519N	509E	John Kilgo	Modern Refuse	undetermined	undetermined	undetermined	3
FS# 40	3/8/1999	516N	509E	Brian Erbe	Clay	Ceramic	Historic	undetermined	5
FS# 40	3/8/1999	516N	509E	Brian Erbe	Lithic	undetermined	undetermined	undetermined	3
FS# 40	3/8/1999	516N	509E	Brian Erbe	Bone	undetermined	undetermined	undetermined	40
FS# 40	3/8/1999	516N	509E	Brian Erbe	Wood	undetermined	undetermined	undetermined	23
FS# 40	3/8/1999	516N	509E	Brian Erbe	Modern Refuse	undetermined	undetermined	undetermined	>30
FS# 41	3/8/1999	516N	506E	Charles Lawson	Clay	Ceramic	Historic	undetermined	1
FS# 41	3/8/1999	516N	506E	Charles Lawson	Bone	undetermined	undetermined	undetermined	64
FS# 41	3/8/1999	516N	506E	Charles Lawson	Modern Refuse	undetermined	undetermined	undetermined	>30