The Guana Shell Ring

Michael Russo
Gregory Heide
Vicki Rolland

The Northeast Florida Anthropological Society

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INTRODUCTION

Prior to investigating the Guana Shell Ring (8SJ2554), the Northeast Florida Anthropological Society (NEFAS) had assisted federal and state agencies with mapping and investigating two other shell rings in northeast Florida, the Rollins Shell Ring (8Du7510) and Oxeye (8Du7478). Using knowledge and experience gained from those projects, NEFAS proposed to map and undertake preliminary investigations at 8SJ2554, a site thought to date to the Late Archaic (circa 4500 to 3000 B.P.), but which had never been sufficiently investigated to confirm its shape or period of construction (Newman and Weisman 1992; Tesar and Baker 1985). NEFAS applied for and received partial funding from the Department of State, Division of Historical Resources (F0126), to undertake the study. The grant began on March 7, 2001, and ended May 15, 2002. It was designated to support NEFAS's efforts to produce a contour map of the site and report on limited excavations.

HISTORICAL AND GEOGRAPHICAL SETTING

The Guana Shell Ring is located in the Guana Tract, a Spanish land grant on the northeast coast of Florida between the Tolomato River and the Atlantic Ocean (Figure 1). The site location can be identified on the USGS South Ponte Vedra Beach quadrangle, Irregular Section 51, T55-R29E, with its center point at latitude 30.055815, longitude 81.341934 (NAD 27). Between the shell ring and the ocean lies Guana Lake, a freshwater reservoir created by a dam located near the mouth of the former tidal creek, the Guana River. The lake is fresher on its northern end, and brackish towards its southern end. Historic accounts from the 1780s suggest that the 13-mile-long Guana River was fed by freshwater marshes at its northern headwaters, yet tidal influence was strong even at its most northern reaches (Schaffer 2000:66–69). During recent prehistory (post-4500 B.P.), the portion of the river near the Guana Shell Ring would have been brackish, being less than halfway to its headwaters from the mouth. The peninsular land form upon which the ring was situated would have been bounded on its east side by saltwater marsh at the latitude of the ring. Today on the western shore of the lake, there lies a narrow unvegetated beach during reservoir draw downs. The lake laps up against the sandy soils of the peninsula during higher water levels and is eroding neighboring archaeological site 8SJ2555. A half mile west of the ring lies the saltwater Tolomato River and its estuary.

Surrounded by saltwater marsh, the Guana peninsula was ideally situated to provide bountiful marine and estuarine resources for prehistoric inhabitants. Fresh water abounded on the peninsula in the forms of ponds and marshes in the 1700s (Schaffer 2000:27) and were likely present in recent prehistory. Today on the eastern side of the shell ring lies an intermittently wet swale only 100 meters from the western shore of Guana Lake (Figures 1 and 2). Prior to historic drainage ditches emptying the swale to the northeast, it would have been more permanently wet, probably with freshwater. Immediately to the west, and between the ring and the Tolomato estuary lies a more permanently watered freshwater marsh vegetated in *Spartina bakeri* grass. To the north and south and on the site itself, well drained sandy soils support a live oak/palm hammock.

Beginning in the 1770s and through 1784, portions of the peninsula were farmed by British Governor James Grant. At the southern tip of the peninsula he established a plantation which predominately grew indigo. The crop rapidly depleted the poor sandy soils, requiring additional forest clearing for successive annual plantings. This spread of the plantation advanced north on the peninsula, but it is unclear if forest was cleared and agricultural fields were as far north as the shell ring

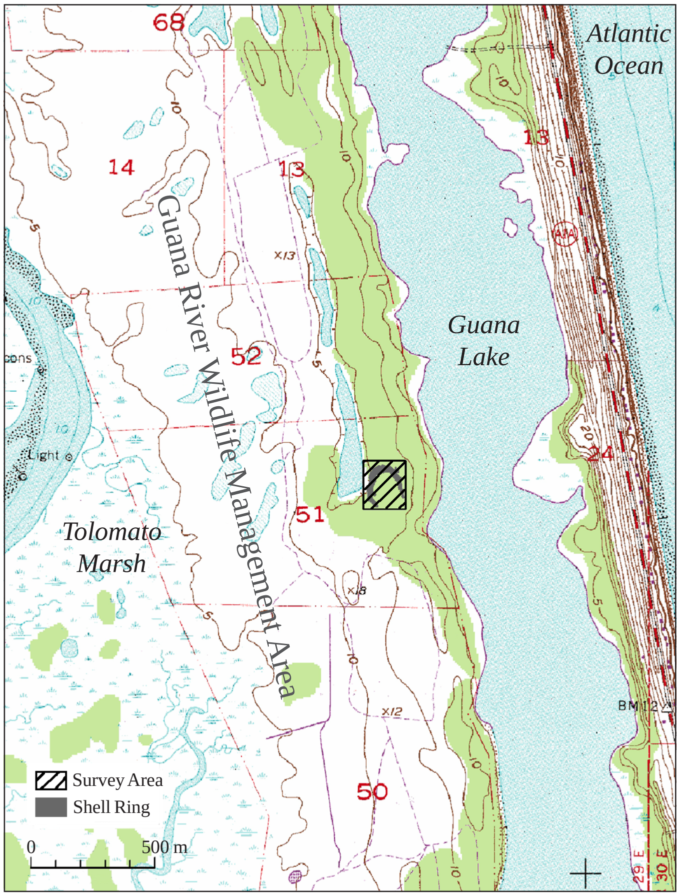

Figure 1 — Guana Shell Ring location.

(Schaffer 2000:28). In 1781, another plantation, Mt. Pleasant, was established at the headwaters of the Guana River, which was dammed to create a freshwater reservoir to grow rice. The rice fields were restricted to the headwaters 7 miles north of the Guana Shell Ring. With the resolution of the Revolutionary War, Florida was returned to Spain, and the Guana Tract was largely abandoned. Shortly thereafter, however, Minorcan immigrants began purchasing small tracts of Grant's former plantations for settlement and farming. Acreage was cleared and homesteads were intermittently established throughout the 1800s. By the 1920s, real estate investors and developers began consolidating small rural land holdings with plans to build urban residences. The depression halted these efforts. In 1957 Florida leased most of the Guana peninsula for recreational purposes. In 1984, the property was purchased by the state through its Conservation and Recreation Lands (CARL) program and two separate entities, the Guana River State Park and the Guana River State Wildlife Management Area, were established to manage the properties.

PREVIOUS RESEARCH

Little previous research has been undertaken on the Guana Shell Ring. In 1985 Tesar and Baker reported on a walkover survey conducted for the Florida Department of Natural Resources, Division of Recreation and Parks, in preparation for the development of the Conceptual Plan for the Guana River State Land. They identified the site as "a large (oyster, clam, conch, coquina) shell ring" about 100 meters in diameter and a meter in elevation. They found an Orange Incised sherd in an area of the ring disturbed by a tree fall and classified the ring as Late Archaic (circa 4500 to 3000 B.P). They considered the site eligible for nomination to the National Register of Historic Places (NRHP) and recommended that mapping and testing be undertaken to facilitate a nomination. The site form completed by Tesar noted that a small historic homestead once stood on the site. On the north side of the ring to the northeast "more recent disturbance" was evidenced by the presence of "Spanish Olive Jar, Peasant Ware, Black Glass, and coquina [rock] rubble" (Tesar and Baker 1985:A-24).

In 1992, Newman and Weisman (see also Newman 1995) suggested that the ring might be the remains of a circular village similar to those of South Carolina where house occupations were thought to occur on top the rings and the center of the sites thought to be relatively clean of debris (Trinkley 1985). They further stated that the "density of remains present suggest intensive if not permanent use of the area but little more can be said in the absence of seasonality studies of archaeofauna" (Newman and Weisman 1992:170).

In 1992, a National Historic Landmark Nomination was completed by the National Park Ser-

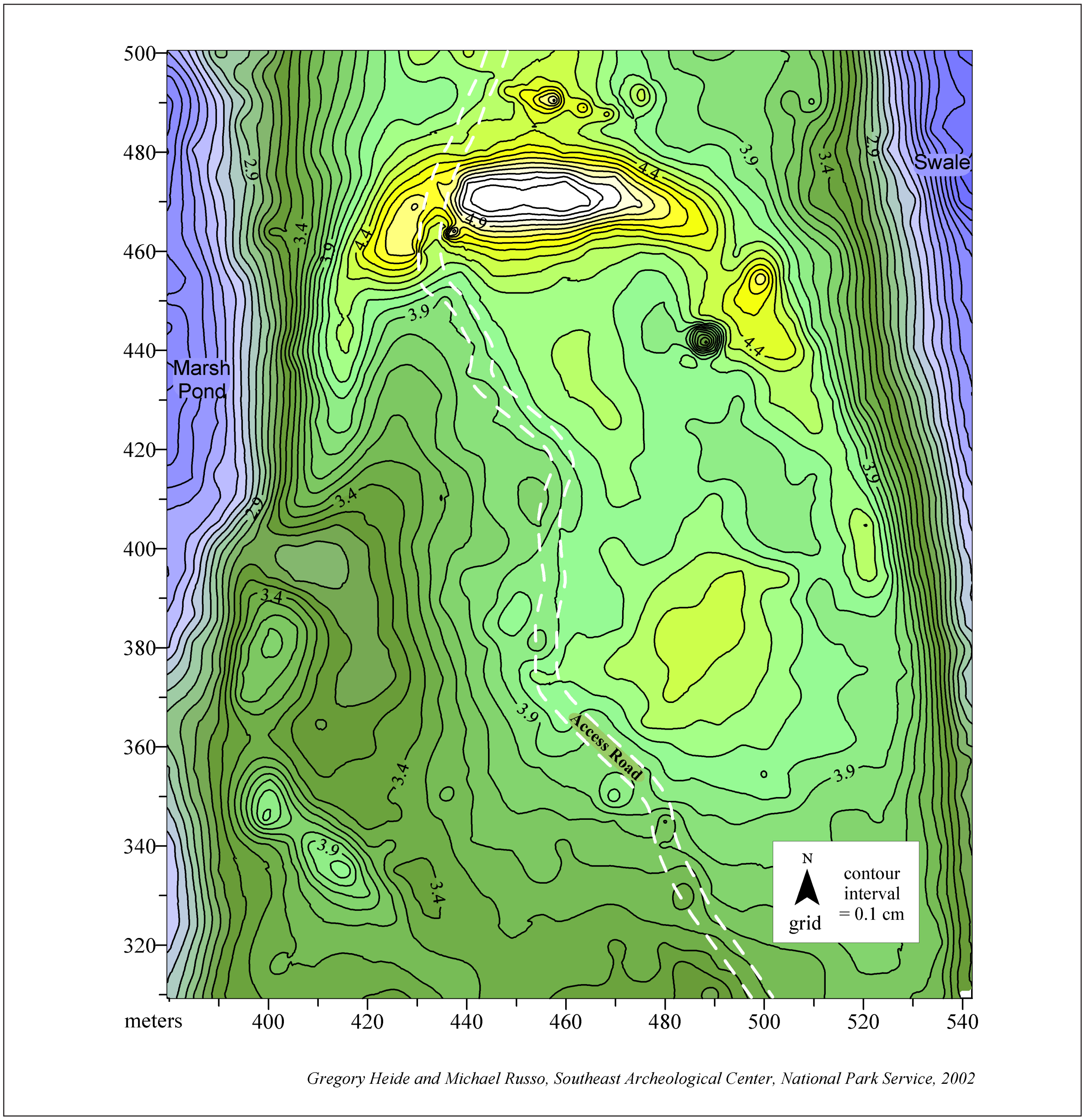

Figure 2 — Guana Shell Ring topographic contour map.

vice (Barnes 1992). It characterized the site based primarily on the conclusions reached by Tesar and Baker (1985) and Newman and Weisman (1992). The nomination mistakenly identified the ring as "largely composed of shells of coquina (*Donax variabilis*), a small species of surf dwelling clam that is most abundant during the fall and winter months" (Barnes 1992 after Miller 1992:105). In fact, Tesar and Baker (the only archaeologists to have surveyed the site) only stated that coquina, along with clam, oyster, and conch, were the shell constituents found at the ring. They did not mention the amount of each species. The nomination seems to have confused Miller's description of coquina middens with shell rings. In fact, no known shell ring is composed largely of coquina, and only three, including Guana, are known to contain any but the most minor amounts of coquina (Russo and Saunders 1999). Additionally, in terms of seasonality and coquina, recent studies indicate that the small surf clam is most abundant in the spring and summer on the beaches, but its greatest abundance in terms of populations of edible sizes occurs during the summer and fall, not fall and winter (Russo and Ste. Claire 1992:339).

Surveys and site testing in the Guana tract and nearby areas have been undertaken, but none have further investigated the shell ring (e.g., Ashley et al. 1996; Dickinson and Wayne 1991; Newman 1998; Weisman and Newman 1992). One survey identified sites near the shell ring, including 8SJ2555 lying to the north and east of the shell ring. The site lies in part along Guana Lake, and a surface collection of artifacts found along the beach during a draw down revealed that most sherds were Orange (Weisman and Newman 1992:8), making the site possibly contemporaneous with the Guana Shell Ring. Human remains were also found eroding from midden onto the beach (see also Newman 2002). However, other cultural periods were identified in the artifact collection, and whether the remains date to the Orange period is unknown.

A multiple component site, 8SJ2463 lies a half mile south of the ring and yielded fiber-tempered ceramics from its Orange component, apparently in a shell midden matrix (Tesar and Baker 1985:A-22; Weisman and Newman 1992:9). At least ten other sites with Orange components are located within the Guana tract, all south of the Guana Shell Ring, one to six miles distant (Newman and Weisman 1992:163; Tesar and Baker 1985; Weisman and Newman 1992). All known Orange sites in the tract are shell middens, but only 8SJ2554 is a shell ring.

PREHISTORIC CULTURE SEQUENCE

Human occupation on the Guana tract began at least as early as the late pre-ceramic Archaic (some time between 6000 and 4000 years ago). Shell midden lacking pottery has been found below Orange pottery bearing strata at 8SJ2463 (Tesar and Baker 1985:A-22) while sites containing preceramic Archaic projectile points have been found at 8SJ3, 8SJ33, 8SJ50, 8SJ2463, and 8SJ32 (Newman and Weisman 1992:164; Tesar and Baker 1985). The lifeways of peoples of this period have not been examined intensively in the region. We do know, however, they hunted terrestrial game, fished in freshwater and saltwater environments, and produced shell middens (Newman and Weisman 1982; Russo 1993).

As described above, the Orange period (4000 to 2000 B.P.) is well represented by shell midden sites in the Guana tract. The Orange period is a time in east Florida when people intensively occupied the near-coastal zone. Regional sites types of the Orange period include mounded shell middens and sheet shell middens of varying sizes, artifact scatters without shell, and shell rings. The actual uses of these site types have never been formally described, but generally speaking, the deeper and larger sheet middens are seen as permanent villages or semipermanent base camps, while large mounded middens are seen as ceremonial sites (Piatek 1994) or refuse dumps. Small middens are most often referred to as sites of intermittent (seasonal) occupation by small groups. Camps, procurement sites, and processing stations are terms often applied to these sites. Sites without shell have been called hunting or butchering camps (Saunders 1985).

A debate goes on about the function of shell rings. Some archaeologists view them as village/habitation sites of some permanence (Newman and Weisman 1992; Trinkley 1985) while others see them as both villages and ceremonial sites with the shape and height of rings designed to facilitate observation of ceremonies in the central plaza, and, conversely, observation of the people on top of the ring by people in the plaza (Russo n.d.; Russo and Heide 2002).

All Orange sites are characterized by the presence of fiber-tempered pottery, the earliest pottery in Florida. Archaeologists recognize that through time that the frequency of plain to decorated pottery, and the kinds of decorations in pots changed. During the earliest period (Orange 1, 4000 to 3600 B.P.) mostly plain pottery with no surface decorations was manufactured. Through time, various types of incising, ticks, and punctations were placed on the surfaces of ceramic vessels until the last period (Orange 4, 3200 to 3000 B.P.) when only simple incised motifs were present (Milanich and Fairbanks 1980:156).

Between 3000 and 2500 B.P. (called the Transitional period by some archaeologists) fiber-tempered pottery slowly fell out of favor, replaced by pottery made with fiber *and* sand or sponge-spicule temper. Pottery tempered only with sand or only with sponge spicules was also manufactured in the region during this time. Pottery type names of this period include semi-fiber tempered and Deptford, although the latter is primarily associated with the St. Johns I period that followed. No type sites for the Transitional period have ever been identified in the region, and usually it is simply the presence of pottery types that indicates a Transitional component in a multiple component site. Newman and Weisman (1992:164) identify only one possible Transitional component in the Guana tract and question its context.

In northeast Florida, the St. Johns I period is characterized by St. Johns Plain, a sponge-spicule-bearing pottery with a soft, chalky feel adopted around 2,500 years ago. Other pottery types may be found in association with St. Johns Plain. These include sand-tempered wares such as Deptford, which may or may not have surface decorations, and Swift Creek, which is most often recognized by complicated stamping. None of these latter pottery types are common south of the mouth of the St. Johns River. The St. Johns II period began around 1,200 years ago and continued until historic contact. People of the period continued to use St. Johns Plain pottery, but they also began stamping a check pattern onto some of their wares. During this time, pottery types made outside the region, but which occasionally are found in St. Johns II assemblages as trade items include Weeden Island and other sand-tempered wares.

St. Johns sites include sheet and mounded shell middens of various sizes. Based largely on size and density, they have been interpreted as villages, camps, and other activity areas. St. Johns I and II cultures, however, are also recognized by their use of sand mounds in which they buried their dead. During the St. Johns II period, large mounds of shell and dirt were constructed, some with flattened tops where chiefs and their retinue may have resided. No such sites are found within the Guana tract, although shell middens of varying sizes and burial mounds are numerous (Newman and Weisman 1992; Tesar and Baker 1985).

MAPPING METHODOLOGY

The two primary goals of the Guana Shell Ring investigations were to map the site's configuration and obtain radiocarbon dates to better understand the site's geographical and temporal (cultural) boundaries. Based on past experience with shell rings, we knew that topography may not always reflect the amount of shell buried beneath the ground, which often has no obvious surface expression (Curren et al. 1987; Russo and Saunders 1999). To account for all shell, we designed the project to map both surface topography and depths of shell deposits.

Grid Placement

Simple visual inspection of the site revealed that much of the ring form could be ascertained without instruments or mapping. The obvious mounded semicircular formation was the evidence Tesar and Baker (1985) first used to identify the site as a shell ring.

We selected an arbitrary point west and north of the ring at an estimated 3 meters above sea level. This point was named Datum 1 and assigned the coordinates 500N 400E. In order to map the site, a 10-meter grid was placed over the observable ring. Using a transit, we placed base lines along the east/west and north/south axes. At every 10 meters along these lines, we marked the ground with pin flags. We then moved the transit along the east west axis and took more readings along the north/south base lines every 50 meters until the eastern edge of the ring was encompassed. With these base lines in place, the rest of the grid was taped in using 50-meter tapes stretched between the base lines. Noting that a small portion of the western edge of the ring lay outside the grid, the grid was extended 20 meters west with tapes to establish a 380 N/S baseline. A total of 340 grid points were placed at the site at 10-meter intervals. Each point was marked in the ground by a 2-inch PVC pipe cut into 12-inch sections with grid coordinates written on them in indelible ink.

The PVC grid was left in place during the project to guide transit readings for surface elevations. Elevations readings were taken at every grid point and the halfway mark between them. This resulted in a data set obtained for developing a topographic map based on readings taken every 5 meters (although PVC pipe was only placed every 10 meters). The grid points were later used to place shovel tests in the ring in order to obtain materials for radiocarbon dating.

Probing and Mapping

Because we suspected that shell lay beneath the ground surface in areas with no obvious surface expression, we used the grid to guide the placement of probes. Stainless steel probes measuring 2 meters long and a half-inch in diameter were placed every 5 meters at grid junctions and between grid points where warranted. At each positive probe location, the depths where shell was first encountered and where it ended were measured and recorded on pin flags. For negative probes, "no shell" was written on the flags. The location of every probed point was then recorded with a total station. Along with horizontal X (east) and Y (north) data and vertical Z data (elevation), the shell depth data values were recorded with the transit data recorder. This X, Y, and Z data was used to create the surface topography map. For the shell thickness map, the Z (elevational) data was replaced by the shell thickness data.

PROBING AND MAPPING RESULTS

The data collected was used to construct a topographic map of the site (Figure 2). As suspected, the map outlines a U-shaped feature on the landscape, although its exact parameters are ambiguous. Starting at 335N 410E and running north, a series of topographic highs about 50 centimeters higher than the adjacent portions of the plaza and a meter higher than the pond to the west (largely off map) suggest the shell ring's western arm of the ring. The eastern side is indicated more by its height above the slough on its east side than its elevation above the plaza. In fact, portions of both the west and east sides of the ring barely rise above the level of the adjacent portions of the plaza. The plaza itself can be seen as decidedly unlevel, in general sloping from east to west and ranging in height from 4.4 to 3.4 meters. The most distinctive part of the ring, as identified by the topographic map, lies on the closed end at its north side. There the ring rises to 5.2 meters, over a meter above the adjacent plaza.

Based solely on the topographic map, the ring would appear to be about 100 meters long on its east side and 150 meters on its west side, with much of the ring barely rising above the plaza. Parts of the ring are, in fact, up to a meter lower than the highest points found in the plaza.

Because of the somewhat confusing aspect of the shell ring presented by the topographic map, the probing data we collected proved critical to understanding the true size and shape of the Guana Shell Ring. Probing revealed that the eastern half of the ring was longer than indicated by the topographic map, with shell deposits extending for nearly 140 meters (Figure 3). On the western side of the ring, sections that seemed below plaza level or otherwise topographically indistinct actually contained significant amounts of shell. By plotting the locations of probes, a clearer picture of the ring was obtained, a picture not entirely visible from the ground (Figure 4). Ultimately, the shell thickness map revealed that the Guana Shell Ring is horseshoe shaped with maximum dimensions measuring 170 meters north to south and 150 meters east to west. From the interior plaza side to the exterior side of the ring (the base), shell deposits average 20 meters wide. The maximum basal width is over 30 meters at the north end, where the ring's maximum shell thickness of 1.2 meters

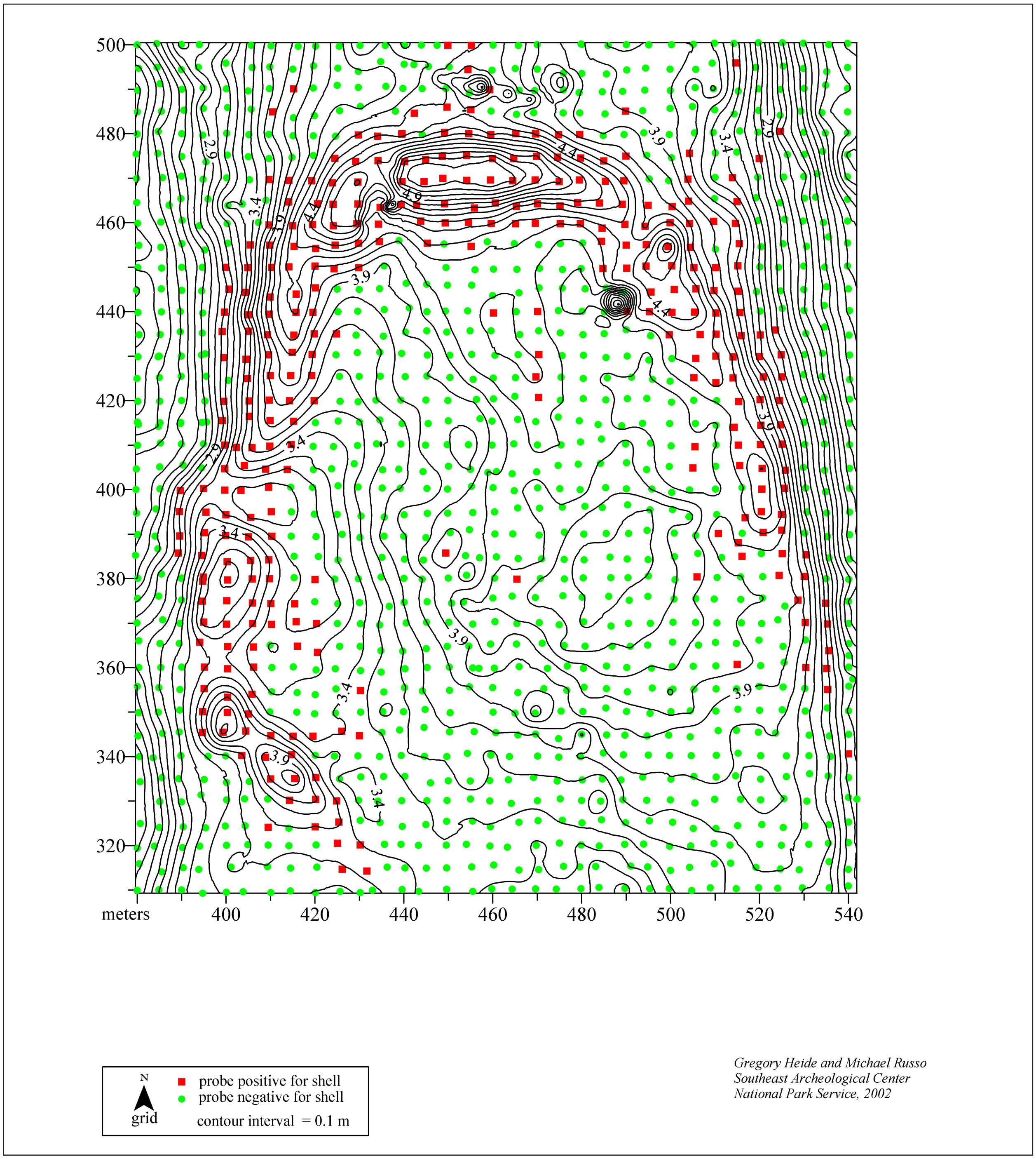

Figure 3 — Positive and negative shell probe distribution.

is also located. Based on the probe data, we estimate the ring volume shell at 3,970 cubic meters.

Both the topographic and shell thickness maps helped identify three areas of the ring with severe disturbance. The road running through the plaza at the northern end of the ring was the most obvious. Push piles of shell next to the road at approximately 460N 440E and 490N 460E (Figure 5), as well as the absence of shell beneath the road as indicated by our probe data (see 465N 435E, Figure 4) suggest that where the road crosses through the ring, road grading had removed much of the shell. In the southwestern portion of the ring, probing data suggests that shell may have been pushed from the ring into the plaza (see the area around 370N 420E, Figures 4 and 5), although testing needs to be undertaken to confirm the disturbed nature of these shell deposits. Two topographically low areas at approximately 400N 400E and 360N 400E suggest that breaches may have been purposely placed in the ring, perhaps for drainage. The area around 370N 420E may be the push pile from

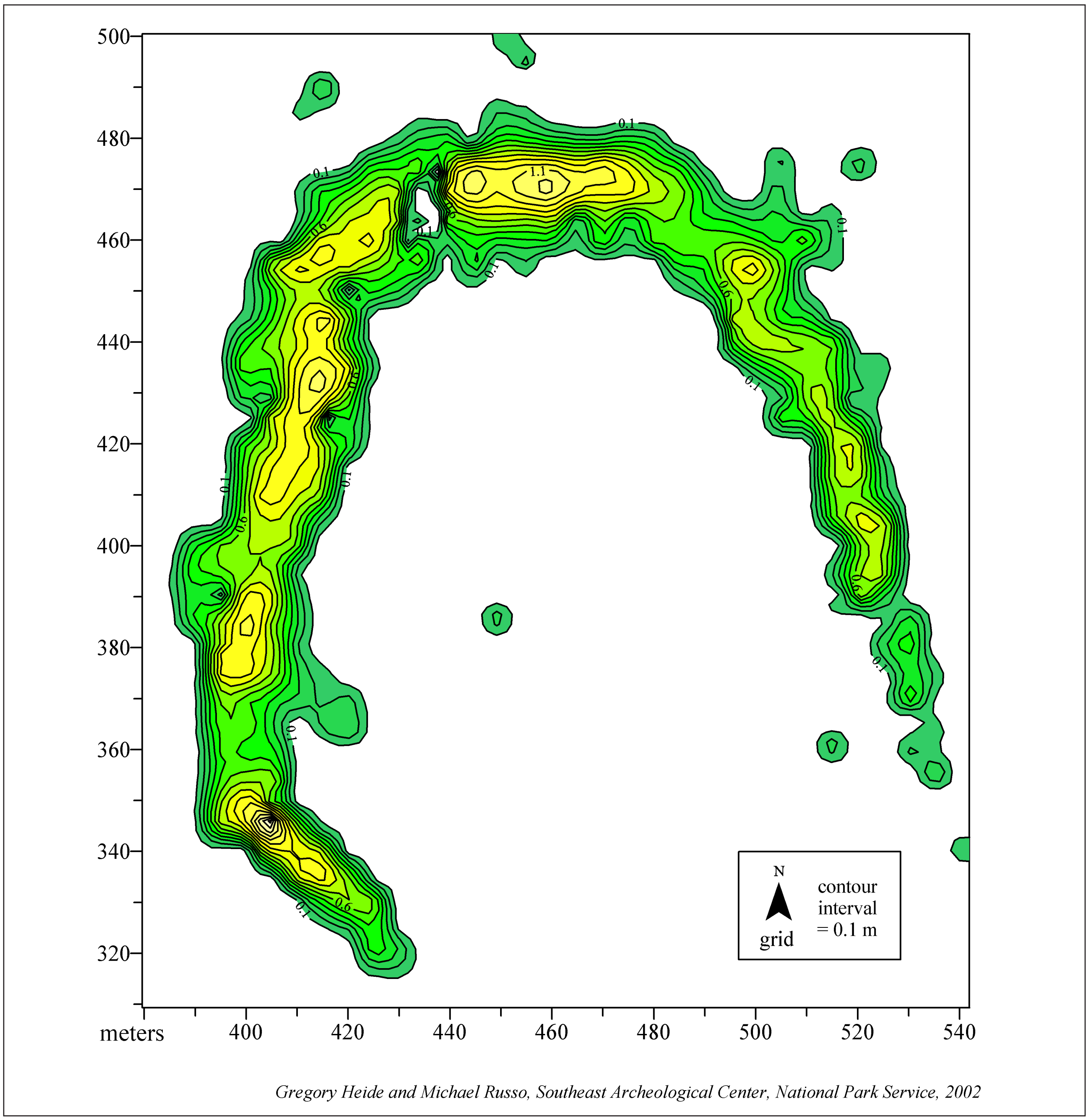

Figure 4 — Guana Shell Ring shell thickness map.

these breaches. In the northeast portion of the site a large hole has been dug into the interior edge of the ring (circa 440N 490E). It is unclear when and why the hole was dug. Bricks found on the surface suggest historic activities.

SHOVEL TESTING AND TEST UNIT: METHODS AND RESULTS

The distribution of positive and negatives probes of shell guided us in placing shovel tests (Figure

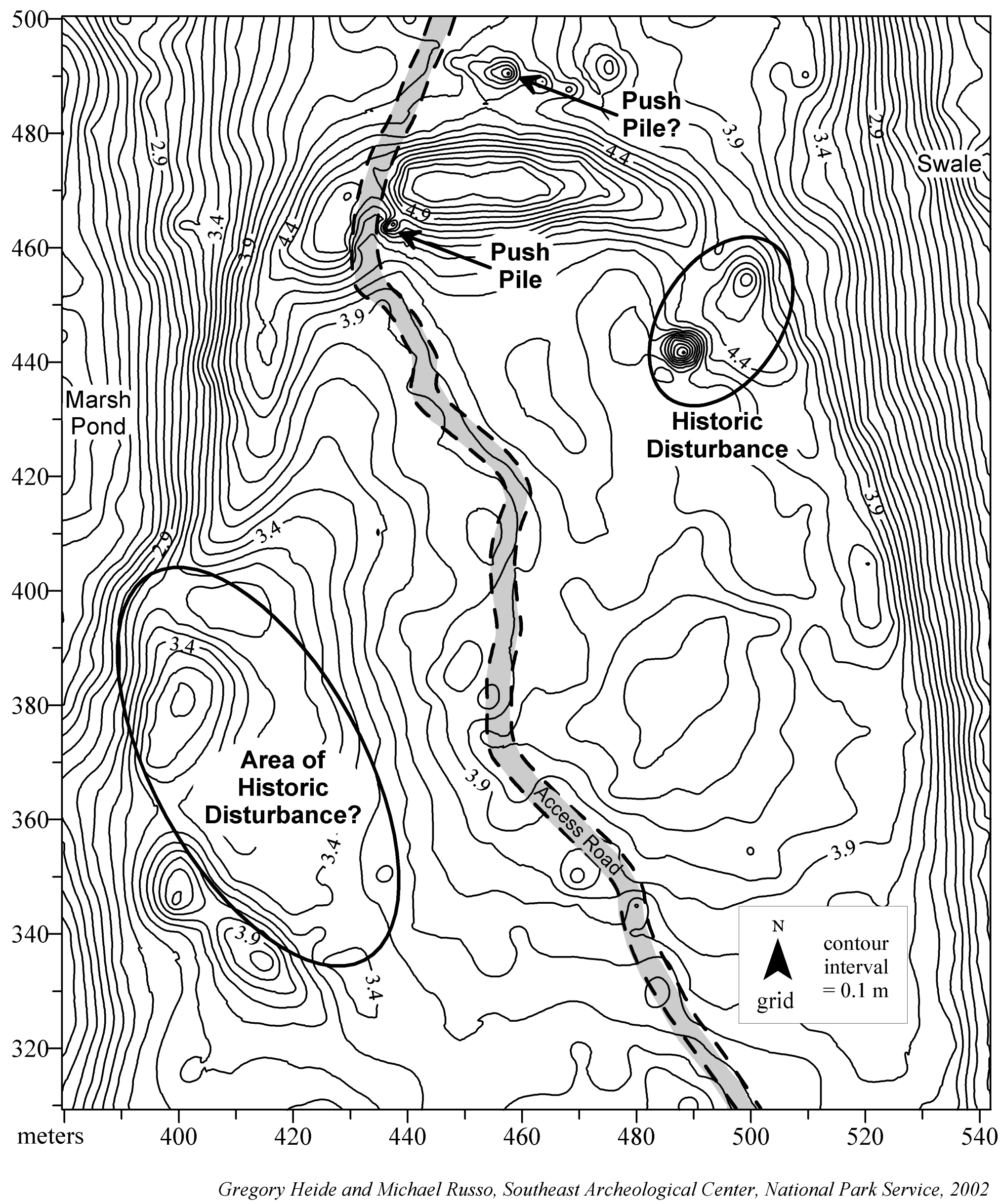

Figure 5 — Disturbed areas at Guana Shell Ring.

3). Thirteen shovel tests and one 1-by-2-meter unit were dug into the shell ring (Figure 6; Table 1) to provide sufficient samples to choose material for radiocarbon dating. Shovel tests were 2,500 square centimeters and were designed to recover similar volumes. Usually this resulted in tests 50-by-50 centimeters in size. However, in deeper shell deposits that proved difficult to reach the bottom, the crew was given the option to dig 80-by-31.25-centimeter units. This facilitated access to the deeper deposits. Shovel tests were excavated until they reached the subsoil below the base of the

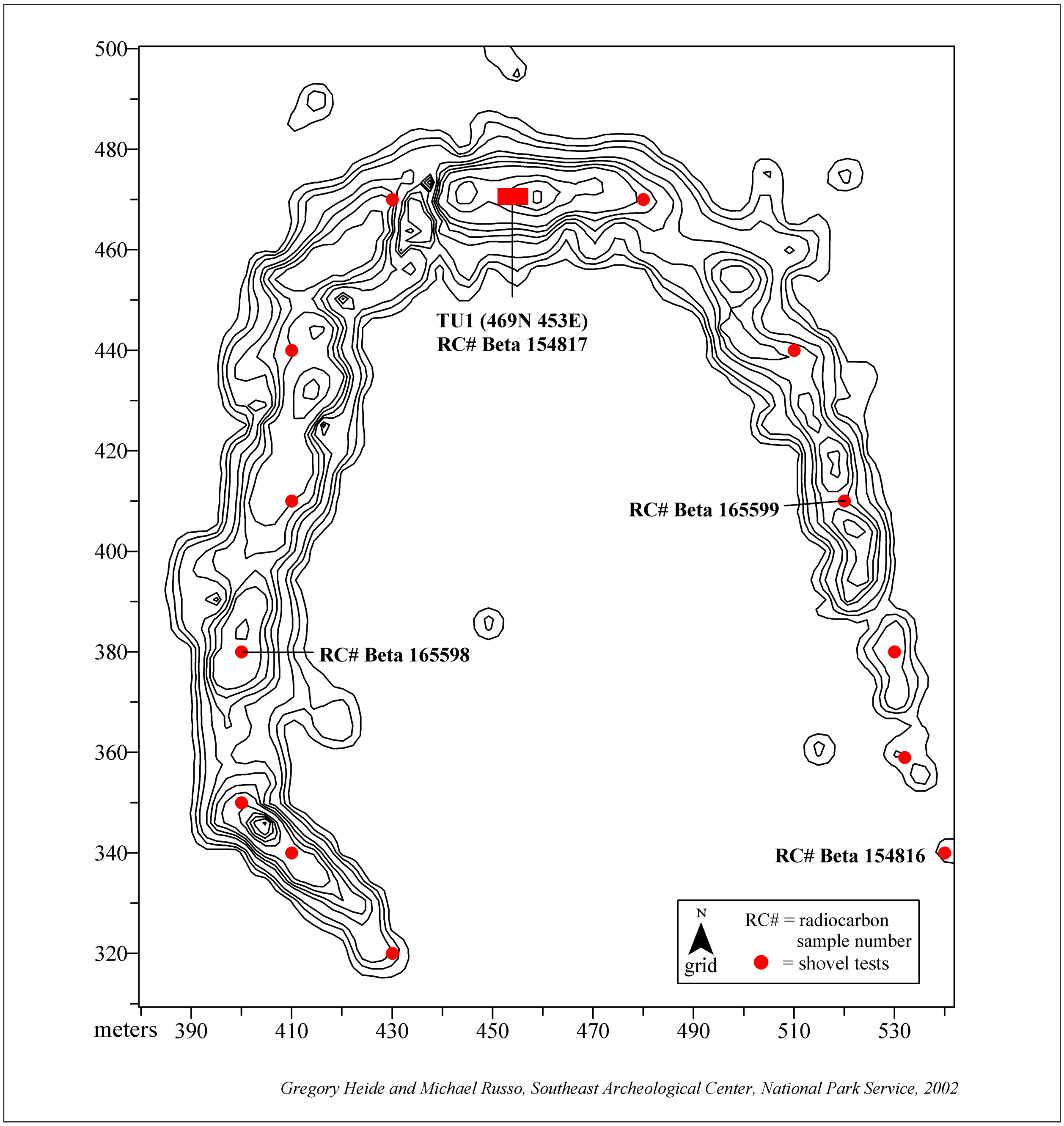

Figure 6 — Location of radiocarbon dates, shovel tests, and the test unit placed in shell deposits.

Table 1— Shovel test and test unit statistics.

Test	*Length m*	*Width m*	*Depth m*	*Volume m^3*
320N 430E	.50	.50	.90	.23
340N 410E	.50	.50	1.15	.29
340N 540E	.50	.50	.80	.20
350N 400E	.50	.50	1.00	.25
359N 532E	.50	.50	.85	.21
380N 400E	.50	.50	1.00	.25
380N 530E	.50	.50	.80	.20
410N 410E	.80	.31	.85	.21
410N 520E	.80	.31	.70	.17
440N 410E	.50	.50	1.00	.25
440N 510E	.50	.50	.80	.20
470N 430E	.50	.50	1.00	.25
470N 480E	.50	.50	1.00	.25
469N 453E	1.00	2.00	1.60	3.20
Total				6.16

shell ring, generally somewhere between 80 and 100 centimeters below surface (see Figure 7–10). One larger test unit, 1-by-2 meters in size, was placed in the thickest part of the ring at 469N 453E. The unit was dug to 160 centimeters below surface. The unit and all shovel tests were excavated in arbitrary 10-centimeter levels. Artifacts were bagged by level, and field forms were used to record information during excavation.

A typical profile of the shovel tests revealed in the uppermost layer a thin humic mat usually only a few centimeters thick. Beneath this mat often lay dark, organic soils with varying amounts of shell, usually a mixture of broken and largely whole shell (mostly oyster). In some units, the humic mat was lacking and the initial horizon primarily consisted of sand or exposed shell. Beneath these upper sand and organic/shell strata, the shell ring was most evident as thick deposits of oyster and clam with lesser amounts of other shell species such as whelk and occasional pockets or lenses of coquina shell. Beneath the ring lay a sand base (subsoil or buried A?) brown to yellowish brown in color.

Overall the shovel tests revealed no obvious living surfaces on or within the ring as evidenced by lenses of crushed shell. Neither was evidence of structural features encountered. Two possible cultural features were noted. One feature encountered in shovel test 410N 520E was a shallow pit filled with dark yellowish brown sand (Figure 9). The feature intruded through a coquina lens at the base of the ring and into sterile subsoil. Whether this was a natural (root?) or cultural feature is unknown. The limited size of the unit and our limited goals (to recover samples for radiocarbon dating) did not allow for further exploration. In shovel test 440N 510E (Figure 10) a pit filled with oyster, clam, and coquina shell was found in the southwest corner of the unit. This pit fill was the same midden material as was encountered in the ring deposits above it, yet there was no visible evidence of intrusion through the ring suggestive of a post mold or tree root. Again the limited size of the excavation and goals of the project precluded further exploration of this feature.

CERAMICS AND RADIOCARBON DATES

One goal of shovel testing was to recover ceramics that, when combined with radiocarbon dates, would help determine the construction and occupation periods of the site. Tables 2–15 list the prehistoric ceramics recovered from each shovel test and the single test unit per level, while Tables 16–21 list each units ceramic statistics in geographically defined groupings. In total, fiber-tempered Orange wares were the dominate ceramic types associated with the shell ring. In total, 76 (1,098.9 grams) Orange Plain, 80 (1,739.7 grams) Orange Incised, and 877 (1,301.4 grams) Orange pottery sherds unidentifiable to a specific type due to small size or eroded surfaces (both cases combined in the “<3 cm” column of Tables 2–15) were recovered (Table 21). The total of 1,033 (4,053.6 grams) Orange ceramics contrasts with the 60 (184.8 grams) St. Johns sherds and 1 (2.5 grams) sand-tempered sherd which were recovered in the upper levels of four shovel tests and the test unit (Tables 7, 8, 10, 13, and 14). In other words, 95 percent of the pottery recovered from the ring is Orange. In the region, Orange ceramics have been

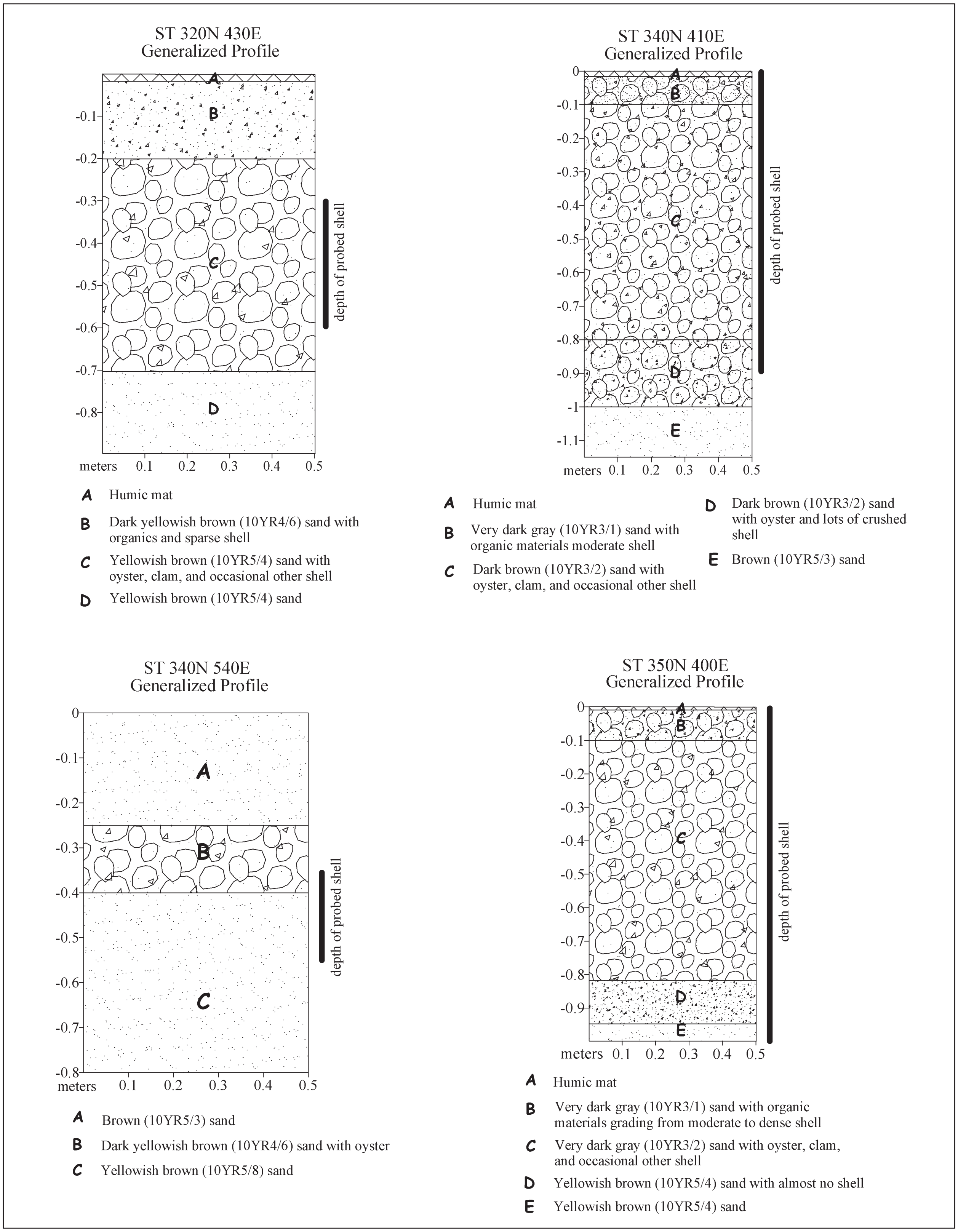

Figure 7 — Shovel test profiles and probe depths.

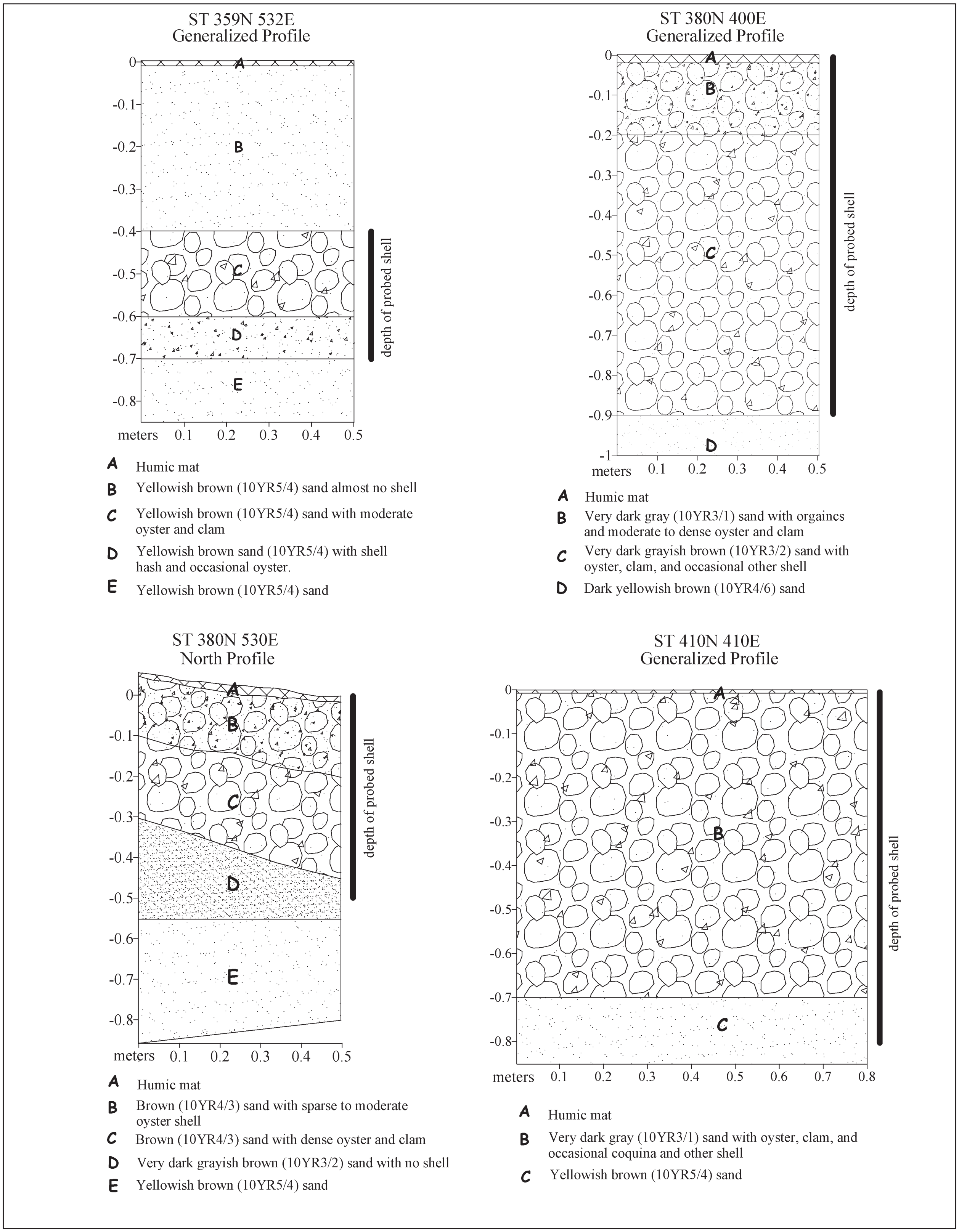

Figure 8 — Shovel test profiles and probe depths.

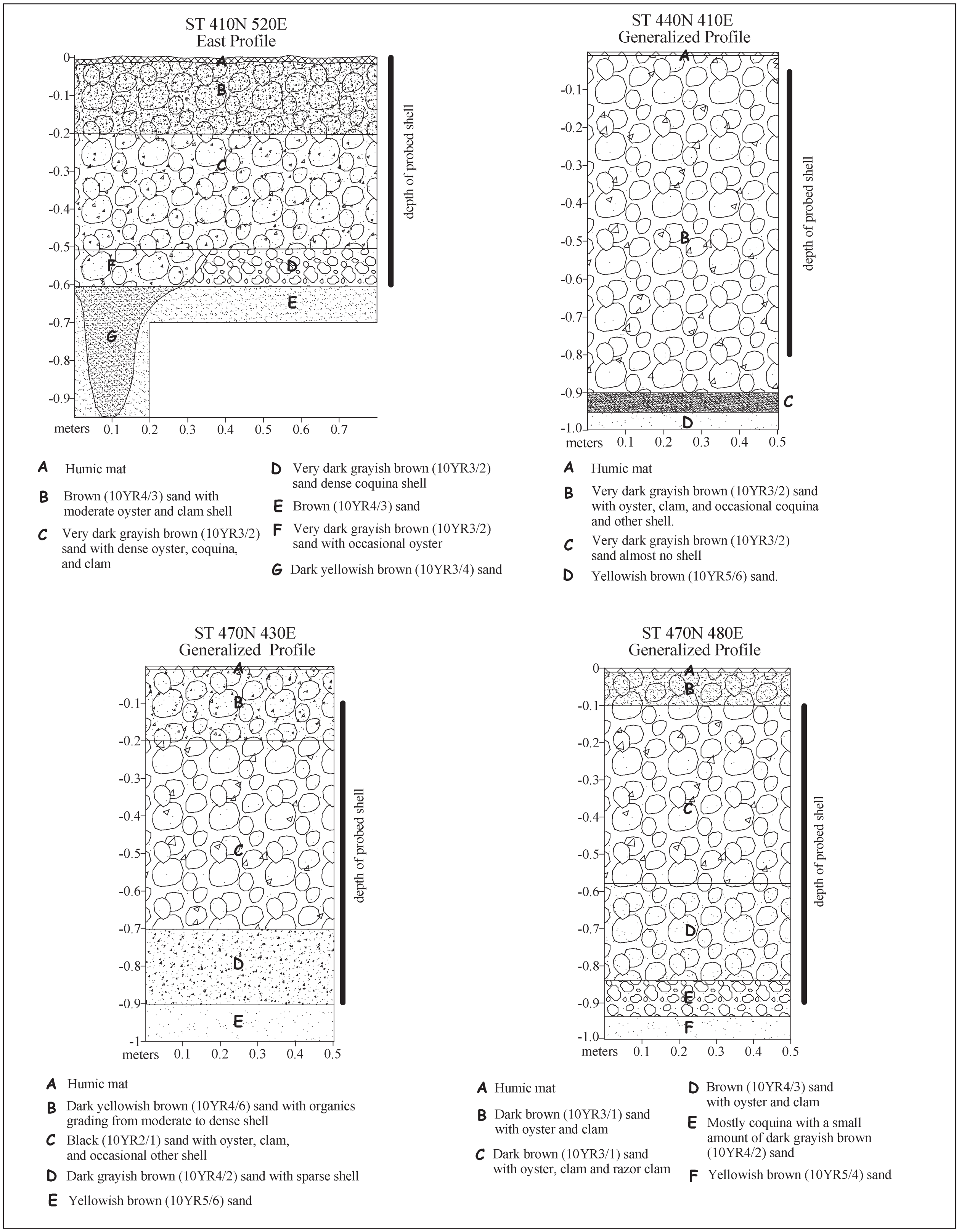

Figure 9 — Shovel test profiles and probe depths.

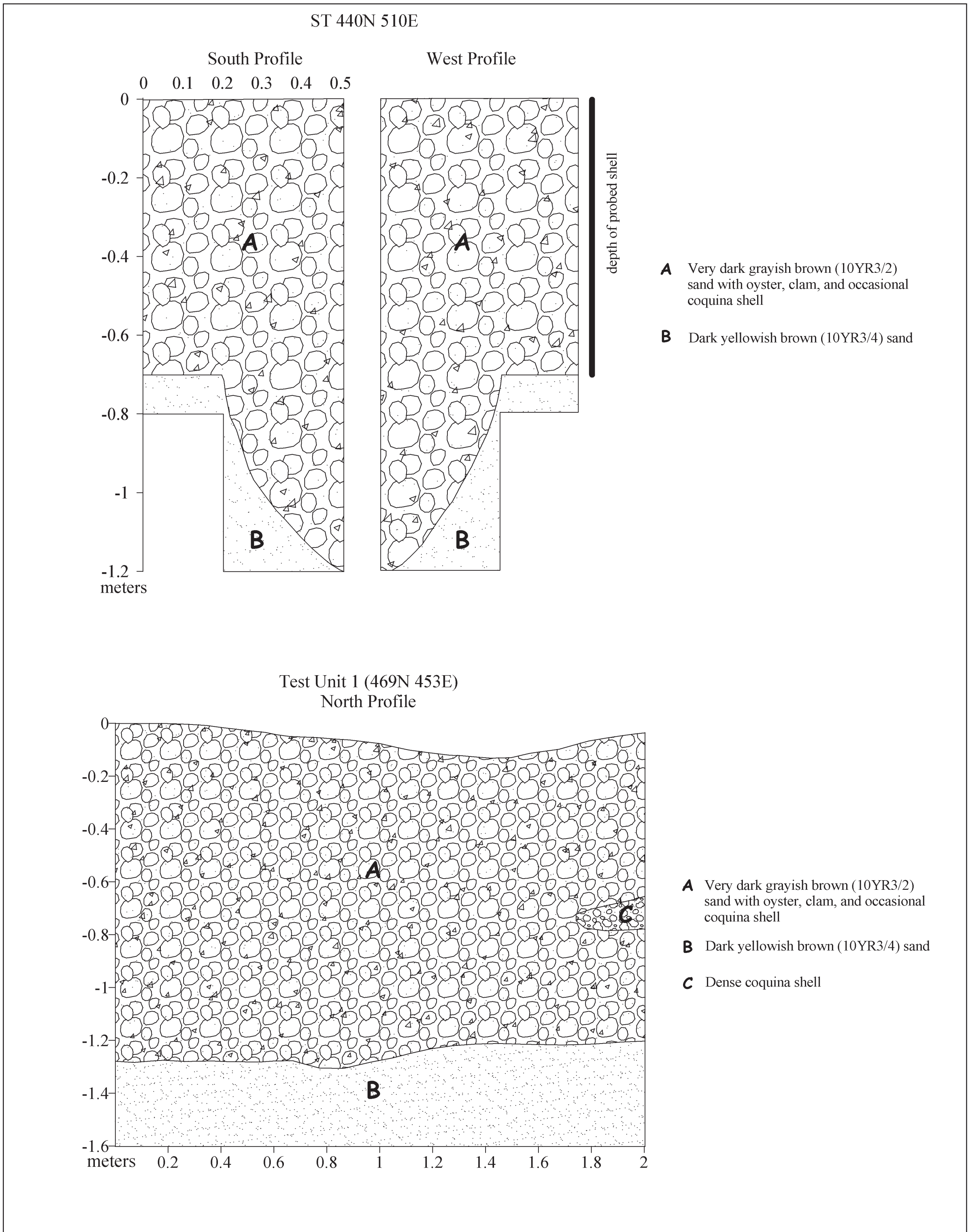

Figure 10 — Shovel test 440N 510E profile and probe depth and test unit 469N 453E profile.

Table 2 — Ceramics from 320N 430E.

FS #	*Level*	*Total*	*>3cm*	*<3cm*	*Type*	*Grams*	*Summary Statistics*
116	3	2	0	2	Orange pottery	2.5	Average wt. all ceramics = 1.2g
117	4	3	0	3	Orange pottery	2.9	Average wt. Orange Incised = 0g
118	5	6	0	6	Orange pottery	3.3	Average wt. Orange Plain = 0g
119	6	2	0	2	Orange pottery	6.6	No. of ceramics per 25,000 cm^3 = 2.6
							Grams of ceramics per 25,000 cm^3 = 3.1
Total		13	0	13		15.3	UID or <3cm sherds to >3cm sherds = 13:0
							Incised vs. Plain (g) = NA

Table 3 — Ceramics from 340N 410E.

FS #	*Level*	*Total*	*>3cm*	*<3cm*	*Type*	*Grams*	*Summary Statistics*
62	2	3	0	3	Orange pottery	4.7	Average wt. all ceramics = 9g
63	3	4	0	4	Orange pottery	6.3	Average wt. Orange Incised = 63.2g
64	4	1	1	0	Orange Incised	8.4	Average wt. Orange Plain = 12.1g
64	4	1	1	0	Orange Plain	3.0	No. of ceramics per 25,000 cm^3 = 5.5
64	4	6	0	6	Orange pottery	12.0	Grams of ceramics per 25,000 cm^3 = 49.6
65	5	1	1	0	Orange Plain	7.3	UID or <3cm sherds to >3cm sherds = 3.2:1
65	5	5	0	5	Orange pottery	6.8	Incised vs. Plain (g) = 316:96.7 or 3.3:1
344	6	5	0	5	Orange pottery	8.5	
66	7	6	0	6	Orange pottery	14.1	
67	8	1	1	0	Orange Plain	9.0	
68	9	2	2	0	Orange Plain	27.1	
68	9	1	1	0	Orange Incised	25.5	
69	10	1	1	0	Orange Plain	10.1	
69	10	3	3	0	Orange Incised	282.1	
69	10	13	0	13	Orange pottery	31.0	
Total		55	13	42		496.1	

Table 4 — Ceramics from 340N 540E.

FS #	*Level*	*Total*	*>3cm*	*<3cm*	*Type*	*Grams*	*Summary Statistics*
143	3	1	0	1	Orange pottery	0.1	Average wt. all ceramics = 0.1g
142	4	1	0	1	Orange pottery	0.1	Average wt. Orange Incised = 0g
							Average wt. Orange Plain = 0g
Total		2	0	2		0.2	No. of ceramics per 25,000 cm^3 = 1
							Grams of ceramics per 25,000 cm^3 = 0.1
							UID or <3cm sherds to >3cm sherds = 2:0
							Incised vs. Plain (g) = NA

Table 5 — Ceramics from 350N 400E.

FS #	*Level*	*Total*	*>3cm*	*<3cm*	*Type*	*Grams*	*Summary Statistics*
121	1	1	0	1	Orange pottery	0.7	Average wt. all ceramics = 5g
123	3	1	1	0	Orange Plain	8.9	Average wt. Orange Incised = 30.9g
123	3	13	0	13	Orange pottery	13.6	Average wt. Orange Plain = 28g
122	4	12	0	12	Orange pottery	13.3	No. of ceramics per 25,000 cm^3 = 6.3
124	5	1	1	0	Orange Incised	22.1	Grams of ceramics per 25,000 cm^3 = 31.5
125	6	1	1	0	Orange Plain	5.3	UID or <3cm sherds to >3cm sherds = 5.25:1
125	6	7	0	7	Orange pottery	14.9	Incised vs. Plain (g) = 28.9:168.2 or 1:5.7
126	7	3	3	0	Orange Plain	141.7	
126	7	5	0	5	Orange pottery	5.1	
127	8	1	1	0	Orange Plain	12.3	
127	8	1	1	0	Orange Incised	6.8	
127	8	4	0	4	Orange pottery	7.3	
Total		50	8	42		252.0	

Table 6 — Ceramics from 359N 532E.

FS #	*Level*	*Total*	*>3cm*	*<3cm*	*Type*	*Grams*	*Summary Statistics*
129	3	1	0	1	Orange pottery	0.4	Average wt. all ceramics = 6.2g
130	5	1	1	0	Orange Plain	41.9	Average wt. Orange Incised = 0g
130	5	5	0	5	Orange pottery	6.5	Average wt. Orange Plain = 41.9g
131	6	1	0	1	Orange pottery	0.7	No. of ceramics per 25,000 cm^3 = 2.7
							Grams of ceramics per 25,000 cm^3 = 16.5
Total		8	1	7		49.5	UID or <3cm sherds to >3cm sherds = 7:1
							Incised vs. Plain (g) = 0:41.9

dated in other contexts between 4200 and 3000 B.P., while St. Johns and sand-tempered ceramics range between 2500 and 500 B.P. This suggests an Orange period of construction with later St. Johns period occupations sporadically scattered on top the ring.

Four samples were assayed for radiocarbon age determinations. All assays were conducted on samples of oyster from contexts associated with Orange pottery. Beta 154816 came from shovel test 340N 540E on the extreme southeastern end of the ring. Level 4 represents the bottom-most deposit of shell, which was very thinly scattered in two levels. Beta 154817 came from near the bottom of the test unit (469N 453E) beneath 1.2 meters of dense shell deposits. Beta 165598 came from the bottom-most deposits of dense shell in unit 380N 400E, while Beta 165599 came from the bottom layer of shell in unit 410N 520E above the feature containing Orange pottery (Figure 9). In short, the samples were taken from across the site and serve to date the initial stages in shell deposits in those areas of the ring (Figure 6).

In terms of conventional ages, the dates indicate that ring construction began around 3500 to 3600 B.P. (Table 22). Shovel test 340N 540E indicates an earlier date at 3860 B.P. Even with calibration, and considering two standard deviations, this age is still slightly older than those from the other portions of the ring. The youngest likely age is 3650 cal B.P. for 340N 540E, while the oldest likely age of 410N 520E is 3640 cal B.P. (Table

Table 7 — Ceramics from 380N 400E.

FS #	*Level*	*Total*	*>3cm*	*<3cm*	*Type*	*Grams*	*Summary Statistics (* = Orange ceramics only)*
132	1	1	1	0	St. Johns Plain	4	Average wt. all ceramics = 2.3g*
132	1	1	0	1	St. Johns	1.4	Average wt. Orange Incised = 7.8g
132	1	2	0	2	Orange pottery	4.5	Average wt. Orange Plain = 9.1g
133	2	4	0	4	Orange pottery	3.1	No. of ceramics per 25,000 cm^3 = 9.7*
134	3	6	0	6	Orange pottery	5.6	Grams of ceramics per 25,000 cm^3 = 21.2*
134	3	1	0	1	St. Johns	0.8	UID or <3cm sherds to >3cm sherds = 2.3:1*
135	4	1	1	0	Orange Plain	6.9	Incised vs. Plain (g) = 7.8:18.3 or 1:2.3*
135	4	8	0	8	Orange pottery	14.7	
136	5	1	1	0	Orange Incised	7.8	
136	5	42	0	42	Orange pottery	102.3	
137	6	1	1	0	Orange Plain	11.4	
137	6	12	0	12	Orange pottery	18.3	
138	7	8	0	8	Orange pottery	12.2	
139	8	2	0	2	Orange pottery	4.4	
Total		90	4	86		197.4	

Table 8 — Ceramics from 380N 530E.

FS #	*Level*	*Total*	*>3cm*	*<3cm*	*Type*	*Grams*	*Summary Statistics (* = Orange ceramics only)*
150	2	1	1	0	St. Johns Check	2.4	Average wt. all ceramics = 9.5g*
150	2	1	1	0	Orange Incised	22.2	Average wt. Orange Incised = 22.2g
151	4	1	1	0	Orange Plain	3.9	Average wt. Orange Plain = 3.9g
152	6	1	0	1	Orange pottery	0.1	No. of ceramics per 25,000 cm^3 = 0.8*
							Grams of ceramics per 25,000 cm^3 = 7.1*
Total		4	3	1		28.6	UID or <3cm sherds to >3cm sherds = 1:3*
							Incised vs. Plain (g) = 22.2:3.9 or 5.7:1*

22). We note that the shovel test from which the older date was obtained indicates only a thin scatter of shell for two levels (Figure 7). The dense shell that characterize the other units was never deposited in this area. Thus it is possible to distinguish the thin shell scatter in this unit, in part, because denser shell deposits have not been compressed upon the thinner deposits. In other parts of the ring, bottom thin scatters may be difficult to distinguish, but they do exist (Figure 7: 350N 400E Zone D; Figure 8: 359N 532E Zone D; Figure 9: 440N 410E Zone C and 470N 430E Zone D). We know from studies of other rings that prior to the deposition of dense shell, the areas of the ring were lived upon (Dickel 1992; Russo 1991; Russo and Saunders 1999; Trinkley 1985). That is, people may have settled in a ring formation prior to constructing the ring. Thus, it is not unexpected to find in lower levels cultural deposits dating earlier than the dense shell deposits that make up the ring. These kinds of deposits may consist of scatters of shell, pit features, hearths, midden, layers of crushed shell, and post holes. These kinds of features may actually represent the initial building stages of the ring. The ring builders had to start somewhere (planning, perhaps clearing land, leveling ground, performing ritual, or simply living) prior to depositing vast amounts of shell to