ecosystem such as this, it is appropriate that sites of all types, ranging from ephemeral procurement stations to substantial base camps, be adequately sampled.

After consultation with DelDOT and DESHPO staff, it was, therefore, proposed to further test not only Sites 7NC-J-212 and 7NC-J-216, the large sites interpreted as base camps, but also a sample of smaller sites within the perceived settlement cluster. This strategy was in keeping with that proposed by Jay Custer in the initial SR 1 work plan (Custer et al. 1984). The smaller sites chosen for testing were Sites 7NC-J-210 and 7NC-J-214. Site 7NC-J-210 was chosen because it is somewhat removed from the other sites to be tested. In addition, a group of four adjacent positive shovel tests were excavated at this site, suggesting an area of significant artifact density on which to focus the testing. Site 7NC-J-214 was characterized by moderate artifact density, and had already produced one diagnostic artifact. The site was quite small, and its function and/or temporal associations may correlate with its size. Phase II evaluations of all four sites have been conducted, and the results are presented in Chapter VI.

E. PHASE I SUMMARY AND CONCLUSIONS

1. Summary of Survey Results

The current project area included approximately 16 kilometers (10 miles) of highway corridor, several associated wetland replacement areas, and one park and ride facility. The project area, excluding existing U.S. Route 13, measured a total of 286 hectares (707 acres). Of this, 133 hectares (328 acres) were considered to have high potential for either prehistoric or historic archaeological sites. The current survey covered all the high-potential areas, and 45 hectares (112 acres), or 30 percent, of the low-potential area. Thus, a total of 178 hectares (440 acres) were tested, 62 percent of the total project area. The survey involved the excavation of more than 3,000 shovel test pits, most on a 20-meter grid. Table 8 summarizes the survey coverage.

During the Phase I archaeological survey, 35 archaeological sites were identified or re-identified in the project area. The sites are listed in Table 9, and their locations are shown in Figures 58, 59, 60, and 61. Of these 35 sites, 22 are prehistoric sites, eight are historic, and five have both prehistoric and historic components. To date, Phase II evaluations have been conducted on 17 of these sites, and the results of these evaluations are reported in Chapter VI.

The overall site density for the survey was 0.119 sites per hectare, or 11.9 sites per 100 hectares (4.8 sites per 100 acres). Historic site density was 4.2 sites per 100 hectares, and prehistoric site density was 9.1 sites per 100 hectares. Of the 35 sites discovered during the surveys reported here, all but one were located in high-potential survey areas. The one exception, Site 7NC-G-142 (the Marl Pit Road Site) was a circa-1900 rural domestic site. The site density in the high-potential portions of the corridor was thus 25 sites per 100 hectares (10 sites per 100 acres), 8.9 per 100 hectares for historic sites and 20 per 100 hectares for prehistoric sites. More meaningful numbers for prehistoric site density can be generated by using only the areas considered high potential for prehistoric sites, since several areas were designated high potential for historic sites only. Excluding the 37 hectares included in the high-potential area because of purely historic

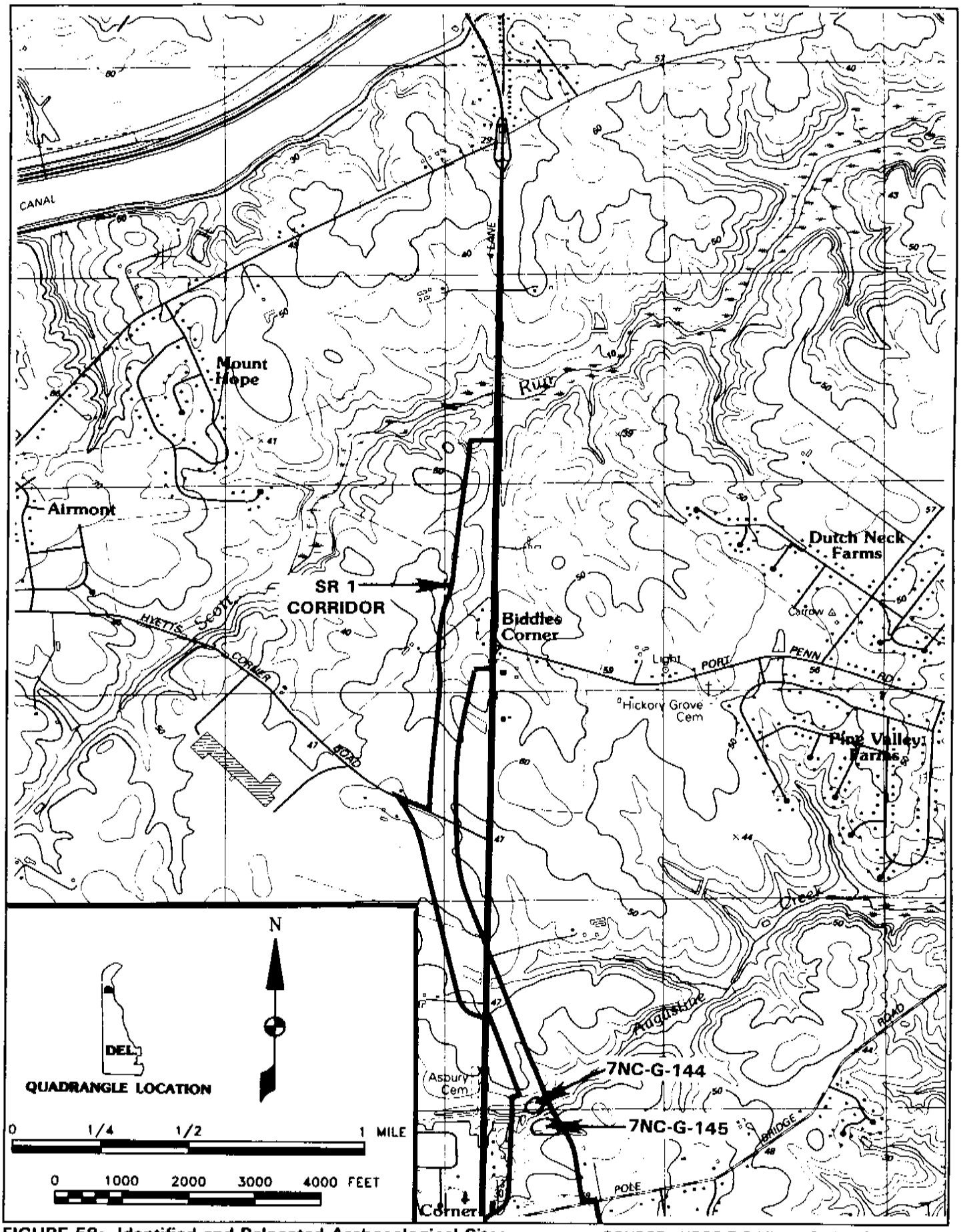

FIGURE 58: Identified and Relocated Archaeological Sites in the Project Area, Northern SR 1 Segment

SOURCE: USGS 7.5 Minute Series, St. Georges, Del. Quadrangle (photorevised 1993)

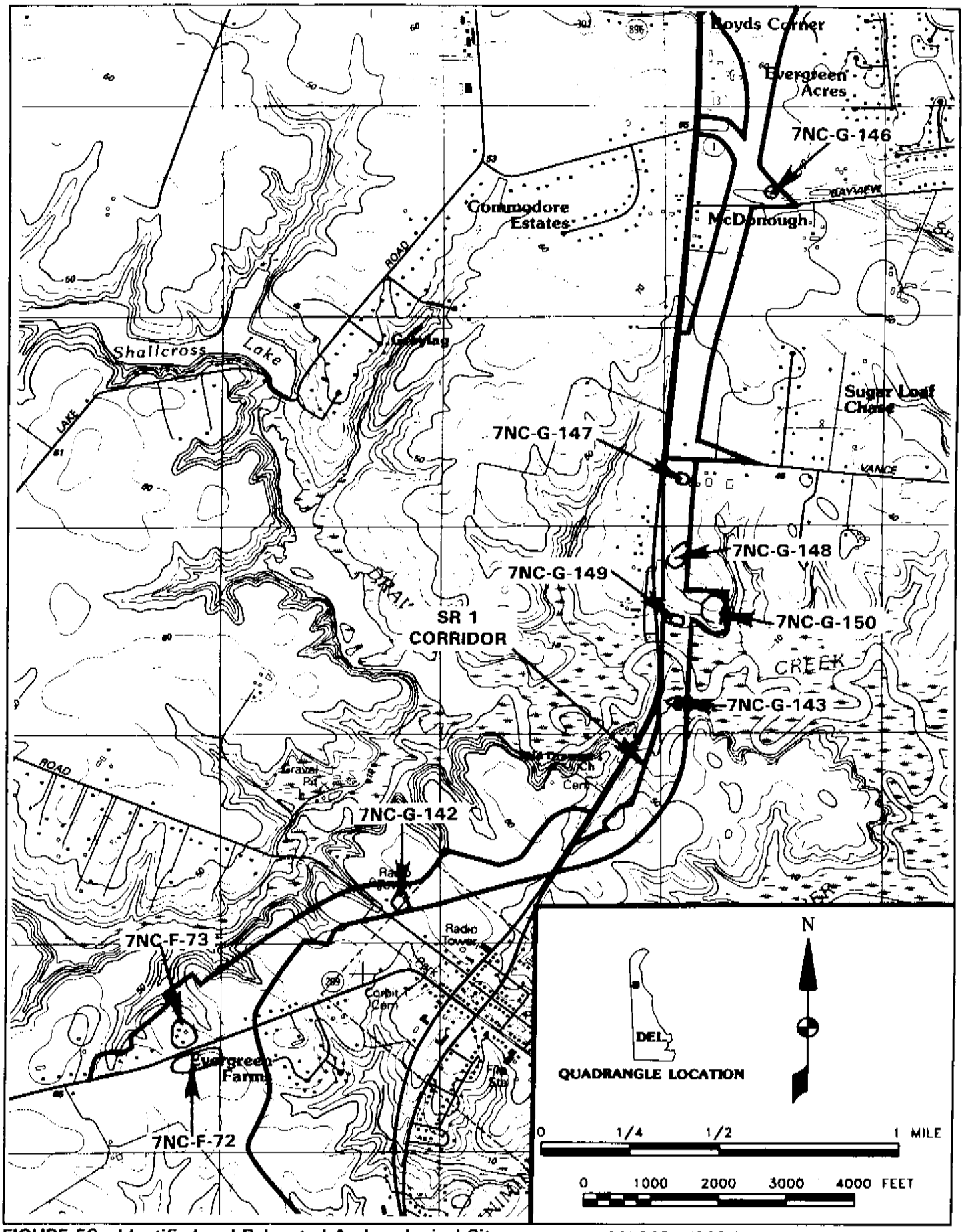

FIGURE 59: Identified and Relocated Archaeological Sites in the Project Area, Central SR 1 Segment

SOURCE: USGS 7.5 Minute Series, Middletown, Del. Quadrangle (Photerevised 1993)

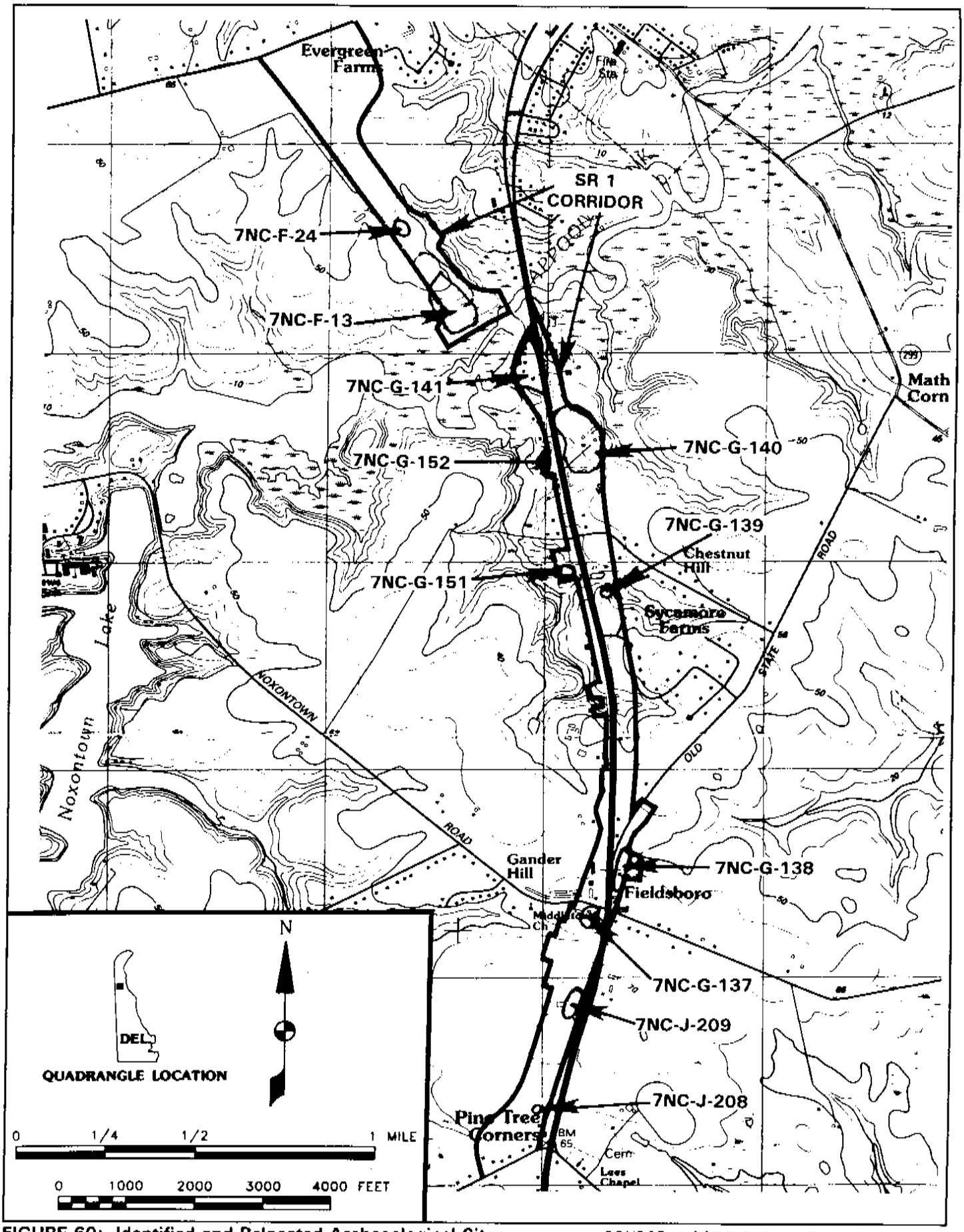

FIGURE 60: Identified and Relocated Archaeological Sites in the Project Area, Southern SR 1 Segment

SOURCE: USGE 7.5 Minute Series, Middletown, Del. Quadrangle (photorevised)

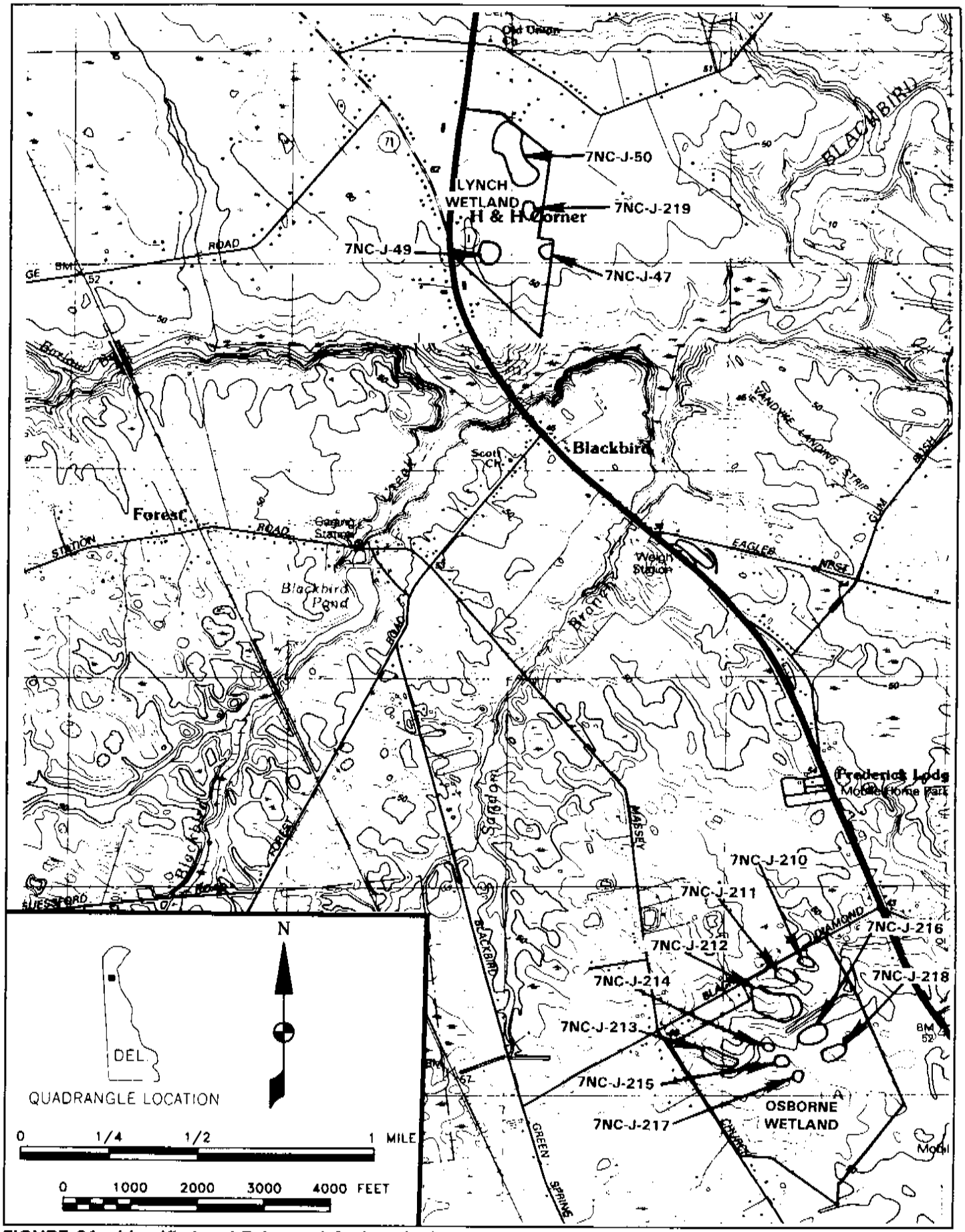

FIGURE 61: Identified and Relocated Archaeological Sites in the Project Area Lynch and Osborne Wetlands

SOURCE: USGS 7.5 Minute Seies, Clayton and Middleton, Del. Quadrangles (photorevised 1970 and 1993)

TABLE 8 SURVEY COVERAGE

Segment	Area in Hectares	(Acres)	Area Tested in Hectares	(Acres)	Percentage Tested	Number of STPs
Scott Run to Drawyer Creek						
High Potential	34	(84)	34	(84)	100	
Low Potential	57	(141)	14	(35)	25	
Subtotal	*91*	*(225)*	*48*	*(119)*	*53*	*938*
Drawyer Creek to Pine Tree Corners						
High Potential	60	(148)	60	(148)	100	
Low Potential	70	(170)	7	(18)	10	
Subtotal	*129*	*(318)*	*67*	*(166)*	*52*	*1,712*
Lynch Wetland						
High Potential	7	(16)	6	(16)	100	
Low Potential	3	(8)	2	(4)	50	
Subtotal	*10*	*(24)*	*8*	*(20)*	*83*	*170*
Osborne Wetland						
High Potential	32	(80)	32	(80)	100	
Low Potential	24	(60)	22	(55)	92	
Subtotal	*56*	*(140)*	*54*	*(135)*	*96*	*230*
Entire Project Area						
High Potential	133	(328)	133	(328)	100	
Low Potential	153	(379)	45	(112)	30	
Project Totals	*286*	*(707)*	*178*	*(440)*	*62*	*3,050*

considerations, the prehistoric site density is 28 sites per 100 hectares. No prehistoric sites were found in areas considered high potential only for historic reasons. Prehistoric site density was significantly higher in the poorly drained area south of Pine Tree Corners, 36 sites per 100 hectares as compared to 9.9 per 100 hectares in high-potential areas in the remainder of the project corridor, 18 per 100 hectares as compared to 6.4 per 100 hectares overall. No historic sites were recorded in the poorly drained area south of Pine Tree Corners.

The majority of the prehistoric sites discovered could not be dated to any specific time period. Two sites (7NC-G-148 and 7NC-G-143), both along Drawyer Creek, yielded diagnostics dating to the Woodland II (Late Woodland) period, and one (Site 7NC-G-151) appeared to date to the Woodland I (late Archaic or Early Woodland) period. Projectile points that most likely date to the Woodland I period were also recovered from two sites in the Osborne Wetland Replacement Area (7NC-J-212 and 7NC-J-214). Site 7NC-J-216, also in the Osborne Wetland Replacement Area, yielded projectile points that most likely date to the Archaic and Woodland I periods. Three sites (7NC-G-150, on Drawyer Creek, and 7NC-G-141 and 7NC-F-13, on the Appoquinimink River) yielded diagnostics for both the Woodland I and Woodland II periods. Overall, the survey confirmed the general impression that this area was not heavily occupied until the Woodland I period, with occupation continuing into the Woodland II period.

TABLE 9 IDENTIFIED OR RELOCATED ARCHAEOLOGICAL SITES

SITE NUMBER	NAME	SITE TYPE	DIMENSIONS	PHASE II
Scott Run to Drawyer Creek				
7NC-G-144	Augustine Creek North	18th-c. farm	60x30 meters	Yes
7NC-G-145	Augustine Creek South	Prehistoric unknown and ca. 1800 farm	60x30 meters	Yes
7NC-G-146	McDonough Road	19th-c. trash deposit	20x20 meters	No
7NC-G-147	Vance Neck Road	Ca. 1900 domestic	60x40 meters	No
7NC-G-148	Hill 50	Woodland II procurement	200x50 meters	No
7NC-G-149	Drawyer Creek North	Prehistoric procurement	30x60 meters	Yes
7NC-G-150	Eisenbrey Wetland	Prehistoric procurement	100x140 meters	Yes
Drawyer Creek to Pine Tree Corners				
7NC-G-143	Drawyer Creek South	Woodland II procurement	60x60 meters	Yes
7NC-G-142	Marl Pit Road	20th-c. domestic	120x70 meters	No
7NC-F-73	Locust Grove	1830 to present farm	90x75 meters	Yes
7NC-F-72	Middletown Road	19th-c. domestic	250x100 meters	Yes
7NC-F-24	Guseman	Prehistoric procurement	50x50 meters	No
7NC-F-13	Appoquinimink North	1780-1820 farm and prehistoric procurement	250x100 meters	Yes
7NC-G-141	Appoquinimink South	Woodland I/II base camp	200x80 meters	Yes
7NC-G-152	P-5	Prehistoric unknown	20x30 meters	No
7NC-G-140	Springfield Realty	20th-c. farm and prehistoric procurement	200x300 meters	No
7NC-G-151	Whitby Branch	Woodland I procurement	20x60 meters	Yes
7NC-G-139	Pine Circle	Prehistoric unknown	30x40 meters	Yes
7NC-G-138	Hammond	20th-c. domestic and prehistoric unknown	200x100 meters	No
7NC-G-137	Hutchinson/ Weldin Store	19th-c. commercial and domestic	50x50 meters	Yes
7NC-J-209	Lore Farm	19th- to 20th-c. farm	120x60 meters	Yes
7NC-J-208	Pine Tree Corners	Prehistoric procurement	60x30 meters	No
Lynch Wetland				
7NC-J-49	Lynch Wetland No. 1	Prehistoric procurement	100x120 meters	No
7NC-J-47	Lynch Wetland No. 2	Prehistoric procurement	120x240 meters	No
7NC-J-219	Lynch Wetland No. 3	Prehistoric procurement	40x50 meters	Yes
7NC-J-50	Lynch Wetland No. 4	Prehistoric procurement	100x250 meters	Yes
Osborne Wetland				
7NC-J-210	Osborne Wetland No. 1	Prehistoric procurement	85x30 meters	Yes
7NC-J-211	Osborne Wetland No. 2	Prehistoric procurement	110x50 meters	No
7NC-J-212	Osborne Wetland No. 3	Prehistoric base camp (?)	150x60 meters	Yes
7NC-J-213	Osborne Wetland No. 4	Prehistoric procurement	180x60 meters	No
7NC-J-214	Osborne Wetland No. 5	Prehistoric procurement	55x45 meters	Yes
7NC-J-215	Osborne Wetland No. 6	Prehistoric procurement	120x240 meters	No
7NC-J-216	Osborne Wetland No. 7	Prehistoric base camp (?)	170x70 meters	Yes
7NC-J-217	Osborne Wetland No. 8	Prehistoric procurement	85x60 meters	No
7NC-J-218	Osborne Wetland No. 9	Prehistoric procurement	140x70 meters	No

Most of the prehistoric sites discovered during the survey were quite small, and probably fall into Custer's (1994) "procurement site" category. Such sites were occupied briefly and sporadically by prehistoric peoples while obtaining food or other resources in the immediate vicinity. Sites that may represent base camps, occupied for longer periods, were located on both banks of the Appoquinimink River (Sites 7NC-F-13 and 7NC-G-141) and in the Osborne Wetland Replacement Area (Sites 7NC-J-212 and 7NC-J-216). No village sites were discovered during the survey. This is consistent with the claim made by Custer (1984) and Weslager (1972) that the Native Americans in northern Delaware remained hunter-gatherers at the time of European contact.

2. Prehistoric Settlement Patterns and Predictive Models

The Phase I surveys under discussion here provide important information on the prehistoric occupants of southern New Castle County. In general, prehistoric sites in this region show a strong tendency to be associated with wetland areas. The results indicate that there are differing prehistoric settlement patterns associated with two distinct regions in the project area, characterized by differences in topography and drainage. One of these regions lies north of Fieldsboro, and the other lies to the south. North of Fieldsboro, where well-drained Sassafras-Matapeake soils dominate, the wetlands are almost all associated with streams. Prehistoric sites, therefore, are also all associated with streams. The only large wetlands present in this area are the tidal marshes along the tributaries of the Appoquinimink River, and all of the substantial prehistoric sites are associated with one of these tidal streams. Of the 13 prehistoric sites discovered in the portion of the project area north of Fieldsboro (Sites 7NC-G-144, 7NC-G-145, 7NC-G-148, 7NC-G-149, 7NC-G-150, 7NC-G-143, 7NC-F-24, 7NC-F-13, 7NC-G-141, 7NC-G-140, 7NC-G-152, 7NC-G-151, and 7NC-G-139), all but two are within 100 meters of a permanent watercourse. The exceptions (Sites 7NC-F-24 and 7NC-G-148) are both associated with ravines leading down to tidal creeks. The current survey thus confirms the results of previous work in the Odessa area (see Chapter III), which also found that prehistoric sites were overwhelmingly associated with tidal creeks.

South of Fieldsboro, where less well-drained Sassafras-Falsington soils dominate, small bay/basin ponds and other wetlands are widely distributed across the landscape, and the prehistoric sites are associated with them. The best example of this topography in the areas covered by the current survey is in the Lynch Wetland Replacement Area. Five ponds, three of which were dry at the time of the survey in September 1995, were present within or adjacent to this 12-hectare (30-acre) wetland survey area. Sites were found in association with all of these ponds. None of these sites was located within 100 meters of any stream.

At the beginning of the project, the investigators were guided by the prehistoric site location model developed by UDCAR for the SR 1 project (Custer et al. 1984). This model was used as a tool for the assignment of a very general evaluation of the probability of the presence of prehistoric sites in survey areas prior to actual field survey. This model, which is based on a computer study of LANDSAT satellite imagery, was intended to apply to the entire Delaware Coastal Plain. It is important to note that, as a result, the UDCAR model does not distinguish

potential differences in topography such as were observed in the present survey. The UDCAR model exists in two versions: one recorded on USGS 1:24,000 maps at the offices of the DESHPO, and an earlier version recorded on DelDOT plans. The earlier version was used in designing the survey of the Drawyer Creek to Pine Tree Corners segment of the SR 1 project area. The later version was used in designing the surveys in the other segments. Because the version on file at the offices of the DESHPO is more complete and more widely used in Delaware, the discussion here will focus on that version.

For the well-drained area north of Fieldsboro, the UDCAR model has a number of puzzling features. For example, large areas of high ground between Scott Run and Augustine Creek, and south of Augustine Creek, more than 250 meters from any stream and not associated with even ephemeral drainages, were marked as having high or moderate potential. From Scott Run to Vance Neck Road, the current survey covered 30 hectares (75 acres) of moderate- and high-potential areas, but the only prehistoric sites discovered were within 50 meters of Augustine Creek. LBA's Survey Area 3 in the Scott Run to Drawyer Creek segment was designated as having moderate potential in the UDCAR model. However, even though it was surveyed by surface inspection at a time of nearly perfect visibility, no prehistoric artifacts were recovered from its 10.5 hectares. Survey Area 6A in the same segment, which measured approximately 2.4 hectares, was designated as having a high potential but also yielded no prehistoric material. Given the prehistoric site density of 28 sites per 100 hectares found in the areas designated high potential by LBA's model, described below, three prehistoric sites would have been expected in these areas. However, no evidence was found of even the most transient prehistoric use.

On the other hand, flat, well-drained peninsulas along Drawyer Creek, including the location of the Drawyer Creek North Site and the Eisenbrey Wetland Site, were considered low potential according to the UDCAR model. Thus, of the five prehistoric sites discovered in the Scott Run to Drawyer Creek segment, two were encountered in UDCAR-designated low-potential areas. Only one site (Site 7NC-G-148) was located in the 28 surveyed hectares of UDCAR-designated high- and moderate-potential areas more than 50 meters from a perennial stream.

The UDCAR model correctly predicts the general probability for site occurrence in the vicinity of the cluster of sites at the confluence of the Appoquinimink River and Drawyer Creek, but even there it inexplicably classifies one area of well-drained, gently sloping waterfront as low potential. Two prehistoric sites (Sites 7NC-G-55 and 7NC-G-58) were identified in this low-potential zone by UDCAR in 1984. Just north of Odessa, another large area was declared high potential by the model despite its great distance from wetlands. Portions of this area, surveyed by LBA because of their potential for historic resources, in Survey Areas 1 and 3 of the Drawyer Creek to Pine Tree Corners segment, yielded only a single, questionable prehistoric artifact. Along the Appoquinimink River, the large Appoquinimink North Site (7NC-F-13) spans areas that the UDCAR model designates as high, moderate, and low potential. Site 7NC-F-24 is located in a low-potential area. South of the river, Sites 7NC-G-140, 7NC-G-141, 7NC-G-151, and 7NC-G-152 are located in high-potential areas, while Site 7NC-G-139 is located in a low-potential area.

The current survey supports earlier work by UDCAR in showing that there was little prehistoric occupation in the area prior to 3000 BC, the beginning of the Woodland I period. The Appoquinimink River and Drawyer Creek, with which most of the sites in the survey area are associated, were small streams before they were inundated by rising seawater. Tidal water probably did not reach the Appoquinimink River/Drawyer Creek confluence until after 4000 BC, and the extensive brackish and saltwater wetlands that probably attracted prehistoric peoples to the area did not develop in the Odessa area until after 3000 BC, in the Woodland I period (Kraft 1977). Sites from the Woodland I (7NC-G-151, Whitby Branch) and Woodland II (7NC-G-143, Drawyer Creek South) periods occupy the same environments, situated for the exploitation of wetland resources. In fact, sites from the two periods are often found in the same location, as at the Appoquinimink North and South sites (Sites 7NC-F-13 and 7NC-G-141) and the Hell Island Site (Site 7NC-F-7) (Thomas 1966).

From Fieldsboro south, in the poorly drained areas, the model has different problems, but was no more accurate at predicting the general probability of site locations. Site 7NC-G-138 was discovered in a low-potential area. At the same time, the large area designated high potential which lies southwest of Fieldsboro, 2.5 hectares of which were surveyed by LBA in Survey Areas 12, 13, and 14 of the Drawyer Creek to Pine Tree Corners segment, failed to yield a single prehistoric artifact. The Pine Tree Corners Site (Site 7NC-J-208) was on well-drained ground adjacent to a bay/basin pond and other wetlands, a location identified as having high potential in the older version of the UDCAR model, but low potential in the more recent model.

The entire Lynch Wetland Replacement Area was defined as having moderate potential, a designation which seems appropriate for a large-scale determination. A finer-scale approach would emphasize the sandy ridges overlooking wetlands, which can be identified by a combination of topographic and soil maps and preliminary reconnaissance. Prehistoric artifacts were recovered from all such locations in the Lynch Wetland Replacement Area, and the results of UDCAR's 1984 and 1992 surveys in the area suggest that there is a very high probability (greater than 50 percent) of sites being found in such locations.

The fortuitous timing of the fieldwork during Phase I of the Osborne Wetland Replacement Area investigations made it possible to carry out much of the survey by surface inspection. This enabled a very thorough survey of this 65-hectare area, and thus provided a basis for comparison and evaluation of predictive models. The nine archaeological sites discovered in the Osborne Wetland Replacement Area were all associated with the stream. The previously recorded site in the adjacent SR 1 corridor (Site 7NC-J-5) was also adjacent to the stream. All but one of the sites were within 100 meters of the stream, and the exception (Site 7NC-J-217), which was 150 meters away, was between the stream and the bay/basin feature. Sites in the Osborne Wetland Replacement Area were also very strongly associated with ridges overlooking the substantial wetlands around the stream. Since sites were found on both sides of the stream, with one of the two largest sites on either side, aspect does not appear to have been a factor in site location. The prehistoric model developed by LBA for this survey, based on factors of slope, elevation, and distance to wetlands, proved to be a reliable predictor of site locations. High-potential Survey Areas 1, 2, 3, 4, 5, 6, 7, 13, and 15 all contained sites, while no sites were found in low-potential

survey areas. Sites were not located in high-potential Survey Areas 12, 14, 17, and 18. The absence of sites in Survey Areas 12 and 18 may be explained by the low relief. The "wetlands" in the wooded area were distinguishable from the surrounding woods by the presence of sedges and buttonwood bushes, but there was no open water and the visual difference was not great. Much of the wooded area did not appear to have been plowed, and there was no evidence that it had been drained, so in the past these wetlands were probably not significantly wetter or more extensive than they are today. These wetlands, although meeting the current legal definition, probably did not contain many of the plant and animal foods that attracted the prehistoric inhabitants of the area to marshes and ponds. If these wetlands ever were larger, much of the now-dry ground around them would also have been wet and not suitable for occupation. The absence of sites in Survey Areas 14 and 17, adjacent to the bay/basin feature, is more puzzling. However, the much poorer survey conditions in Survey Area 17 may have contributed, and it may be that people did not establish a camp by the bay/basin because it could be exploited from better sites adjacent to the stream, only 100 meters away.

The UDCAR model was moderately effective at predicting site locations in the Osborne wetland. That model designated the entire central portion of the wetland area, between the stream and the woods, as having high potential for prehistoric sites, with strips of moderate potential on either side and low-potential areas in the woods and in the northern half of Survey Areas 1, 2, and 3. Sites 7NC-J-210, 7NC-J-211, and 7NC-J-212, north of the stream, were thus split between low- and moderate-potential areas. Site 7NC-J-5 was located in a moderate-potential area. Prehistoric artifacts were observed south of the right-of-way on high ground overlooking the stream in an area that the UDCAR model designated as having low potential; Site 7NC-J-219 has now been recorded in that location. Thus, although the UDCAR model designates less than 20 percent of the project area as having low potential for prehistoric sites, the designated low-potential area includes all or part of four known prehistoric sites. A traditional model based on slope, elevation, and distance to water, on the other hand, designates approximately 50 percent of the project area as low potential but still locates all the sites.

The sites in the Osborne wetland have yielded artifacts that probably date to all periods from the Archaic to the Woodland II, and there is no evidence of a change in settlement or resource-use patterns over time. UDCAR's earlier work in the Blackbird vicinity (Custer and Bachman 1986a), as well as in the similar environment of the Muddy Branch drainage east of Dover (Custer and Bachman 1986b), also showed that sites on sandy ridges in these poorly drained wetland areas have been used in all periods of prehistory since the Paleoindian. The UDCAR data show a large increase in population in the Woodland I period, but no fundamental change in the settlement pattern.

Although the UDCAR model was an interesting and pioneering attempt to use satellite data and rigorous mathematics to develop a site-location model for a large area, the results of the current survey indicate that a traditional model that incorporates information on slope and distance to water appears to be more successful (Gardner 1978; Kavanagh 1982; Thomas 1980; Thomas et al. 1975). The current survey included substantial testing of areas designated as having low potential for the presence of prehistoric sites. It also included survey of areas considered to have

high potential for the presence of historic sites. These latter areas may be considered to be randomly selected with respect to the probability of occurrence of prehistoric sites. Thus, overall, the current survey appears to provide a reasonable test of the competing predictive models. Whether applied to the long, narrow highway corridor or the large block of the Osborne Wetland Replacement Area, the traditional model designated much less of the project area as having high potential, and yet was more successful in accurately predicting areas where sites were encountered.

The following model is therefore proposed for the location of prehistoric archaeological sites in the Mid-drainage zone of southern New Castle County. This model is of the type called by theoreticians "descriptive," i.e., it is based only on where sites have been found, not on a model of prehistoric behavior or a statistical analysis (Hay et al. 1982). Soil and topographic maps should be used to divide the project area, in a rough way, into well-drained and poorly drained regions. Within the well-drained region, all well-drained areas, with a slope of less than 6 percent, within 100 meters (330 feet)of a tidal or perennial stream should be designated high potential. All well-drained, gently sloping areas between 100 and 200 meters (330 to 660 feet) from a major tidal creek, or within 100 meters (330 feet) of a ravine head leading down to a tidal creek, should be designated as having moderate potential. All other areas should be designated as having low potential. In poorly drained regions, characterized by bay/basin topography, the focus should be on the sandy ridges overlooking wetlands. Well-drained, gently sloping areas within 100 meters (330 feet) of perennial and tidal streams should be designated as having high potential, but also any identifiable sandy ridges adjacent to poorly drained areas, and any well-drained location within 50 meters (165 feet) of a bay/basin pond, whether or not it currently contains water. Well-drained, gently sloping areas between 100 and 200 meters (330 to 600 feet) from a major tidal creek, and well-drained areas within 50 meters (165 feet) of any wetlands, should be considered as having moderate potential. All other areas should be designated as having low potential for the presence of prehistoric sites.

3. Historic Settlement Patterns and Predictive Models

Because no historic period sites dating to the 1630-1730 period were found during the survey, no conclusions can be drawn about the validity of the model for predicting the locations of those sites. It is possible that colonial sites were present in the project corridor and were missed by the shovel testing survey. Researchers in the Virginia Tidewater have shown that seventeenth-century sites, especially those that were occupied for a brief time, sometimes leave very few artifacts in the plowzone (Lucketti et al. 1992; Noel Hume 1982). However, surveys carried out by UDCAR and by Lu Ann De Cunzo in numerous high-potential locales in the Odessa vicinity, employing both surface inspection and intensive shovel testing, located very few seventeenth-century sites, a reminder of how rare these sites are.

At least two sites were located that date to the 1730-1770 period. The Augustine Creek North Site (7NC-G-144) is located on a well-drained terrace of the creek, 150 meters (500 feet) from U.S. Route 13. At this location, U.S. Route 13 follows the route of a major colonial road. The Augustine Creek South Site is on the bank opposite Augustine Creek North, so it is also on the creek, 150 meters (500 feet) from the road. One site dating to the 1770 to 1830 period was

located, the Appoquinimink North Site (Site 7NC-F-13). The Appoquinimink North Site is located more than 120 meters (400 feet) from the river, on a commanding rise. Because a marshy creek lies between the site and U.S. Route 13, it is several hundred meters from the nearest accessible colonial road, SR 299. On the basis of the limited evidence obtained during this survey, locations along streams seem better candidates for sites from the 1730 to 1770 and 1770 to 1830 periods than locations along roads.

The locations of nineteenth-century sites were predicted using maps, in particular the 1849 Rea and Price *Map of New Castle County*, the 1868 Beers *Atlas of Delaware*, and the 1881 Hopkins *Atlas of New Castle County* (see Figures 8, 9, 10, and 11). On the basis of these maps, several sites were predicted in the project corridor. The 1868 Beers atlas shows a structure in Survey Area 4 of the Scott Run to Drawyer Creek segment, near the Buttonwood house, but no site was found in this location. The structure shown was probably outside the corridor to the west. Locust Grove (Site 7NC-F-73) is still standing in the location shown on all these maps, and deposits associated with the house were found. The historic component of the Springfield Realty Site (Site 7NC-G-140) is associated with a house shown on all these maps as the Scott or Davis residence. However, the Scott/Davis residence is not in the SR 1 corridor as LBA investigators initially projected it onto these maps, so the site was not initially associated with this house. The Hutchinson/Weldin Store Site (Site 7NC-G-137) and the Lore Farm Site (Site 7NC-J-209) were found in the map-predicted locations. In the case of the Hutchinson/Weldin Store Site and the other structures in Fieldsboro, it was not clear what had been destroyed by the widening of U.S. Route 13 and subsequent commercial construction at the crossroads. No site was found in Pine Tree Corners, where the 1881 Hopkins map shows a house attributed to "H. Jones." That structure was probably outside the corridor, closer to U.S. Route 13, and has probably been destroyed by road widening and more recent construction. The most accurate historic maps used during the survey were the early USGS 1:62,500 sheets, which correctly predicted the Marl Pit Road (Site 7NC-G-142) and Vance Neck Road (Site 7NC-G-147) sites.

Two sites that date to the period after 1849 were found in locations not predicted by maps. The McDonough Road Site (Site 7NC-G-146) is a mid-nineteenth-century trash dump probably associated with a house located outside the corridor to the east, but it could not be linked to any house shown on a nineteenth-century map. The Middletown Road Site (Site 7NC-F-72) was probably a tenant house of the 1860 to 1890 period that was occupied too briefly, or was simply too insubstantial, to be included on any map.

Overall, the use of historic maps was found to be a very effective, but imperfect, guide to locating nineteenth-century sites. The placement of structures on these maps is rarely accurate enough to guide survey precisely, and the farther the mapped structures are from good landmarks such as roads, the less accurate the placement. Sometimes individual mapmakers have tendencies that can be identified and corrected for. For example, the 1881 Hopkins map tends to show structures that were actually adjacent to roads, some distance away, probably for reasons of clarity. (See above, discussion of Survey Area 9, Drawyer Creek to Pine Tree Corners segment). However, not all errors can be accounted for, so the locations of structures on historic maps must always be regarded as approximate. Historic maps, while they are an excellent guide, cannot substitute for field survey.