ARCHAEOLOGICAL SURVEY

RESEARCH DESIGN

Perhaps the most important development in cultural resource management (CRM) studies in recent years has been the increased attention given to the explicit use of research designs. Although the proposed federal guidelines "Recovery of Scientific, Historic and Archaeological Data: Methods, Standards and Reporting Requirements" (36 CFR 66) recommend the use of research designs for all projects, the use of research designs has often been neglected, particularly on small projects. The inattention to research designs in the CRM profession has been pointed out periodically by various investigators, and CRM practitioners have been urged to develop regional models amenable to use on small survey and testing projects. It has also been argued that valid assessments of cultural significance must be carried out with respect to preservation planning priorities that are based on local and regional cultural models (Goodyear et al. 1978; Raab and Klinger 1979).

The kinds of research questions that may be addressed during a particular CRM project depend on the project's scope and the quality of information available from previous investigations. The present study is the first CRM investigation of the Route 113 project area. Because the scope of work focuses on the location and evaluation of prehistoric and historic sites within the right- of-way, this project is best suited to the study of settlement patterns, that is, the distribution of sites across the landscape.

Delaware's management plan for prehistoric resources (Custer 1986) provides an excellent basis for assessing the overall archaeological sensitivity of the Route 113 corridor and for the development of explicit predictions regarding the occurrence of prehistoric sites. The state management plan was developed according to the Department of the Interior's Resource Protection Planning Process (RP3) model, and it provides a number of explicit settlement pattern models that characterize the various periods of the state's prehistory. The state plan describes expected site types for each period, together with their locational characteristics, which enables identification of predicted zones of archaeological sensitivity.

Following the initial background research of the study area vicinity, the alignment was stratified into high, moderate, and low potential zones. In general terms, high potential areas for prehistoric resources were defined as locations where non-erosional environments could be associated with a highly preferred occupational setting, especially terraces and floodplains adjacent to principal drainages. Moderate potential areas were defined as settings that have not been subject to severe erosion (e.g., heavy agricultural usage) and that occur adjacent to minor streams and tributaries. Elevated areas of well-drained soils were also considered to have a medium to high prehistoric potential. For historic archaeological resources, high potential areas were defined as loci at road intersections or other areas where cartographic sources indicated the presence of nineteenth-century or twentieth-century structures. (No suitable seventeenth- or eighteenth-century cartographic sources were available.) All remaining portions of the study area were defined as having low potential.

After definition, the areas of predicted sensitivity were marked to USGS quadrangle maps (Figures 13, 14, and 15), and then the locations were transcribed to a set of project plans. In practice, the areas of moderate and high potential were combined and designated as moderate/high potential, thereby reducing the number of strata to two zones: low potential and moderate/high potential. Stratification of the study area into areas of varying sensitivity allowed the fieldwork to focus on those areas with the greatest archaeological potential. To prevent the survey design from becoming a self-fulfilling prophecy, the field survey plan also provided for some examination of low probability areas.

An important component of the prehistoric research was the collection of data pertaining to the geomorphic processes which have been active in the area. There is evidence that Holocene aeolian deposition may have buried some Pleistocene occupation surfaces in the Delmarva Peninsula (Curry and Ebright 1989; Foss et al. 1978). Therefore, the field survey plan included measures to evaluate the potential for buried cultural deposits, and ascertain their probable location within the study corridor. This work was accomplished through the use of hand-retrieved cores and bucket auger samples within the drainageways and other depositional environments in the study corridor.

The initial Phase I field survey was carried out during the period July 26 to August 26, 1988, with a field survey team that ranged from three to six archaeologists. The field survey began with a pedestrian walkover survey of the entire study area. The initial walkover was carried out in order to assess the general field conditions, locate visible cultural remains, and identify areas of potential sensitivity that were not evident from the inspection of topographic maps. In addition to the walkover examination, a split-spoon auger was used to probe the subsurface soils in order to assess the potential for deeply buried cultural remains.

Survey of the selected areas was normally carried out by a walkover examination supplemented by shovel testing. Coverage on the high/moderate potential landscapes was 100 percent; that is, all areas of identified archaeological sensitivity were examined. Each area was subjected to a pedestrian survey, using intervals no greater than 20 meters (65 feet). Because much of the terrain to be explored was forested, rigidly positioned transects were not used.

The shovel tests provided a small but important aperture for assessing the presence of archaeological materials. The shovel tests measured roughly 50x50 centimeters in plan, and they were excavated in 10-centimeter arbitrary intervals. Normally, shovel tests were advanced to a depth of one meter; in some cases, the shovel tests were extended by a bucket auger, in order to examine a deeper stratigraphic profile. All excavated soil was screened through 1/4-inch mesh hardware cloth. Schematic soil profiles including soil texture and Munsell soil color notation were recorded for each shovel test on a standardized form. Each shovel test was backfilled upon completion.

A set of DelDOT engineering drawings scaled at 1 inch to 60 feet was carried in the field to provide locational control. Shovel tests, significant landscape features, and field notes were marked directly on these maps, supplementing the shovel test forms and the field supervisor's journal. Survey areas were identified according to survey stations, as taken from the DelDOT engineering drawings. Survey stations were marked at 100-foot intervals and numbered in ascending order from the south to north. Within each survey area, shovel tests were numbered sequentially.

Black-and-white photography was used to record sites and general field conditions throughout the study area. After completion of the fieldwork, site survey forms were completed and submitted to the Bureau of Archaeology and Historic Preservation. Copies of the completed site forms are included in Appendix G of this report.

The Phase II fieldwork was carried out during the period from June 10 through July 16, 1991, and included completion of the Phase I survey of the right-of-way and testing of potentially significant sites to determine their National Register eligibility. The field survey was completed at three locations that had been evaluated as having archaeological sensitivity but which were inaccessible during the 1988 fieldwork. These areas are located at Stations 142, 278, and 651.

The Phase II field methods were oriented toward site evaluation as opposed to site identification (Phase I), and they were designed to be compatible with and complementary to the Phase I survey, so that all data could be easily incorporated into the evaluation of the sites. The Phase II field investigations began with a brief walkover survey of each site, to relocate shovel tests or survey control points established during the Phase I survey. Subsequent testing involved excavation of shovel tests and test units. First, grids were established at each site for horizontal control. The grids were oriented to the highway alignment, and at least two survey control stakes were left in the event that subsequent data recovery would be authorized. Points on the grid were given North and East coordinates, with grid origin point located well outside the site area. In most cases, transects were laid out at 6-meter (20-foot) intervals within the grid and individual shovel test locations were marked at 6-meter intervals along the transects.

Shovel tests were staggered on adjacent transects to provide a systematic unaligned sampling pattern.

The initial work at each site consisted of shovel testing, which provided a method to identify artifact concentrations and refine the site boundaries established during the Phase I testing. At one site (7S-F-67), the surface conditions permitted an intensive walkover survey, and the shovel test interval was correspondingly expanded to 10 meters (30 feet). The Phase II shovel tests were excavated according to natural strata, usually plowzone (A-horizon) and subsoil (B-horizon and C-horizon).

Based on the shovel testing results, locations within each site were selected for test excavations, generally in areas that appeared to have the highest density of cultural material or potential for features. The test excavations included the use of 1x2-m and 1x1-m units, and they were used to obtain a larger sample of cultural material from each site and to evaluate the depth of the deposits, the presence of cultural material in subplowzone contexts, and the presence of features.

The test units were excavated by arbitrary 10-centimeter levels within strata, except for plowzone layers, which were removed as a single level. Stratigraphic layers, or strata, were defined on the basis of soil color, soil texture, and artifact content, and they were identified alphabetically, while the 10-centimeter levels were given numeric identification. A continuous numeric sequence of levels was assigned within each excavation unit, so that each provenience included stratum and level identification. For example, a typical sequence might be:

Stratum A, Level 1
Stratum A, Level 2
Stratum A, Level 3
Stratum B, Level 3
Stratum B, Level 4
Stratum B, Level 5
Stratum C, Level 5
Stratum C, Level 6
Stratum C, Level 7
etc.

As excavation proceeded, depth measurements were taken from datum stakes set to the side of the feature; elevations for the datum stakes were referenced to a site datum established at each site.

Standardized field forms were used to record excavation levels and features, and were supplemented by scaled plan and profile drawings. Black-and-white and color slide film was used to photographically record the field excavations, including soil profiles, features, and general site conditions. Standard scientific descriptions of excavated soil strata were employed, using standard USDA field tests for soil textural classes and Munsell soil color notation.

After being cleaned and sorted according to major material categories (prehistoric lithics, prehistoric ceramics, historic ceramics, glass, small finds, etc.), the collections were analyzed by specialists and the artifact attributes were coded on computer data entry forms. Artifact cataloging and tabulation were accomplished using LBA's computerized database system. The system was developed using the MicroRim RBase System V relational database software package, which runs on IBM PC XT-compatible microcomputers. The database allows recordation of more than a dozen attributes for each artifact. In addition to standard descriptors, lengthy notes specific to individual artifacts can also be entered into the database. LBA's database handles both prehistoric and historic artifacts, with separate but linked datafiles for each. The system also allows ad hoc data queries as well as data exports to other microcomputer systems for analysis at remote locations.

Historic artifacts were cataloged according to standard typologies (e.g., Noel Hume 1970; South 1977), using the class, type, and variety approach (for example, class = glass, type = bottle, variety = case). First, the entire collection was sorted according to major classes -- ceramics, curved glass, pipes, and small finds. The small finds class is a residual or catch-all category that comprises a broad variety of items, including artifacts assignable to South's (1977) Architectural, Furnishings, Arms, Personal, Clothing, and Activities groups. Cataloging of the ceramics and glass was carried only to the level of individual sherds, rather than vessels, and no crossmends or Minimum Number of Vessel determinations were made. Dating of deposits was accomplished primarily by the Terminus Post Quem (TPQ) technique, using the beginning date of manufacture for artifacts with a known temporal range. Some of the attributes -- date ranges, for example -- were automatically entered by the computer for commonly encountered artifact types. Data processing speed and storage were enhanced by the use of alphabetic and numeric codes for the various attributes, but more lengthy "translations" were generated as well, particularly for printing catalog sheets. For example, the codes "CRW 10" translates to "Ceramic, whiteware, shell-edged blue," with an automatically entered date range of 1820 to 1900.

The cataloging of prehistoric artifacts was also carried out according to a techno-morphological classification system. First, the collection was sorted into major formal classes: bifacial tools, unifacial tools, cores, chunks, flakes, cobble tools, groundstone tools, cracked rock, and ceramics. Within the major lithic classes, each item was then classified according to more specific functional types. Debitage types include decortication flakes, early reduction flakes, biface reduction flakes, bipolar reduction flakes, block shatter, flake shatter, flake fragments, other flakes, and indeterminate flakes. Core types identified in the collection include freehand cores and bipolar cores. Unifacial tool types include utilized flakes, retouched flakes, sidescrapers, and endscrapers. Incompletely finished bifacial tools were sorted according to the early-stage, middle-stage, and late-stage categories defined by Callahan (1979); other types include projectile points and indeterminate biface fragments. All lithic items were sorted and coded according to raw material. Bifacial tools, cores, and other tools were weighed. Projectile points were measured (length, width, and thickness) and assigned to a formally defined type if possible. Weights, as well as specimen counts, were recorded for fire-cracked rock. Ceramics were cataloged according to temper, surface treatment, and surface decoration and assigned to a formally defined ware if possible.

An catalog listing of the recovered cultural material has been prepared to accompany the artifact collections.

SURVEY RESULTS

This section presents the results of the archaeological field survey. Altogether, a total of 46 survey areas were examined. Of these, 38 were evaluated as having potential for prehistoric resources, and 9 were evaluated as having historic potential. (Two survey areas were evaluated as having potential for both prehistoric and historic resources.) One area of low potential was examined in order to test the validity of the predictive model. Within the right-of-way, the field survey resulted in the identification of seven sites. Four of these sites had historic components and five of the sites had prehistoric components. In addition, one prehistoric site was recorded outside the right-of-way. Figures 13, 14, and 15 show the location of the survey areas and sites recorded during the survey.

The survey results are discussed in the following section, which is organized according to individual survey areas, proceeding from south to north. A summary discussion of the survey results follows the description of the individual survey areas.

Survey Area: Station 108
Classification: High/Moderate Prehistoric Potential
Soil Type: Pocomoke sandy loam
Survey Methods and Results:

This area is located on the south side of a drainage ditch on the property of radio station WSEA. Most of the survey area consisted of an open field/lawn area. Four shovel tests were excavated at 15-meter intervals in two transects parallel to the ditch (Figure 16). The local soils were mapped as poorly drained Pocomoke sandy loam. Two brick fragments were recovered from the shovel test nearest the ditch and Route 113; they do not appear to represent a historic occupation. Spoil from the ditch and disturbance from the road were the most notable features of this station.