

3.0 METHODS

3.1 RESEARCH DESIGN

The research design for the project was aimed at providing cultural contexts for the Indian River Bridge replacement and wetland mitigation areas. The approach focuses on settlement patterns during various cultural time periods represented in the region based on previous investigations, synthesis of regional data, and management documents within the region. Landscape and/or environmental variables influenced prehistoric settlement, as well as interactions between neighboring groups and the surrounding regions. This approach is congruent with the “biosocial” perspective on culture advocated by Custer (1984a:21-22; 1986b:2-8; 1987:1-3; 1989:23-25) and by Thomas et al. (1975). The approach is also informed by the human ecology of Butzer (1982) and the historical ecology of Crumley (1994), and recognizes other perspectives on the past (see Hodder 1991, for example). The basic assumption is that past cultures adapted to combinations of natural and social constraints and opportunities operating in a given area at a particular time. Thus the presence or absence of prehistoric archeological sites will be determined through a combination of environmental and field research.

Contexts for historic structures and archeological sites are based in part on a similar approach, augmented with knowledge of transportation networks, historical maps, aerial photographs, and other visual images of the project region. In addition, a fuller knowledge of social processes, trends, and patterns is available for the historic period based on documents, oral and traditional statements, and published histories. The findings of the background research are integrated and interpreted based on the relevant cultural contexts.

3.2 BACKGROUND RESEARCH

Background research for the project included a literature review of relevant geological, ecological, archeological, and historical sources. Research for the historic overview was conducted at Morris Library, University of Delaware, the Delaware Historic Preservation Office, the South County Library (Bethany Beach), and the Delaware Public Archives. Review of previous archeological and architectural research relied on the report files maintained at the State Historic Preservation Office (SHPO), Dover. The SHPO maintains the state Cultural Resource Survey (CRS) files referenced to a set of aerial photography mosaic maps (SPO maps). Background research was conducted to develop the historic overview for the study area and to determine previously surveyed archeological and architectural properties within the study area. Sources used included books, journal and newspaper articles, governmental reports, cultural resource reports, photographs and maps.

A review of publications and research related to geologic data within the study area was conducted to facilitate a determination of the probability for the preservation of archeological sites within the study area. Natural tidal inlets typically follow predictable yet dynamic processes that open and close them. Indian River Inlet is currently stabilized and preserved under the direction of the United States Army Corps of Engineers (USACE). Naturally, tidal inlets are typically cut during storm events and then close through coastal processes. These natural coastal processes have led to several documented historic and prehistoric cuts of the barrier north and south of the present inlet location.

After a review of available documentation, a sensitivity analysis for the potential for preserved prehistoric archeological sites was developed related to the study area.

Plotting the locations of historic tidal inlets was undertaken using the Indian River map from the *Atlas of the State of Delaware* (Beers 1868), the *Rehoboth, Del.* 15-minute topographic quadrangle (USGS 1918), U.S. Department of Agriculture aerial photographs from 1926, 1938, and 1960 (Inkster 2001; USDA 1938, 1960), and the *Rehoboth Beach, Del.* and *Bethany Beach, Del.* 7.5-minute topographic quadrangles (USGS 1984) within ArcGIS.

The Delaware Geological Survey, the Department of Geology at the University of Delaware, and the University of Delaware Library were used to obtain documentation regarding the environments and geography of the paleoenvironments of the present Indian River Inlet.

The marine archaeological survey began with a review of previous maritime investigations in the area of the Indian River Inlet. The archaeological reviews were combined with historical research of the Indian River Inlet maritime resources and shipping. Historical research included information from libraries and collections along with personal conversations with people knowledgeable about the history and archaeology of the Delaware coast.

Information concerning previously identified historic architectural properties was gathered from aerial maps, survey forms, and a National Register nomination in the Data Room of the SHPO. Additional information was provided by Gwen Davis, staff archeologist for the SHPO, and Elizabeth Ross, Kent County Historic Preservation Planner. Ms. Ross is the author of a draft National Register nomination for World War II defense fortifications associated with Fort Miles (see discussion of Fire Control Tower #2, Section 5.1).

3.3 GIS DATA COLLECTION

JMA gathered cultural resources information from the SHPO. The initial work undertaken focused on a 2-mile radius area from the present Indian River Inlet Bridge that was later increased to a 5-mile radius from the present bridge (Figures 1 and 2). JMA collected the necessary attribute data related to those cultural resources located within the 5-mile radius study area from the Delaware Cultural Resource (CRS) Inventory and National Register files housed at the SHPO in Dover, Delaware (Appendix II). JMA utilized ArcGIS (ArcView 8.3) to create and display the spatial attributes of specific cultural resources within the study area from a referenced set of aerial photography mosaic maps (SPO maps).

The attribute data from the CRS Inventory forms were entered into a standardized spreadsheet previously used for other projects in Sussex County, Delaware to aid in the transcription of data that is presently available in paper and microfiche formats. Attributes that were recorded include: CRS Number; property name; property location; status of property (e.g. NR listed, NR eligible, and inventory); property class (e.g. agricultural, domestic, military, etc.); temporal period (as defined by the state management and comprehensive plans (prehistoric and historic). This standardized spreadsheet allows the viewing of attribute data within ArcGIS. The spatial and attribute data was collected and stored on a laptop computer and later downloaded onto the JMA server.

Within the 5-mile radius of the Indian River Inlet Bridge study area, attribute data was collected for 326 individual Cultural Resource Properties (Figure 18) (Appendix II). The Cultural Resource Property spatial points (CRS points) were digitized in ArcGIS from mosaics of the 1964 orthophotographs.

Table 1. Summary of Cultural Resource Properties within a 5-mile radius of Indian River Inlet Bridge

Type	Number	National Register-listed	National Register-eligible	Undetermined status	Total
Standing Structures	290	1	2	287	290
Standing Structures with historic archeology	1	0	0	1	1
Archeological-Prehistoric/Historic	1	0	0	1	1
Archeological-Prehistoric	34	2	0	32	34
Total	326				326

A total of 326 Cultural Resource Survey Properties were identified within the 5-mile radius study area (Table 1). A total of 291 properties were standing structures with one being National Register-listed property (the Indian River Life Saving Station) and two National Register-eligible. A total of 34 properties within the 5-mile radius study area are prehistoric archeological sites with two (7S-K-21 and 7S-G-22) listed on the National Register. There is one property identified as an archeological site related to both prehistoric and historic periods (7S-K-13) and its status has not been determined and one historic archeological site (7S-G-126).

3.4 ARCHEOLOGICAL FIELD METHODS

The historical research was combined with a physical walk over of the two-mile-radius study area both north and south from the center of the Indian River Inlet Bridge between the ocean and the bay (Figure 1). This survey was a visual inspection of the area for any observable maritime archaeological resources. Pedestrian survey methods followed the oral directions provided by the SHPO during a field meeting on May 19, 2003. The pedestrian survey was intended to locate surface evidence of archeological resources (historic and/or prehistoric). Excavation, in the form of shovel tests units, was to occur only if surface evidence of archeological resources was discovered. No artifacts were recovered, and no excavation was undertaken. Black and white and color photographs were taken of observable maritime cultural resources and landscape features.

The geotechnical borings which were monitored were BI-6 and BI-7 per request of the Delaware SHPO and DeIDOT. These borings were performed by Mactec and Free State Drilling, Inc., using standard methods for penetration tests and split-barrel sampling of soils. A hollow stem auger was used for drilling purposes. Casings were also used to maintain the borings to depths of 60 feet due to collapse due to instability of the saturated unconsolidated sediment. For archeological purposes, samples were continuously recovered for the upper 10 feet of the boring and 5 feet into the basal sand of each geotechnical boring (Appendix III). These two sections of continuous sampling were

identified as having high potential for the potential preservation of cultural materials and having landscapes that potentially supported human occupation. Continuous sampling allowed recovery and visual analysis of samples to determine the presence of buried landscapes that may have supported human occupation. Geotechnical samples were taken for the remainder of each geotechnical boring from the basal 1.5 feet of every 5 foot section of the boring. These standard geotechnical samples were also examined for evidence of stable landscapes and cultural material. Any sediment remaining after the geotechnical sample was recovered was screened through ¼ inch metal mesh to facilitate the recovery of any cultural materials. In addition, cuttings from the remaining 3.5 feet of every 5 ft section were screened through ¼ inch metal mesh to facilitate the recovery of cultural material.

3.5 ARCHITECTURAL FIELD METHODS

Following completion of the background research and file check, JMA conducted a windshield survey of the initial two-mile study area (Figure 1). This field view included field checks of previously identified historic architectural properties to determine whether changes to them have occurred since the time of previous survey. The field view also included driving every publicly accessible thoroughfare to identify additional buildings, structures, and districts that could be visually dated to pre-1960. The exterior of each newly identified pre-1960 property was photographed, and brief descriptive notes were compiled concerning its appearance.