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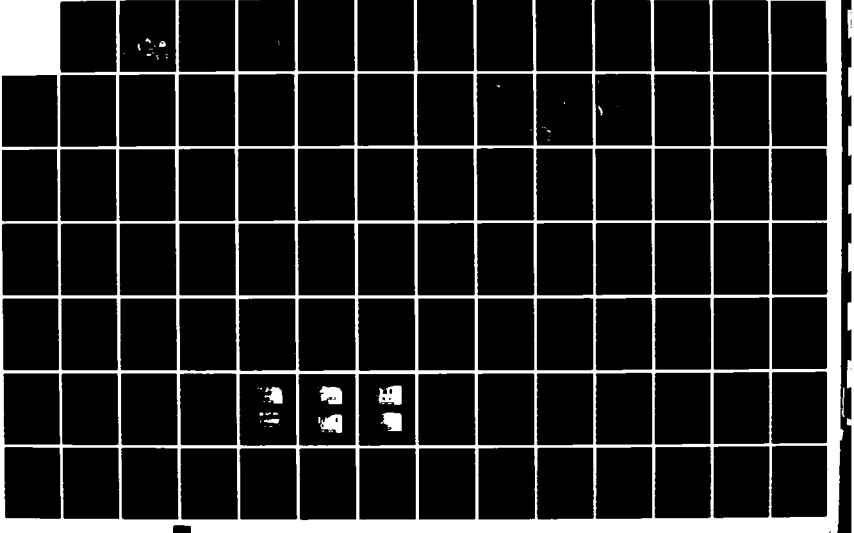

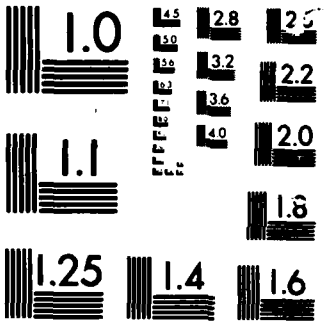

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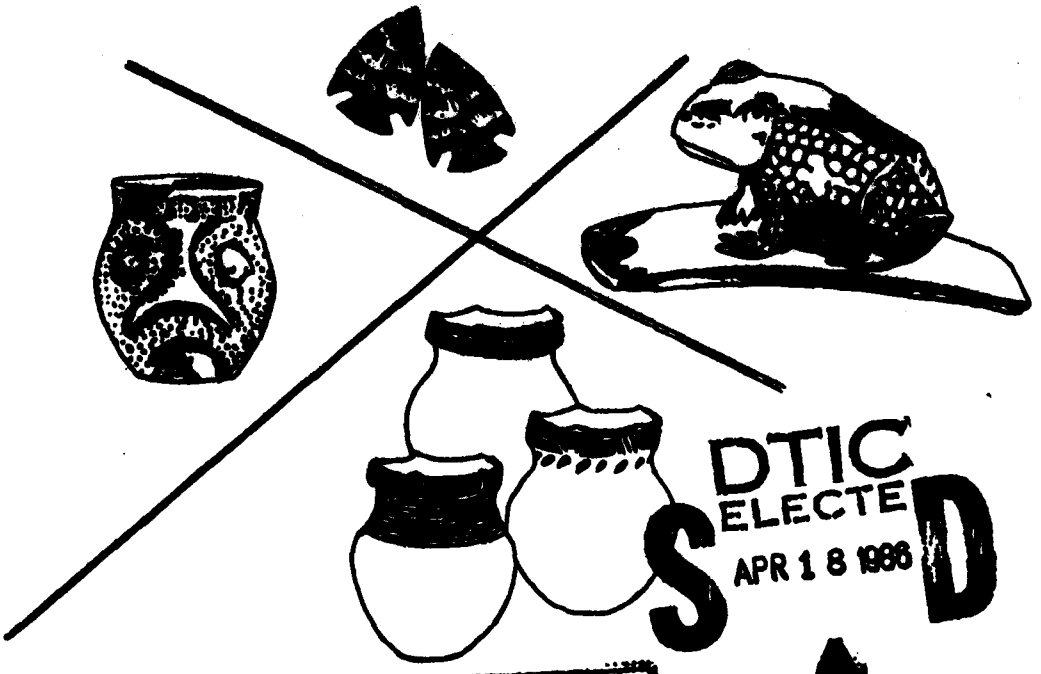
Reports of Investigation No. 163

ARCHAEOLOGY AND GEOMORPHOLOGY OF RED OAK RIDGE ISLAND, NAVIGATION POOL 7, UPPER MISSISSIPPI RIVER VALLEY



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An archaeological investigation was conducted at Red Oak Ridge Island and the four adjacent islands. The report contains a technical proposal and research design to conduct intensive archaeological survey; establish a landscape model through geomorphic investigations for the interpretation of archaeological deposits; determination of the research potential for site 47 Lc 163 and utilization of the results to project the potential significance of other sites located during the course of the investigation....

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ARCHAEOLOGICAL INVESTIGATIONS AT RED OAK RIDGE ISLAND, LAKE ONALASKA, LA CROSSE COUNTY, WISCONSIN

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In Compliance With: Contract No. DACW37-85-M-1142
(Modification P00001)

February, 1986

MANAGEMENT SUMMARY

During the months June-September 1985, Great Lakes Archaeological Research Center, Inc. conducted archaeological investigations at Red Oak Ridge Island and at four small islands adjacent to Red Oak Ridge Island. The investigations included a survey of all five islands and an evaluation of a previously reported archaeological site designated 47 Lc 163. Six previously unreported archaeological sites were identified on Red Oak Ridge Island, and, three previously identified archaeological sites were found at three of the nearby islands. Site 47 Lc 163 was subjected to test excvations which revealed that the site had been occupied from Late Archaic through Late Woodland times. However, the contexts of cultural remains have been disturbed, largely by natural agencies during the mid-late Holocene. Further, acidic soil conditions indicate that preservation of organic remains is very poor. Given these conditions, it is likely that Lc 163 has very limited integrity and is not suitable for answering research questions beyond those of local culture history. As a result, the site is not considered eligible for The National register of Historic Places.

The archaeological work was conducted to secure partial fulfillment of St. Paul District, Corps of Engineers responsibilities regarding cultural resources. The legislative mandates that apply are as follows: (1) National Historic Preservation Act of 1966 (P.L. 89-665) as amended; (2) The National Environmental Policy Act of 1969 (P.L. 91-190); (3) Executive Order 11593; (4) Archaeological and Historic Preservation Act of 1974 (P.L. 93-291); (5) National Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties (36 CFR, Part 800); (6) the Deaprtment of the interior guidelines regarding cultural resources (36 CFR, Part 60); and (7) applicable Corps of Engineers regulations (ER 1105-2-50).

St. Paul District, Corps of Engineers objectives for the project were to secure a planning tool to aid the Corps in meeting its obligations to preserve and protect our cultural heritage. Thus, the desired product was a comprehensive, scholarly document not only to meet the demands of the legislative framework above, but to serve as a useful reference for future professional studies in the region. To meet these objectives a technical proposal and research design was developed to: (1) conduct intensive archaeological survey within the limits of the designated areas; (2) to establish a landscape model through geomorphic investigaitons that would apply locally and, perhaps, regionally for the interpretation of archaeological deposits; (3) determine the research potential of site 47 Lc 163, and (4) utilizing the results of 1-3 above, project the potential significance of other sites located during the course of the investigations.

In most general sense, these investigations have determined that the prominent features of the now-inundated low terrace-floodplain have been intensively occupied from Late Archaic through Late Woodland times. Further, the Woodland culture sequence in this locality likely shares greater affinities with those prehistoric cultures identified to the north and west rather than to the south and east. It is unfortunate that the contexts in which cultural materials are found are disturbed by the effects of climate and to lesser extent by man. Thus, the applications of future research are by and large limited to local cultural-historical reconstructions as most the archaeological sites occur as lag deposits on distressed surfaces.

The total cost of these investigations is $22214.00. Notes, photographs, artifacts, and associated documents are currently housed at Great Lakes Archaeological Research Center, Inc., 7509 West Harwood Avenue, Wauwatosa, WI 53213, (414) 259-6020, 259-6021.

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INTRODUCTION:

Project History:

During the months of June-September, 1985, Great Lakes Archaeological Research Center, Inc. conducted cultural resources investigation of Site 47 LC 163 and survey of Red Oak Ridge Island, Lake Onalaska, La Crosse County, Wisconsin. Work was conducted under the auspices of Contract No. DACW37-85-M-1142, St. Paul District, Corps of Engineers. The contract was subsequently modified, Modification No. P00001, to include additional archaeological investigations on Fish and Wildlife Service lands on Red Oak Ridge Island and at off-shore sites of four unnamed islands northeast of Red Oak Ridge Island. The locality is known to harbor four recorded archaeological sites (47 LC 160, 47 LC 161, 47 LC 162, 47 LC 163) and uncodified collections of archaeological materials have been reported by local investigators.

Red Oak Ridge Island, and four unnamed islands to the northeast, are located in Pool 7 of the Mississippi River approximately 4,500 feet north of dam 7 on Lake Onalaska (Figures 1 and 2).

The investigations were guided by a technical proposal and research design originally submitted to the National Fish and Wildlife Service. Apparently, although no formal or informal notification was ever received, the St. Paul district, rather than the Fish and Wildlife Service assumed responsibility for the project and issued its own scope of work. As the project, at the time of submission, was almost identical to the Fish and Wildlife Service specifications, the same research design was applied. During the implementation of the original survey of Red Oak Ridge Island and the evaluation of site Lc 163, the modification to Contract DACW37-85-M-1142 was issued. This modification derived from consultation between the Historic Preservation Division, State Historical Society of Wisconsin, the Fish and Wildlife Service, and the St. Paul District Corps of Engineers. A second proposal and work plan was submitted in response to the modification. These documents are appended to the report as follows: (1) St. Paul District, Corps of Engineers scope of work: Appendix A; (2) Original technical proposal and supplementary work plan developed by Great Lakes Archaeological Research Center, Inc: Appendix B; and (3) Relevant agency correspondence: Appendix C.

Project Goals and Objectives:

Having completed an evaluation of both strengths and limitations of the current archaeological data base and in view of the specific management needs identified in the scope of work (Appendix A), several goals and objectives were identified. The major limitations were a result of

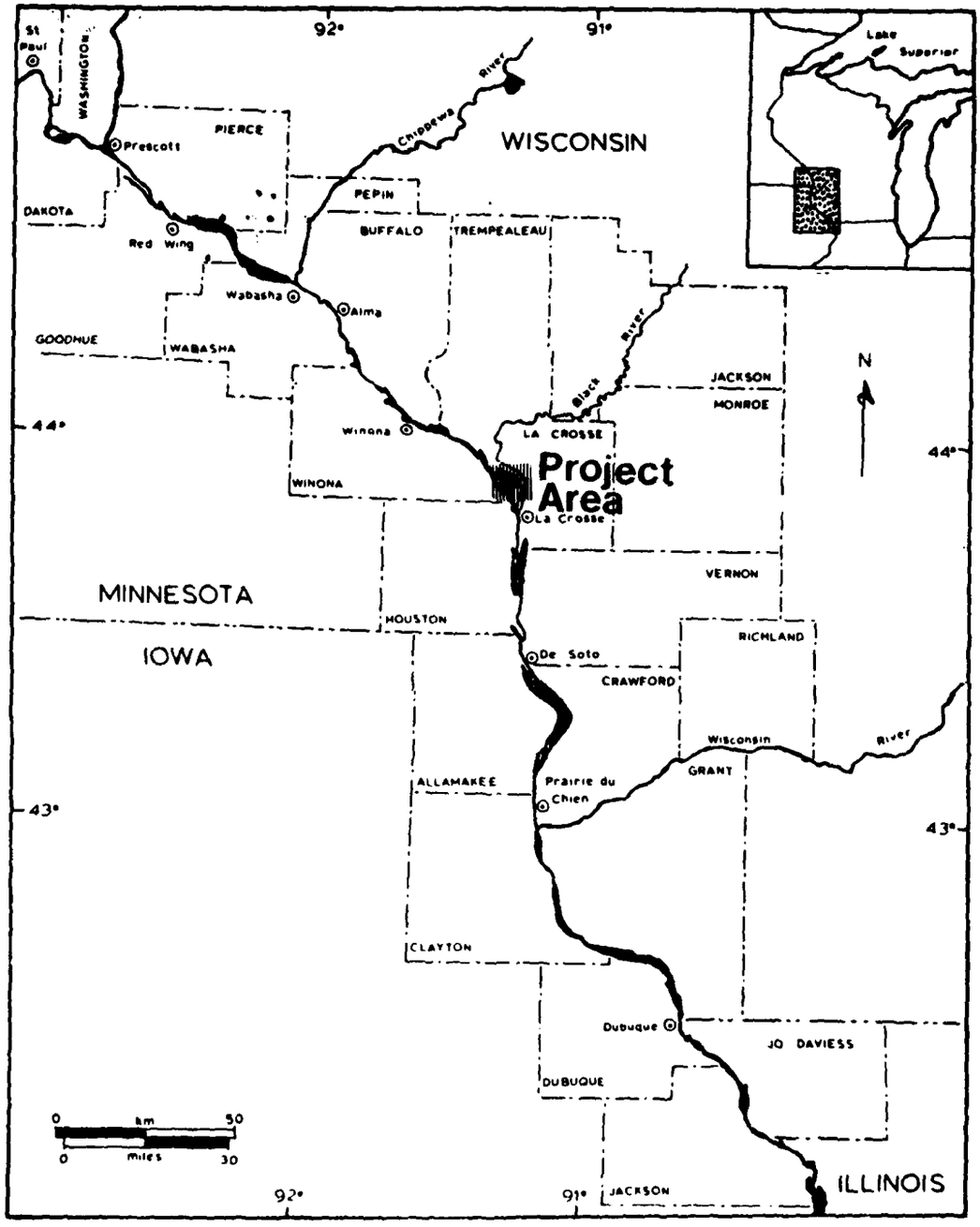


Figure 1: Regional Map depicting project location.

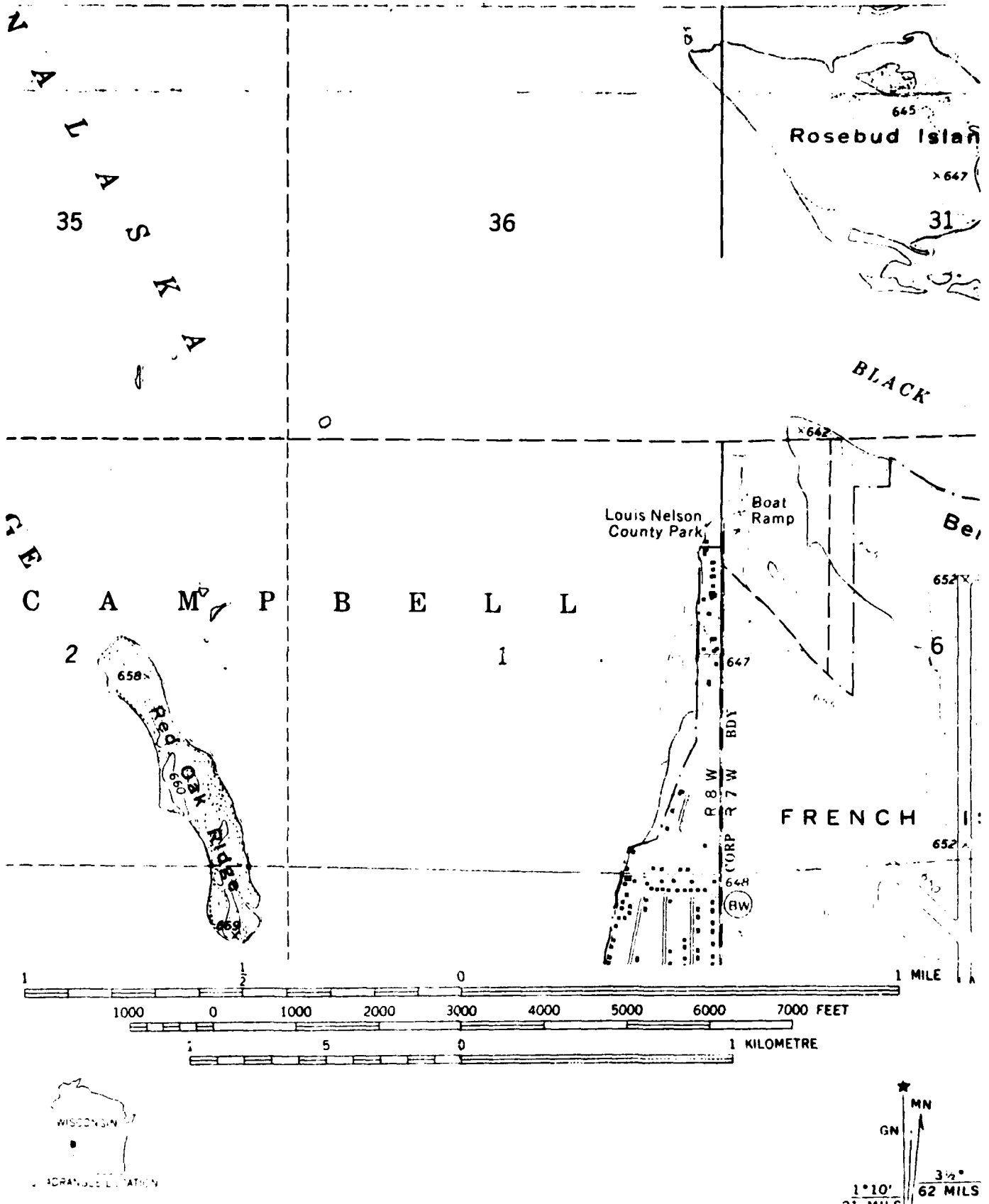


Figure 2: Red Oak Ridge Island and vicinity (adapted from Holmen Quadrangle).

limited previous research in the project locality. The only reconnaissance work conducted in the immediate study locality was reported by Boszhardt (1983). The conclusions drawn from this reconnaissance indicated that: (1) Woodland ceramics from sites Lc 163 and Lc 160 did not compare favorably with typological ceramic constructs from the Tri-State locality (Logan 1956, Benn 1978), and, (2) knowledge of landform features and site formation processes had not been addressed in any significant way, save the very broad brush comparisons noted by Boszhardt (1983: 4-11). Of additional interest, although not surprizing, was the lack of Oneota presence on the floodplain and associated low terraces of the Mississippi River. This phenomenon has also been noted in Pools 10, 11, and 12 of the Upper Mississippi River Basin and we had no reason to assume that Pool 7 would prove an exception to this pattern. Given these considerations and the specific management objectives detailed in the attached scope of work, several tasks were identified to realize both research and management goals. These tasks are summarized below.

1. National Register Evaluation of Lc 163:

Testing of Lc 163 was designed to provide sufficient data to evaluate site significance in terms of the explicit National Register Criteria. Emphases were placed on ascertaining the degree of integrity of the archaeological deposits and their potential for future research. The techniques utilized were deployment of 2x2m test excavation units placed parallel to the eroding bank. This was done for two reasons. First, bank stabilization was anticipated and would likely result in significant disturbance at the cut-bank crest. Second, a major farm complex was situated just to the south of this area and we sought to conduct testing in an area that would not have been significantly disturbed by 20th century agricultural activities at Lc 163.

2. Comprehensive inventory of Corps and U.S. Fish and Wildlife Service lands on Red Oak Ridge Island:

Survey of federal agency lands, virtually the entirety of Red Oak Ridge Island, was to be accomplished by application of three techniques: (1) shovel probing at 15.0m intervals along pre-determined transects; (2) cut-bank surveys; and (3) informant interviews. As a supplement to these three techniques, silt probe cores and bucket auger holes were to be applied. The purpose was to secure a complete inventory and identify any previously unknown archaeological sites (no standing structures remain on Red Oak Ridge Island).

3. Investigation of "Off-shore" archaeological sites at four unmaned islands northeast of Red Oak Ridge Island:

Avocational archaeologists have apparently been collecting artifacts from inundated contexts near these islands. Because erosion is rapidly destroying these

landforms they were slated for potential shoreline stabilization. Various communications between Fish and Wildlife Service staff, the Wisconsin Historic Preservation Division, and the St. Paul District, Corps of Engineers resulted in the conclusion that "sieve collection" should be conducted in the proposed impact areas on the northwest side of these islands. The ostensible purpose of this task was to secure information based on these discussions. The specific recommendation reads as follows:

> However, it is important to know more about the submerged portions of the site(s) before they are covered, and it is important to investigate any near-shore areas that may be affected by dredging. Therefore, we recommend that a qualified archaeologists conduct a controlled survey of the areas to be dredged or covered. This might best be done through seining or seiving (sic) at regular intervals, so that the distribution, density, and degree of integrity of materials can be assessed. In view of the large number of sites in the Lake Onalaska area, we recommend the same procedure for the other three islands (see Appendix C).

During negotiations with Fish and Wildlife Service and Corps of Engineers staff, the Principal Investigator indicated his belief that this approach would add virtually no new information. The conclusion of the discussion was that such investigation would be carried out, however, the context of materials would be better evaluated with investigations related to site formation processes. As a result, the "shoreline collection" was supplemented by soil probe and bucket auger investigations designed to secure controlled soil samples for subsequent laboratory analyses.

4. Historic map Review:

To provide an initial assessment of site context prior to the formation of Lake Onalaska by lock and dam construction historic baseline maps were analyzed. These were compared with contemporary U.S.G.S. 7.5' quads and air photos in order to determine the nature of landscapes destroyed by inundation and subsequent erosion related to the 9 foot navigation project.

5. Geomorphic Investigations:

The principal investigator and project geomorphologist held certain assumptions regarding the level of site destruction on prominent Late Woodfordian features (terraces and terrace outliers). Previous investigations in Pool 10, 11, and 12 and at the Osceola Site (47 Gt 24) had indicated an alarming pattern of destruction by eolian activities likely related to Holocene climatic variations and to lesser degree by man's activities at habitation sites (Overstreet 1984a, 1984b, 1985, Smith 1985, Mallam, personal

communication). Our geomorphic investigations using hand tools (silt probes and bucket augers) were designed to assess the landform contexts, site formation processes, and degree of disturbance by natural and human agencies. These would be critical features for evaluation of Lc 163 and for research potential at other sites on Red Oak Ridge Island and the surrounding islands. The investigations would also provide additional data on the effects of Holocene climate on archaeological sites situated on Late Woodfordian landscapes.

6. Library Research:

A pre-field search of literature and archive sources was to be conducted at local and state repositories to acquire baseline knowledge of the specific project environs and surrounding localities. Sources reviewed are detailed in a subsequent section of this report.

7. Laboratory Analyses:

Laboratory analyses were projected in two specific areas: (1) processing of cultural remains and (2) processing of soil samples. All artifacts were to be cleaned, cataloged, and appropriate documentation, e.g., site forms, lot check lists, provenience recordation (plan view, profiles, photographs), and identification and evaluation of diagnostic materials completed. Soil profile evaluation included particle size analysis, organic matter determination, and soil pH.

Appendices D and E present raw data from laboratory analyses. Specific implementation of these anticipated tasks is detailed in a subsequent chapter entitled "Methods and Techniques of Investigation".

REGIONAL ENVIRONMENTS:

Prehistoric Contexts:

Red Oak Ridge Island and the four unnamed islands of the project area are located in a section of the Upper Mississippi River which cuts through adjoining upland landforms that comprise part of the unglaciated Driftless Area. The Driftless Area is found solely in southwestern Wisconsin and in extreme southeastern Minnesota, northeastern Iowa and northwestern Illinois (Figure 3). This area is characterized by dissected upland topography with sandstone and dolomite bedrock creating plateaus that rise several hundred feet above the floodplain.

In this section of the Driftless Area the walls of the Mississippi gorge are formed by relatively soft Cambrian sandstone. The bottomland of the trench is comprised primarily of the inundated river floodplain and several narrow, discontinuous terraces. The bedrock floor of the trench underlies as much as 70' of alluvial sediment. Presently, the amount of valley fills and the depths of pre-Wisconsin deposits are not fully understood.

Surficial valley features are of Late Wisconsinan and Holocene origins. Aggradation and degradation processes related to glacial advance and retreat continued throughout the Wisconsinan Age. During the Late Wisconsinan or Woodfordian substage (22,000 - 10,000 years B.P.) major deposits of sand and gravel were laid in the valley. Floodplain aggradation undoubtedly continued until approximately 12,200 years B.P. after which rapid entrenchment occurred. With glacial advance aggradation was renewed and again was followed by subsequent entrenchment until approximately 10,800 years B.P. The last entrenchment episode occurred when glacial advances blocked the eastward drainage of Lake Superior causing meltwater to discharge through the Mississippi from approximately 9900 to 9500 years B.P.

The post-glacial valley terraces were subject to modification by climatic fluctuations. Climatic conditions affect the type and density of vegetation which, in turn, controls the geomorphic and pedogenic processes working to modify the landscape. Fluctuations in prevailing climate during the Holocene throughout the Upper Mississippi Valley resulted in the migration and succession of botanical species. The prairie/forest ecotone advanced and retreated east and west in response to climatic fluctuation. However, given the unrefined nature of current models it remains to be demonstrated how climatic fluctuations and their effects on the landscape, notably floral and faunal communities, influenced human behavioral patterns.

In the vicinity of the project area, the bottomlands of the Mississippi trench consist of floodplain and outwash terraces. The terraces are composed of glaciofluviel sands and gravels. Their formation is probably related to glacial

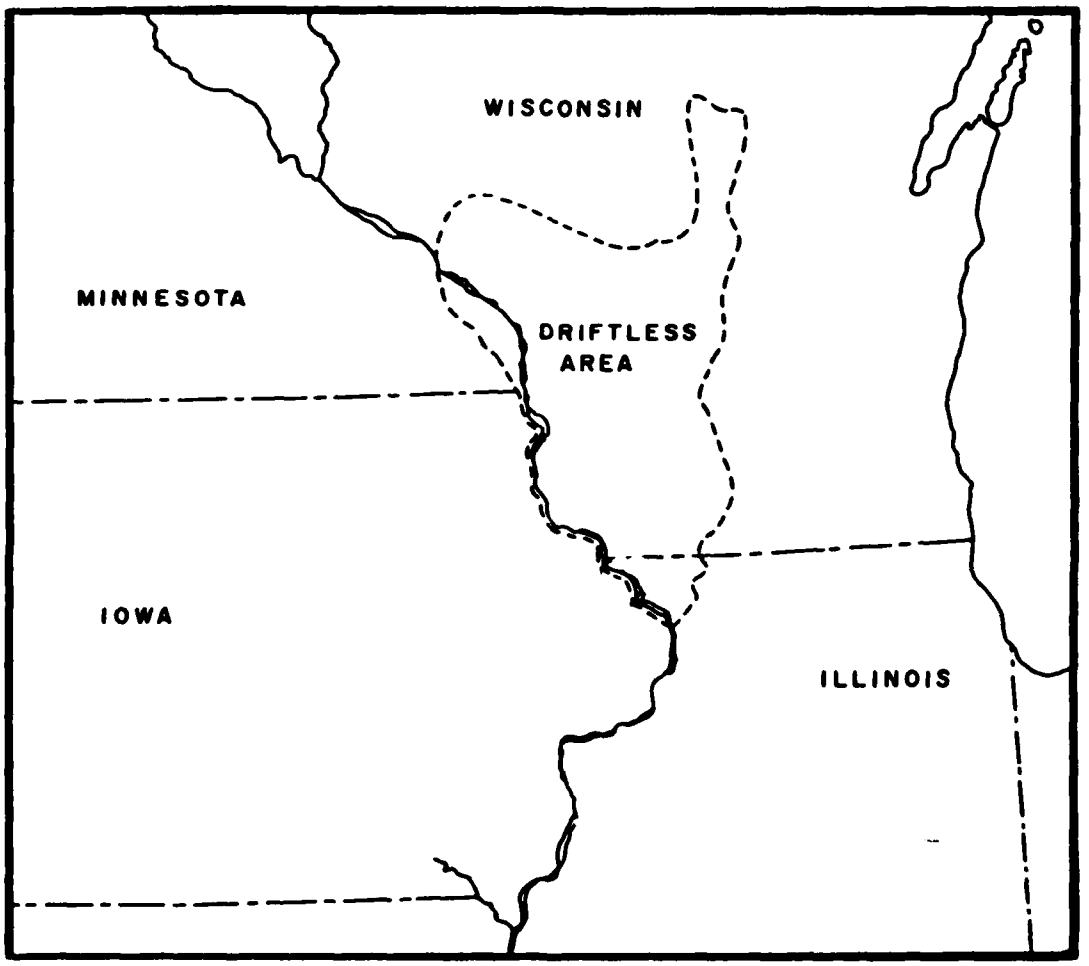


Figure 3: Driftless Area - Wisconsin, Minnesota, Iowa, and Illinois.

lake discharge through the Mississippi from 9900 to 9500 years B.P. These terraces, which range in elevation from 20 - 60' above the present floodplain exhibit differences in height and size due to initial formation, subsequent deflation and sand dune activity. Several terraces found in the vicinity include the La Crosse Terrace, Brice Prairie, French Island, and Onalaska Terraces. Red Oak Ridge Island represent another Pleistocene terrace remnant. The sandy terrace soils are generally very well drained and currently reflect prairie soils with deep A horizons.

In many localities along the Mississippi River archaeologists have mistakenly equated this deep A horizon with stability and antiquity (e.g., Geier 1978, Ritzenthaler 1946). However, this A horizon formation, consistent with known pedogenic rates, may only be several hundreds of years old. More typically, archaeological sites on these terrace soils reflect lag deposits. The droughtly potentially unstable sandy soils have been subjected to deflation throughout the middle and into the late Holocene. Eolian transport of the low bulk density A horizon can occur very quickly subsequent to dessication and removal of the surface vegetation. Again, this phenomenon undoubtedly occurred many times during the Middle-Late Holocene resulting in lithic concentrations typically of pebbles and gravels in the Woodfordian matrix but often including concentrations of stone tool manufacturing debitage and other cultural materials such as firecracked rock, ceramics, and other items. As a result, it is unlikely that undisturbed archaeological sites, with the exception of those from the very late prehistoric period will be found on the terraces. The obvious exception will be in depositional environments such as those associated with alluvial fans, foot and side slopes, or other depositional features.

The four unnamed islands of the project area are Holocene landforms. Their landform morphology, textural constituents, and elevation mitigate against their definition as Late Woodfordian terrace outliers. Tentatively, it appears that these once prominent features on the now inundated landscape owe their origins to processes other than the Late Woodfordian events resulting in formation of the major terraces.

Presettlement vegetation in the project vicinity varied with landscape position and climatic episodes. Dry prairies and oak savanna occupied terraces, wetland forest and prairies and marshes were situated on the floodplain and oak forest and savanna dominated the adjoining dissected uplands. This local diversity of plant communities provided a wide range of potentially exploitable floral and faunal resources immediately available to prehistoric occupants but resources of this nature were undoubtedly more concentrated on the floodplain and low terraces.

Fauna available in the open water and wetlands include fish and mussels as well as waterfowl, beaver, muskrat and otter. Floral species found in these wet prairies, sedge meadows and marshes consist of willow, cottonwood, cattails,

cranberries and wild rice. Floodplain bottomlands supported a mixed forest of silver maple, ash, elm and basswood with oaks occurring in the better drained localities. Animal species found here include white-tailed deer, opossum, raccoon, rabbit, squirrel and beaver. Terraces supported the growth of prairie grasses and various oak species providing habitat for deer, elk and possibly bison as well as smaller mammals and upland birds. In the adjoining dissected uplands, oak forest and savannas predominated but forest communities varied in species composition with respect to slope exposure. Various large and small mammals occupied the uplands.

This landscape overview is derived from recent investigations in the Mississippi River trench (Overstreet 1984a, 1984b, Church 1984). More specific discussion may be found in Bartlein and Webb (1982), Clayton (1982, 1983), Clayton and Moran (1982), Flock (1983), Knox (1975, 1979, 1983), Knox and Johnson (1974), Knox, McDowell, and Johnson (1981), Webb, Cushing and Wright (1983), and Wright (1976). It is intended only as an overview or scenario within which archaeological deposts may be interpreted and also functions as a point of departure for specific geomorphic studies at the project locality.

Knox (1985) has recently summarized the geomorphic history of the nearby Sand Lake Site. While his focus was placed on identification of the Sand Lake Site characteristics during the period of Oneota settlement and for the time period circa A.D. 1400, the conclusions are useful for interpreting past environments at Red Oak Ridge Island. Of particular interest is the discussion relating to the topography and geomorphology of the Onalaska terrace:

> The Onalaska terrace, acting as a local base level control, has significantly influenced the geomorphic processes at the Sand Lake Site in Sand Lake Coulee. The Onalaska terrace ranges from about 1.5 to 2.3km (0.9 to 1.4 mi) width at the mouth of Sand Lake Coulee. Although the elevation of the terrace averages about 23m (75 ft) above the level (of) the adjacent Mississippi River, the surface is quite irregular due to the abundance of sand dunes. The dune field has undoubtedly been active at various times of extended droughts during the Holocene (post-glacial) (Knox 1985: 2).

Investigations of the four small islands adjacent to Red Oak Ridge Island and review of pre-lock and dam maps yields evidence that dune activity was also a common process on landscapes at lower elevations. Support for Knox's contention that such activity was in effect during various times is supported by the retrieval of a Middle Woodland artifact from a dune at the McIlvane Site (47 Lc 160) from a depth of ca. 1.0m.

Historic Modifications:

The construction of Lock and Dam 7 at La Crosse resulted in dramatic changes to the floodplain environment. Figure 4 depicts the area near the close of the 19th century when river improvements were limited to wing dams, canals, and steamboat landings. Despite environmental modification related to agriculture on French Island and other terrace lands, the ecological diversity of the floodplain zone is obvious. The margins of Rice Lake (now inundated by Lake Onalaska) serve as a prime example of wetlands rich in flora and fauna. The many backwater lakes, ponds, streams and marshes would have provided nesting grounds for waterfowl, muskrat, beaver, otter and habitat for other aquatic species. Along the west and southeast sides of Red Oak Ridge Island a tributary stream flows south to join French Slough. More prominent floodplain features are evidenced by the recorded growth of oak, elm and maple surrounding Red Oak Ridge Island. This once diverse habitat is now inundated. Red Oak Ridge Island represents one of the few landforms on the floodplain that escaped inundation under the lock and dam impoundment. With the creation of Pool 7, fluctuating water levels combined with navigation and wave action have created severe erosion along the shorelines of Red Oak Ridge Island and four unnamed islands. Further, it is apparent that these small remnant features, given the present rate of erosion, will be completely obliterated in the near future.

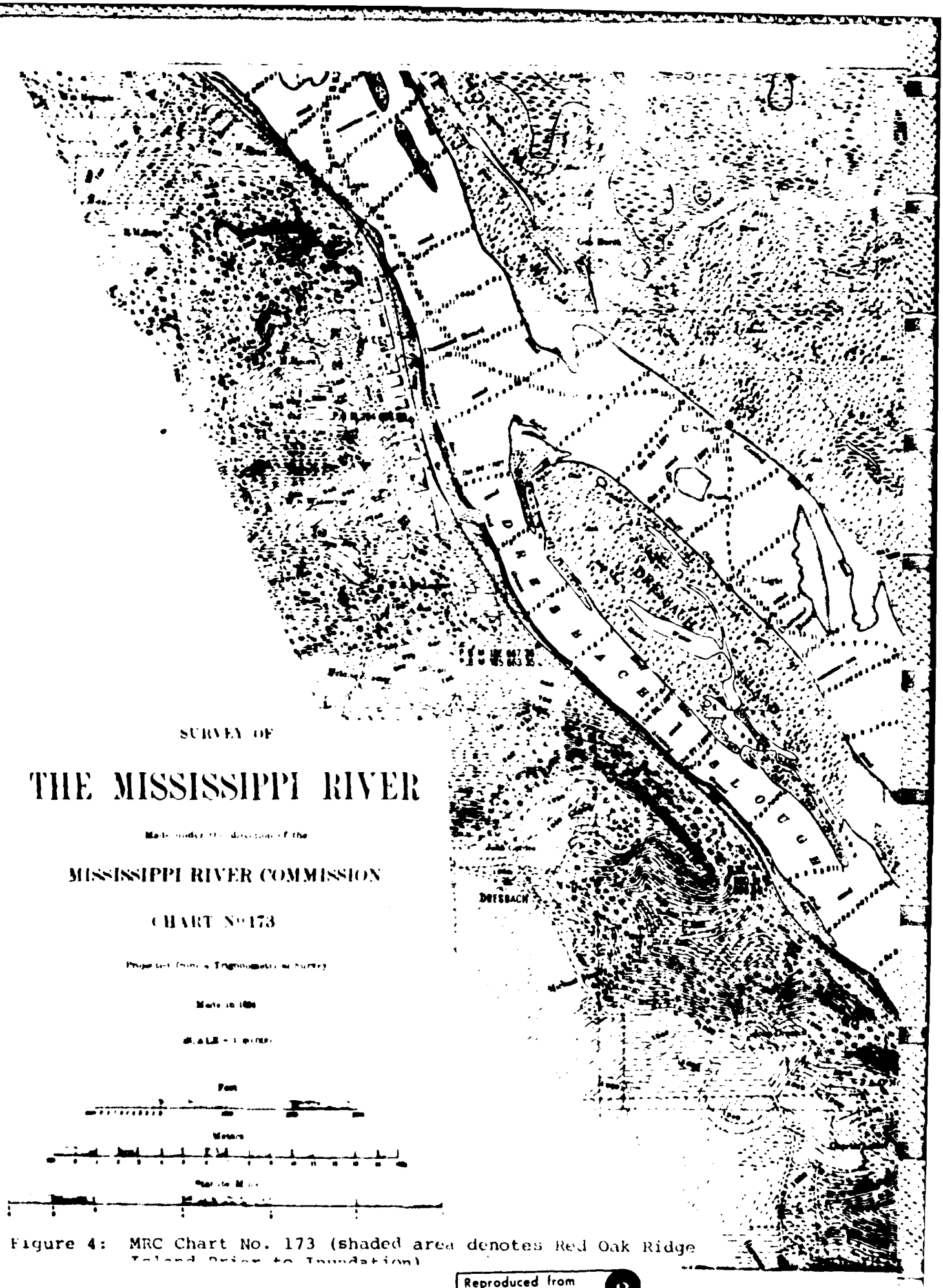
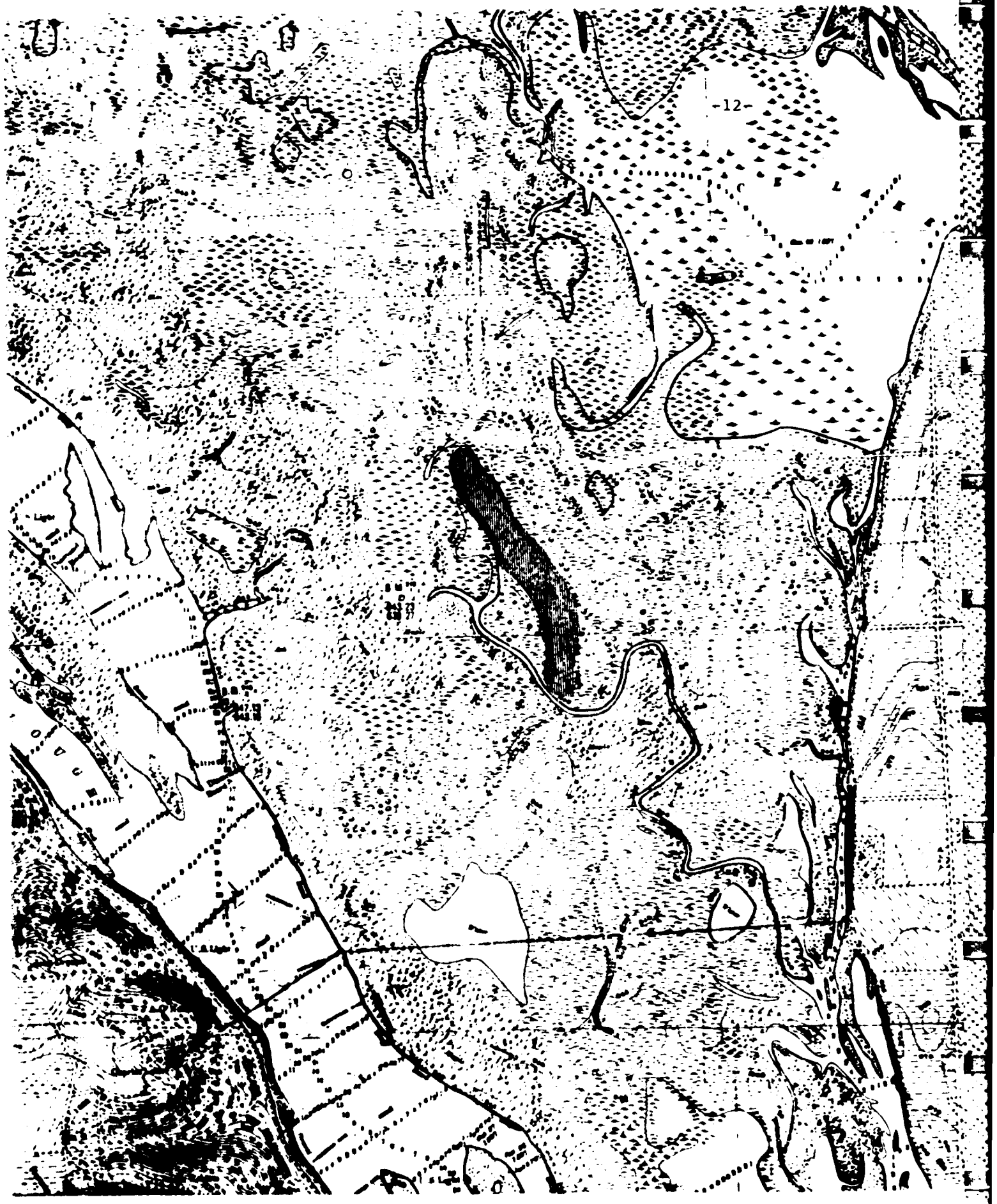


Figure 4: MRC Chart No. 173 (shaded area denotes Red Oak Ridge Island Prior to Inundation)



PREVIOUS INVESTIGATIONS:

The prehistory of the Upper Mississippi Valley has been the subject of study since the last quarter of the 19th century when antiquarians focused their attention on the numerous prehistoric earthworks found on the terraces and blufftops. Early investigators attempted to resolve questions regarding the origins and significance of the mounds. One pioneer researcher, the Right Reverend Stephen D. Peet, authored numerous treatises relating to the Mound Builders (1882, 1883, 1884a, 1884b, 1884c, 1884d, 1885, 1887a, 1887b, 1889a, 1889b, 1889c, 1889d, 1889e, 1890, 1891a, 1891b, 1891c, 1892a, 1892b, 1892c, and 1895).

Two Minnesota pioneer archaeologists, Theodore Lewis and Alfred Hill researched mound building activity during the "Northwestern Archaeological Survey" conducted from 1880 through 1895. This survey consisted of platting mounds and mound groups along the Mississippi river between St. Anthony Falls, Minnesota and Guttenburg, Iowa.

During this same era, surveys were sponsored by the Smithsonian Institution and funded by the Bureau of American Ethnology. Survey and excavations were conducted at many localities in the Upper Mississippi River valley including Wisconsin. Cyrus Thomas, project director, reported the results of the surveys and extensive excavations providing information about mound construction and mortuary behavior (1884a, 1884b, 1886, 1887a, 1887b, 1891, 1894 and 1898).

Much of the information relating to the prehistory of La Crosse County was collected during the last decade of the 19th century and the first two decades of the 20th century by avocational archaeologists under a program of archaeological survey and preservation initiated by Charles E. Brown. Brown reported various phenomena including burials, Indian trails, artifacts, and archaeological sites (1906, 1908, 1909, 1912, 1925).

Subsequent investigations in the vicinity during the 1930's and 1940's include the survey and excavation of sites conducted by the Milwaukee Public Museum under the direction of Dr. Will C. McKern (1931, 1945).

More recently, investigators in La Crosse County have focused specifically on upland and terrace environments. The surveys associated with the Great River Road project have provided new data and significant re-evaluation of sites reported during earlier periods of archaeological research (Penman 1980, Rusch and Penman 1982, and Ford, Penman and Knox 1982). Survey and testing operations conducted by the Mississippi Valley Archeology Center (Boszhardt 1983, Boszhardt, Theler and Gallagher 1984, Gallagher 1980, Gallagher and Stevenson 1980, Gallagher Rodell and Stevenson 1982, and Sasso 1984) have contributed to a better understanding of late prehistoric Oneota, subsistence and settlement patterns on the valley terraces. However, archaeological investigations of the floodplain environment have been limited (Boszhardt 1983) and consequently prehistoric occupation here is known only from material collected as a result

of minor surveys. Preliminary survey of Red Oak Ridge Island and neighboring islands in Pool 7 by personnel of the Mississippi Valley Archaeology Center resulted in the location of four prehistoric sites in the project environs (47 LC 160, 47 LC 161, 47 LC 162, 47 LC 163). Work was limited to examination of eroding shorelines, and since cultural material was recovered from exposed cut banks there was no understanding of cultural context at these sites. The materials recovered represented Late Archaic through Late Woodland activity with a noted absence of Oneota materials.

At Red Oak Ridge III (47 LC 163) and the McIlvaine Site (47 LC 160) a Late Archaic occupation was identified on the basis of Durst Stemmed projectile points. Most diagnostic materials from these sites were Woodland ceramics but also included lithic remains, e.g., two Monona stemmed-like points. Both Middle and Late Woodland occupations have been identified from these diagnostic ceramics and projectile points. The many questions raised by such preliminary surveys demonstrate the need for further research, particularly in the floodplain settings of the Upper Mississippi Valley.

METHODS AND TECHNIQUES OF INVESTIGATION:

The following methods and techniques of investigation were employed during the course of archaeological investigations at Red Oak Ridge Island and four unnamed islands in Lake Onalaska, La Crosse County, Wisconsin. The methods of data acquisition here summarized were determined as those best suited to fulfill the objectives required by the scope of work and those stated in the technical proposals.

Archives and Literature Search:

Pre-field research entailed a literature search of published and unpublished sources as well as of archives and serial file systems. Published literature sources that were consulted include: The Wisconsin Archeologist, a quarterly journal continuously published since 1901; The Wisconsin Historical Collections, consisting of 20 volumes published by the State Historical Society of Wisconsin between 1903 and 1920; The Wisconsin Magazine of History, the journal of the State Historical Society of Wisconsin, and the Bulletin of The Public Museum of the City of Milwaukee, several of which report archaeological investigations during the years that the museum conducted active field work in Wisconsin.

Unpublished sources which were examined are represented by four different formats: (1) serial entry file systems; (2) manuscript files; (3) archaeological survey reports and (4) map files.

Two serial entry file systems were reviewed. The first of these is the Wisconsin Archaeological Site Codification File housed at the Museum Division, State Historical Society of Wisconsin. This file system consists of an inventory of reported historic and prehistoric sites in the state and includes both locational and descriptive data and cultural materials and literature references. The second file reviewed is the Historic Preservation Inventory file housed at the Historic Preservation Division, State Historical Society of Wisconsin. This file includes both archaeological sites and structures that are identified as possessing architectural and/or historical significance.

Manuscript files investigated include the Charles E. Brown manuscript file, housed at the Museum Division, State Historical Society of Wisconsin, comprising some 50 years of notes and correspondence relating to Wisconsin's archaeological sites. The county files, housed at this same location, include reports (unpublished), photographic records, newspaper clippings, and correspondence relating to prehistoric and historic archaeological materials and sites. These files also include data derived from the Museum's highway archaeology program.

Archaeological survey reports on file at Great Lakes Archaeological Research Center, Inc. and at Madison, Wisconsin were reviewed for information on archaeological

investigations of the Upper Mississippi River Basin and, in particular, navigation pools 7 and 8 at La Crosse, Wisconsin.

Several map files which provide information relating to prehistoric and historic site occupation, as well as presettlement topography and vegetation, were examined. The first of these is the Charles E. Brown Archaeological Atlas which records the general locations of sites on county plat maps. These historic and prehistoric sites were reported to Brown during his tenure as editor of The Wisconsin Archeologist and as a staff member of the State Historical Society of Wisconsin. The Government Land Office records, copies of which are on file at the Archives Division, State Historical Society of Wisconsin, provide information relating to presettlement vegetation, topography, aquatic features, and in some instances cultural information such as Indian trails, villages, pioneer settlements, and, improvements such as roads, mills, and cultivated lands are noted. Two sets of baseline maps were utilized to reconstruct historic landform modification for the purpose of assessing impact to landforms and site contexts. The Mississippi River Commission maps were made during the years 1893-1894 following the first major navigation improvements on the river and represent the best rendition of pre-lock and dam topography and vegetation. The Brown Survey, conducted from Hastings, Minnesota to Grafton, Illinois, compiled topographic maps immediately prior to the construction of the 9-foot navigation project during the years 1929-1930.

Historic Map Analyses:

The purpose of the historic map analyses was to provide an assessment of landforms and site contexts of the project area prior to land modification associated with lock and dam construction. The analyses involved scale conversion and comparison of the historic maps and contemporary renderings of the landscape. The Mississippi River Commission maps were drawn at a scale of 1:20,000 while the Brown Survey maps have a scale of 1:2,000. The mapping procedure was designed to rectify and calibrate these scales to the 1:24,000 scale of contemporary U.S.G.S. 7.5' quadrangles. Map overlays detailing topographic conditions at two earlier time periods can be superimposed on modern topographic maps to depict lands made or lost since the late 19th century. This procedure has significant management application for cultural resources. First, it permits determination of landforms developed since the late 19th century which will obviously not harbor prehistoric sites, and second, provides information about relative rates of erosion and deposition at various locations on the floodplain. Figure 5 depicts post-lock and dam landform loss from erosion at Red Oak Ridge and the offshore islands.

Figure 5: Reconstruction indicating limits of eroded-inundated lands adjacent to Red Oak Ridge Island (Adapted from Brown Survey Maps.

GEOMORPHIC INVESTIGATIONS:

Site Formation Processes - Pre-Wisconsinan Events:

The basal alluvial deposits found in the upper Mississippi valley are sediments likely deposited during the pre-Illinoian Age. The last major episode of deep upper Mississippi valley incision apparently occurred during Illinoian glaciation. Isostatic downbending under glacial load accompanied by upwarping in the peripheral belt of the glacier could have accounted for major Mississippi valley incision. Forebulge uplift in the Driftless area of southwestern Wisconsin and northwestern Illinois steepened the valley gradient necessary for rapid and deep incision of the upper Mississippi River valley (Willman and Frye, 1969, Knox and Johnson, 1974). As the Illinoian glacier retreated the weight of the ice was reduced on the recently glaciated landscape. The landscape tended to rebound while the forebulged Driftless area began to subside. The steep valley gradient of the Mississippi was greatly reduced resulting in valley aggradation.

Alluvial deposition probably continued throughout much of the post Illinoian, although the magnitude and duration of valley aggradation is for the most part unknown. Near Dubuque, Iowa, Whitlow and Brown (1963) estimate the depth of valley fill in the Mississippi to be approximately 400 feet. Upstream about 10 miles from Dubuque near Potosi, Whitlow and West (1966) estimate the depth of fill to be approximately 300 feet. A detailed geologic cross section taken across the Mississippi near Prairie du Chien, Wisconsin, included a total of 27 borings. None of the holes penetrated the valley fill into the underlying bedrock (Church, 1984). Consequently, the amount of valley fill found in the upper Mississippi valley is unknown and the amount considered to be pre-Wisconsinan is even more obscure.

Wisconsinan and Holocene Terrace Development:

Episodes of valley aggradation and degradation occurred throughout the Wisconsinan Age. This is particularly evident during the late Wisconsinan or Woodfordian Substage when much of the sand and gravelly sand units were deposited in the Mississippi River valley. During the late Woodfordian rapid alluviation occurred in the Mississippi and Wisconsin River valleys (Knox and Johnson, 1974). The Mississippi continued to aggrade until the Red River and Superior Lobes retreated north around 12,200 years B.P. (Clayton, 1982).

Upon retreat of the lobes, rapid entrenchment occurred in the valley. By 11,500 B.P. both the Red River and Superior Lobes re-advanced causing renewed aggradation. This event was followed by subsequent entrenchment until 10,800 B.P. The final episode of entrenchment occurred when glacial advances blocked eastward drainage to Lake Superior

causing the discharge of meltwater through the Mississippi from 9900 to 9500 B.P.

The Mississippi River valley aggraded and degraded in response to the sediment load and discharge volume of the glacial meltwater. During periods of glacial advances bedload was introduced into the drainage network causing aggradation from high coarse sediment volumes. But when drainage was blocked or when glacial lakes (such as Lake Agassiz) formed, periodic high magnitude discharges would occur, perhaps catastrophically with relatively sediment free water initiating valley entrenchment.

Although catastrophic discharges associated with glacial lake drainage carried little bedload, Flock (1983) suggests that these discharges carried considerable quantities of fine grained sediment. According to Flock, the clay rich sediment found on Mississippi River terraces (the Savannah Terrace) and in tributary terraces result from high magnitude discharges associated with the drainage of glacial Lakes Agassiz and Superior between 13,000 and 9500 B.P. Meltwater containing red clay from glacial Lake Superior drained through the St. Croix River valley and into the Mississippi valley. Further west, Lake Agassiz containing grey clay discharged through the Minnesota River valley and into the Mississippi valley. This suggests that discharges were of significantly high magnitude to create slack-water conditions necessary for the deposition of fine grained sediments.

Woodfordian aggradation of the Mississippi river floodplain is represented locally along the east valley margin. The Onalaska terrace along this margin represents the maximum level of late-glacial aggradation and is correlative to the Savannah terrace (Knox, 1985). Red Oak Ridge Island is a terrace outlier and has been cutoff from the main Onalaska terrace . Both Red Oak Ridge Island and the Onalaska terrace lack loess caps indicating that the formation of this surface post-dated loess fall. Consequently, they developed after about 13,000 B.P.

The lack of fine grained loess derived sediment and the predominance of sand has facilitated surficial instability on this late Woodfordian surface. The surface of the Onalaska terrace is quite irregular due to the abundance of dunes which have likely been active at various times of extended drought during the Holocene (Knox, 1985). Likewise, Red Oak Ridge Island has considerable relief suggesting that eolian reworking has been active during the Holocene. Due to the high permeability and subsequent droughty nature of coarse textured soils, the stabilizing effects of vegetation may have been attenuated repeatedly during the Holocene.

Holocene Climatic Impact :

During the early and into the middle Holocene atmospheric circulation was greatly affected by the wasting Laurentide ice mass to the north of the Driftless area. A

zonal upper atmospheric circulation component dominated providing a cool and relatively dry northwesterly flow out of Canada (Knox, 1983). The persistence of a zonal circulation regime effectively blocked the intrusion of maritime tropical air masses derived from the Gulf of Mexico. As the Laurentide ice mass wasted further to the north, a more westerly upper atmospheric component penetrated the upper Mississippi valley. This circulation pattern provided for the intrusion of Pacific derived air masses, which continued to block the more humid maritime tropical air masses to the south. The result was the persistence of warmer more arid pacific air masses dominating the upper Mississippi valley during the middle Holocene. From 9500 to 4700 B.P. in east central Minnesota there was an increase in the duration of Pacific air producing a 2 inch decrease in precipitation during the maximum penetration of westerly air about 7200 B.P. (Webb and Bryson, 1972). There were likely long periods of drought in southwestern Wisconsin, perhaps a century in duration. This would indicate that landscapes particularly sensitive to the desiccating effects of drought may have lost their vegetative cover resulting in surface reworking and instability.

The prevailing climatic regime determines the nature of the vegetation cover, while the type and density of vegetation colonizing a landform controls both the geomorphic and pedogenic processes working to change the landform. Webb, Cushing, and Wright (1983), and Wright (1976), have traced Holocene climatic changes through the upper Mississippi valley from the migration and succession of several vegetation species. The early advance and later retreat of the "Prairie Peninsula" suggests changes in air mass dominance during the Holocene. In response to increased aridity, the prairie/forest ecotone advanced eastward across the Iowa-Wisconsin border about 8000 B.P.

The waning of Laurentide ice continued during the middle Holocene and by 6500 B.P. the ice had retreated to the Quebec/Labrador plateau (Wright, 1983). This condition began to deteriorate the persistent zonal circulation pattern that was established earlier in the Holocene. Consequently, a meridional upper atmospheric circulation pattern was beginning to influence the climatic scenario in the upper Mississippi valley.

Meridional circulation patterns provide the mechanism necessary for the mixing of unlike tropical and polar air masses. This pattern results in an increase in the frequency and magnitude of precipitation events (Knox 1975). By the beginning of the late Holocene about 4500 B.P., the upper Mississippi valley was experiencing a more dominant meridional circulation regime. The prairie/forest ecotone responded by migrating back to the west, crossing the Iowa-Wisconsin border around 4000 B.P. (Webb, Cushing, and Wright, 1983).

The late Holocene climate which includes contemporary twentieth century climate is characterized by persistent

episodes of either meridional or zonal circulation. The orientation of the jet stream over the North American continent determines whether the upper Mississippi valley will receive a relatively cool/moist, cool/dry, warm/moist, or warm/dry climatic pattern (Knox, 1979). Persistence of any one of these climatic scenarios can change the magnitude and direction of geomorphic processes controlling landscape evolution.

Methodology:

Investigations at Red Oak Ridge Island and the adjacent islands included preliminary air photo and topographic map analysis. Survey maps from 1894 and 1930 with a contour interval of 5 feet and U.S.G.S. 7.5 minute topographic maps with an interval of 20 feet provided some of the initial base data for the geomorphic evaluation. Other base data included air photographs which were taken during April 1973, and were provided by the Corps of Engineers. These photographs used in the analysis are at a scale of 1:6000.

Field investigations included descriptions of archaeological test units excavated on the north end of the island. Core descriptions were taken from bucket auger holes (3.0") on both the north and south end and from silt probe cores (1.0") near the center of Red Oak Ridge Island. To the east of Red Oak Ridge Island on an adjacent unnamed island additional bucket auger holes were placed and one was described in detail (island #3, 37 Lc 160).

Samples for laboratory analysis were taken from archaeological test unit #1 (see Figure 9) which was cored through the bottom of the unit with a bucket auger to a depth of 328cm. Test unit #5 which shows an analagous profile to test unit #1 was also sampled. Additional samples were taken from a bucket auger hole located on the south end of the island. This profile was somewhat different from that encountered on the north end of the island. In addition, samples taken from the unnamed island to the east showed a profile that was considerably different from that seen on Red Oak Ridge Island.

Soil analysis included particle size determination which utilized the hydrometer method (Bouyoucos, 1936) in order to obtain the silt and clay fraction while the sand fraction was obtained through wet sieving. The samples taken from the surface A horizon were pre-treated with a 35% solution of hydrogen peroxide in order to dissolve organic material which tends to floculate clay. Samples with very low organic content were not pre-treated. Oven dry samples were weighed up to 30 grams then immersed in a solution of sodium hexametaphosphate and mechanically shaken overnight. This method will dissaggregate colloidal fine grained material and prepares the sample for hydrometer analysis. The sample solution was then poured through a #10 seive (to capture the fraction greater than 2mm) and into a 1 liter volumetric cylinder. Hydrometer readings were taken at 2,4,8,15,and 30 minutes, 1,2,4,and 7 hours. Temperatures

for the soil solutions were additionally recorded with the hydrometer readings. After the readings were recorded each sample was wet seived through 3 additional screens. The #40, #60, and #230, screens separate the fine, medium and coarse sand fraction. The sand fraction was dryed and the weights were recorded.

Organic matter determination was accomplished by the Walkley Black titration method (Allison, 1965) by which organic carbon is put into solution with potassium dichromate and surfuric acid. The solution is then titrated with ferrous sulfate. When the end point is reached, distinguished by color, the volume of the titrant is recorded and compared to the normality of a standard. Algebraic calculations are applied and the amount of organic matter in the sample is determined.

Additional sample analyses included soil pH which was determined in the field by using of the Hellige-Truog pH tester. The presence of carbonates, which provides evidence for the degree of profile weathering, was tested in the field through the application of a 14% hydrochloric acid solution.

RESULTS OF INVESTIGATIONS:

Field Inventory:

The field inventory phase of archaeological investigations involved a systematic survey of both Corps of Engineer and Fish and Wildlife Service lands on Red Oak Ridge Island and at off-shore sites of four unnamed islands (see Figures 6 and 7).

Archaeological survey of Red Oak Ridge Island was accomplished by means of shovel probing along a series of transects to provide comprehensive survey coverage. In this case shovel probes were excavated to a depth of 35cm. and their contents screened through 1/4" mesh. After examination of shovel probe contents, the soil stratigraphy exposed in each hole was noted and it was immediately backfilled. Transects were established at intervals of 15m and shovel probes within transects were executed every 15m. A lensatic compass was used to maintain accuracy of direction and distances between and within transects. Shovel probing procedures were modified when archaeological materials were encountered. In this case intervals were decreased to provide intensive coverage to determine the nature and areal extent of cultural materials.

On Corps of Engineers lands archaeological survey coverage was realized by means of a series of 36 north-south shovel probe transects (Figure 7). Survey of two parcels of Fish and Wildlife Service lands on Red Oak Ridge Island also involved shovel probing along a predetermined number of transects to facilitate total survey coverage. Parcel 1, at the south end of the island, was surveyed by means of 15 east-west transects and Parcel 2, at the east-central section of the island, was surveyed using 12 north-south transects. These parcels are indicated as Fish and Wildlife Service lands on Figure 6. Furthermore, the entire shoreline, in particular the eroded, exposed banks, were visually inspected

Archaeological survey at off-shore sites of four unnamed islands, northeast of Red Oak Ridge Island (Figure 8), entailed sieve collection along a 20' wide strip of the northwest shores. Prior to survey, the approximate length of designated shoreline impact and the number of transects required for survey coverage was calculated. Transects were established at 10m intervals and shovel probes were executed at intervals of 5, 10, 15, and 20 feet from the shoreline. Material from the probes was screened in the water. Additional probes were placed next to those from which cultural material was recovered.

Archaeological survey of the southernmost island, referred to here as Island 1, was realized with a series of twelve transects, Island 2, immediately north of the former, was surveyed using a series of eight transects. The west shoreline of the northernmost island, Island 3, was surveyed by means of eight transects, as was Island 4, the

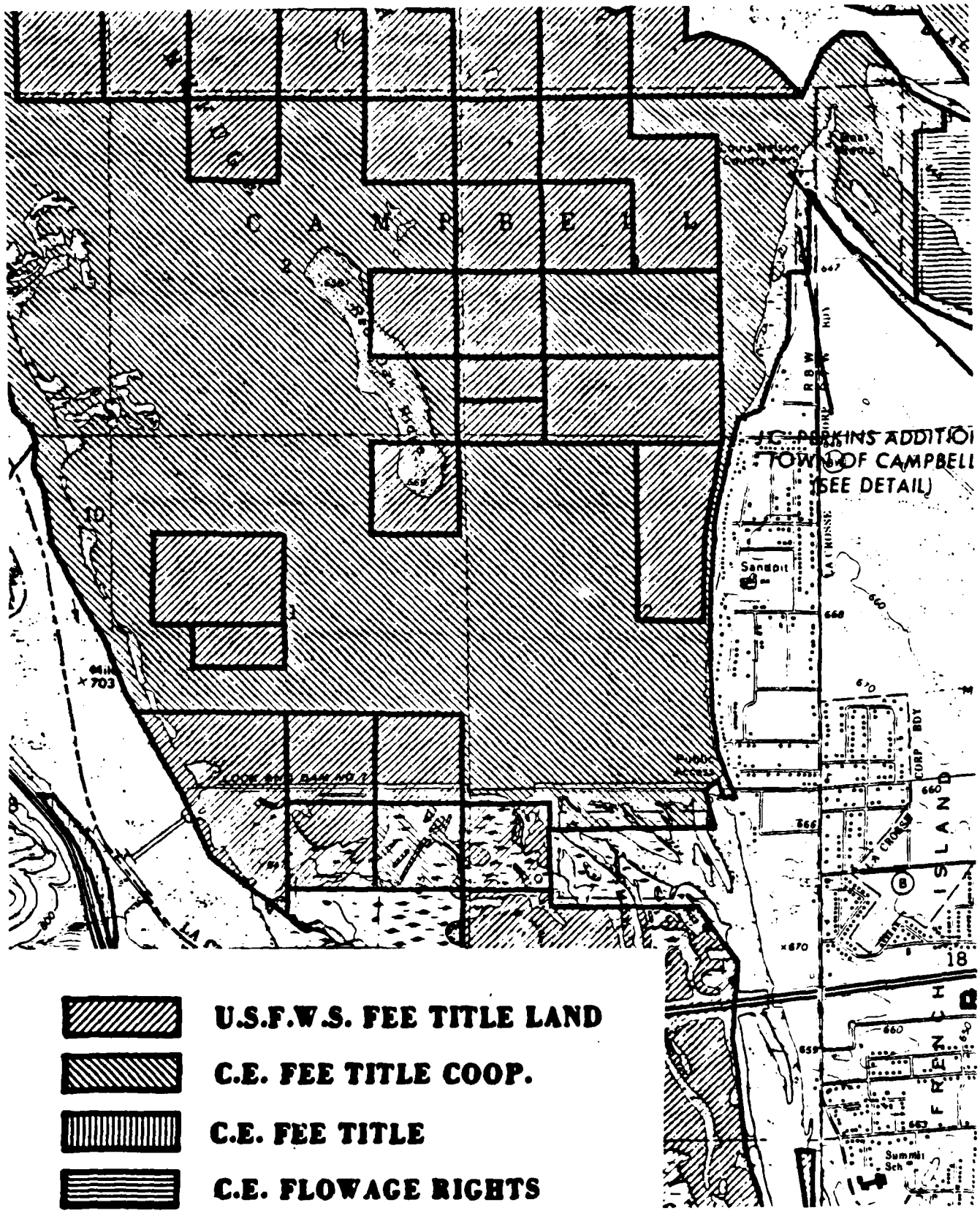


Figure 6: Land Ownership Key - Red Oak Ridge Island.

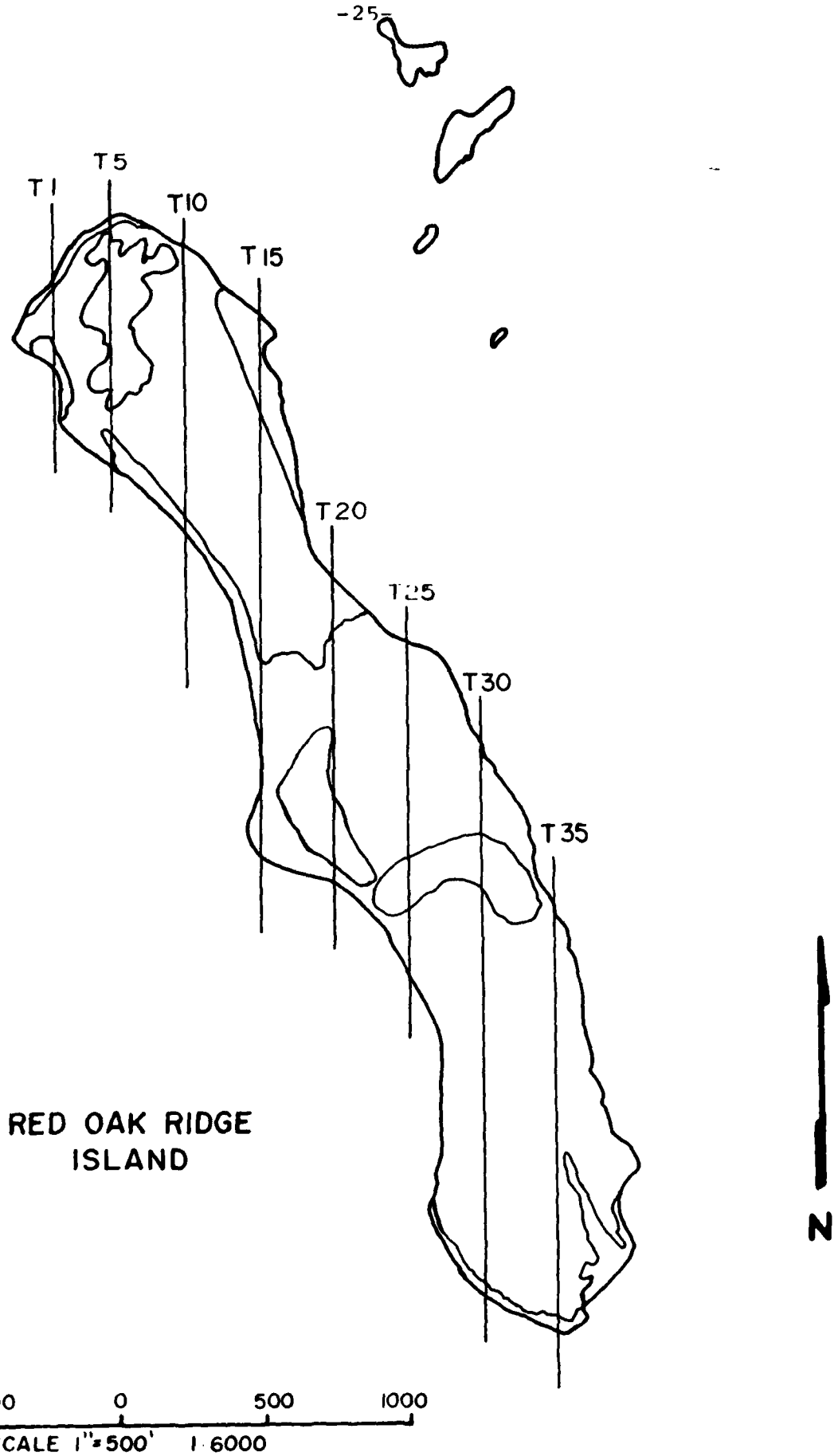


Figure 7: Survey Coverage (Shovel Test Transects).

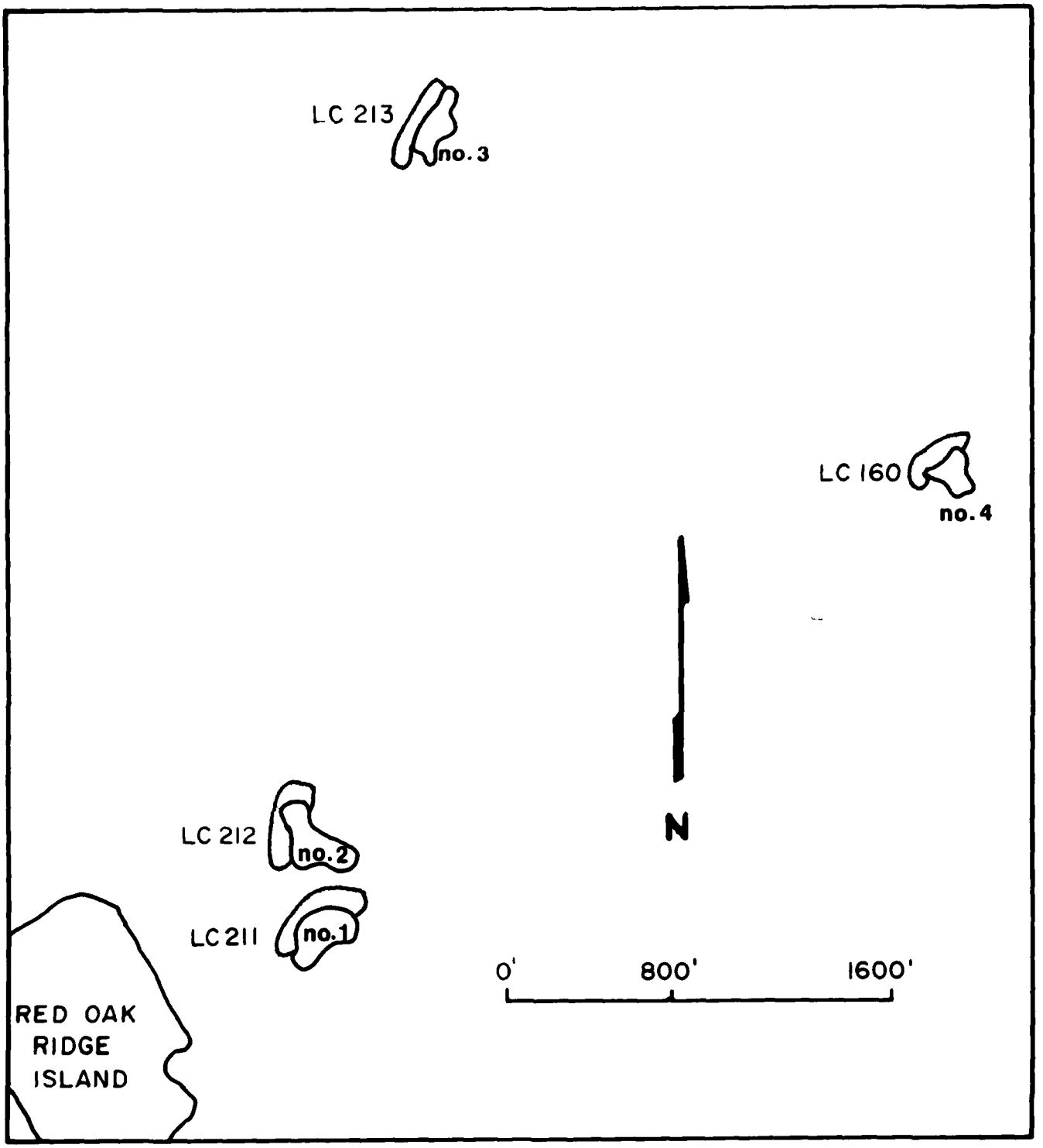


Figure 8: Area surveyed at four unamed islands (stippled area denotes both location of impact and survey).

easternmost island and locus of a reported archaeological site 47 LC 160, the McIlvaine site. Cultural materials were recovered using the water screen technique from the areas of designated impact of all four islands.

Evaluation of 47 Lc 163:

Archaeological site 47 Lc 163 on the north end of Red Oak Ridge Island was evaluated to determine site eligibility in terms of the specific criteria for inclusion on the National Register of Historic Places.

Evaluation consisted of formal 2 x 2m test excavation units. The test units were excavated in arbitrary 10cm levels by skimming shovels and trowels and backdirt was passed through 1/4 inch mesh screens. All units were excavated in quadrants identified as "A" through "D" beginning with the northwest quarter and continuing clockwise to the southwest quarter. Collection of screened material from each quadrant was bagged separately. In quadrant "A" cultural as well as all non-cultural material (rock) was collected. Test units were oriented parallel to the north cut-bank of the island where erosion appears most active. The test unit locations were tied to a datum on the northeast corner of a concrete foundation (see Figure 9).

Furthermore, soil samples from profile walls and silt probe and bucket auger samples from test units were utilized to identify soil matrix and depositional content of archaeological material in test units. All excavation units were backfilled upon completion of profile and soils documentation.

Archaeological Survey:

As the result of archaeological survey on Red Oak Ridge Island six additional archaeological sites were discovered (see Figure 10).

Site 47 Lc 204 is located near the northeast boundary of Corps of Engineer land on a rise approximately 50m from the east shore of the island. The apparent localized scatter of material included one silicified sandstone flake, two chert waste flakes, and two grit-tempered (micaceous paste) sherds of .45cm thickness that are tentatively interpreted as Middle - Late Woodland in origin. A metal harness piece, associated with past farming activities, was also recovered (see Appendix D).

Site 47 Lc 205 is located on the southern toe of a north-south ridge at 660 foot elevation on the west-central side of the island. While the site probably represents a small campsite, without diagnostic artifacts, it remains indeterminate in origin. Two waste flakes, one of chert and one of silicified sandstone, and a single large piece of fire-cracked rock are the only artifacts found at this site (see Appendix D).

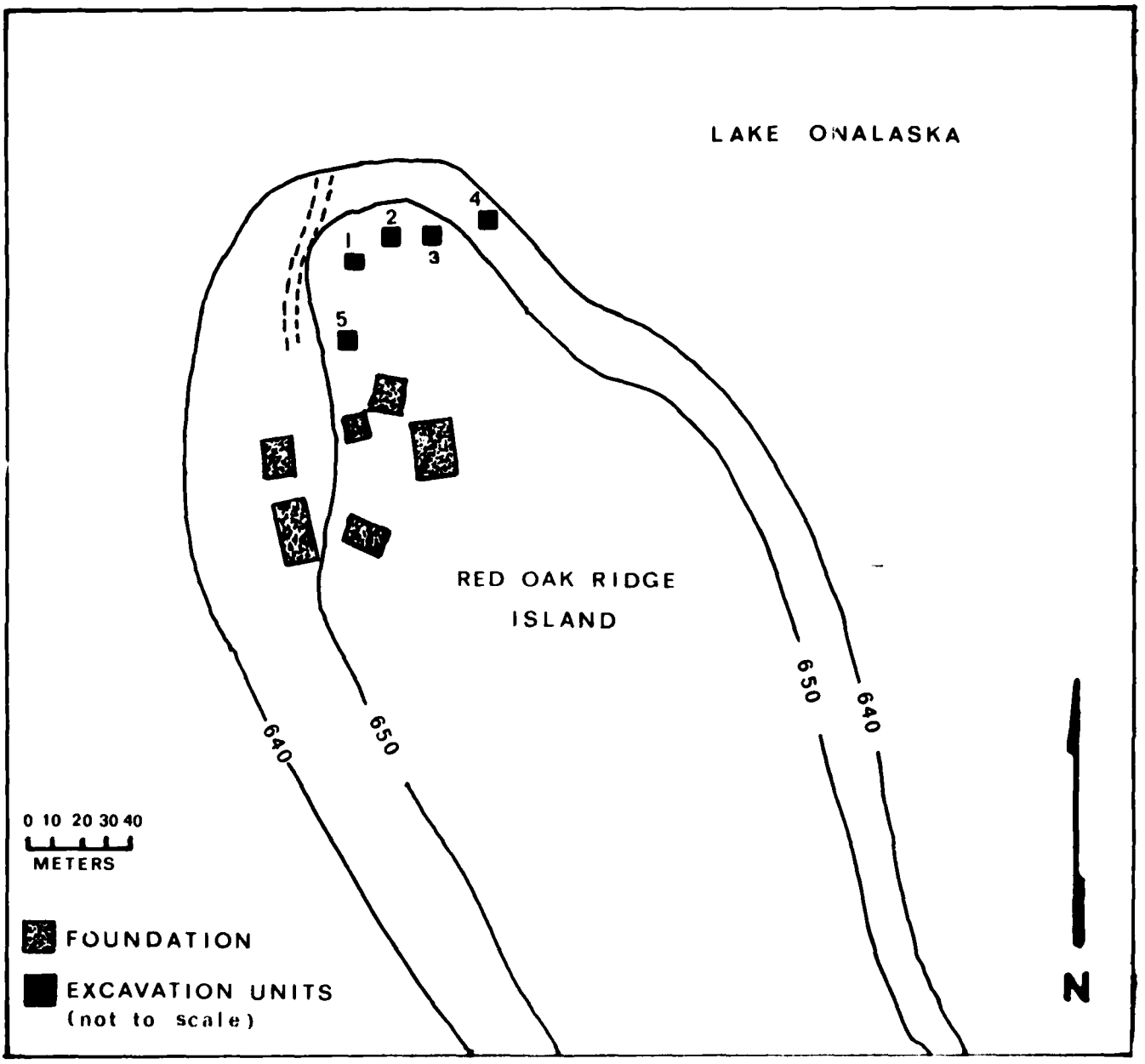


Figure 9: Location of excavation units at 47 Lc 163.

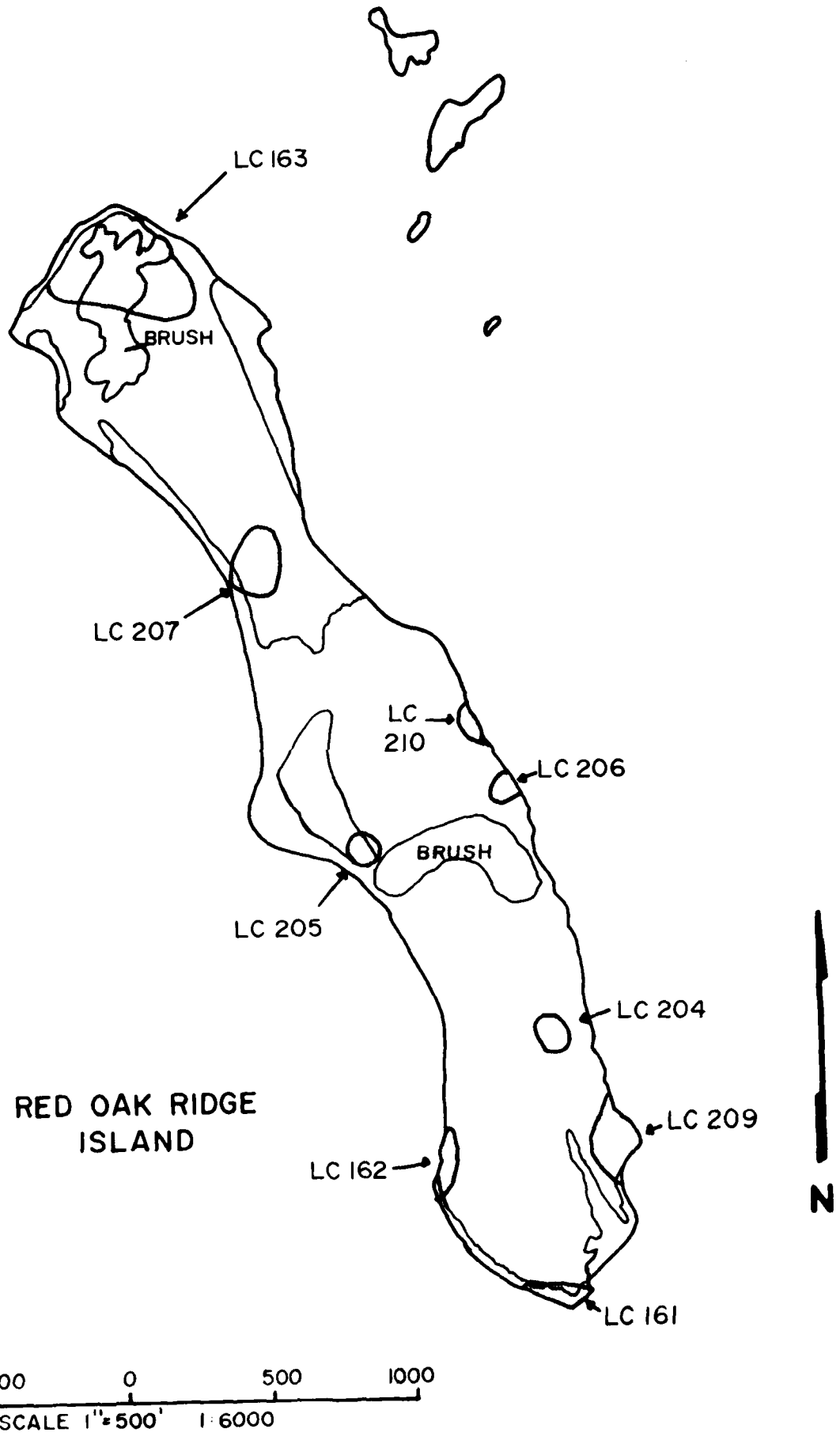


Figure 10: Archaeological Site Locations - Red Oak Ridge Island.

Site 47 Lc 161 is situated at the southern tip of Red Oak Ridge Island. Chert shatter and other debitage, as well as Late Woodland ceramics, were collected from Lc 161 by Boxzhardt (1983). However, no cultural materials were found above the cut-bank at this location in shovel probe units.

Site 47 Lc 206 is located on the high bank of the east-central side of the island. A chert waste flake and piece of shatter, two pieces of fire-cracked rock, and a single undiagnostic sherd of sandy local alluvial paste, suggest a small campsite. Historic debris including a fragment of glass and piece of metal band were also recovered.

Site 47 Lc 207 is located near the southern end of a north-south ridge on the northwest side of the island. The area is on the south edge of a once cultivated field presently overgrown with sumac. Lithic materials recovered include sixteen chert and ten silicified sandstone waste flakes, a broken silicified sandstone biface and a piece of fire-cracked rock. A single chert core and piece of rough rock were found along the eroded surface of the nearby cut-bank. Ceramic remains consisted of grit-tempered, micacious paste, cordmarked, plain and red-slipped decorated sherds of .46cm thickness. These ceramics likely represent Middle and Late Woodland occupations.

Site 47 Lc 209 is located on Fish and Wildlife Service land near the southeast end of the island. From the site, an area approximately 100m x 50m, chert waste flakes and two pieces of chert shatter, eight silicified sandstone flakes were recovered. In addition, five small exfoliated grit-tempered pottery sherds and a single rim sherd having an eroded surface with exterior bosses and sandy, grit-tempered paste suggesting a variety of Early - Middle Woodland pottery were found. A .22 shell casing was also found at this locality.

Site 47 Lc 210 is located on Fish and Wildlife Service land at the central section of the island. Two silicified sandstone waste flakes were recovered from a shovel probe along the high bank of this section of the east shore. Since no diagnostic artifacts were found identification of origin is presently indeterminate.

Site 47 Lc 162 had additional cultural materials recovered during shovel probing and examination of the exposed cut-bank at this previously reported site. Lithics were limited to two silicified sandstone waste flakes. Ceramics included four exfoliated sherds and a Late Woodland cordmarked, grit-tempered sherd.

Site 47 Lc 163 yielded prehistoric and historic materials at three localities at the north end of the

island. Since the areas were separated only by impenetrable vegetation which prohibited shovel probing, it is likely that the prehistoric material represents occupation associated with 47 LC 163. In area "A" visual inspection of exposed cut-bank surfaces, water collection of over-bank deposits and shovel probing yielded ten silicified sandstone flakes, five chert flakes and four pieces soft fire-cracked rock. Ceramics included grit-tempered cord-marked sherds of .75cm thickness, plain sandy paste sherds of .50cm thickness and a plain with fingernail-impressed sherd of .50cm in thickness. In area "B" one silicified sandstone waste flake was found. Area "C" produced one chert flake, three silicified sandstone flakes and four pottery sherds similar in type to those found in area "A". The historic material found in Area "A" including a pig tooth and two fragments of glass represent items associated with an early twentieth century farmstead, the structual remains of which are presently visible in this locality. The architectural features encountered are cement foundations of six buildings, the specific functions of which cannot be identified but undoubtedly include a house, at least two barns and other outbuildings.

To determine the age of the farmstead the previously mentioned historic maps were examined. The Mississippi River Commission map of 1893-1894 shows no structures on the island. However, the Brown Survey map of 1929-1930 indicates the six structures at the north end of the island (Figure 11). This same map also notes two adjoining structures on a rise near the east central section of the island. These structures could not be relocated, however, historic debris including rusted metal fragments, pieces of glass, and a harness part were found. It is likely, given this information that the farmstead, which is in no danger of immediate impact, represents an early twentieth century occupation.

Archaeological survey of four unnamed islands northeast of Red Oak Ridge Island resulted in the identification of three prehistoric sites and re-collection of one reported site (Figure 12). As noted, the survey involved water screening of shovel probes placed at 5, 10, 15, and 20 foot intervals from the shoreline along transects established every 10m.

Site 47 Lc 211 is located in submerged over-bank deposits off the southwest shore of Island 1. Three large cores of silicified sandstone and one piece of chert shatter were recovered. This site is interpreted as a possible worksite of indeterminate origin.

Site 47 Lc 212 is inundated and located along the west shore of Island 2. Cultural materials found include eleven silicified sandstone waste flakes, one piece of chert shatter, one small piece of sandstone and one grit-tempered, sandy paste sherd with an eroded surface an a mica and grit

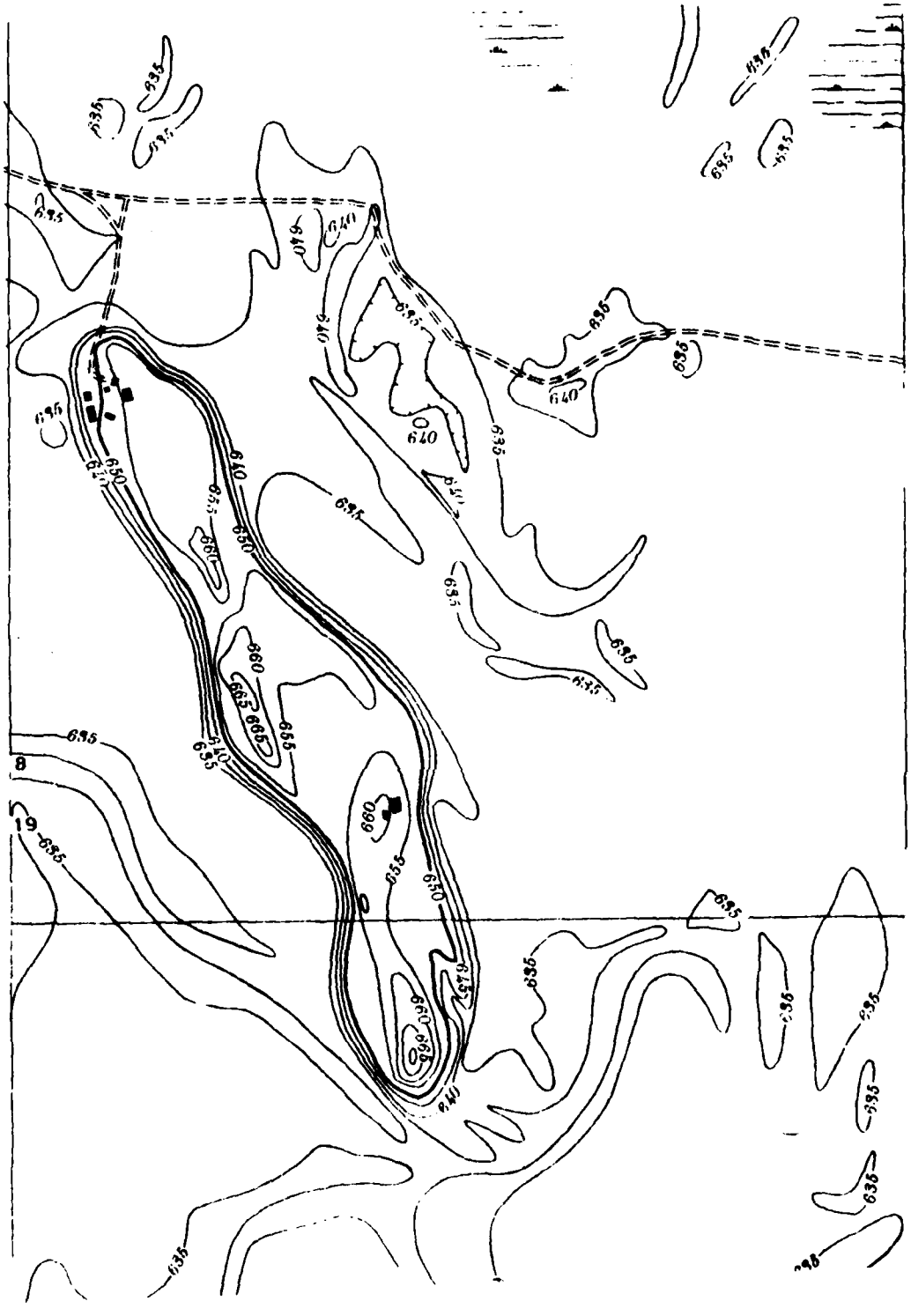


Figure 11: Farmsteads on Red Oak Ridge Island (Brown Survey, 1929-1930).

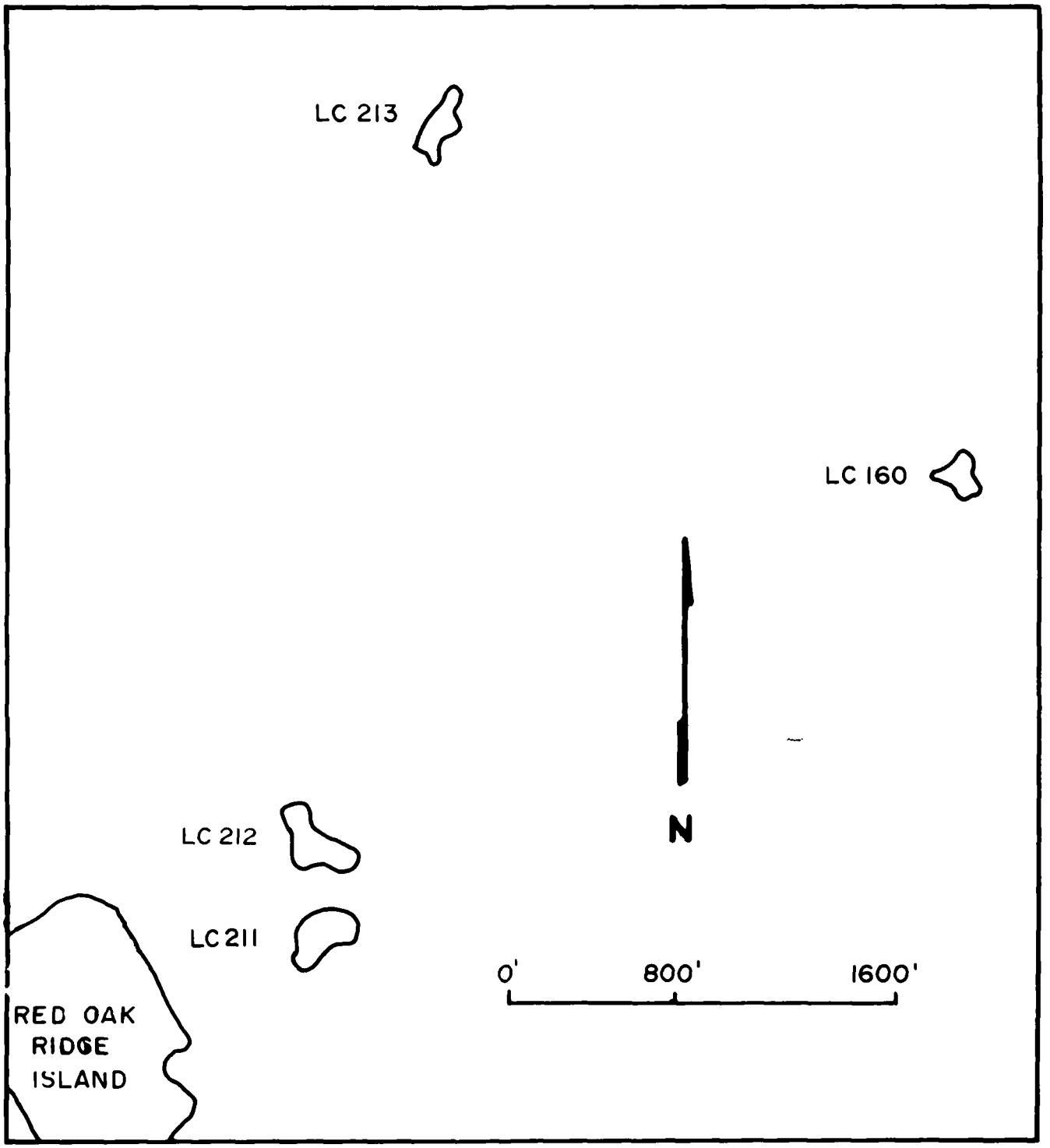


Figure 12: Archaeological Site locations and designations at four unamed islands.

paste cordmarked pottery sherd. The ceramics likely represent Middle and Late Woodland occupations.

Site 47 Lc 213 is located off the northwest shoreline of Island 3. Cultural material from this site is limited to a single silicified sandstone flake and one sandy paste sherd having an eroded surface. It is tentatively identified as a Woodland site.

Site 47 Lc 160, the McIlvaine site on island 4, the easternmost of the four, has been identified from previous archaeological investigations (Boszhardt, 1983) as a multi-component site of Late Archaic through Late Woodland occupation. Water collection yielded five chert waste flakes, eight pieces of chert shatter, twenty silicified sandstone waste flakes, eight pieces of fire-cracked rock and sixteen pieces of rough rock. Ceramic material, in poor condition, included seven small exfoliated sherds. A single square nail is the only historic item found at this site.

Evaluation of 47 LC 163

In this case, site evaluation involved the excavation of 5 2 x 2m units. The units were placed within the site area as defined by positive shovel probes. All were located parallel to the islands north cut-bank where impact to the site area is most immediate (see Figure 11).

Unit 1:

Test Unit 1 was excavated to a depth of 70cm below the surface. Cultural materials were recovered from all levels. Historic debris associated with the early twentieth century farmstead was found to a depth of 30cm below the surface. Prehistoric material was encountered in all levels with a noticeable concentration of pottery sherds and lithic debris in Levels 3 and 4 (20 - 40cm below surface). At a depth of 32cm below the surface large pieces of a broken vessel were encountered. The pottery which has a sandy paste and cord impressions over a cordmarked surface, share stylistic affinities with Brainerd Ware, an early Middle Woodland variety. A few small pieces of fire-cracked rock were extracted from a lag deposit observed in profile as a lens of compact soil approximately 15cm in thickness. The profile and flat lying orientation of pottery at this level denote a deflated surface.

The concentration of lithic material from Levels 3 and 4 is marked by a predominance of silicified sandstone waste flakes as well as a hammerstone, a broken adze and a polished greenstone fragment. Ceramics from these levels include a grit-tempered cordmarked flat-lipped sherd resembling Fox Lake vertical cordmarked ware, a Middle Woodland type. A stylistic companion type, Fox Lake trailed, represented by grit-tempered sandy paste cordmarked decorated with wide trailed lines suggest early Middle Woodland affiliation. Noteworthy from Level 5 is an exotic

chalcedony flake and from Level 6, a silicified sandstone triangular projectile point. More detailed discussions of these ceramics and lithic implements as well as those from other excavtion units are presented in a subsequent discussion.

Unit 2:

Cultural material was recovered from all levels of this unit which was excavated to a depth of 70cm below the surface. Historic debris was again confined within Levels 1-3 (0 - 30cm below surface). From these same levels a large quantity of fire-cracked rock, from no apparent cultural feature, was extracted. Prehistoric materials were concentrated in Level 4 - 5 (30 - 50cm below surface). Lithic debris consisted primarily of silicified sandstone waste flakes but also included chert flakes and shatter and a chalcedony flake. Diagnostic pottery sherds include a sandy paste ware with stab and drag decoration. This pottery exhibits stylistic affinities with Early and Middle Woodland Laurel ceramics. No features or organic stains were encountered in the excavation of this unit.

Unit 3:

Cultural material was recovered to a depth of 70cm below the surface where excavation of the unit terminated. A small amount of historic debris was confined within Levels 1 and 2 (0 - 20cm below surface). In this unit there was a dense concentration of lithic debitage in Level 5 (40 - 50cm below surface). Lithic material from this level included 148 silicified sandstone flakes, 5 chalcedony flakes, 2 chert flakes and four bifaces, 3 of chert and 1 of silicified sandstone. The small combined amount of pottery sherds from Levels 3, 4 and 5 exhibit much stylistic variety. No cultural features or organic stains were encountered in the excavation of this unit.

Unit 4:

Unit 4 was located near the eastern margins of the site and immediately adjacent to the cut-bank. This unit was excavated to a depth of 70cm below the surface. No material was recovered from Level 1 (0 - 10cm below surface) and historic materials were confined to Levels 2 and 3 (20 - 30cm below surface). A small triangular Late Woodland projectile point of silicified sandstone was recovered from Level 2. A substantial amount of cultural material was recovered from Levels 4, 5 and 6 (30 - 60cm below surface). Particularly dense concentrations of silicified sandstone wasteflakes from all three levels and equally dense concentrations of pottery from Level 4 was noted. Also, Level 6 yielded a sizeable amount of fire-cracked rock.

Pottery sherds from these levels again manifested great stylistic variability which included a grit-tempered exfoliated rim sherd; and grit-tempered cordmarked sherds with decorations such as vertical cordwrapped paddle impressions, punctates, fingernail and cord impressions,

oblique dentate stamp reminiscent of Sorg Phase ceramics, and grit-tempered with fingernail impressions on the exterior rim. These ceramic styles suggest Middle Woodland, late Middle Woodland and Late Woodland affiliation.

Unit 5:

Cultural material was recovered from Levels 1 through 7 of Unit 5 which was excavated to a depth of 70cm below the surface in quadrants "A", "C" and "D" and to a depth of 90cm in quadrant "B". Levels 1 - 3 (0 - 30cm below surface) contained historic debris and a sparse amount of prehistoric material. Lithics, pottery and fire-cracked rock were recovered in moderate amounts from Levels 4, 5 and 6 (30 - 60cm below surface). In addition to chert and silicified sandstone waste flakes, two drills, a biface, one re-worked contracting stem projectile point, two hammerstones and a ground stone axe were recovered. Diagnostic sherds include a grit-tempered sandy paste cordmarked decorated rim with fingernail impressions and a grit-tempered vertical cord impressed and combed sherd with horizontal fingernail impressions.

Summary:

Ecavations at Lc 163 were terminated, with one notable exception, at 70.0cm beneath the present surface. One quadrant was excavated to a depth of 90.0cm (Unit 5, quad B). The reason for the greater depth of this quadrant derived from encountering an organic stain. This stain was initially thought to have been a feature, however, careful analysis demonstrated that this was simply another case of krotovina, ostensibly related to an old animal burrow. All of the cultural materials found beneath the 60-65.0cm depth were associated with krotovina. This is a common occurrence on late Woodfordian terraces adjacent to the Mississippi River. For example, ecavations at the Osceola Site (47 Gt 24) were extended to 1.50m. In virtually all isntances lithic debris and a few pot sherds were found at this depth. Careful recording of flake orientations (not to mention the association of these materials with three articulated woodchuck skeletons) serves to underscore how materials on these terraces are translocated throughout the solum. Careful review of the artifact frequency distributions will demonstrate that cultural materials are translocated both above and below the deflated surface which now resides some 40-60cm beneath the present surface. The later overburden, primarily fine grained materials that include a higher silt fraction, has been deposited by eolian processes during the late Holocene after Late Woodland times (for analogs to the Red Oak Ridge Island depositional history see Overstreet 1984a, 1984b, 1985).

This means that we are left with mixed cultural deposits, at least from late Archaic through Late Woodland. All of these materials found in intimate association on a deflated surface. This surface is buried, late in the Holocene by fine to medium sands and silts derived from the

main trench of the Mississippi River when base level is significantly reduced. This does not mean to imply that there are no possibilities to encounter intact deposits on Late Woodfordian terraces. Such deposits undoubtedly exist under alluvial fans or other depositional contexts such as sand dunes, mass-wasted areas, or areas of slope wash. There is also the possibility that pit features may have extended below the deflated surface in some areas. However, we encountered no such contexts at 47 Lc 163.

Geomorphology:

Evaluation of the laboratory and field data have produced the following interpretations. The north and south ends of the island can be characterized as surfaces which have been reworked episodically throughout the Holocene. The island is without a doubt a late Pleistocene terrace which has undergone periodic eolian scour and deposition. The island is apparently correlative to the nearby Onalaska terrace described by Knox (1985). In contrast, the smaller island to the east (island #3) is a sand dune which overlies a lower now inundated Holocene Mississippi river terrace.

LC 163 - Stratigraphy:

The north end of the island where the excavation units are found (LC 163) is the most severely reworked surface. The textural data seen in Figure 13 shows the overall coarse nature of the sedimentological matrix, while the profile from unit 1 (Figure 14) contained the highest proportion of coarse sediment. In many of the excavation units the coarse clasts (particles greater than 2mm.) constituted a lag component. This was observed in the field and can be seen in Figure 13 which shows a peak in the proportion of sediment greater than 420 microns (coarse sand and larger) between 50 and 100 cm. The high variability in the coarse fraction (from 43% to 84%) suggests that finer sediments have been winnowed from the matrix leaving the coarser fraction as a lag.

In addition to a discontinuous coarse lag, a banded B horizon was observed in test unit #1. This horizon is located at 231cm below the surface and only consists of a single textural lamella. Other studies in similar sandy material (Berg 1984, Gile 1979, Dijkerman, Cline and Olson 1967) suggest that the wavy textural bands are pedogenic in nature and result from illuviation. This is likely the case with the single band observed in unit #1. Textural bands require considerable time to develop, generally greater than one thousand years and during longer periods of stability will often develop numerous fine grained lamellae as was observed on a similar late Woodfordian terrace near Dubuque (Overstreet, 1984b). However, the single textural band deep in the profile indicates that repeated instability has likely occurred above the band. The instability has likely

TEXTURAL DATA

RED OAK RIDGE ISLAND, UNIT 1 (LC 163)

Sand & Coarser Fraction Compared to Total Sample Weight

Percent of Sample >63μ (includes fine, med., & coarse sand, granules and pebbles).

Percent of Sample >420μ (includes coarse sand, granules, and pebbles).

Percent of Sample > 2mm. (includes granules and pebbles).

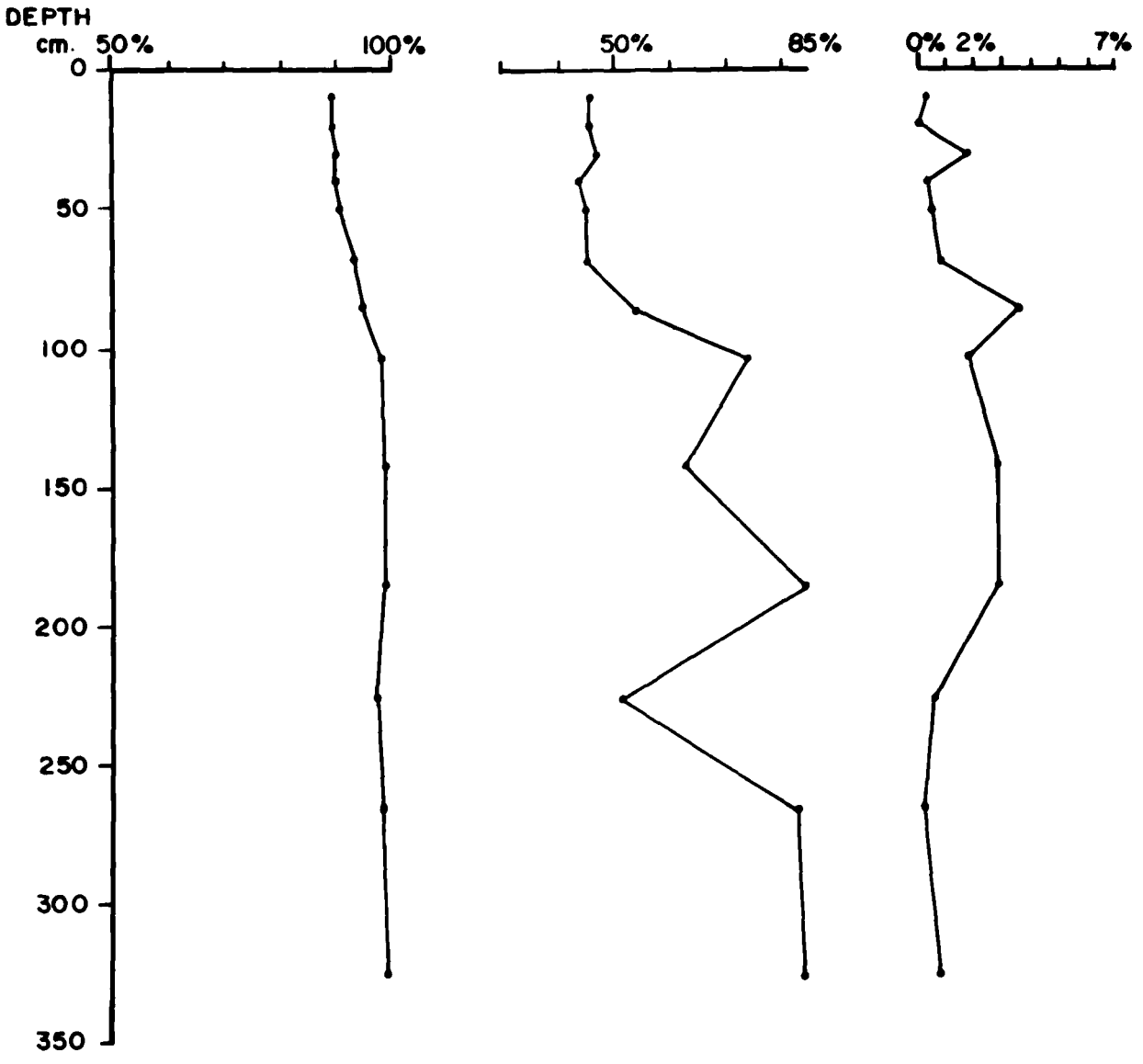
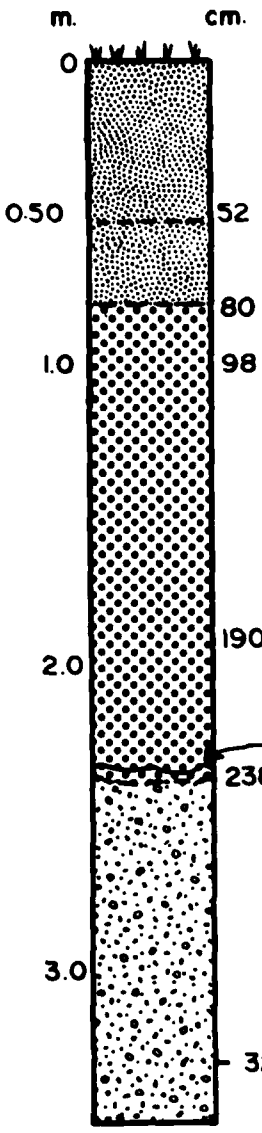


Figure 13: Textural Data from 47 Lc 163.



10YR 2/2, silty sand, (sandy loam) with many coarse sand grains, weak to moderate coarse to medium granular structure breaking to single grain, v. friable moist, many fine roots, pH to 40 cm 5.5, changing to pH 6.0 at 50 cm, krotovina observed,gradual smooth boundary

7.5YR 3/4, sand with minor silt (loamy sand), very weak medium subangular blocky structure breaking to single grain, v. friable moist, pH to 6.0, krotovina observed, gradual smooth boundary

7.5YR 3/6, coarse sand, structureless single grain

10YR 4/6, coarse sand, structureless single grain

pH at 105 cm = 6.3

Color changing to 10YR 5/4, pH at 224 cm = 7.0

Diffuse smooth boundary

(textural lamella 0.5 cm thick, 7.5YR 3/4)

10YR 5/4, pebbly coarse sand , structureless single grain

pH at 326 cm = 7.0

Figure 14: Profile, Excavation Unit 1, 47 Lc 163.

eroded previously developed bands or has prevented development of additional bands.

In addition to the textural data, the relatively low values for organic matter content suggest that this surface has suffered degradation (Figure 15). Historical agricultural practices have been responsible for the destruction of the natural vegetation cover which has led to accelerated surface erosion (Knox, 1977). As a result organic matter content has been greatly reduced in soil profiles which have undergone cultivation.

Not only has surface erosion occurred on the north end of the island but the relatively non-cohesive and easily mobilized sandy sediment has also been affected by biopedoturbation which tends to mix the soil and inhibit pedogenesis. This is especially evident in the solum where biotic activity plays an active role mixing material (Hole 1981) from the A horizon with material from the subjacent horizon. Considerable evidence of organic matter translocation was observed in the field and is probably responsible for the slight increase in organic matter content seen at 50cm below the surface (Figure 15).

The pH measurements taken from Unit #1 indicate highly acid conditions, particularly in the solum. The acid soil conditions thoroughly leached of carbonates are not favorable for organic preservation. In conjunction with the acid conditions, the high infiltration capacity and permeability of the soil matrix promote rapid leaching and will tend to degrade buried organic enriched horizons.

Based on field and laboratory analysis the north portion of Red Oak Ridge Island has undergone several episodes of erosion which has led to the concentration of coarse material stratigraphically high up in the profile. The historical effects of cultivation have accelerated erosion of the surface A horizon and the turbative effect of soil animals have vertically mixed the solum. As a result, the potential for stratigraphic integrity along this portion of the island is remote. Figures 16 - 19 present profiles of excavation units 2 - 5.

South End of Red Oak Ridge Island:

In contrast to the north end of the island, the Holocene geomorphic history along the south end of the island where LC 162 is situated is more obscure. There is considerable evidence suggesting that this end of the island has escaped major historical degradation, however the relative degree of eolian activity on a Holocene time scale is not clear.

The textural data (Figure 20) show a sedimentological profile containing relatively well sorted medium and coarse sand. In all of the samples taken from the profile no fraction greater than 2mm. was recovered. This aspect of the sedimentology was considerably different from the significant coarse fraction seen at the north end of the island. The general coarsening trend from the surface to

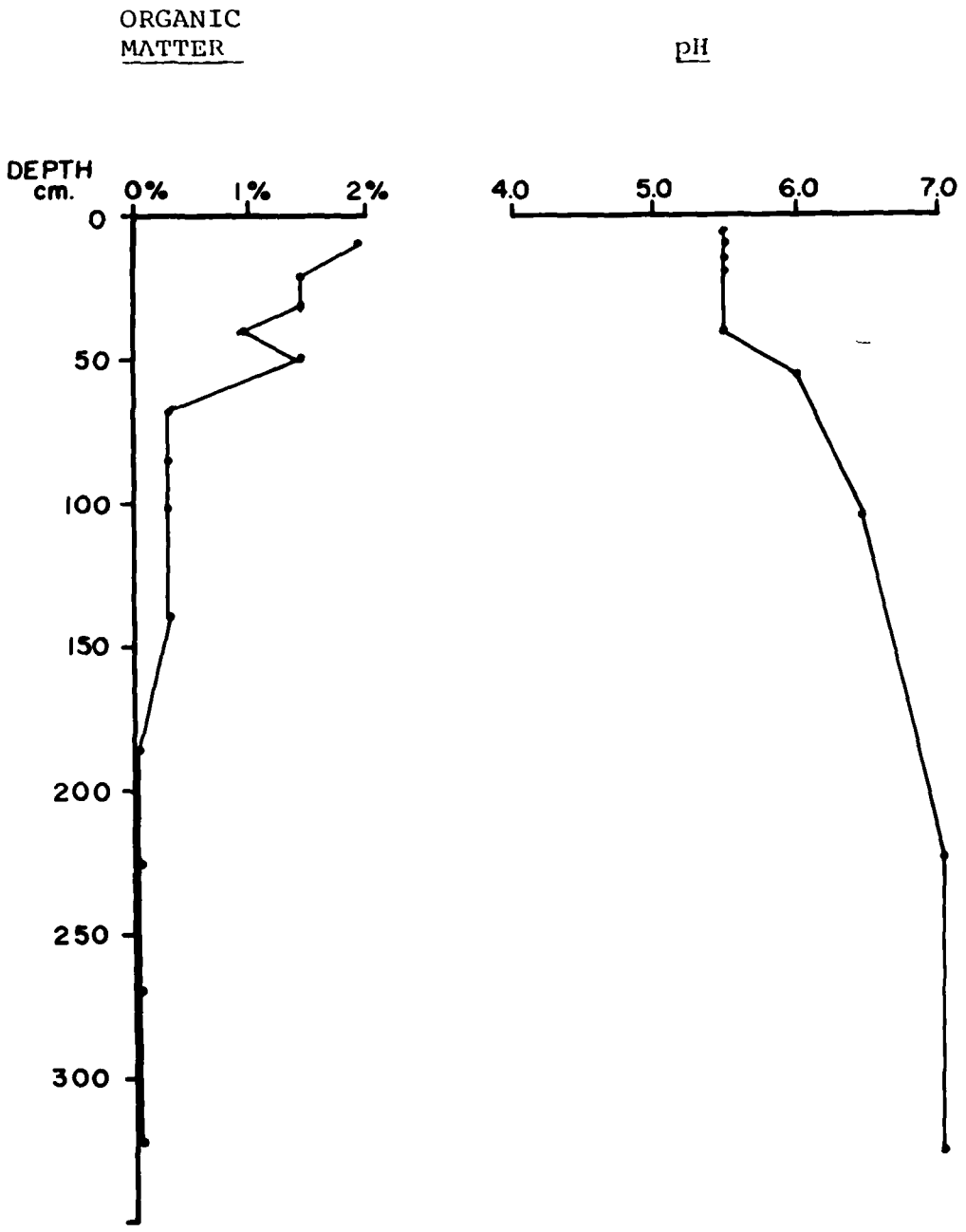
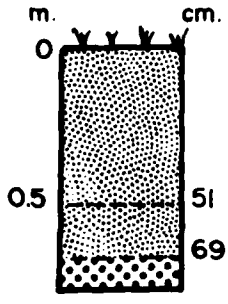


Figure 15: Organic matter content and pH, 47 Lc 163, Excavation Unit 1.

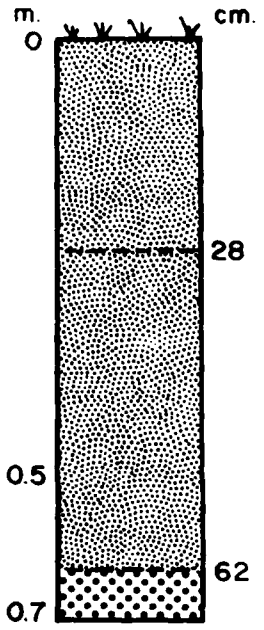


10YR 2/2, sand with minor silt (loamy sand) weak moderate to coarse subangular blocky breaking to single grain structure, very friable moist, many fine roots, pH 5.5, krotovina observed, gradual smooth boundary

7.5YR 3/4, sand with minor silt (co. sand), v. weak medium subangular blocky breaking to structureless single grain, pH 5.7, krotovina observed, gradual smooth boundary

7.5YR 3/6, coarse sand, structureless single grain

Figure 16: Profile, Excavation Unit 2, 47 Lc 163.

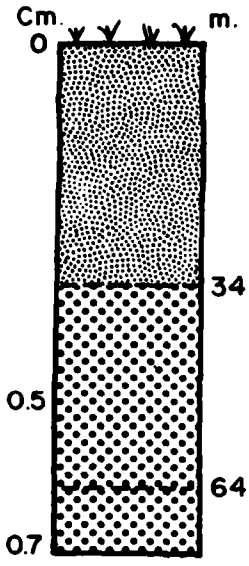


10YR2/2, sand with minor silt (loamy sand) many coarse sand grains, weak to moderate coarse to medium grannular structure breaking to single grain. Very friable, moist, many fine roots. Krotovina observed, gradual smooth boundary.

7.5YR3/4, sand with very minor silt (coarse sand), very weak, medium subangular blocky structure breaking to a single grain, very friable moist. Krotovina observed, gradual smooth boundary

7.5YR3/6 coarse sand, structureless single grain.

Figure 17: Profile, Excavation Unit 3, 47 Lc 163.



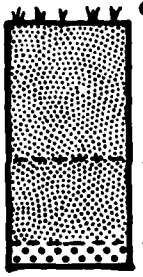
10YR 2/2, sand with minor silt (loamy sand) many coarse sand grains, weak to moderate coarse to medium granular structure breaking to single grain. Very friable moist, many fine roots, with krotovina, gradual smooth boundary.

7.5YR 3/4, coarse sand, very weak medium subangular blocky structure breaking to single grain, very friable moist, krotovina, gradual smooth boundary

large quantity of alluvial well rounded pebbles between 40-50 cm.

7.5YR 3/6 coarse sandy structureless single grain

Figure 18: Profile, Excavation Unit 4, 47 Lc 163.



10YR 2/2, sand with minor silt (loamy sand) weak moderate to coarse subangular blocky breaking to single grain, v. friable moist, many roots, pH 5.5, krotovina observed, gradual smooth boundary

7.5YR 3/4, sand with minor silt (co. sand), v. weak medium subangular blocky breaking to structureless single grain, pH 5.7, krotovina observed

7.5YR 3/6-4.6, coarse sand, pH 6.0, sturctureless single grain

Figure 19: Profile, Excavation Unit 5, 47 Le 163.

TEXTURAL DATA

RED OAK RIDGE ISLAND, BA 1, (LC 162)

Sand and Coarser Fraction Compared to Total Sample Weight

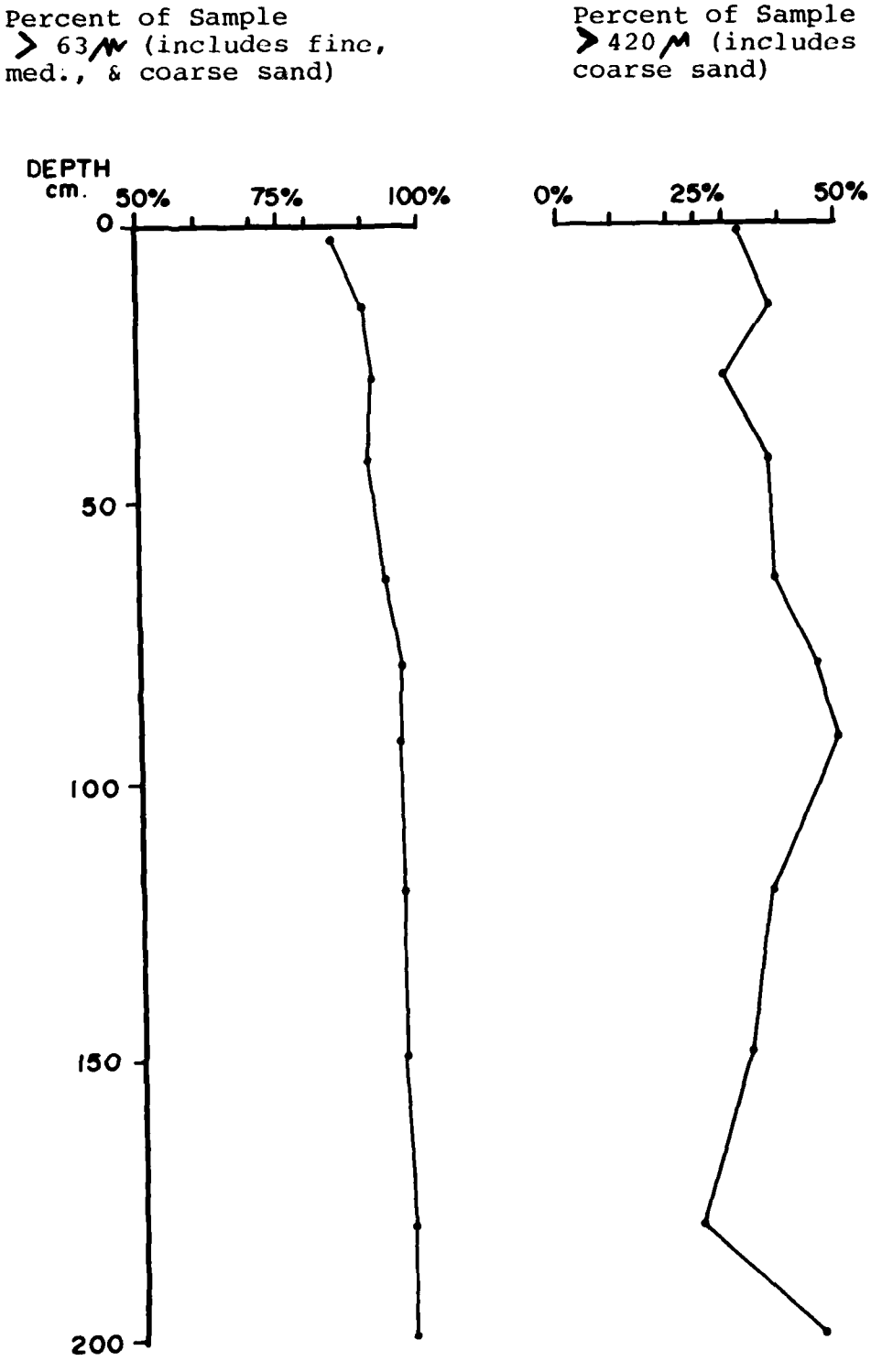


Figure 20: Textural Data, 47 Lc 162, Bucket Auger #1.

about 1 meter then a reversal in the trend toward fining could be explained through several different interpretations. The three peaks in the coarse sand fraction at 20, 90, and 200cm may represent eolian deflation lags. However, the distribution of medium and coarse sand through the profile may represent the effects of variable flow regimes in association with late Woodfordian deglaciation and resultant fluctuating paleo discharges.

The 7.5 minute topographic map provides another line of evidence favoring a different geomorphic interpretation. Topographically, the south end of the island is about 10-15 feet higher than the severely deflated north end. Conceivably, winnowing of the finer medium sand component which produced the coarse lag from the north end could have been deposited on the south end during episodes of destabilization when persistent periods of drought occurred during the Holocene.

The plot of organic matter (Figure 21) shows considerably higher content in the top 50cm. of the profile. Apparently, less historical agricultural disturbance has occurred on the south end of the island. However, surface A horizons develop rapidly (within 100 years) in humid and subhumid environments (Hallberg et al, 1978; Schafer et al, 1979). After several centuries A horizons reach a steady state condition between additions of organic material accumulating on the surface and losses of eluvial humus down through the profile (Bockheim 1980, Buol, Hole, and McCracken 1980: 13). Parsons, Scholtes, and Riecken (1962) suggest a steady state in A horizon development on 1000 year old Indian mounds in northeastern Iowa. Therefore the well developed stable surface horizon may represent only a few centuries and not thousands of years which would be required for argillic subsurface horizon development.

The weakly developed soil profile infers a young age and would tend to support that eolian additions to this surface occurred late in the Holocene. This is supported by the lack of fine textured translocation and lamellae development in the 2 meter profile. However, deeper penetration to lower stratigraphic units may uncover textural lamellae but in this case the water table inhibited further downward progress. Changes in pH through the profile are similar to what was observed along the north end of the island.

The low pH seen near the surface is a result of decomposition of oak leaf vegetation which is highly acidic. The general trend toward an increase in pH with depth also implies relative youth, since soils that have been stable for long time intervals tend to have a leached horizon below the surface horizon. The pH curve would show a decrease in pH in this leached horizon, evidently a leached horizon does not exist and is not observed from the plot in Figure 21.

The field and laboratory evidence indicate that less deflation has occurred on the south portion of the island. The coarse lag components that were present on the north end of the island are not observed on the south. The relative

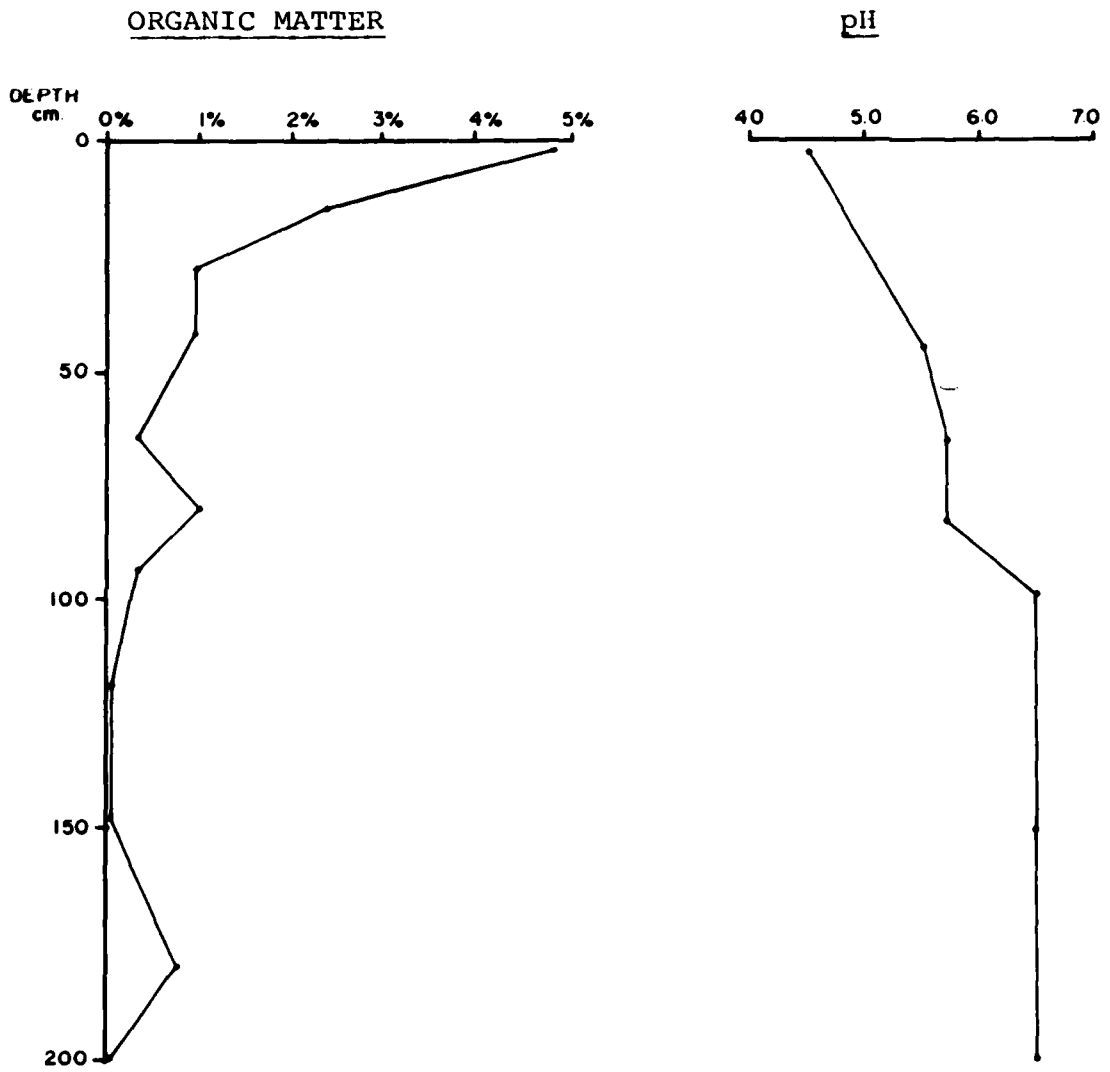


Figure 21: Organic matter content and pH, 47 Lc 162, Bucket Auger #1.

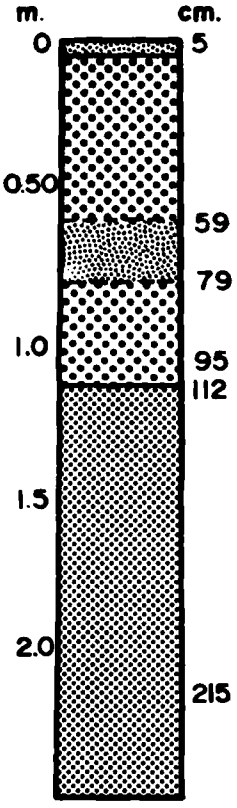
homogeneity of the sand matrix may in effect relate to an episode or episodes of eolian deposition however, conclusive evidence supporting this interpretation at this time does not exist. Although the surface A horizon is well developed and shows minimal disturbance evidence from the remainder of the profile shows weak soil development indicative of rather short term stability (Figure 22). More accurate assessment of the archaeological potential of the south end of Red Oak Ridge Island and LC 162 cannot be provided without additional investigations.

Island #3 (LC 160):

Island #3 is considerably different from Red Oak Ridge Island which is demonstrated through the laboratory and field observations. Topographically much lower than Red Oak, this island is not a late Woodfordian terrace outlier but is a dune which caps a lower Holocene Mississippi river terrace. The textural data (Figure 23) strongly suggest that this island is composed of dunal deposits at least through the upper 150cm of the profile where the particle size distribution is dominated by fine and medium sand. However by 200cm an increase in the coarse fraction indicates that there is a change from dune sand to lateral accretion alluvial sand.

Relatively low values for organic matter content (Figure 24) in this case result from surface erosion. Field observations confirmed that the surface has experienced historical surface erosion which presumably first occurred from agricultural land use than more recently from overbank fluvial erosion.

Similar to that which is observed at Red Oak Ridge Island, this profile showed weak soil development which may result from reworking of the soil material biopedologically or from the relatively late Holocene age of the deposit. It is unclear whether the slight drops in pH seen at 80 and again at 130cm have any significance in reference to a leached horizon. Likewise the significance of the slight increase in organic matter content seen at 70cm and 155cm is also unclear. Increasing the sample size through additional soil cores would be necessary to determine if these changes in pH and organic matter content consistently occur and are significant. We believe at this time that these changes do not represent buried soil horizons but instead are the product of biotic soil mixing and eolian reworking.



N2/0- 10YR 2/1, organic enriched silty sand (sandy loam) mod. med, granular structure, friable moist, partially decomposed plant material. pH 4.5, abrupt smooth boundary

10YR 2/2 - 2/1, silty coarse sand (loamy sand) v. weak medium and coarse granular structure, common fine roots, friable moist, krotovina observed, pH = 5.5, gradual smooth boundary

10YR 3/2-2/2, sand with minor silt (loamy sand) weak med. subangular blocky and prismatic breaking to med. structure granular friable moist, few fine roots, pH 5.7, gradual smooth boundary

10YR 3/4, coarse sand with v. minor silt (loamy sand) v. weak med. subangular blocky structure breaking to single grain, friable moist, translocated humus down root & worm holes, pH 5.7, gradual smooth boundary

95 cm 10YR 4/6 , coarse-med. sand, structureless single grain, pH 6.5, abrupt smooth boundary

10YR 6/4, med. sand, structureless single grain , pH 6.5

well sorted medium and coarse sand

Figure 22: Profile, Bucket Auger #1, 47 Lc 162.

TEXTURAL DATA

ISLAND NO. 3, (47 LC 160), BUCKET AUGER #2

Sand and Coarser Fraction Compared to Total Sample Weight

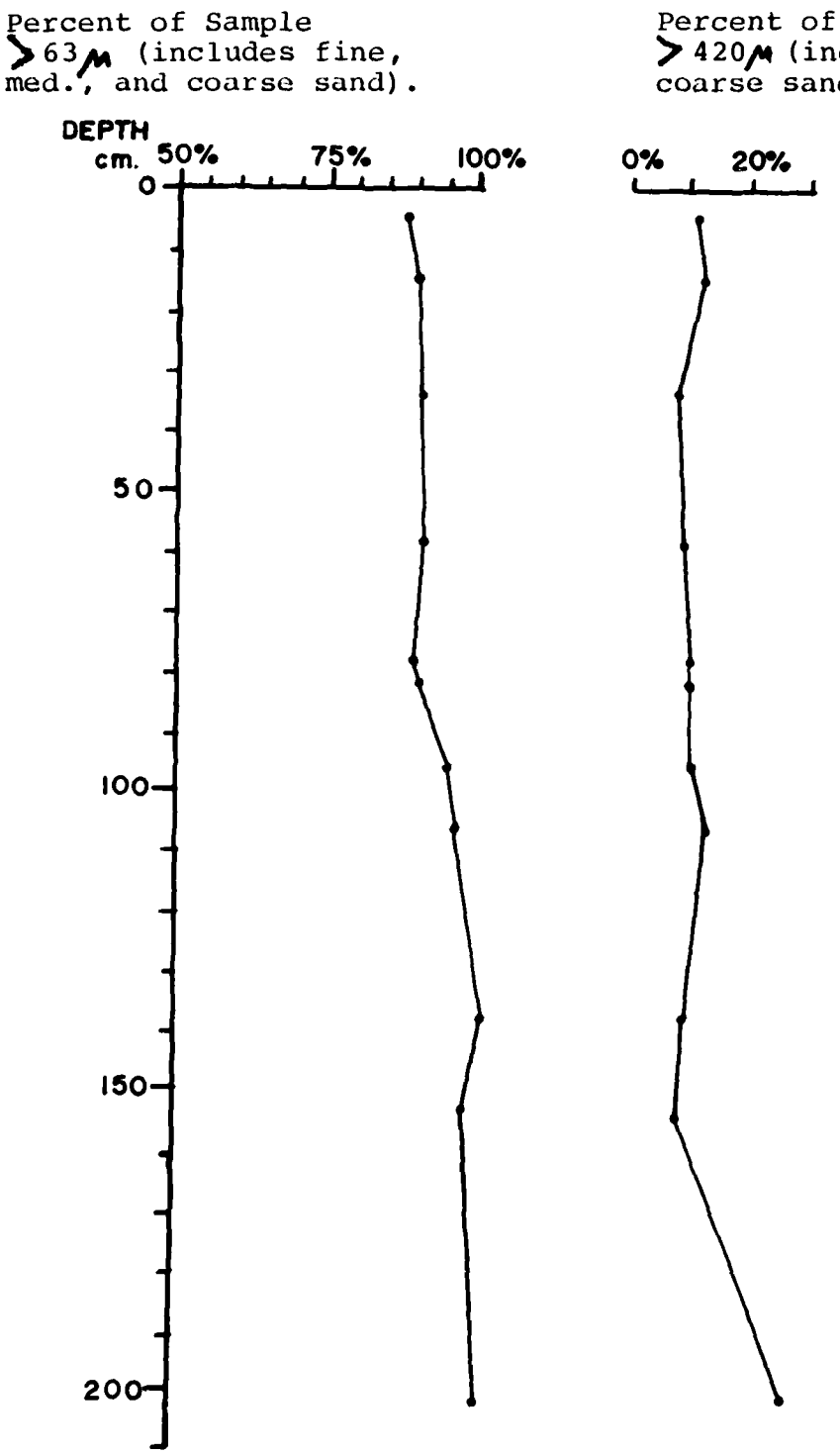


Figure 23: Textural Data, Island #3, Lc 160, Bucket Auger #2.

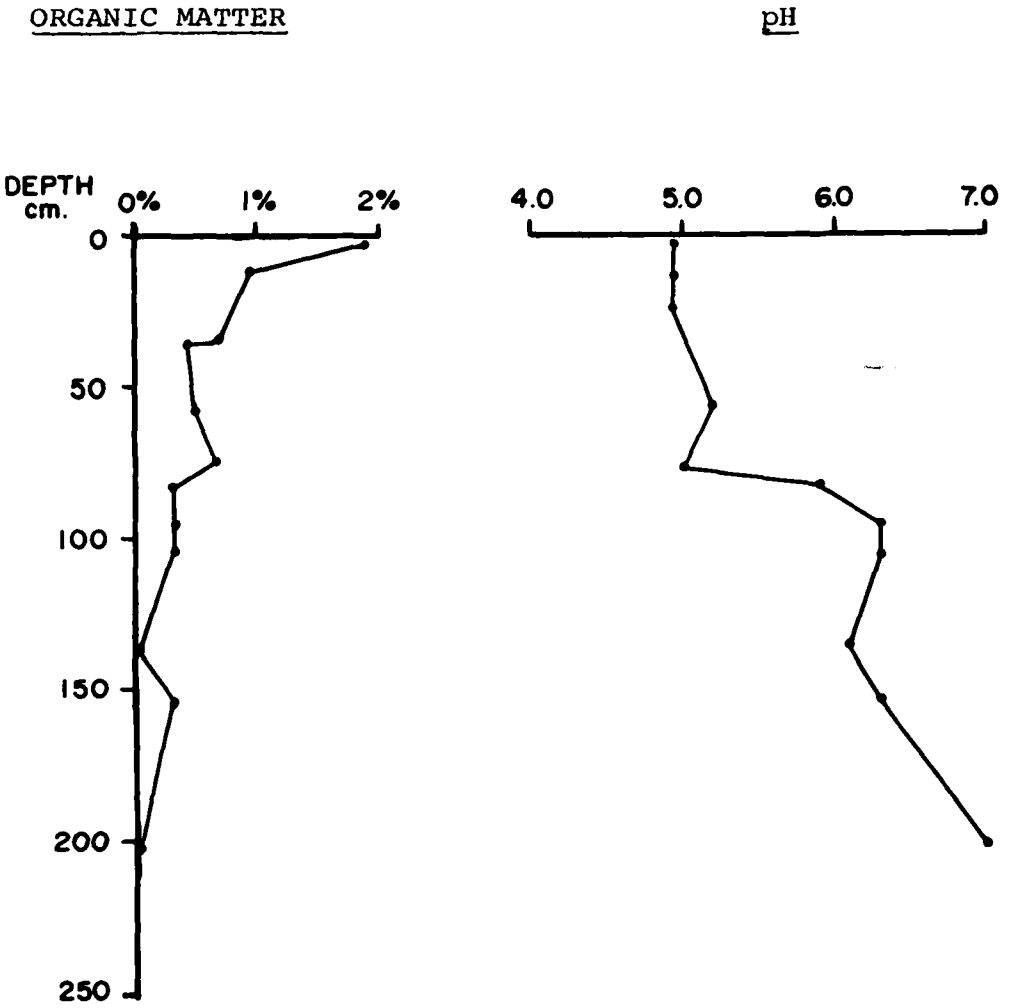


Figure 24: Organic matter content and pH, Island #3, 47 Lc 160, Bucket Auger #2.

SUMMARY AND CONCLUSIONS:

The following summaries and conclusions are presented for each archaeological site encountered during the course of the investigations. The discussion focuses first on site 47 Lc 163 which has received the most intensive application of archaeological method and technique. Subsequent to this discussion, the conclusions from 47 Lc 163, in so far as possible, are applied as a basis of extrapolation to the remaining sites identified during inventory. Finally, based on these conclusions, recommendations are presented in the final chapter of this report.

47 Lc 163:

Based on observations made during test excavations, during geomorphic field work, and laboratory analyses we do not believe that 47 Lc 163 meets the criteria for inclusion in The National Register of Historic Places. First, much if not all of the integrity of the archaeological deposits has been destroyed by eolian re-working of surfaces during the Holocene. Ceramics and lithic implements indicate, based on their depositional context, that more than 1,000 years of occupational history have been "mixed." Thus, the research potential of this site is similar in most all respects to an archaeological site contained wholly within a plow zone. There is no method that can be applied to segregate one component from another at 47 Lc 163 with the exception of diagnostic artifacts. Lithic assemblages, faunal assemblages, and other units of material culture have little analytical value in this respect.

A second, albeit less significant, detracting factor is the soil chemistry of 47 Lc 163. Soil acidity is such that preservation of organic remains is very poor. As a result, reconstruction of a generalized subsistence base for the Woodland components (lumped together) is a poor prospect.

The scenario we are able to reconstruct from the data secured from 47 Lc 163 is that from Late Archaic to Late Woodland times, prehistoric residents utilized this prominent Late Woodfordian feature for unidentified purposes. Review of the lithic assemblage indicated biface production, tool reworking, perhaps drilling or perforating, wood working (based on the presence of both an axe and the bit of an adze), and hide processing. Unfortunately, it is not possible to associate these specific activities with any of the recognized components at 47 Lc 163. Climatic variations, notably droughty conditions, human activity in the form of burning, foot traffic, and other activities that would result in denudation, have worked to lesser or greater degree to promoté deflation and reworking. Sometime after the Late Woodland occupation the surface was stabilized. The end result of this stabilization was formation of a prairie soil (Typic Hapludoll) with a weakly developed color B horizon (no argillic horizon). The thick "A" horizon,

measuring on the average ca. 50-55 cm., is a mollic epipedon and was likely formed within 250-300 years following the Late Woodland occupation.

The eolian reworking of surfaces at Lc 163 likely occurred on several periods of extended droughty conditions during the Holocene. The result has been the development of lag deposits consisting of pebbles and gravels originally incorporated in the late Woodfordian outwash, and, archaeological remains deposited at various times during the occupational history of Lc 163. The nature of disturbance is such that we cannot conclude that Lc 163 harbors significant research potential. In turn, recovery operations do not appear to be warranted based on the anticipated data yield.

At the same time, test excavations at 47 Lc 163 have provided some insights with reference to the local Woodland culture history. Boszhardt (1983: 11-12) has noted the difficulty of integrating a small, poorly provenienced collection of Woodland ceramics within existing Tri-State locality typology (Benn 1978, Logan 1976). This is borne out by what probably represents the largest Woodland ceramic assemblage from any site in the La Crosse area (47 Lc 163). The ceramic assemblage and selected lithic implements and their stratigraphic contexts are the subject of the ensuing discussion.

Ceramic and Lithic Assemblages:

A total of at least 10 distinct vessels are represented in the ceramic assemblage. In addition, various decorated body sherds manifest decorative motifs or modes of application that may be significant for chronological or cultural/historical purposes. As there is no apparent stratigraphic separation or obvious correlation between and within excavation units, the ceramics are described by broad classes of rim sherds and decorated body sherds in Table 1. Table 2 presents the array of formal lithic implements.

TABLE 1: Ceramic Sherds, 47 Lc 163

Plate I-A. This rim has a slight exterior bevel with cord impressions applied on the lip in parallel rows. The paste is hard and compact with grit temper. Exterior decoration consists of a row of fingernail impressions applied in a horizontal alignment just below the lip. the exterior of the vessel is cordmarked and thickness of the vessel wall is .90cm. The combination of cord impressions seem unusual. This style is likely a local late Middle Woodland - early Late Woodland type. (Unit 5 level 4).

Plate I-B. The vessel rim is characterized by a lip with a slight exterior bevel and a tool has been dragged across the lip creating a row of parallel trailed lines. the sherd manifests a rather friable grit tempered paste tending to exfoliation. The surface of the sherd is cord marked and a series of punctates are placed just below the lip. The sherd is similar in many respects to the type Fox Lake Vertical Cordmarked (Anfinson 1979). Sherd thickness is .60cm. Style is probably a local Early-Middle Woodland form (Unit 3, level 4).

Plate I-C. The relatively flat lip of this rim has a mild exterior bevel. The vessel is grit tempered with a cord marked surface. A series of horizontal rows of fingernail impressions are applied below a row of bosses (interior punctates). The fingernail impressions are applied at sharp angle and the nodes have been smoothed, removing cord marking from the surface. This is a probable Middle Woodland style Sherd thickness is .90cm. (Unit 3, level 4).

Plate I-E. A rounded lip characterizes this thin-walled vessel that manifests a hard compact paste with grit tempering. The exterior surface is cord marked and a series of vertical stamped impressions are applied to the exterior rim. Sherd thickness is .60cm. This sherd may be a local late Middle Woodland style. (Unit 2, level 3).

Plate I-D. This rim has a flat lip with a moderate exterior bevel. A series of parallel trailed lines traverse the lip. The exterior of the vessel is cordmarked. The only discernable decorative motif is a group of vertical trailed lines below the lip and interior punctates which create bosses. The vertical trailed lines are discontinuous and have not been applied above the boss on this sherd leaving an unmodified zone of the original cordmarked surface. Where trailed lines are applied, there is a furrowed effect. Sherd thickness is .90cm. (Unit 1, level 3). This vessel likely represents a local Middle Woodland style.

Plate I-F. A rounded lip is formed on this thin walled vessel. Sherd thickness is .40cm. Unfortunately, most of the exterior surface is eroded and no decorative motif is observed. Based on the vessel wall thickness and the compact grit tempered paste this sherd is interpreted as a Late Woodland style. (Unit 4, level 5). (A late Middle Woodland type similar to those in the Linn series is also a plausible alternative).

Plate I-G. This grit tempered rim has interior and exterior applications of a cord-wrapped stick or dowel. The decorative motif is not uncommon on clam river ware or various Middle and Late Woodland styles in central and northern Wisconsin. Vessel wall thickness is .60cm. (Unit 3, level 4).

Plate I-H. This surface find is a detached lip. The lip appears to be part of a small collared vessel with vertical trailed lines on the exterior lip. A Late Woodland affiliation seems a safe assumption. The sherd is grit tempered with a relatively hard, compact paste.

Plate I-I. This rim manifests a rounded lip with extruded clay on the exterior surface where lip and rim conjoin. The surface of this extruded clay, which is neither a filet or separate application, is decorated with a series of oblique lines. These could be either stab-drag or fingernail incisions. The vessel wall is thin and the paste (grit tempered) is hard and compact. The exterior surface has been smoothed. Vessel wall thickness is .50cm. The sherd would not be out of place in the Onamia Series and could likely be accommodated within Laurel assemblages. Temporal range is likely late Middle Woodland to early Late Woodland. (Unit 4, level 4).

Plate I-J. This vessel has a flat smooth lip resulting in a "squared" appearance. Vessel walls are thin (.45cm). Exterior surface is smoothed and parallel rows of oblique stamps (fingernail incisions?) are applied to the exterior surface. The motif is Laurel-like. (Unit 2, level 4).

Plate II-A. This grit-tempered body sherd has a thickness of .65cm and has several decorative elements. A series of three trailed lines traverse a cordmarked surface. The trailed lines are bordered by fingernail impressions. No distinct cultural affiliations are suggested. (Unit 4, level 4).

Plate II-B. Annular punctates are placed in parallel rows on this cord marked body sherd. The sherd is grit tempered and has a maximum thickness of .45cm. The punctates are deep, resulting in a cameo effect on the vessel interior. This design motif (paired vertical rows of punctates is a common attribute of Madison Punctated). A Late Woodland affiliation is suggested. (Unit 4, level 4).

Plate II-C. This sherd with relatively broad trailed lines imposed on a cordmarked surface can be accommodated within the type: Fox Lake Trailed. It is one of numerous incised over cordmarked styles in the Upper Mississippi valley that mark the transition between Early and Middle Woodland. (Unit 1, level 3).

Plate II-D. Application of a dentate stamp with differing orientations on this smooth surface body sherd is representative of Middle Woodland styles. It is probably more appropriate to affiliate this sherd with Howard Lake Phase rather than Trempealeau Phase. (Unit 4, level 4).

Plate II, E-G. These three smoothed surface body sherds all share parallel rows of fine stamping. The sherds have a sandy texture and vessel thickness averages .60cm. Such design motifs occur on St. Croix comb stamped, Onamia Series, and Laurel series vessels. In this instance the comparison to Onamia and St. Croix appears more plausible than Laurel and a suggested cultural affiliation is late Middle Woodland-early Late Woodland. (E: Unit 2, level 3; F: Unit 5, level 3; G: surface).

Plate III-A. This portion of a thick walled (1.2cm) cord marked vessel has crossed cords that, although the surface is eroded, mimic net impressions or cross-combing. Combined with rows of cord-wrapped stick impressions, these factors suggest certain stylistic affinities to Brainerd ware. This likely represents an early Middle Woodland style. (Unit 1, level 4).

Plate III-B. This portion of a thick walled (.90cm) cord marked vessel has both linear stamps and fingernail impressions. The design motif is similar in many respects to Ryan phase materials farther south. However, the sherd is heavily tempered with grit and lacks the expected sandy paste. The vessel likely represents a local Early-Middle Woodland style.

TABLE 2: Selected lithic implements, 47 Lc 163

Plate IV-A. Crude contracting stemmed point with a length of 4.9cm, width of 2.2cm, and thickness of .8cm. Blade has been re-sharpened and likely saw use as a knife. Hixton silicified sandstone. (Unit 5, level 4).

Plate IV-B. Biface with rounded base, plano-convex cross-section. Probable knife. Length 4.1cm, width 2.0cm, thickness .70cm. Hixton silicified sandstone. (Unit 4, level 5).

Plate IV-C. Probable small corner notched projectile point manufactured from Hixton silicified sandstone. Length (broken base) 3.2cm, width 1.8cm, and thickness .80cm. (Unit 5, level 3).

Plate IV-D. Side notched point with basal grinding. Probable Late Archaic form manufactured from Hixton silicified sandstone. Length 3.4cm, width 1.70cm, thickness .60cm. (Unit 4, level 5).

Plate IV-E. Broken drill or perforater. (Unit 5, level 4).

Plate V-A. Broken chert stage I biface. (Unit 3, level 5).

Plate V-B. Broken biface, finished artifact with secondary retouch along blade margins. Hixton silicified sandstone. (Unit 2, level 4).

Plate V-C. Stage III preform, Hixton silicified sandstone. (Unit 1, level 5).

Plate V-D. Stage I preform, Hixton silicified sandstone. (Unit 1, level 5).

Plate V-E & F. Broken bifaces, finished artifacts with secondary retouch, both manufactured from grey-white mottled chert. (E: Unit 5, level 5; F: Unit 1, level 4).

Plate VI-A. Crude granitic ground stone axe. Poll and bit heavily battered. Ungrooved, but with minor hafting indentations on lateral margins with limited polish from hafting on and adjacent to indentations. (Unit 5, level 6).

Plate VI-B. Fragment of polished stone object, either gorget section or base of platform pipe. Morphology suggests latter identification is more probable. (Unit 4, level 4).

Review of the diagnostic ceramic and lithic implements demonstrates that Lc 163 has a rather lengthy occupational history ranging from Late Archaic to Late Woodland. While it is difficult to draw conclusions from the small sample acquired from disturbed contexts, one feature is of particular note. The ceramic assemblage does not share the expected affinities with typologies from the Tri-State locality. Instead, stronger ties are seen with Woodland Cultures to the north and west of the La Crosse area. Early Woodland ceramic styles do not compare favorable with the Prairie Phase materials from the pool 10 locality (Stoltman, Theler and Boszhardt 1981). Trempealeau-McGregor Phase materials (Benn 1978, Stoltman 1979) are absent as are items that could be readily classified at Milville-Alamakee (Benn 1978, Stoltman 1979). These conclusions of course are tentative and the typological assessments suffer from low frequencies and poor context. Further, it is unlikely that Woodland adaptive strategies and culture histories will be refined from the perspective of sites situated on the terraces of the La Crosse area. More intensive investigations are needed on the lowland floodplain where potentials for encountering good stratigraphic sequences are more promising.

47 Lc 207, 210, 206, 205, and 204:

These sites have yielded prehistoric cultural remains that allow, in some cases, for tentative assignment of cultural-historical association. In spite of this, it is not highly probable that these sites harbor contexts and stratigraphic associations that would foster a determination of eligibility for The National Register of Historic Places. If formal evaluation of these sites is desired, it is

recommended that detailed on-site studies be conducted to determine site formation processes, presence or absence of buried surfaces, and assessment of surface stability prior to any intensive archaeological investigations. While the latter may result in the acquisition of large artifact inventories, the former would provide documentation of site contexts in which artifacts will predictably be found. While sufficient data are not available to determine the degree of instability and degradation, the results from 47 Lc 163 foster the conclusion that these sites likely do not harbor good stratigraphic potentials.

47 Lc 162, Lc 161, and Lc 209:

There is greater potential for stratigraphic preservation and stability of paleosols at the south end of Red Oak Ridge Island than at the north end where 47 Lc 163 is situated. However, more detailed investigations must be conducted before this potential can be stated with any degree of certainty. As a result, it is recommended that more detailed geomorphic studies be conducted at sites Lc 162, 161, and 209. Again, these investigations should be conducted prior to any intensive archaeological testing program.

47 Lc 160, Lc 213, Lc 211, and Lc 212:

It is quite unlikely that these archaeological sites located on once prominent Holocene landscape features harbor any intact archaeological deposits. Destruction undoubtedly occurred as a result of climatic events during the middle and late Holocene and from the activities of human occupants. Within a very few years, these "island sites" will be removed from the landscape by erosion resulting from construction of the 9 Foot Channel Navigation System. In any event, site 47 Lc 160, 213, 211, and 212 have extremely limited research potential and thus are not considered qualified for inclusion on The National Register of Historic Places.

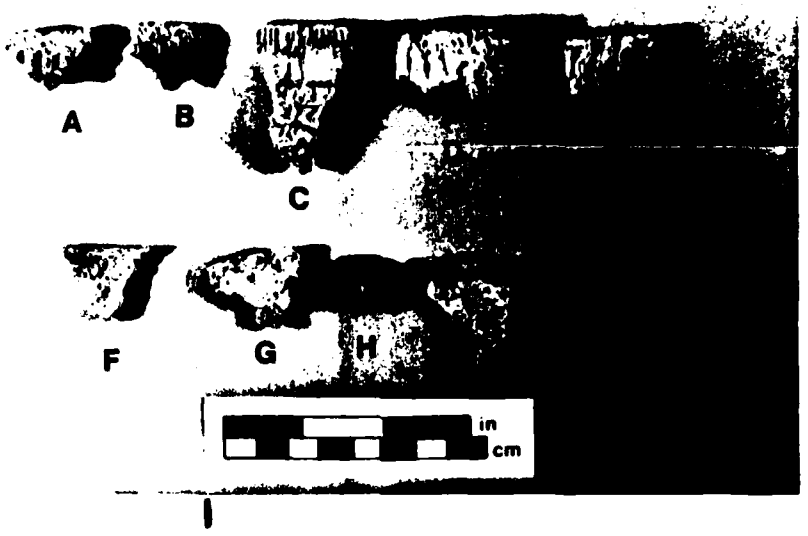
In summary, more detailed studies are warranted at site 47 Lc 209, 161, and 162. These investigations should focus on the identification of stable buried surfaces and not on securing a so-called statistically reliable sample of cultural materials. Should site formation process analyses indicate site stability, further archaeological investigations should be conducted.

Sites 47 Lc 207, 210, 206, 205, and 204 appear to have less potential for encountering intact stratigraphic contexts than those archaeological sites on the southern segment of Red Oak Ridge Island. That potential could be verified or rejected by geomorphic investigations conducted simultaneously with investigations at 47 Lc 209, 161, and 162 to avoid duplication of costs. Finally, it is recommended that emphases be placed on understanding landscape degradation and stability prior to more

traditional archaeological investigations, i.e., formal test excavations or recovery work. The appropriate level of investigation should include literature and archives search, site reconnaissance with probing and/or coring, and limited excavation of soil pits. Laboratory work should minimally include pH, organic carbon content, and particle size analyses. This approach is particularly important in the Upper Mississippi valley where landscpaes are incredibly complex, but, where upland setting (terraces) are often badly disturbed and where lowlands (floodplain, low terraces) are characterized by depositional processes that obfuscate site discovery.

PLATES

I.



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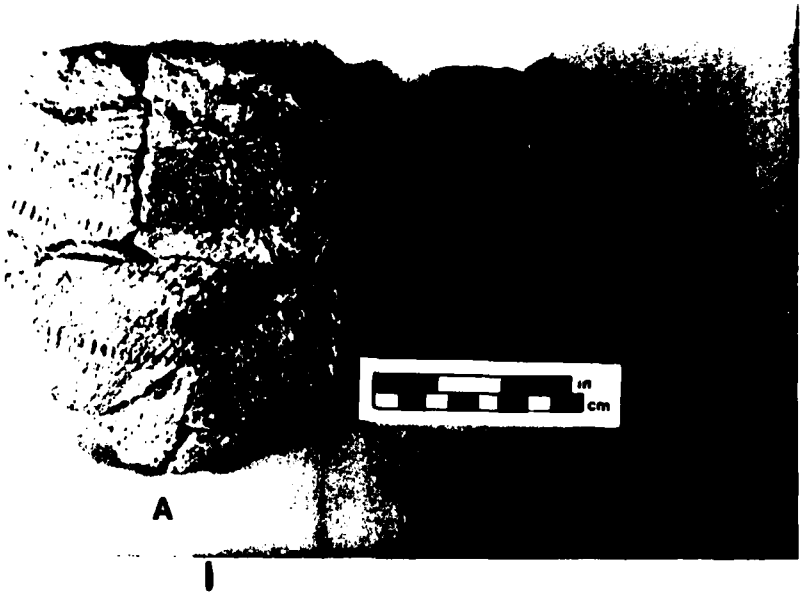

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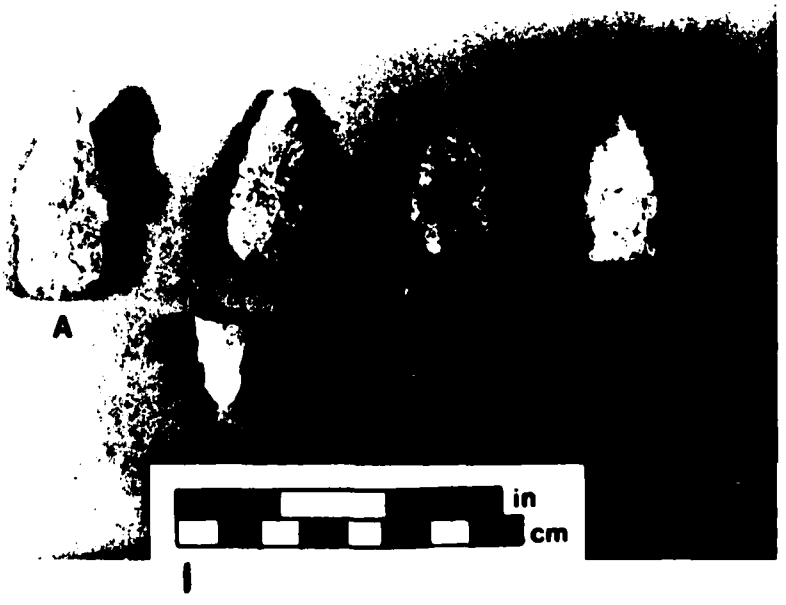

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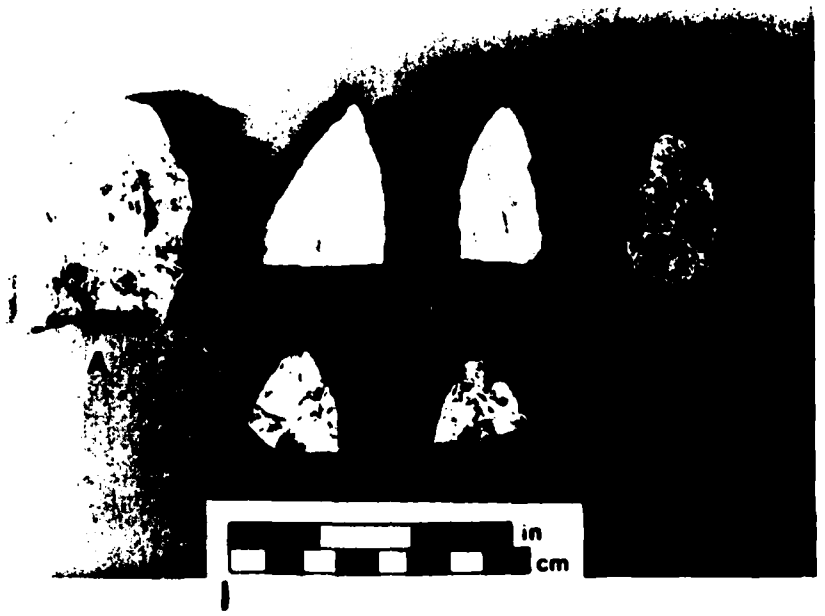

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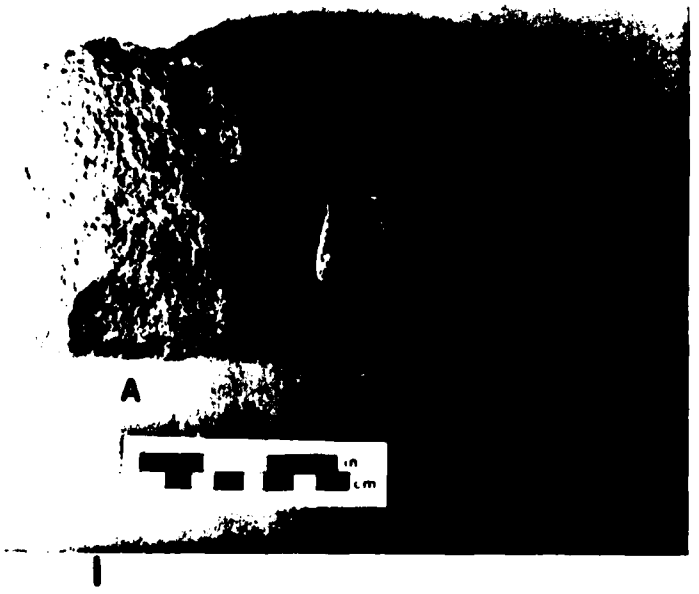


REFERENCES CITED

ALLISON, L.E.
1965 Organic Carbon. In: Methods of Soil Analysis (part 2) C.A. Black (ed.) , Am. Society of Agronomy, Madison Wisc., p. 1367-1378.

ANFINSON, SCOTT F.
1979 A Handbook of Minnesota Prehistoric Ceramics. Minnesota Archaeological Society, Occasional Publications in Minnesota Anthropology 5. St. Paul.

BARTLEIN, PATRICK J. and THOMPSON WEBB III
1982 Holocene Climatic Changes Estimated From Pollen Data From the Northern Midwest. In: Quaternary History of The Driftless Area - Field Trip Guidebook Number 5, The Geological and Natural History Survey. Madison.

BERG, R.C.
1984 The Origin and Early Genesis of Clay Bands in Youthful Sandy Soils along Lake Michigan, U.S.A. Geoderma 24: 71-85.

BENN, DAVID W.
1978 The Woodland Ceramic Sequence in the Culture History of Northeast Iowa. Midcontinental Journal of Archaeology, 3 (2): 215-284.

BOCKHEIM, J.G.
1980 Solution and Use of Chronofunctions in Studying Soils Development. Geoderma, 24: 71-85.

BOSZHARDT, ROBERT F.
1983 A Comparison of the Floodplain Archaeology of Navigation Pools 7 and 8 at La Crosse with Pools 10, 12, and 16 of The Upper Mississippi River. Paper presented at the Midwest Archaeological Conference, Iowa City, Iowa.

BOSZHARDT, ROBERT F., JAMES L. THELER, and JAMES P. GALLAGHER
1984 A Cultural Resources Evaluation of the Pammel Creek Site (47Lc61): An Oneota Occupation at La Crosse, Wisconsin. Reports of Investigations Number 11, Mississippi Valley Archaeology Center. La Crosse, Wisconsin.

BOUYOUCOS, GEORGE J.
1936 Directions for making mechanical analyses of soils by the hydrometer method. Soil Science , 42: 225-229.

BROWN, CHARLES E.
1906 A Record of Wisconsin Antiquities. The Wisconsin Archeologist, (OS) Vol. 5 (3-4).

1908 Additions to the Record of Wisconsin Antiquities, II. The Wisconsin Archeologist, (OS) Vol. 7 (1).

1909 Additions to the Record of Wisconsin Antiquities, II. The Wisconsin Archeologist, (OS) Vol. 8 (3).

1912 Fourth Addition to the Record of Wisconsin Antiquities. The Wisconsin Archeologist, (OS) Vol. 10 (4).

1925 Fifth Addition to the Record of Wisconsin Antiquities. The Wisconsin Archeologist, Vol. 3 (2): 52-57.

BUOL, S.W., HOLE F.D., and R.J. McCRAKEN
1980 Soil Genesis and Classification. The Iowa State University Press. Ames.

CHURCH, PETER E.
1984 The Archaeological Potential of Pool No. 10, Upper Mississippi River: A Geomorphological Perspective. U.S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Mississippi.

CLAYTON, LEE
1982 Influence of Aggassiz and Superior Drainage on the Mississippi River. In: Quaternary History of The Driftless Area-Field Trip Guidebook Number 5, Geological and Natural History Survey, 83-87. Madison.

1983 Chronology of Lake Agassiz Drainage to Lake Superior. In: Glacial Lake Agassiz, J.T. Teller and L. Clayton, Eds. Geological Association of Canada Special Paper No. 26: 291-307.

CLAYTON, LEE and S.R. MORAN
1982 Chronology of Late Wisconsinan Glaciation in Middle North America. Quaternary Science Review, 1: 55-82.

DIJKERMAN, J.C., M.G. CLINE and G.W. OLSON
1967 Properties and Genesis of Textural Subsurface Lamellae. Soil Science 104: 7-16.

FLOCK, MARK A.
1983 The Late Wisconsin Savanna Terrace in Tributaries to the Upper Mississippi River. Quaternary Research 20: 165-176.

FORD, BENJAMIN W. JR.,, JOHN T. PENMAN, and JAMES C. KNOX
1982 Transportation Archaeology in Wisconsin: The 1982 Field Season. Wisconsin Department of Transportation, Archaeological Report 9. Madison.

GALLAGHER, JAMES P.
1980 La Crosse Area Archaeological Survey, 1979 Season. Report prepared for the State Historical Society of wisconsin and the University of Wisconsin-La Crosse Center for Regional and Environmental Studies.

GALLAGHER, JAMES P., ROLAND RODELL, and KATHERINE STEVENSON
1982 The 1980-1982 La Crosse Area Archaeological Survey. Mississippi Valley Archaeology Center, Reports of Investigations No. 2. La Crosse, Wisconsin.

GALLAGHER, JAMES P. and KATHERINE STEVENSON
1982 Oneota Subsistence and Settlement in Southwestern Wisconsin. In Oneota Studies, G. Gibbon, Ed. University of Minnesota Publications in Anthropology 1. Minneapolis.

GEIER, CLARENCE
1978 An Analysis of The Pottery Assemblage from the Hog Hollow Site: A Transitional Middle/Late Woodland Habitation in the Mississippi River Valley. The Wisconsin Archeologist, 59 (2): 151-245.

GILE, L.H.
1979 Holocene Soils in Eolian Sediments of Bailey County, Texas. Soil Sci. Am. J. 43: 994-1003.

HALLBERG, G.R., N.C. WOLLENHAUPT and G.A. MILLER
1978 A Century of Soil Development in Spoil Derived from Loess in Iowa. Soil Sci. Am. J. 42: 339-343

HOLE, FRANCIS D.
1981 Effects of Animals on Soil. Geoderma, 25: 75-112.

KNOX, J.C.
1975 The Response of Floods and Sediment Yields to Climatic Variation and Land Use in the Upper Mississippi Valley. Institute for Environmental Studies, Report 52, University of Wisconsin-Madison.

1977 Human Impacts on Wisconsin Stream Channels. Annals of the Association of American Geographers Vol. 67, 3: 323-342.

1979 Hydrogeomorphic Implications of Climatic Change. Center for Geographic Analysis and Department of Geography, University of Wisconsin, Madison.

1983 Responses of River Systems to Holocene Climates. In: Late-Quaternary Environments of the United States: The Holocene, H.E. Wright Jr. ed. University of Minnesota Press. Minneapolis, Mn.

1985 Holocene Geomorphic History of the Sand Lake Site: LaCrosse County, Wisconsin. Final Report of Investigations Interinstitutional Agreement between UW-LaCrosse and UW-Madison Contract Reference No. LAX-58, University of Wisconsin, Madison. 62p.

KNOX, J.C. and W.C. JOHNSON

1974 Late Quaternary Valley Alluviation in the Driftless Area of Southwestern Wisconsin; In: Knox, J.C. and Mickelson, D.M. (eds.); Late Quaternary Environments of Wisconsin. Wisconsin Geological and Natural History Survey, pp. 134-162.

LOGAN, WILFRED D.

1976 Woodland Complexes in Northeastern Iowa. Publications in Archaeology 15. U.S. Department of the interior, National Park Service.

McKERN, WILL C.

1931 A Wisconsin Variant of the Hopewell Culture. Milwaukee Public Museum Bulletin No. 10, (2): 189-329.

1945 Preliminary Report on The Upper Mississippi Phase in Wisconsin. Bulletin of The Public Museum of The City of Milwaukee, 16 (3): 109-285.

OVERSTREET, DAVID F.

1984a Archaeological Reconnaissance Survey of Pool 10, Upper Mississippi River, Grant and Crawford Counties, Wisconsin And Allamakee and Clayton Counties , Iowa. Great Lakes Archaeological Research Center, Inc., Reports of Investigations No. 139. Wauwatosa, WI.

1984b Archaeological Investigations at the Grant River Public Use Area. Great Lakes Archaeological Research Center, Inc., Reports of Investigations No. 149. Wauwatosa, Wi.

1985 Archaeological Investigations, Navigation Pool 11, Upper Mississippi River Basin. Great Lakes Archaeological Research Center, Inc., Reports of Investigations No. 151. Wauwatosa, WI.

PARSONS, R.B., W.H. SHOLTES and F.F. RIEKEN

1962 Soils of Indian Mounds in Northeastern Iowa as Benchmarks for Studies of Soil Science. Soil Science Society Proceedings, p.491-496.

PEET, STEPHEN D.

1882 Emblematic Mounds in Wisconsin. Wisconsin Historical Collections. Vol. 9: 40-74.

1883 Editorial: Explorations of Mounds. The American Antiquarian and Oriental Journal. Vol. 5 (4): 332-340.

1884a The Emblematic Mounds of Wisconsin. The American Antiquarian and Oriental Journal. Vol. 6: 7-29.

1884b Relic Hunting Versus Archaeological Survey. The American Antiquarian and Oriental Journal. Vol. 6: 204-208.

1884c The Emblematic Mounds. The American Antiquarian and Oriental Journal. Vol. 6: 254-275.

1884d Destruction of Mounds. The American Antiquarian and Oriental Journal. Vol. 6: 276-277.

1885 Explorations Among the Emblematic Mounds. The American Antiquarian and Oriental Journal. Vol. 7: 298-301.

1887a Village Life and Clan Residences Among the Emblematic Mounds. The American Antiquarian and Oriental Journal. Vol. 9: 10-34.

1887b Who were the Effigy Builders? To What Race and Age did they belong? The American Antiquarian and Oriental Journal. Vol. 9: 67-94.

1889a Indian Myths and Effigy Mounds. The American Antiquarian and Oriental Journal. Vol. 11: 139-163.

1889b the Animals Known to the Effigy Builders. The American Antiquarian and Oriental Journal. Vol. 11: 139-163.

1889c Burial Mounds Viewed as Monuments. The American Antiquarian and Oriental Journal. Vol. 11: 359-378.

1889d Animal Effigies and Tribal History. The American Antiquarian and Oriental Journal. Vol. 11: 383-387.

1889e The So-called Elephant Mound in Grant County and Effigies Surrounding It. Transactions of the Wisconsin Academy of Arts, Science, and Letters, Vol. 7: 204-220.

1890 Prehistoric America--Vol. 2, Emblematic Mounds and Animal Effigies. American Antiquarian Office, Chicago.

1891a The Migrations of the Mound builders. The American Antiquarian and Oriental Journal. Vol. 13: 129-150.

1891b the Mysterious Races. The American Antiquarian and Oriental Journal. Vol. 13: 255-281.

1891c The Religion of The Mound Builders. The American Antiquarian and Oriental Journal. Vol. 13: 305-330.

1892a Prehistoric America, Vol. 1. American Antiquarian Office, Chicago, IL.

1892b The Mound Building and The Mastodon. The American Antiquarian and Oriental Journal. Vol. 14: 59-86.

1892c The Clan Centers and Clan Habitat of the Effigy Builders. Transactions of The Wisconsin Academy of Science, Arts, and Letters. Vol. 8: 299-311.

1895 Comparison of the Effigy-Builders with the Modern Indians. The American Antiquarian and Oriental Journal. Vol. 17: 19-43.

PENMAN, JOHN T.
1980 Archaeology of the Great River Road: Site Survey in Buffalo, Pepin, and Pierce Counties. Wisconsin Department of Transportation, Archaeological Report 3. Madison.

RUSCH, LYNN A. and JOHN T. PENMAN
1982 Historic Sites Along the Great River Road. Wisconsin Department of Transportation, Archaeological Report 7. Madison.

RITZENTHALER, ROBERT E.
1946 The Osceola Site, an "Old Copper" Site near Potosi, Wisconsin. The Wisconsin Archeologist, 27.

SCHAFER, W.M., G.A. NEILSON, D.J. DOLLHOPH and K. TEMPLE
1979 Soil Genesis, Hydrological Properties, Root Characteristics, and Microbial Activity of 1-to-50-Year-Old Stripmine Spoils EPA 6007-79-100 U.S. Environmental Protection Agency. Cincinnati, Ohio

SASSO, ROBERT F.
1984 Archaeological Data Recovery at the Overhead Site (47 Lc 20) La Crosse County, Wisconsin. Mississippi Valley Archaeology Center, Report of Investigations Number 18.

SMITH, CHARLES
1984 The Blandings Landing Site, Jo Daveiss County, Illinois. The Wisconsin Archeologist, 65 (4).

STOLTMAN, JAMES B.
1979 Middle Woodland Stage Communities of Southwestern Wisconsin. In: Hopewell Archaeology: The Chillicothe Conference. Midcontinental Journal of Archaeology, Special Paper 3: 122-139. Kent State University Press.

THOMAS, CYRUS

1884a The Destruction of Mounds. The American Antiquarian and Oriental Journal, Vol. 6: 41.

1884b Manner of Preserving Mound Builder's Relics. The American Antiquarian and Oriental Journal, Vol. 6: 103-106.

1886 Mound Explorations in 1885, under the Ethnological Bureau. The American Antiquarian and Oriental Journal, Vol. 8: 35-37.

1887a Burial Mounds of the Northern Sections of the United States. Fifth Annual Report of the Bureau of Ethnology, 1883-1884: 3-119.

1887b Work in Mound Exploration of the Bureau of Ethnology. Bureau of American Ethnology, Bulletin 4: 1-15.

1891 Catalogue of Prehistoric Works East of the Rocky Mountains. Bureau of American Ethnology, Bulletin 12: 226-228.

1894 Report on Mound Excavations of the Bureau of Ethnology. Twelfth Annual Report of the Bureau of American Ethnology, 1890-1891: 1-742.

1898 *Introduction to the Study of North American Archaeology*. The Robert Clarke Company, Cincinnati.

WEBB, T. III, E.J. CUSHING and H.E. WRIGHT Jr.

1983 Holocene changes in the vegetation of the Midwest. In Late-Quaternary Environments of the United States, The Holocene, H.E. Wright Jr., (ed.) University of Minnesota Press. Minneapolis, MN.

WEBB, THOMPSON III and R.A. BRYSON

1972 Late-and Postglacial Climatic Change in the Northern Midwest, USA. Quantitative Estimates Derived from Fossil Pollen Spectra by Multivariate Statistical Analysis. Quaternary Research 2: 70-115.

WHITLOW, JESSE W. and C.E. BROWN

1963 Geology of the Dubuque North Quadrangle, Iowa-Wisconsin-Illinois: U.S. Geological Survey Bulletin 1123-C, 139-168.

WHITLOW, JESSE W. and WALTER S. WEST

1966 Geology of the Potosi Quadrangle, Grant County, Wisconsin and Dubuque County, Iowa. Geological Survey Bulletin 1123-1, 533-571.

WILLMAN, H.B. and J.C. FRYE
1969 High-Level Glacial Outwash in the Driftless Area of Northwestern Illinois. Illinois State Geological Survey Circular 440, p. 23.

WRIGHT, H. E., JR.
1976 The Dynamic nature of Holocene Vegetation: Holocene Stratigraphy and Paleoclimatology, Biogeography, and Stratigraphic Nomenclature: Quaternary Research 6: 581-596.

APPENDIX A

St. Paul District, Corps of Engineers

Scope of Work

SCOPE OF WORK
CULTURAL RESOURCES INVESTIGATION
OF SITE 47LC163 AND SURVEY OF RED OAK RIDGE ISLAND,
LAKE ONALASKA, LA CROSSE COUNTY, WISCONSIN

1.00 INTRODUCTION

1.01 The Contractor will undertake a cultural resources investigation of site 47LC163 and a survey of Red Oak Ridge Island in Lake Onalaska, La Crosse County, Wisconsin.

1.02 This cultural resources inventory partially fulfills the obligations of the Corps of Engineers (Corps) regarding cultural resources, as set forth in the National Historic Preservation Act of 1966 (Public Law (PL) 89-665), as amended; the National Environmental Policy Act of 1969 (PL 91-190); Executive Order (EO) 11593 for the "Protection and Enhancement of the Cultural Environment" (Federal Register, 13 May 1971); the Archeological and Historical Preservation Act of 1974 (PL 93-291); the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties (36 CFR Part 800); the Department of the Interior guidelines concerning cultural resources (36 CFR Part 60); and the applicable Corps regulations (ER 1105-2-50).

1.03 The laws listed above establish the importance of Federal leadership, through the various responsible agencies, in locating and preserving cultural resources within project areas. Specific steps to comply with these laws, particularly as directed in PL 93-291 and EO 11593, are being taken by the Corps "... to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures, and objects of historical, architectural, or archeological significance." A part of that responsibility is to locate, inventory, and nominate to the Secretary of the Interior all such sites in the project area that appear to qualify for listing on the National Register of Historic Places.

1.04 EO 11593 and the 1980 amendments to the National Historic Preservation Act further direct Federal agencies "... to assure that any federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished or substantially altered." In addition, the Corps is directed to administer its policies, plans, and programs so that federally and non-federally owned sites, structures, and objects of historical, architectural, or archeological significance are preserved and maintained for the inspiration and benefit of the people.

1.05 This cultural resources investigation will serve several functions. The Contractor's technical report will be a planning tool to aid the Corps in meeting its obligations to preserve and protect our cultural heritage. It will be a comprehensive, scholarly document that not only fulfills federally-mandated legal requirements but also serves as a scientific reference for future professional studies. It will identify sites that may require additional investigations and that may have potential for public-use development. Thus, the report must be analytical in nature, not just descriptive.

2.00 PROJECT DESCRIPTION

2.01 Red Oak Ridge Island is located in pool 7 of the Mississippi River approximately 4,500 feet north of dam 7 in Lake Onalaska (see plates 1 and 2). The island is an outlier terrace that was surrounded by floodplain prior to construction of the lock and dam in 1935. Since pool 7 was created, fluctuating water levels in combination with navigation and wave action have created erosion problems on the island. Erosion is most severe along the northern section but is evident along much of the shoreline of the island. Because of the higher elevation of the island, the erosion problem has created banks 20 to 30 feet high.

2.02 During 1982 and 1983, personnel from the Mississippi Valley Archeology Center conducted shoreline surveys within pools 7 and 8. Red Oak Ridge Island was included in this shoreline survey effort, and three previously unrecorded sites were located along the banks (see plate 3).

2.03 The Red Oak I Site (47LC161) is located at the southern tip of the island along a nearly 30-foot-high bank. Material collected included quartzite and chert flakes and a number of grit-tempered sherds. The site has been tentatively assigned to the Late Woodland Period.

2.04 The Red Oak Ridge II Site (47 LC162) is located along the southwest shore in an area of moderate erosion. Lithic debitage was collected from the banks and one possible feature was partially exposed on the surface. There is no known cultural affiliation presently associated with this site.

2.05 The Red Oak Ridge III Site (47LC163) is located at the severely eroding northern tip of the island. Early Middle Woodland ceramics and undiagnostic lithic material were recovered from the bank. A possible midden was also exposed in the bank profile.

2.06 Red Oak I and portions of Red Oak II are fee title property of the U.S. Fish and Wildlife Service. Red Oak III is located on Corps of Engineers fee title property (see plate 4).

2.07 This project will consist of the intensive testing of 47LC163 to determine its significance and eligibility to the National Register of Historic Places (including preparation of a Determination of Eligibility, if necessary), the survey of portions of the island to determine the physical extent of known archeological resources, and the identification of any unknown resources that may exist. The purpose of the project will be to determine the need for implementing protective measures or data recovery efforts at the Red Oak Ridge III site, to determine the conditions and potential impacts to other identified and unidentified sites, and to make recommendations for the effective management of archeological resources on Red Oak Ridge Island.

3.00 DEFINITIONS

3.01 Cultural resources are defined to include any building, site, district, structure, object, data, or other material relating to the history, architecture, archeology, or culture of an area.

3.02 Phase I cultural resources survey is defined as an intensive, on-the-ground survey and testing of an area sufficient to determine the number and extent of the resources present and their relationship to project features. A Phase I cultural resources survey will result in data adequate to assess the general nature of the sites present; a recommendation for additional testing of those resources that, in the professional opinion of the Contractor, may provide important cultural and scientific information; and detailed time and cost estimates for Phase II testing.

3.03 Phase II testing is defined as the intensive testing of those sites that may provide important cultural and scientific information. Phase II testing will result in data adequate to determine the eligibility of the resources for inclusion on the National Register of Historic Places, a plan for the satisfactory mitigation of eligible sites that will be directly or indirectly impacted, and detailed time and cost estimates for mitigation.

4.00 SURVEY AND TESTING SPECIFICATIONS

4.01 Phase II testing will be conducted by the Contractor at site 47LC163 in accordance with Section 3.03 above.

4.02 A Phase I cultural resources survey will be conducted by the Contractor on all Corps of Engineers fee title property on Red Oak Ridge Island.

4.03 The Contractor will use a systematic, interdisciplinary approach in conducting the study. The Contractor will provide specialized knowledge and skills during the course of the study to include expertise in archeology and in other social and natural sciences as required. It is recommended that a geomorphologist or soil scientist be present at times during the testing of site 47LC163 to interpret the depositional nature of the cultural deposits.

4.04 The extent and character of the work to be conducted by the Contractor will be subject to the general supervision, direction, control, review, and approval of the Contracting Officer.

4.05 Techniques and methodologies that the Contractor uses during the investigation shall be representative of the current state of knowledge for their respective disciplines.

4.06 The Contractor must keep standard records that shall include, but not be limited to, field notebooks, site survey forms, field maps, and photographs.

4.07 The recommended professional treatment of recovered materials is curation and storage of the artifacts at an institution that can properly insure their preservation and that will make them available for research and public view. The Contractor will be responsible for making curatorial arrangements for any collections that are obtained. Such arrangements must be coordinated with the appropriate officials of Wisconsin and approved by the Contracting Officer.

4.08 The Contractor will provide all materials and equipment as may be necessary to expeditiously perform these services required of the study.

4.09 The Contractor will test the site areas sufficiently to determine the existence of cultural materials and/or features, their condition (*in situ* or disturbed), the horizontal and vertical distribution of the remains, and, if possible, the cultural affiliation of the site(s).

4.10 Recommendations on the significance of the site(s) according to the National Register of Historic Places criteria will be included in the Contractor's report. These recommendations will include a detailed justification for the significance or non-significance of the site(s), including what research questions the site(s) can answer.

4.11 The Contractor's on-the-ground examination will involve an intensive survey and shovel testing of the area to determine the number and extent of cultural resources present. These resources include standing structures as well as historical and prehistorical archeological sites.

4.12 The Contractor's survey will include surface inspection in areas where surface visibility permits adequate recovery of cultural materials and subsurface testing in all areas where surface visibility is limited or obscured. Subsurface investigation will include shovel testing, coring, soil borings, cut bank profiling, or other appropriate testing methods. If field methods vary from those specified here, they must be described and justified in the Contractor's technical report.

4.13 The required survey grid or transect interval is 15 meters (50 feet), and the testing interval is 15 meters (50 feet). However, this interval may vary depending upon field or site density/size conditions. If the Contractor does not use recommended interval, written justification should be presented in the Contractor's technical report for selection of an alternate interval. All subsurface tests will be screened through 1/4-inch mesh hardware cloth and will be recorded on appropriate testing forms. All subsurface testing forms will be included in the appendix to the Contractor's technical report. The Contractor will also indicate the locations of all subsurface tests on USGS and/or project maps and will key these with the testing forms in the appendix.

4.14 The Contractor will recommend appropriate mitigative measures, including time and cost estimates, where warranted.

4.15 All testing will employ standard archeological techniques, including formal test pits. All material will be screened through 1/4-inch mesh screen.

4.16 The tested areas will be returned as closely as practical to pre-survey conditions by the Contractor.

5.00 GENERAL REPORT REQUIREMENTS

5.01 The Contractor will submit the following types of reports, which are described in this section and in section 8.00: field report, field notes, draft technical report, and final technical report, plus a completed National Register form(s), if appropriate.

5.02 The Contractor's technical report will include, but will not be limited to, the following sections, as appropriate to the study.

a. Title page: The title page will provide the following information: the type of investigation undertaken; the cultural resources that were assessed (archeological, historical, and architectural); the project name and location (county and State); the date of the report; the Contractor's name; the contract number; the name of the author(s) and/or Principal Investigator; the signature of the Principal Investigator; and the agency for which the report is being prepared.

b. Management summary: This section will include a concise summary of the study, which will contain all essential data for using the document in the Corps of Engineers management of the project. This information will minimally include: budget; why the work was completed; summary of the study (field work; lab analysis), study limitations, study results, significance, recommendations, and the repository of all pertinent records and artifacts.

c. Table of contents

d. List of figures

e. List of plates

f. Introduction: This section will identify the sponsor (Corps of Engineers) and the sponsor's reason for the study; and an overview of the cultural resource project, with the site(s) located on USGS quad maps. This section will also define the location and boundaries of the study areas (with regional and area-specific maps); define the study area within its cultural, regional, and environmental context; reference the scope of work; identify the institution that did the work, the number of people involved in the study, and the number of person-days/hours spent on the study; identify the dates when the various types of work were completed; identify the repository of records and artifacts; and provide a brief overview or outline of how the study report will proceed and an overview of the major goals that the study and report will accomplish.

g. Previous archeological and historical studies: This section will provide a brief summary and evaluation of previous archeological and historical studies of the study area including the researchers, date, extent, adequacy of the past work, study results, and cultural/behavioral inferences derived from the research.

h. Environmental background: This section will include a brief description of the study area environment, including the following categories: geology, vegetation, fauna, climate, topography, physiography, and soils, with reference to prehistoric, historic, ethnographic, and contemporary periods. Any information available on the relationship of the environmental setting to the area's prehistory and history will also be included. This section will be of a length commensurate with other report sections.

i. Theoretical and methodological overview: This section will include a description or statement of the goals of the Corps of Engineers and the study researcher, the theoretical and methodological orientation of the study, and the research strategies that were applied in achieving the stated goals.

j. Field methods: This section will describe the specific archeological activities undertaken to achieve the stated theoretical and methodological goals. The section will include all field methods, techniques, strategies, and rationale or justification for specific methods or decisions. The description of the field methods will minimally include: a description of field conditions, topographic/physiographic features, vegetation conditions, soil types, stratigraphy, testing results with all appropriate testing forms to be included as an appendix, and the rationale for eliminating uninvestigated areas. Testing methods will include descriptions of test units (size, intervals, stratigraphy, depth) and the rationale behind their placement.

k. Laboratory methods: This section should explain in detail the laboratory methods employed and the rationale behind the method selected. This section should also contain references to accession numbers used for all collections, photographs, and field notes obtained during the study, and the location where they are permanently housed.

l. Analysis: This section will describe and provide the rationale for the specific analytic methods and techniques used, and will describe and discuss the qualitative and quantitative manipulation of the data. Limitations or problems with the analysis based on the data collection results will also be discussed.

m. Investigation results: This section will describe all of the archeological resources encountered during the study, and other data pertinent to a complete understanding of the resources within the study area. The description of the data will minimally include: a description of the site; amounts and type of material remains recovered; relation of the site or sites to physiographic features, vegetation, and soil types; direct and indirect impacts on the site(s); analysis of the site and data (e.g., site type, cultural historical components and information, cultural/behavioral inferences or patterns); site condition; and location and size information (elevation, complete quad map source, legal description, address if appropriate, and site size, density, depth, and extent).

n. Evaluation and conclusions: This section will evaluate and formulate conclusions concerning location of the site(s); size, condition, distribution, and density in relation to other sites in the area; and significance in relation to the local and regional prehistory, protohistory, and history. This section will also discuss the potential and goals for future research; discuss the reliability of the analysis; relate results of the study and analysis to the stated study goals; identify changes, if any, in the research goals; synthesize and compare the results of the analysis and study; integrate ancillary data; and identify and discuss cultural/behavioral patterns and processes that are inferred from the study and analysis results.

o. Recommendations: This section will discuss the significance of the site(s) in relation to the research goals of the study and the National Register of Historic Places criteria, make potential recommendations as to the eligibility of the site(s) to the National Register, and make suggestions with regard to the Corps of Engineers management goals. These recommendations will include a time and cost estimate for mitigation, if necessary. If it is the Contractor's preliminary assessment that the site(s) is (are) or is (are) not significant, the methods of investigation and reasoning that support this conclusion will be presented. Any evidence of cultural resources or materials that have been previously disturbed or destroyed will be presented and explained. If certain areas are not accessible, this section will make recommendations for future consideration.

p. References: This section will provide standard bibliographic references (American Antiquity format) for every publication cited in the report. References not cited in the report will be listed in a separate "Additional References" section.

q. Appendix: This section will include the Scope of Work, resumes of all personnel involved, all correspondence derived from the study, all State site forms, and all testing and any other pertinent report information referenced in the text as being included in the appendix.

5.03 The location of all sites and other features discussed in the text will be shown on a legibly photocopied USGS map and will be bound into the report. All maps will be labeled with a caption/description, a north arrow, a scale bar, township, range, map size, and dates, and the map source (e.g., the USGS quad name or published source) and will have proper margins.

5.04 All sites identified in the course of the study, including find spots and known sites, will be presented on State site forms as an appendix to the report. Data should also be provided about the present condition of the sites (disturbance by natural or manmade processes) and content of any collections from the sites. Known sites all have their State site forms updated as necessary. All State site forms will be submitted to the State Archeologist.

5.05 Failure to fulfill these report requirements will result in the rejection of the Contractor's report by the Contracting Officer.

6.00 FORMAT SPECIFICATIONS

6.01 The Contractor shall submit to the Contracting Officer the photographic negatives for all black and white photographs that appear in the final report.

6.02 All text materials will be typed, single-spaced (the draft reports should be space-and-one-half or double-spaced), on good quality bond paper, 8.5 inches by 11.0 inches with 1.5-inch binding and bottom margins and 1-inch margins on the top and other margin. All copies of the report (not the originals) will be printed on both sides of the paper.

6.03 Information will be presented in textual, tabular, and graphic forms, whichever are most appropriate, effective, or advantageous to communicate the necessary information.

6.04 All figures and maps must be clear, legible, self-explanatory, and of sufficiently high quality to be readily reproducible by standard xerographic equipment, and will have margins as defined above.

6.05 The final report cover letter shall include a budget of the project.

6.06 The draft and final reports will be divided into easily discernible chapters, with appropriate page separation and heading.

7.00 MATERIALS PROVIDED

7.01 The Contracting Officer will furnish the Contractor with the following materials: access to any publications, records, maps, or photographs that are on file at the District headquarters.

8.00 SUBMITTALS

8.01 The St. Paul District is planning on protecting site 47LC163, if necessary, with fiscal year 1985 funds. This will necessitate completing all protective measures prior to October 1, 1985. Therefore, Phase II testing of site 47LC163 must be completed no later than July 1, 1985. Survey of the remaining portions of the island can be completed after the testing of 47LC163; however, this should be done as early as possible, with no survey work extending beyond the 1985 field season.

8.02 The Contractor will submit reports according to the following schedules:

a. Field report: The original and one copy of the field report will be submitted after completion of the field testing and again after completion of the survey work. The field report will summarize the work, project/field limitations, methodology used, time used, and survey results.

b. Project field notes: One legible copy of all the project field notes will be submitted with the draft technical report.

c. Draft technical report: Seven (7) copies of the draft technical report will be submitted on or before December 1, 1985. The draft technical report will be reviewed by the Corps of Engineers, the State Historical Preservation Officer, the State Archeologist, and the National Park Service. The draft report will be prepared according to the report and contract specifications outlined in this scope of work.

d. Final technical report: The original and 15 copies of the final technical report will be submitted 60 days after the Corps of Engineers comments on the draft report are received by the Contractor. The final report will incorporate all the comments made on the draft report.

8.03 Neither the Contractor nor his representative shall release any sketch, photograph, report, or other materials of any nature obtained or prepared under this contract without specific written approval of the Contracting Officer prior to the acceptance of the final report by the Government. After the Contracting Officer has accepted the final report, distribution will not be restricted by either party except that data relating to the specific location of extant sites will be deleted in any distribution to the public.

8.04 All materials, documents, collections, notes, forms, maps, etc., that have been produced, gathered, or acquired in any manner for use in the completion of this contract shall be made available to the Contracting Officer upon request.

9.00 METHOD OF PAYMENT

9.01 Requests for partial payment under this fixed price contract shall be made monthly on ENG Form 93. A 10-percent retained percentage will be withheld from each partial payment. Upon approval of the final reports by the Contracting Officer, final payment, including previously retained percentage, shall be made.

APPENDIX B

Technical Proposal & Work Plan

PROPOSAL TO CONDUCT ARCHAEOLOGICAL INVESTIGATIONS AT RED OAK RIDGE ISLAND, UPPER MISSISSIPPI RIVER WILFLIFE AND FISH REFUGE

Submitted By:

David F. Overstreet, Ph.D.
Principal Investigator
Great Lakes Archaeological Research Center, Inc.
7509 Harwood Avenue
Wauwatosa, WI 53213

Submitted To: U.S. Fish and Wildlife Service
FWS-3-RFQ-16
ATTN: Mr. Michael Willett
Federal Building Room 668
Fort Snelling
Twin Cities, MN 55111

March 1, 1985

Introduction:

Recent investigations of prehistoric and historic archaeological sites within the floodplain and adjacent settings of the Upper Mississippi Valley reveals complex fluvial geomorphic contexts (Overstreet 1984, 1985, Church 1984). Studies which have focused on the evolution of floodplain landscapes have documented the burial of occupied surfaces by post-Middle Holocene and historic (post-A.D. 1850) sediments (Overstreet 1984). At the same time, substanial degradation has been demonstrated on surfaces not inundated during early and middle Holocene times. At the Grant River Public Use area, for example, archaeological deposits often occur as lag deposits from eolian reworking of coarse-grained sediments.

The eolian re-working of terrace settings and the burial of low-lying areas by water borne sediments raises a number of questions relative to man-land relationships. First, as present survey and excavation data are based exclusively on the investigation of relatively recent landscapes, the full range of human prehistory is unknown. As a result, the following tasks are proposed to address both research and management needs relating to identified cultural resources at Red Oak Ridge Island.

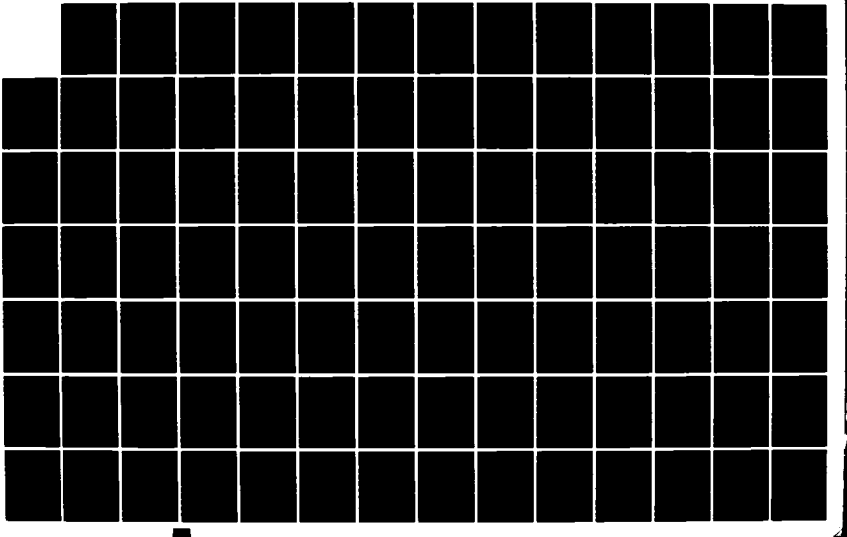
Task 1: Given the topographic setting of Red Oak Ridge Island it is unlikely that sediment deposition has been significant. Thus, potential seems low for encountering undisturbed surfaces associated with human occupation. To test this assumption, initial investigations will consist of cut-bank profiling, silt probe (Oakfield tool) and bucket auger sampling of the 6,000 square foot site. Emphases will be placed on evaluating and identifying the site formation processes. This will require analyses of core and auger samples to identify water-borne as opposed to wind-blown deposition units, fluvial and pedogenic histories of the site matrix, and evaluation of the depositional contexts of archaeological materials.

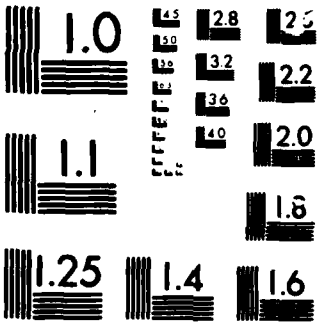
Task 2: Following completion of task 1, task 2 will be implemented. This task consists of establishing a series of horizontal and vertical controls for the site, and, conducting shovel testing of the 6000 square foot tract. Results from tasks 1 and 2 will be integrated into task 3 and will include the distribution of identified landscapes, the distribution of cultural materials, and precise locations of silt-probe tests, bucket auger samples, and shovel tests.

Task 3: Site map preparation comprises task 3. The 6000 foot tract will be mapped at a scale appropriate for the site and in compliance with the specifications cited in the Scope of Service. Maps will be developed with the use of a transit and stadia rod. During the course of map development, eight (8) 2 x 2 meter excavation units will be established and their locations recorded on the base map. Selection of locations of excavation units will be dependent on the results of tasks 1 and 2.

AD-A167 050 ARCHAEOLOGY AND GEOMORPHOLOGY OF RED OAK RIDGE ISLAND NAVIGATION POOL 7 U.. (U) GREAT LAKES ARCHAEOLOGICAL RESEARCH CENTER INC WAUWATOSA WI D F OVERSTREET ET AL. 2/3

UNCLASSIFIED FEB 86 DACW37-85-M-1142 F/G 5/6 NL





MICROCOPY CHART

Task 4. This task will consist of test excavations. Test units will be excavated by trowel and/or skimming shovels dependent on archaeological and/or geomorphic contexts. Ten centimeter arbitrary levels will be utilized unless cultural strata or geomorphic contexts require employment of other techniques. Excavations will not exceed 2.0m in depth. However, it should be noted that this may not be sufficient to encounter culturally sterile deposits. Should this be the case, silt probes and/or bucket augers will be utilized to identify the contact between the Late Woodfordian (culturally sterile) surface and Holocene (potentially occupied by prehistoric man) deposits. All excavations, including cut-banks will be photographically recorded with 35 mm. format black and white and color film. Plan views and profiles of general excavation units and features will be completed. One liter soil samples will be collected from each excavation level or features and returned to the lab for flotation or dry-screening. Additional matrix samples for chemical soils analyses will also be collected and returned to the lab for processing.

Task 5. Back filling and final recordation comprises task 5 and also completes field work at Red Oak Ridge Island.

Library and Laboratory Phases of Investigation:

Pre-field literature, of course, will be conducted prior to deployment of the field crew. Literature and archive sources will be consulted at state and local repositories to acquire base-line knowledge of specific project environs and the surrounding localities.

Laboratory investigations will be conducted subsequent to field work and consist of the following tasks.

Task 6: Cleaning, cataloging. Artifacts recovered during field work will be appropriately cleaned and site number and provenience recorded on each artifact. Lot check list records and other records in a format compatible with the requirements of the institution accepting the materials for curation (Mississippi Valley Archaeology Center, Inc.).

Task 7: Recovered archaeological and solum specimens will be sorted and recorded. Archaeological specimens will be analyzed as assemblages, i.e, lithic, ceramic, floral, faunal, bone, or other functional or stylistic categories. In so far as recovered assemblages permit, interpretation of assemblages will be directed to addressing systems of resource procurement and processing, seasonality, functionally-specific or task-specific localities within the boundaries of 47 Le 143 or other sites within the project boundaries. Identification will focus on definition of specific components, if stratigraphic contexts permit, rather than on the site assemblage as a whole.

Soil samples will be subjected to chemical analyses such as carbonate content or Ph to refine and support conclusions of site formation processes, depositional history, rates of soil development, and landscape chronology. Data from these analytical

techniques will be applied to interpretation of past climatic events and fluvial histories and their subsequent effects on human occupation of Red Oak Ridge Island.

Task 8: This task entails preparation of the draft report. Several specific efforts can be identified such as preparation of photographic illustrations and line drawings, integration of literature search, field investigations, and lab analyses in the framework of the research design. Unfortunately, we are unable at this juncture to specify the specific research questions noted in the scope of services. There is currently no published evidence of occupational sequences, abundance or lack or floral and faunal data, or fluvial history of the site. Further, to address issues such as trade and social networks at the current level of knowledge relative to 47 Lc 143 would be mere speculation. The research orientation here is one of landscape evolution. First, we seek to identify and define past and present landscapes at Red Oak Ridge Island. In turn, the development and/or destruction of landscapes will be compared with those studied at other localities in the Upper Mississippi Valley. Specifically, localities that may have comparability are the Sand Lake site in LaCrosse County, Wisconsin where unique depositional processes have buried late prehistoric components, the Osceola Site in Grant County where detailed studies have been made of depositional and erosional contexts, and Buck Creek Terrace in northeastern Iowa where significant detailed studies have been completed.

In the event that sufficient diagnostic cultural materials are recovered at 47 Lc 143 and specific components can be identified, assemblages will be utilized to place the life-ways of prehistoric and historic residents within the framework of existing models. If for example, a particular component of Early, Middle, or Late Woodland could be associated with shellfish procurement and processing, Theler's (1983) model of lowland floodplain settlement and subsistence could be evaluated. Should an Upper Mississippian or Oneota occupation be identified, results from excavation and analyses would have to be integrated within the regional framework for the LaCrosse terrace. Were Middle Archaic or earlier cultural contexts to be identified, current conceptualization regarding the age and position of floodplain landscapes would be significantly modified.

Historic period occupation should not be discounted. Overstreet et al (1983) have identified several historic period patterns of utilization of the lowland floodplain of the Upper Mississippi Valley. It would not be surprizing to encounter occupation or utilization associated with French or British fur trade eras, early logging or rafting endeavors, or clamshell button industry activities at Red Oak Ridge Island. Should such deposits be encountered, the significance of sites will have to be evaluated from the perspectives of the extant data base relating to such historic patterns. Again, addressing these "potential" research questions from current data can only be speculative.

Capabilities:

Great Lakes Archaeological Research Center, Inc. is a corporation registered under the laws of the state of Wisconsin. During the past 10 years, numerous survey, excavation, and planning projects have been conducted for state and federal agencies as well as for municipalities and clients in private industry. The Center maintains a 3,000 square foot office and lab, maintains field vehicles, field equipment, lab and office equipment, and possesses necessary staff to provide accounting and administrative services. The Center has successfully operated for a decade with an annual average of $250,000-$300,000 in cultural resources management contracts or grants.

Sample survey, recordation, and excavation forms utilized in various projects are appended for review. In addition, curriculum vitae of project personnel are also appended. Great Lakes Archaeological Research Center, Inc. does not employ unqualified college or high school students or utilize unqualified volunteer labor. All personnel meet or exceed government standards for cultural resources investigations. Further, all employees are protected by workman's compensation insurance and corporate liability insurance. Certificates of insurance will be forwarded on request. All financial records and documents are housed at Great Lakes Archaeological Research Center, Inc., in compliance with current internal revenue or other government agency requirements.

Schedule:

The following tasks and efforts are identified by person-day allocations and travel requirements to assist in evaluation of the proposal. Detailed cost figures are provided in a separate envelope.

Task:	Man-Days	Personnel
Literature Search/Archives (4 days travel)	4	P.I.
Field Work-Geomorphology (10 days travel)	10	Geomorphologist
Field Work-Excavation (30 days travel)	30	Supervisor/ 2 technicians
Field Work-Excavation (5 days travel)	5	P.I.
Lab Analyses-Soil Analyses	20	Geomorphologist/ Technicians
Report Preparation	30	P.I., Geomorphologist

Summary:

This proposal represents a work effort to ensure competent and timely completion of the scope of services presented in the RFQ. The research design is directed to securing a determination of significance (providing adequate information for a determination of eligibility of the site(s) for the National Register of Historic Places). In addition, the work plan set forth, at this level of investigation, is designed to provide a significant contribution to Midwestern History and Prehistory as well as fluvial geomorphology, paleohydrology, and paleoclimatology. This multi-disciplinary approach which draws from anthropology, history, cultural geography, geology, and geography, will address the nature of man-land relationships in the Upper Mississippi Valley in spite of the possible disturbed nature of many upland or terrace remnant sites in the Upper Valley. Even if archaeological materials are found only as lag deposits on deflated surfaces, questions of depositional and fluvial histories and impacts of past climatic events on past landscapes will be evaluated. The degree to which the deposits are undisturbed will determine the level of refinement of the articulation of past populations with ever-changing landscapes. Illucidating past human adaptive strategies will be possible only in the event that in-situ contexts with significant faunal and floral preservation are encountered.

Should the results of investigations yield significant archaeological data, an appropriate regional Journal such as state archaeological journals will receive manuscripts for publication. However, again, should results of investigations be appropriate, either The Mid-Continental Journal of Archaeology or The Field Journal of Archaeology will be sent manuscripts for review and possible publication. It is possible that significant information may relate exclusively to geomorphic and/or climatic phenomena. In that event, an appropriate journal such as Quaternary Research or Proceedings of the Wisconsin Academy of Arts, Science, and Letters would be a more appropriate outlet. Finally, should significant historical remains be encountered, The Wisconsin Magazine of History would receive a copy of the report for review and possible publication. It is the policy of Great Lakes Archaeological Research Center, Inc. to submit significant results of investigation for publication in regional journals, see for example, Bruhy & Wachman (1980), Boszhardt and Overstreet (1983), and Overstreet (1981, n.d.).

REFERENCES CITED

BRUHY, MARK E. and JOHN F. WACKMAN
1980 Test Excavations at the Butternut Lake Site (47 Fr 122), Forest County, Wisconsin. The Wisconsin Archeologist, Vol. 61 (4): 389-451.

BOSZHARDT, ROBERT F. and DAVID F. OVERSTREET
1983 Preliminary Investigations: Archaeology and Sediment Geomorphology, Navigation Pool 12, Upper Mississippi River. The Wisconsin Archeologist, Vol. 64 (1-2): 111-183.

CHURCH, PETER
1984 The Archaeological Potential of Pool No. 10, Upper Mississippi River: A Geomorphological Perspective. U.S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Mississippi.

OVERSTREET, DAVID F.
n.d. Archaeological Investigations on the Lowland Floodplain of Navigation Pool 10, Upper Mississippi River. Ms. submitted for publication in The Wisconsin Archeologist.

1981 Applications of Menominee-Winnebago Subsistence Patterns to Late Prehistoric Manifestations in the Green Bay Coastal Corridor. In: Current Directions in Midwestern Archaeology--Selected Papers from the Mankato Conference, S. Anfinson, Ed. Occasional Publications in Minnesota Anthropology, No. 9. Minnesota Archaeological Society.

1984 Archaeological Reconnaissance of Pool 10, Upper Mississippi River, Grant and Crawford Counties, Wisconsin and Allamakee and Clayton Counties, Iowa. Great Lakes Archaeological Research Center, Inc., Reports of Investigations No. 139. Wauwatosa, WI.

1985 Archaeological Investigations at the Grant River Public Use Area. Great Lakes Archaeological Research Center, Inc., Reports of Investigations No. 149. Wauwatosa, WI.

OVERSTREET, DAVID F., et al
1983 Cultural Resources Literature Search and Records Review - Upper Mississippi River Basin. Great Lakes Archaeological Research Center, Inc., Reports of Investigations No. 116. Wauwatosa, WI.

THELER, JAMES L.
1983 Woodland Tradition Economic Strategies: Animal Resource Utilization in Southwestern Wisconsin and Northeastern Iowa. Unpublished Ph.D. dissertation, Department of Anthropology, University of Wisconsin-Madison.

Red Oak Ridge Island-Contract Modification
Work Plan

Introduction:

The following work plan is designed to include additional investigations to an existing scope of work for archaeological investigations at Red Oak Ridge Island. The work plan includes survey investigations on Fish & Wildlife Service lands on Red Oak Ridge Island and at off-shore sites of 4 unnamed islands northeast of Red Oak Ridge Island. Several specific tasks are identified to secure data necessary to fully survey Red Oak Ridge Island and to assess the distribution, density, and integrity of cultural materials at inundated sites nearby.

Historic Map Analyses:

Utilizing baseline maps, e.g., GLO surveys, Mississippi River Commission maps, Brown surveys, the landforms associated with inundated sites will be reconstructed to the scale of contemporary U.S.G.S. 7.5' topographic maps. This will allow for an assessment of site contexts prior to inundation of archaeological sites associated with lock and dam construction.

Red Oak Ridge Island Survey:

Survey will be conducted on Fish & Wildlife Service lands. Methods and techniques will be consistent with those utilized for Corps of Engineer lands as directed in the Scope of Work governing the survey and testing investigations. Any sites encountered on Fish & Wildlife lands will be fully reported, however, they will not be evaluated in terms of the National Register of Historic Places criteria. Data from Fish and Wildlife Service lands will be integrated within the Corps of Engineers report.

Geomorphic Investigations:

Soil coring will be conducted on Fish and Wildlife Service lands on Red Oak Ridge Island and at the four small islands nearby. Attempts will be made to secure silt probe cores from inundated sites, however, matrix composition may prohibit recovery from underwater locations. These information sets will be incorporated within the Red Oak Ridge Island geomorphic investigations.

Shoreline Collections:

At regular intervals (10.0m), sieve collection will be conducted along a 20' strip on the northwest side of the four small islands. The density of cultural materials will be portrayed on an iso map.

Laboratory Analyses:

All cultural materials, notes, records, and other data derived from this modification workplan will be incorporated within the documents specified for the Corps of Engineers survey investigations.

APPENDIX C

Correspondence

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
1135 U.S. POST OFFICE & CUSTOM HOUSE
ST. PAUL, MINNESOTA 55101-1479

February 10, 1986

REPLY TO
ATTENTION OF
Environmental Resources Branch
Planning Division

Mr. David Overstreet
Great Lakes Archaeological Research Center, Inc.
7509 West Harwood Avenue
Wauwatosa, Wisconsin 53213

Dear Mr. Overstreet:

Enclosed are the comments of the St. Paul District, the State Historic Preservation Officer, the National Park Service, and the U.S. Fish and Wildlife Service on your Reports of Investigation No. 163, entitled Archaeology and Geomorphology of Red Oak Ridge Island, Navigation Pool 7, Upper Mississippi River Valley.

We look forward to receiving the final report. If you have any questions concerning the comments or how to address them in making corrections to the report, please contact Mr. David Berwick of my staff at (612) 725-7854.

Sincerely,

Robert J. Whiting
Acting Chief, Environmental Resources Branch
Planning Division

Enclosure
Comments

ST. PAUL DISTRICT COMMENTS
ON
GREAT LAKES ARCHAEOLOGICAL RESEARCH CENTER
REPORTS OF INVESTIGATIONS NO. 163
ARCHAEOLOGY AND GEOMORPHOLOGY OF RED OAK RIDGE ISLAND,
NAVIGATION POOL 7, UPPER MISSISSIPPI RIVER VALLEY

1. Page 10 states that Red Oak Ridge is a terrace remnant, but on page 15 it is described as a floodplain landform. This discrepancy needs to be clarified.

2. Page 27, paragraph 1: This passage mentions an unnamed island to the east of Red Oak where additional bucket auger holes were placed. Which island was this? Please refer to figure 8.

3. The test units described on page 27 should be referenced to figure 9.

4. It is impossible to identify the four unnamed islands referenced in the first paragraph (page 29) on figure 6? Perhaps another figure would better show these islands in relation to Red Oak Ridge.

5. Page 29, paragraph 2: The sentence beginning "A lensatic compass..." is awkward.

6. Page 29, paragraph 3: Parcels 1 and 2 are supposed to be shown on figure 7 but are not, and Parcel 1 consisted of 15 east-west transects that also are not shown.

7. The islands in figure 8 should be identified by the numbers referenced on page 32.

8. In the evaluation of 47LC163 (page 42) and in tables 1-5 which show the artifact frequency distribution, it does not appear that the five excavation units were taken down to sterile cultural levels. All five units were terminated at 70 cm (except for quadrant B in test unit 5, which was excavated to 90 cm), and all five units had cultural remains in the last unit excavated. Please explain the rationale for this method of excavation.

9. Because a significant amount of cultural material was located below 35 cm and because level testing of the island was limited to the first 35 cms, what is the possibility that unrecorded sites may still exist within the context of the island's geomorphology?

10. The description of Unit 2 (page 43) states that "prehistoric material was concentrated in level 4..." Based upon the distribution of material in table 2, "concentrated" does not seem an appropriate term. While the prehistoric material certainly appears to be concentrated in level 4, the lithic material is more concentrated in levels 4-6.

11. What was the rationale for excavating quadrant B of Test Unit 5 to 90 cm (page 44)?

12. The discussion of the stratigraphy of LC-163 (page 45) state that the particle size data seem to suggest that the soils between 50 and 100 cm have been deflated. In many of the test units cultural material was located in the first 50 cm. Does this suggest that the upper levels of the site are not deflated or are not as severely deflated?

13. Page 48, the word "horizonation" is not in our dictionaries. This could be reworded to say "...and inhibit natural processes that makes soil horizons apparent."

14. Page 50, last paragraph: Is "abundant" the proper term for the coarse fraction seen at the north end of the island? Figure 13 shows no sample (for fraction that is greater than 2 mm) which exceeds 4 percent.

15. Figure 20 shows bucket auger #1. Where did this sample come from?

16. The description of the sherd (page 65) shown as Plate I-B is not designated by unit and level.

17. The description is missing for the ceramic sherd in Plate III-B.

18. Table 1

a. The 20 historic items for level 2 do not agree with the number shown in lot 1-2.

b. The waste flakes shown in level 5 do not add up. Does this include the chalcedony flake described in the text?

19. Table 2: Level 3 does not show the quartzite flake recovered from this unit.

20. It would be helpful to have a map showing the locations of the shovel probes (especially positive ones) on Red Oak Island and on the four outer islands.

21. It would also be helpful to have a table that shows the artifacts that were located in the shovel tests. Currently if this information is sought, it has to be extracted from the lot check lists.

22. Please include some photographs of the sites and the eroding shorelines.

23. Why do you think there is a differing degree of Holocene degredation at the south and north ends of the island? Degradation at the north end might have been aggravated by plowing and subsequent surface erosion; however, that should affect only the uppermost portion of the solum.

24. How mixed are the diagnostic artifacts at LC-163? Is there any stratigraphic ordering?

THE STATE HISTORICAL SOCIETY OF WISCONSIN
shs
1846

HISTORIC PRESERVATION DIVISION

January 21, 1986

Mr. Wayne A. Knott
Chief, Environmental Resources Branch
St. Paul District, Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101-1479

Dear Mr. Knott:

Thank you for sending the draft of the report entitled "Archaeology and Geomorphology of Red Oak Ridge Island, Navigation Pool 7, Upper Mississippi River Valley" by D. Overstreet, J. Anderson, L. Brazeau, and P. Lurenz. We apologize for the long delay in transmitting our comments to you. We hope they will still be useful.

The report is explicit in defining its goals, but the broader purposes of the project are not addressed in the text. Our file correspondence shows that the Fish and Wildlife Service proposed erosion control measures, a laudable proposal based on our knowledge of land loss in this area. But readers should learn why the investigations were requested or deemed necessary. The information on proposed management actions scattered through various Appendixes should be brought together in a concise statement early in the report, to supplement the discussion of project goals. What proposed management actions were planned that necessitated archeological survey and testing? Or was the work more of the "Executive Order" type of survey required on all federal lands? What kind(s) of control measure(s) are planned? Will bank shaping be conducted at Red Oak Ridge and if so, to what extent? Will dredged material be dumped at the other islands and if so, what associated disturbance may result? And which agency will be responsible for the erosion control work?

The discussion on pages 10 and 11 is a useful summary of factors affecting site formation in the area. The statement (p. 11) that "it is unlikely that undisturbed archaeological sites" except very late ones will be found on the terraces may be misinterpreted by readers who are not aware that deep pit features were excavated and utilized by Woodland groups. Even seasonally occupied Woodland habitation sites often have such features. Aren't these pits often deep enough to have escaped destruction by deflation? Are there any estimates of the depth to which the effects of deflation have destroyed stratigraphic integrity? A question arising after reading pages 12 and 13 is whether sand dunes may have existed on Red Oak Ridge, as they apparently did on nearby terraces, and as suggested on pages 24 and 56. Is it not possible or likely that paleosols may be found

beneath stabilized dunes?

Our copy of the draft is missing page 15, but there appears to be no gap in the text.

On page 27, it would be useful to know the diameters of the silt probes and bucket augers and to what depth they were commonly used. The discussion of survey methods and techniques on pages 29 through 34 would be more appropriately placed under a separate "Archaeological Field Methods" heading, rather than under "Results of Investigation."

On page 42, and in reference to Figure 9, it would be useful to know how close the five test excavation units were to the eroded bank edge, and whether the areas tested are likely to be affected by bank shaping, or by erosion if the bank is not protected. It would also be useful to have references to particular illustrations (Plates) as the diagnostic artifacts are mentioned in this section (pages 42-45) rather than having to scan Table 1 (pp. 65-69) to determine which artifacts are being discussed.

The presence of a large pottery vessel portion at 47-Lc-163 in a deposit disturbed by eolian activity shows that deflation obviously affects vertical stratigraphic relationships to some degree but that artifact concentrations still appear to retain some horizontal integrity, certainly more than in settings such as plowed fields.

The question of the National Register eligibility of 47-Lc-163 is treated on pages 63 through 70. There is no question this is a multicomponent site with vertical mixing. But it is a large site also, based on the map on page 36 (Fig. 10). Twenty square meters were tested along one edge of a site that encompasses perhaps 3600 square meters. Granted that vertical mixing and erosion have affected the site, there is still quite a lot of information present in the site's ceramics, as noted at several points in the report. (Ceramics previously collected from the site and now in various collections could have been reexamined and discussed in this section.) Ceramic concentrations may mark activity areas that can be attributed with varying degrees of certainty to particular occupations. Nearly all of the diagnostic pottery appears to be generally "Middle Woodland" or "early Middle Woodland" and the tendency of Woodland peoples to excavate pit features deep enough, possibly, to have escaped major disturbance, provides some basis for believing that the site may well contain information of such importance as to make it eligible for the National Register of Historic Places.

At this point we certainly can not say that site 47 Lc-163 is eligible for the National Register. However, it is clear that the

materials already recovered from this site show it is important in leading to a possible rethinking of Woodland cultural relationships in this region, and we believe there is good reason to believe it is likely to produce even more data along these lines.

The conclusions and recommendations made with respect to the other sites investigated appear to be well founded. We agree that intensive geomorphic analysis should precede or accompany archeological work in this area. However, the search for stable buried surfaces should not blind us to the very real possibility that deep pit features and somewhat disturbed features such as pottery concentrations may remain at Pleistocene terrace sites and may contain important information not available in other settings.

We commend the report's authors and your agency for conducting this pathbreaking work and hope it will lead to further geoarcheological efforts in the Upper Mississippi River trench. Such work is essential in trying to understand this region's archeological resources and in trying to minimize the loss of information due to rapid land loss.

Sincerely,

William Green
Staff Archeologist

0590D
cc: D. Overstreet ✓
J. Dobrovolny

United States Department of the Interior
NATIONAL PARK SERVICE
ROCKY MOUNTAIN REGIONAL OFFICE
655 Parfet Street
P.O. Box 25287
Denver, Colorado 80225

IN REPLY REFER TO:

H2415 (RMR-PR)

DEC 0 4 1985

Mr. Wayne A. Knott
Chief, Environmental Resources Branch
Planning Division
Attention: Mr. David Berwick
Department of the Army
St. Paul District, Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101-1479

Dear Mr. Knott:

In response to your request of November 15, 1985, we have reviewed the draft report entitled "Archaeology and Geomorphology of Red Oak Ridge Island, Navigation Pool 7, Upper Mississippi River Valley." Enclosed please find a copy of the review comments.

With a minor exception, we find this to be thorough report that meets its stated purposes. We are especially impressed with the geomorphological approach to assessing the integrity of archeological deposits by limited sampling, data collection, and analysis. Since several such studies of the Upper Mississippi Valley have been producted by various Corps districts, we suggest that it may be appropriate to synthesize these results into a regional model to guide future archeological explorations.

Thank you for allowing us to review this report; we trust that our comments prove useful.

Sincerely,

Jack R Rudy, Chief
Branch of Interagency Archeological Services

Enclosure

United States Department of the Interior

NATIONAL PARK SERVICE

ROCKY MOUNTAIN REGIONAL OFFICE
655 Parfet Street
P.O. Box 25287
Denver, Colorado 80225

IN REPLY REFER TO:

H2415 (RMR-PR)

Memorandum

To: Review Coordinator JJH

nteragency Archeological
ces, Rocky Mountain Region

Subject: Review of "Archaeology and Geomorphology of Red Oak Ridge Island, Navigation Pool 7, Upper Mississippi River Valley"

Subject report is a draft reviewed at request of St. Paul District, Corps of Engineers. It concerns the archeological survey and geomorphological assessment of archeological deposits at five adjacent islands. Purpose of the study is to evaluate site 47LC163 for National Register eligibility, and develop a topographic model for interpreting the research values of any other archeological sites found in survey. The authors handily fulfill this purpose, and provide a useful contribution to the history of Holocene landscapes in the La Crosse area.

This report carefully assembles a large amount of field and documentary evidence to arrive at a credible history of geomorphology and paleoclimate for the study area. It has become increasing clear within the last few years that such efforts are necessary for rational assessment of archeological deposits, particularly within large river valleys, and the upper Mississippi is an ideal laboratory. Thirteen sites are reported here; seven on Red Oak Ridge Island and six on unnamed, adjacent islands. The latter islands appear to be rapidly eroding sand dunes on the (former) bottomlands, while Red Oak Ridge is a more substantial landform. Three sites including 47LC163 were previously recorded, but not assessed.

The authors describe a variety of techniques for examining surface, sub-surface and inundated deposits, both cultural and natural. Recovered lithics and ceramics suggest limited occupations and various functions from Late Archaic to Late Woodland times. Unfortunately, the geomorphological assessment indicates that little of the archeological evidence is usable. This is particularly true at site 47LC163 where test excavations failed to show stratigraphic integrity of cultural deposits. Due to aeolian re-working of surfaces, the deposit is a mixture of 1000 years of occupation. There is little analytical value to the deposit, and poor preservation of organics. Lacking of defined research value, the deposit at 47LC163 is not considered eligible for National Register listing.

While National Register evaluation of other sites was not required, the authors do include culture-historical associations and geomorphological observations in case such efforts are required in the future. The structural integrity of five sites on Red Oak Ridge Island is questionable, and little information potential is seen. Should evaluation be desired, the authors suggest further investigation of the geomorphology before deciding the necessity of archeological assessment. The same is recommended for three sites at the south tip of the island where a greater potential for structural integrity is expected. Sites located on the unnamed islands (former sand dunes) have little or no structural integrity, highly limited research potential, and are actively eroding. They are not considered eligible for National Register listing.

For the most part, this is a thorough, well-written report that meets stated purposes. I did note that the discussion of site survey on pages 34-42 failed to include a description of 47LC161 which is mentioned in the recommendations on page 71. With attention to the above, this draft should serve well as the basis of the final report.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111

IN REPLY REFER TO:
AW/PSW

NOV 26 1985

Colonel Joseph Briggs
District Engineer
U. S. Army Corps of Engineers
1135 U. S. Post Office and Custom House
Saint Paul, Minnesota 55101

Dear Colonel Briggs:

We have reviewed the draft report "Archaeology and Geomorphology of Red Oak Ridge Island, Navigation Pool 7, Upper Mississippi River Valley" by David Overstreet. Our conclusion overall is that Mr. Overstreet has adequately investigated five islands in Pool 7, and determined site 47 LC 163 does not meet the criteria for the National Register. He also identifies appropriate research questions in event of more archeological investigations on the islands. We noted four editorial changes to consider; attached are copies of the appropriate pages. Site 47 LC 163 is not on U. S. Fish and Wildlife Service land, but we are curious why test unit excavations stopped at 70 cm depth when prehistoric materials were found in all layers; apparently culturally sterile layers were not reached.

The result of combining U. S. Fish and Wildlife Service archeology with Army Corps of Engineers archeological contract seems to have worked out well. We look forward to receipt of seven copies of the final report for our internal distribution.

Sincerely yours,

Thomas F. Fellrath

Thomas F. Fellrath
Acting Assistant Regional Director
Wildlife Resources

Attachments

COPY

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111

IN REPLY REFER TO:
AW/PSW

JUL 24 1985

Colonel Joseph Briggs
District Engineer
U. S. Army Corps of Engineers
1135 U. S. Post Office and Custom House
Saint Paul, Minnesota 55101

Dear Colonel Briggs:

The U. S. Fish and Wildlife Service, Region 3, desires to enter into an agreement with the U. S. Army Corps of Engineers, Saint Paul District, as described herein.

The Wisconsin State Historic Preservation Officer has recommended an archeological survey be conducted off-shore of four small islands in Lake Onalaska, at approximately river mile 704, Pool 7, of the Mississippi River, La Crosse County, Wisconsin. The archeological survey is to be accomplished prior to placement of riprap adjacent to the northwest shore of the four islands, in a space totalling 1500 feet by 20 feet. In addition, the Service desires to complete the archeological inventory of Service-owned land on Red Oak Ridge Island, totalling approximately 15 acres.

The Corps has awarded an archeological contract to Dr. David Overstreet, Great Lakes Archaeological Research Center, to conduct an archeological inventory and analysis on Corps-owned land on Red Oak Ridge Island prior to a Corps project to stabilize the northwest shoreline of the island.

Discussion between David Berwick of your office, John Dobrovolny of our office, and David Overstreet resulted in preliminary agreement to have the Corps add to David Overstreet's contract the archeological survey work needed by the Service. David Overstreet subsequently submitted a work plan and a cost proposal for the archeological survey needed by the Service, as attached.

The agreement between the Service and the Corps would include:

1. Corps to amend the contract with David Overstreet to add the five elements as listed in the Red Oak Ridge Island-Contract Modification Work Plan transmitted June 21, 1985.

2. Corps to amend the contract with David Overstreet to include Service lands and Service interests in paragraphs 1.02, 1.05, 4.02, 5.02.f., 5.02.i., 8.02.c., 8.02.d. The Service will need seven copies of the final report for its distribution requirements.

3. Corps to inform the Service of anticipated field work dates and other coordination through the Regional Historic Preservation Officer.

4. Service to transfer to the Corps $5,714.00 in FY 1985 funds for the additional contracted work.

If you concur with this agreement, please sign below and return a copy to us as authorization for an inter-agency transfer of funds.

Sincerely yours,

John Popowski
Acting Regional Director

Attachment

CONCUR _____
U. S. Army Corps of Engineers Date

The St. Paul District has added a 10 percent fee for administrative services in order to expedite a modification to our contract. The transfer should be increased from $5,714.00 to $6,314.00.

Red Oak Ridge Island-Contract Modification
Work Plan

Introduction:

The following work plan is designed to include additional investigations to an existing scope of work for archaeological investigations at Red Oak Ridge Island. The work plan includes survey investigations on Fish & Wildlife Service lands on Red Oak Ridge Island and at off-shore sites of 4 unnamed islands northeast of Red Oak Ridge Island. Several specific tasks are identified to secure data necessary to fully survey Red Oak Ridge Island and to assess the distribution, density, and integrity of cultural materials at inundated sites nearby.

Historic Map Analyses:

Utilizing baseline maps, e.g., GLO surveys, Mississippi River Commission maps, Brown surveys, the landforms associated with inundated sites will be reconstructed to the scale of contemporary U.S.G.S. 7.5' topographic maps. This will allow for an assessment of site contexts prior to inundation of archaeological sites associated with lock and dam construction.

Red Oak Ridge Island Survey:

Survey will be conducted on Fish & Wildlife Service lands. Methods and techniques will be consistent with those utilized for Corps of Engineer lands as directed in the Scope of Work governing the survey and testing investigations. Any sites encountered on Fish & Wildlife lands will be fully reported, however, they will not be evaluated in terms of the National Register of Historic Places criteria. Data from Fish and Wildlife Service lands will be integrated within the Corps of Engineers report.

Geomorphic Investigations:

Soil coring will be conducted on Fish and Wildlife Service lands on Red Oak Ridge Island and at the four small islands nearby. Attempts will be made to secure silt probe cores from inundated sites, however, matrix composition may prohibit recovery from underwater locations. These information sets will be incorporated within the Red Oak Ridge Island geomorphic investigations.

Shoreline Collections:

At regular intervals (10.0m), sieve collection will be conducted along a 20' strip on the northwest side of the four small islands. The density of cultural materials will be portrayed on an iso-map.

Laboratory Analyses:

All [illegible] will be incorporated within the [illegible] survey investigations.

Great Lakes Archaeological Research Center, Inc.

Cultural Resource Management

7509 WEST HARWOOD AVENUE
WAUWATOSA, WISCONSIN 53213
(414) 259-6020

June 21, 1985

Mr. William Green
Historic Preservation Division
State Historical Society of Wisconsin
816 State Street
Madison, WI 53706

Dear Mr. Green:

Enclosed please find a work plan which addresses additional investigations at Red Oak Ridge Island and four small islands nearby. We now have an existing contract to provide archaeological survey and testing efforts at St. Paul District, Corps of Engineers lands on Red Oak Ridge Island. It is my understanding that while Fish & Wildlife Service will fund the work, it will be conducted under a contract modification with the St. Paul District.

With regard to your question relating to dredging at the four small islands--Mr. Dobrovolny indicated that no such impacts will in fact occur. Should you need further information relating to ostensible impacts I would recommend that you contact Mr. Dobrovolny. Finally, should you have any comments or questions regarding the work plan please contact me.

Sincerely,

David F. Overstreet

David F. Overstreet, Ph.D.
Principal Investigator

DFO/hos
Encl.

Great Lakes Archaeological Research Center, Inc.
Cultural Resource Management
7509 WEST HARWOOD AVENUE
WAUWATOSA, WISCONSIN 53213
(414) 259-6020

June 21, 1985

Mr. John Dobrovolny
U.S. Fish & Wildlife Service
Federal Building
Fort Snelling
Twin Cities, MN 55111

Dear Mr. Dobrovolny:

With regard to our discussions in St. Paul and recent telephone conversations, enclosed please find a cost proposal and work plan to conduct archaeological investigations at Fish & Wildlife Service lands on Red Oak Ridge Island and four small islands nearby.

I have forwarded copies of these documents to Mr. Berwick at the St. Paul District, Corps of Engineers. In addition, I have provided Mr. William Green, Historic Preservation Division, State Historical Society of Wisconsin, a copy of the proposed work plan. I would hope that if he has any reservations they will be addressed early in project effort.

Thank you for your cooperation and patience relating to the Red Oak Ridge Island modifications. Should you have any questions regarding the documents please contact me.

Sincerely,

David F. Overstreet

David F. Overstreet, Ph.D.
Principal Investigator/Project Manager

DFO/nw
Encl.

Great Lakes Archaeological Research Center, Inc.

Cultural Resource Management

7509 WEST HARWOOD AVENUE
WAUWATOSA, WISCONSIN 53213
(414) 259-6020

June 21, 1985

Mr. David Berwick
St. Paul District, Corps of Engineers
1135 U.S. Post Office & Custom House
St. Paul, MN 55101-1479

Dear Mr. Berwick:

Enclosed please find a copy of a cost proposal to perform archaeological investigations at Fish & Wildlife Service lands on Red Oak Ridge Island and at 4 small islands nearby. I have also included a work plan which was developed subsequent to discussions with Mr. Richard Dexter and Mr. William Green, Historic Preservation Division, State Historical Society of Wisconsin, and, Mr. John Dobrovolny, U.S. Fish & Wildlife Service.

I have forwarded a copy of the cost proposal and work plan to Mr. Dobrovolny and thus assume that he will contact you regarding transfer of funds and other necessary authorizations. In addition, I have forwarded a work plan to Mr. Green. Should he have comments or questions regarding these matters I would hope that they can be addressed early in the project efforts.

Thank you for your cooperation and patience relating to the Red Oak Ridge Island modifications. Should you have any questions regarding the documents please contact me.

Sincerely,

David F. Overstreet

David F. Overstreet, Ph.D.
Principal Investigator/Project Manager

DFO/nw
Encl.

THE STATE HISTORICAL SOCIETY OF WISCONSIN
1846
RICHARD A. ERNEY, DIRECTOR

MAY 22

May 16, 1985

5/23/85

Mr. Richard E. Toltzman
Acting Refuge Manager
Fish and Wildlife Manager
Federal Building, Fort Snelling
St. Paul, Minnesota 55111

SHSW: #485-85
RE: Stabilize 4 Islands,
Lake Onalaska

Dear Mr. Toltzman:

We have reviewed your proposal to stabilize four small islands in Lake Onalaska.

One archeological site (47-Lc-160, the McIlvaine site) is located on the island in section 36, while unconfirmed reports of archeological materials exist for the islands in section 2. No archeological sites have yet been reported for the island in section 35.

The McIlvaine site contains a high density of Woodland stage archeological material, indicative of an important campsite or other type of habitation site. Artifacts have been found on the shore and in the water as far as 150 feet from the present shore. Certainly there has been some disturbance to the site's integrity as a result of erosion, and the proposed protective action will help preserve the remaining site area. However, it is important to know more about the submerged portions of the site before they are covered, and it is important to investigate any near-shore areas that may be affected by dredging. Therefore, we recommend that a qualified archeologist conduct a controlled survey of the areas to be dredged or covered. This might best be done through seining or seiving at regular intervals, so that the distribution, density, and degree of integrity of materials can be assessed. In view of the large number of archeological sites in the Lake Onalaska area, we recommend the same procedure for the other three islands. In addition, we recommend survey of the French Island disposal site.

The recommended archeological investigations should be neither expensive nor time-consuming. Recovery of all materials to be covered should not be the goal. However, we believe it is important to obtain data on the areas to be affected so the actual impacts of this project can be thoroughly known.

THE STATE HISTORICAL SOCIETY OF WISCONSIN
816 STATE STREET · MADISON, WISCONSIN 53706

w/ h refuge staff 85

APPENDIX D

Lot Check Lists and Artifact Frequencies

TABLE 1: ARTIFACT FREQUENCY DISTRIBUTION

TEST UNIT 1

Level	Ceramic	Uni-face	Bi-face	Lithic Waste Flakes	S.S.	Chert	Fire-Cracked Rock	Historic
1	7			1		1		Dense Concentration, modern debris
2	8			2		2		28 items
3	21			27	23	4	8	6 items
4	60		1	39	33	6	15	
5			1	11	8	4	7	
6			1	3	2	2	5	
7				5		5		

TABLE 2: ARTIFACT FREQUENCY DISTRIBUTION

TEST UNIT 2

Level	Ceramic	Uni-face	Bi-face	Lithic Waste Flakes	S.S.	Chert	Fire-Cracked Rock	Historic
1				3	2	1	44	15 items
2							65	18 items
3	1			4	1	2	60	2 items
4	17			29	17	12	6	
5	3			11	2	9	1	
6				36		36		
7				6		6		

TABLE 3: ARTIFACT FREQUENCY DISTRIBUTION

TEST UNIT 3

Level	Ceramic	Uni-face	Bi-face	Lithic Waste Flakes	S.S.	Chert	Fire-Cracked Rock	Historic
1				1		1		2 items
2				4	3	1		2 items
3	2			22	17	5	9	
4	13			45	41	4	4	
5	12		4	150	149	5	7	
6				14	12	2	3	
7				11	6	5	3	

TABLE 4: ARTIFACT FREQUENCY DISTRIBUTION

TEST UNIT 4

Level	Ceramic	Uni-face	Bi-face	Lithic Waste Flakes	S.S.	Chert	Fire-Cracked Rock	Historic
1								
2			1	8	7	2		3 items
3	2			27	23	4		1 item
4	162	1	3	126	119	11	5	
5	11		2	768	712	58	13	
6	2			136	102	34	64	
7				19	7	12	4	

TABLE 5: ARTIFACT FREQUENCY DISTRIBUTION

TEST UNIT 5

Level	Ceramic	Lithic					Fire-Cracked Rock	Historic
		Uni-face	Bi-face	Waste Flakes	S.S.	Chert		
1				3	1	2	1	5 items
2				1		1	4	9 items
3	8			28	19	9		1 item
4	27		2	88	69	21	7	
5			2	26	9	18	7	
6	1			62	5	57	9	
7				13		13	2	

TABLE 6: ISLAND SIEVE PROBE RESULTS

Total Transects	Positive Probes		Cultural Material
Island 1			
12T	T.1	S.P. 3	35.5 cores
	T.2	S.P. 1	1 Chert Shatter
Island 2			
8T	T.2	S.P. 3	1 pt., 1 fl. s.s.
	T.3	S.P. 2	1 fl. s.s.
	T.3	S.P. 3	1 pt., 4 fl. s.s., 1 chert shat.
	T.4	S.P. 2	2 fl. s.s.
	T.4	S.P. 3	1 fl. s.s.
	T.4	S.P. 4	1 pt., 2 fl. s.s., 1 p. sandstone
Island 3			
8T	T.4	S.P. 3	1 fl. s.s.
	T.5	S.P. 2	1 pt.
Island 4 47 LC 160			
8T	T.1	S.P. 1	6 fl. s.s., 4 pc. R.R.
	T.1	S.P. 2	2 pts., 1 fl. s.s., 1 FCR
	T.1	S.P. 3	1 pt., 2 fl. s.s., 2 chert shat. 3 RR, 1 FCR
	T.1	S.P. 4	2 chert shat.
	T.2	S.P. 2	2 fl. s.s., 1 sandstone, 2 FCR
	T.2	S.P. 3	1 FCR, 1 Historic
	T.2	S.P. 4	1 pt., 1 fl. s.s., 2 RR
	T.3	S.P. 4	4 pt., 1 fl. s.s., 1 FCR, 3 RR
	T.4	S.P. 2	1 chert flake
	T.4	S.P. 3	1 pt., 1 fl. s.s., 1 FCR
	T.4	S.P. 4	1 pt.
	T.5	S.P. 4	1 pt., 1 chert flake, 1 RR
	T.6	S.P. 1	1 fl. s.s.
	T.6	S.P. 2	1 fl. s.s.
	T.6	S.P. 4	1 RR
	T.7	S.P. 1	1 Chert flake, 1 FCR
	T.7	S.P. 2	1 fl. s.s., 4 chert shat.
	T.7	S.P. 3	1 fl. s.s.
	T.8	S.P. 2	1 fl. s.s., 2 chert shat., 1 RR

LOT CHECK LIST

Lot Number 1-1 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 0-10 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 1 Quad A-D

CONTENTS:

Ceramics 7 body sherds

Lithics 1 chert flake

Rough Rock 2 sandstone, 4 rough rock

Bone Burned butchered bone, fish bone

Charcoal

Historic Misc. metal fragments including round and square nails, glass fragments and whiteware

Other

Washed By B.O.,C.O.,R.O Sorted By P. Lurenz, Jr Labeled By B.O.,C.O.,R.O.

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS:

Soil Description

Associations

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 1-2 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 10-20 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 1 Quad A-D

CONTENTS:

Ceramics 8 body sherds

Lithics 2 chert flakes

Rough Rock 1 rough rock

Bone _____

Charcoal _____

Historic 2 white ware fragments, 14 glass fragments, 2 earthenware fragments, 10 nails.

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 1-3 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 20-30 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island.

Test Unit 1 Quad A-D

CONTENTS:

Ceramics 20 bodysherds, 1 rimsherd

Lithics 23 silicified sandstone flakes, 1 quartzite chunk, 4 chert flakes, 1 chert shatter

Rough Rock 3 burned snadstone, 5 FCR, 3 rough rock

Bone 1 burned bone

Charcoal _____

Historic 2 brick fragments, 3 whiteware shards, 1 glass fragment

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz, Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 1-4 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 30-40 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 1 Quad A-D

CONTENTS:

Ceramics 59 bodysherds, 1 rim sherd (49 pieces from same vessel)

Lithics 33 salicified sandstone flakes, 6 chert flakes, 1 broken adze, 1 groundstone fragment/possible gorget, 1 biface tip

Rough Rock 15 FCR, 5 RR, 1 possible hammerstone

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz, Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 1-5 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 40-50 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 1 Quad A-D Quad D was sterile

CONTENTS:

Ceramics _____

Lithics 4 chert flakes, 6 silicified sandstone flakes, 1 silicified sandstone core, 1 silicified sandstone biface, 1 chalcedony flake

Rough Rock 7 FCR, 1 RR

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz, Jr Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 1-6 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 50-60 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 1 Quad A-D

CONTENTS:

Ceramics _____

Lithics 1 silicified sandstone triangular point, 1 silicified sandstone flake, 2 chert flakes

Rough Rock 5 FCR

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 1-7 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 60-70 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 1 Quad A-D B sterile

CONTENTS:

Ceramics _____

Lithics 5 chert flakes

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lorenz, Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 2-1 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 0-10 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 2 Quad A-D

CONTENTS:

Ceramics _____

Lithics 3 quartz shatter, 2 silicified sandstone flakes, 1 chert flake.

Rough Rock 44 FCR, 11 rough rock

Bone _____

Charcoal _____

Historic 1 earthenware, 6 whiteware, 5 glass fragments, 3 nails.

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 2-2 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 10-20 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 2 Quad A-D

CONTENTS:

Ceramics _____

Lithics 5 quartz shatter

Rough Rock 65 FCR, 2 rough rock

Bone _____

Charcoal _____

Historic 2 nails, 11 glass fragments, 3 earthenware, 2 whiteware

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 2-3 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 20-30 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island.

Test Unit 2 Quad A-D

CONTENTS:

Ceramics 1 bodysherd

Lithics 1 quartz flake, 1 silicified sandstone flake, 3 quartz shatter, 2 chert flakes

Rough Rock 60 FCR

Bone _____

Charcoal _____

Historic 1 nail, 1 earthenware shard

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 2-4 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 30-40 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 2 Quad A-D

CONTENTS:

Ceramics 16 body sherds, 1 rim

Lithics 17 silicified sandstone flakes, 12 chert flakes, 1 chert shatter, 1 chalcedony flake

Rough Rock 6 FCR, 6 rough rock, 1 possible hammerstone

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 2-5 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 40-50 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 2 Quad A-D

CONTENTS:

Ceramics 3 bodysherds

Lithics 2 silicified sandstone flakes, 9 chert flakes

Rough Rock 1 FCR, 1 rough rock

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz, Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 2-6 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 50-60 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 2 Quad A-D

CONTENTS:

Ceramics _____

Lithics 36 chert flakes

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 2-7 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 60-70 test Cm. below Surface. Date Collected 6/85

Associations 2 x 2m excavations on north end of Red Oak Island

Test Unit 2 Quad A-D B sterile

CONTENTS:

Ceramics _____

Lithics 6 chert flakes

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 3-1 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 0-10 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 3 Quad A-D A,C, and D sterile

CONTENTS:

Ceramics _____

Lithics 1 flake

Rough Rock _____

Bone _____

Charcoal _____

Historic 2 glass fragments

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 3-2 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 10-20 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island.

Test Unit 3 Quad A-D C sterile

CONTENTS:

Ceramics _____

Lithics 3 silicified sandstone flakes, 1 chert core, 1 chert flake

Rough Rock _____

Bone _____

Charcoal _____

Historic 2 brick fragments

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 3-3 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 20-30 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 3 Quad A-D

CONTENTS:

Ceramics 2 body sherds

Lithics 5 chert flakes, 1 chert shatter, 17 flakes

Rough Rock 9 FCR

Bone 1 piece of enamel possibly from deer molar

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 3-4 Site Name Red Oak Ridge Island III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 30-40 Cm. below Surface. Date Collected 6/85

Associations 2x2 test excavations on north end of Red Oak Ridge Is.

Test Unit 3 Quad A-D

CONTENTS:

Ceramics 13 body sherds

Lithics 4 chert flakes, 41 silicified sandstone flakes

Rough Rock 4

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By B.O.,C.O.,R.O. Sorted By P. Lurenz Labeled By B.O.,C.O.,R.O.

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 3-5 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 40-50 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 3 Quad A-D and wall scrapings

CONTENTS:

Ceramics 12 body sherds

Lithics 148 silicified sandstone flakes, 1 broken silicified sandstone biface, 3 broken chert bifaces, 2 chert flakes, 5 chalcedony flakes

Rough Rock 6 rough rock, 7 FCR

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz, Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 3-6 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 50-60 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 3 Quad B, D

CONTENTS:

Ceramics _____

Lithics 2 chert flakes, 12 silicified sandstone flakes

Rough Rock 3 FCR, 1 rough rock

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 3-7 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 60-70 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 3 Quad B,C, D

CONTENTS:

Ceramics _____

Lithics 6 silicified sandstone flakes, 5 chert flakes.

Rough Rock 3 FCR

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 4-1 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 0-10 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 4 Quad A-D sterile

CONTENTS:

Ceramics _____

Lithics _____

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 4-2 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 10-20 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 4 Quad A-D

CONTENTS:

Ceramics _____

Lithics 6 silicified sandstone flakes, 2 chert flakes, 1 silicified sandstone projectile point.

Rough Rock _____

Bone _____

Charcoal _____

Historic 1 glass fragment, 1 strap buckle, 1 misc. metal piece

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 4-3 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 20-30 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 4 Quad A-D

CONTENTS:

Ceramics 2 body sherds

Lithics 23 silicified sandstone flakes, 3 chert flakes, 1 white exotic chert

Rough Rock 3 FCR

Bone _____

Charcoal _____

Historic 1 piece misc. metal

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 4-4 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 30-40 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 4 Quad A-D

CONTENTS:

Ceramics 159 body sherds, 3 rim sherds

Lithics 115 silicified sandstone flakes, 11 chert flakes, 3 silicified biface fragments, 1 silicified sandstond blade, 1 chalcedony flake.

Rough Rock 5 FCR

Bone 9 very small bone fragments

Charcoal on pottery

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 4-5 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 40-50 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 4 Quad A-D

CONTENTS:

Ceramics 9 body sherds, 2 rim sherds

Lithics 58 chert flakes, 710 silicified sandstone, 2 silicified sandstone projectile points, 3 chert shatter

Rough Rock 13 FCR

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 4-6 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 50-60 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 4 Quad A-D

CONTENTS:

Ceramics 2 body sherds

Lithics 102 silicified sandstone flakes, 34 chert flakes

Rough Rock 64 FCR, 1 possible hammerstone

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz, Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 4-7 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 60-70 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 4 Quad A-D

CONTENTS:

Ceramics _____

Lithics 12 chert flakes, 7 silicified sandstone flakes

Rough Rock 4 FCR

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 5-1 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 0-10 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 5 Quad A-D

CONTENTS:

Ceramics _____

Lithics 1 silicified sandstone flake, 2 chert flakes

Rough Rock 1 FCR, 1 rough rock

Bone _____

Charcoal _____

Historic 3 glass fragments, 1 pull tab, 1 misc. piece of metal

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 5-2 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 10-20 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 5 Quad A-D

CONTENTS:

Ceramics _____

Lithics 1 chert shatter

Rough Rock 4 FCR

Bone _____

Charcoal _____

Historic 2 metal washers, 3 glass fragments, 1 coal slag, 2 misc. pieces of metal, 1 brick fragment

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 5-3 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 20-30 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 5 Quad A-D

CONTENTS:

Ceramics 8 body sherds

Lithics 4 chert shatter, 1 silicified sandstone chunk, 19 silicified sandstone flakes, 9 chert flakes

Rough Rock _____

Bone _____

Charcoal _____

Historic 1 bottle cap

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 5-4 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 30-40 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 5 Quad A-D

CONTENTS:

Ceramics 2 rim sherds, 25 body sherds

Lithics 21 chert flakes, 66 silicified sandstone flakes, 1 silicified sandstone drill top, 1 modified silicified sandstone projectile point, 1 utilized silicified sandstone flake

Rough Rock 7 FCR, 1 hammerstone

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 5-5 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 40-50 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 5 Quad A-D

CONTENTS:

Ceramics _____

Lithics 17 chert flakes, 9 silicified sandstone flakes, 3 chert shatter, 1 broken biface, 1 chert point tip

Rough Rock 7 FCR, 1 possible broken hammerstone

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 5-6 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 50-60 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 5 Quad A-D and wall scrapings

CONTENTS:

Ceramics 1 body sherd

Lithics 57 chert flakes, 5 silicified sandstone flakes, 2 chert shatter, 1 ground stone ax

Rough Rock 9 FCR, 3 rough rock

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 5-7 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location 60-70 Cm. below Surface. Date Collected 6/85

Associations 2 x 2m test excavations on north end of Red Oak Island

Test Unit 5 Quad A-D A,D sterile

CONTENTS:

Ceramics _____

Lithics 13 chert flakes

Rough Rock 2 FCR

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By BO/CO/RO Sorted By P. Lurenz,Jr. Labeled By BO/CO/RO

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 6 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected 6/85

Associations Shovel Test probes of ACOE Land on Red Oak Island.

AREA: A North cut bank collection and partial water collection

CONTENTS:

Ceramics 2 body sherds

Lithics 4 silicified sandstone flakes, 4 chert flakes

Rough Rock 4 FCR

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By P.L. Sorted By P. Lurenz, Jr. Labeled By P.L./N.W.

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 7 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected 6/85

Associations Shovel Test probes of ACOE Land on Red Oak Island.

AREA: A Probes T1 H1, 2,3,6; T2 H4; T3 H1 (T1 begins at North cut bank)

CONTENTS:

Ceramics 2 body sherds

Lithics 5 silicified sandstone flakes, 1 chert flake

Rough Rock _____

Bone pig molar

Charcoal _____

Historic _____

Other 2 glass fragments

Washed By P.L. Sorted By P. Lurenz, Jr. Labeled By P.L./N.W.

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 8 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected 6/85

Associations Shovel Test probes of ACOE Land on Red Oak Island.

AREA: B Probe T4 H1

CONTENTS:

Ceramics _____

Lithics 1 silicified sandstone flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By P.L. Sorted By P. Lurenz, Jr. Labeled By P.L./N.W.

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 9 Site Name Red Oak Ridge III

Feature Number _____ Site Number 47 Lc 163

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected 6/85

Associations Shovel Test probes of ACOE Land on Red Oak Island.

AREA: C beginning on north edge of sumac opening T1H2; T2H2; T3H4,5,6; T4H6

CONTENTS:

Ceramics 4 body sherd fragments

Lithics 1 chert flake, 3 silicified sandstone flakes

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By P.L. Sorted By P. Lurenz, Jr. Labeled By P.L./N.W.

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 10 Site Name Red Oak Ridge VII

Feature Number _____ Site Number 47 Lc 207

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected 6/85

Associations Shovel Test probes of ACOE Land on Red Oak Island.

AREA: D Top of west cut bank at the end of T5

CONTENTS:

Ceramics _____

Lithics 1 chert core

Rough Rock 1 rough rock

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By P.L. Sorted By P. Lurenz, Jr. Labeled By P.L./N.W.

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 11 Site Name Red Oak Ridge VII

Feature Number _____ Site Number 47 Lc 207

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected 6/85

Associations Shovel Test probes of ACOE Land on Red Oak Island.

AREA: E T7 H5; T9 H9,10; T10 H6,7,8, 8 brackets, 9, 13

CONTENTS:

Ceramics 8 body sherds

Lithics 10 silicified sandstone flakes, 16 chert flakes,
1 broken silicified sandstone biface

Rough Rock 1 FCR

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By P.L. Sorted By P. Lurenz, Jr. Labeled By P.L./N.W.

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 12 Site Name Red Oak Ridge V

Feature Number _____ Site Number 47 Lc 205

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected 6/85

Associations Shovel Test probes of ACOE Land on Red Oak Island.

AREA: F T11 H4 and east bracket

CONTENTS:

Ceramics _____

Lithics 1 chert flake, 1 silicified sandstone flake

Rough Rock 1 FCR

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By P.L. Sorted By P. Lurenz, Jr. Labeled By P.L./N.W.

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 13 Site Name Red Oak Ridge VI

Feature Number _____ Site Number 47 Lc 206

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected 6/85

Associations Shovel Test probes of ACOE Land on Red Oak Island.

AREA: G T22 H1 and 2 and shoreline at end of T22

CONTENTS:

Ceramics 1 bodysherd

Lithics 1 chert flake, 1 chert shatter

Rough Rock 2 FCR

Bone _____

Charcoal _____

Historic 1 glass fragment, 1 metal strip

Other _____

Washed By P.L. Sorted By P. Lurenz, Jr. Labeled By P.L./N.W.

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 14 Site Name Red Oak Ridge IV

Feature Number _____ Site Number 47 Lc 204

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected 6/85

Associations Shovel Test probes of ACOE Land on Red Oak Island.

AREA: H T 25 near deer blind on knoll

CONTENTS:

Ceramics 1 body sherd

Lithics _____

Rough Rock _____

Bone _____

Charcoal _____

Historic 1 metal harnest piece

Other _____

Washed By P.L. Sorted By P. Lurenz, Jr. Labeled By P.L./N.W.

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 15 Site Name Red Oak Ridge IV

Feature Number _____ Site Number 47 Lc 204

Horizontal Location _____ Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected 6/85

Associations Shovel Test probes of ACOE Land on Red Oak Island.

AREA: I

CONTENTS:

Ceramics 1 body sherd

Lithics 2 chert flakes, 1 silicified sandstone flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By P.L. Sorted By P. Lurenz, Jr. Labeled By P.L./N.W.

Date 7/85 Date 7/85 Date 7/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 16-1 Site Name Island 1
U.S. Corps of Engin. & F.W.S.

Feature Number _____ Site Number 47 Lc 211

Horizontal Location Transect 1 S.P. 3 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected 8/28/85

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 3 modified large pieces of silicified sandstone.

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 16-2 Site Name Island 1
U.S. Corps of Engin. & F.W.S.

Feature Number _____ Site Number 47 Lc 211

Horizontal Location Transect 2 S.P. 1 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 1 piece chert

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 17-1 Site Name Island 2
U.S. Corps of Engin. & F.W.S.

Feature Number _____ Site Number 47 Lc 212

Horizontal Location Transect 2 S.P. 3 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics 1 sherd cord-impressed grit-tempered

Lithics 1 tiny flake silicified sandstone

Rough Rock

Bone

Charcoal

Historic

Other

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS:

Soil Description

Associations

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 17-2 Site Name Island 2
U.S. Corps of Engin. & F.W.S.

Feature Number _____ Site Number 47 Lc 212

Horizontal Location Transect 3 S.P. 2 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 1 silicified sandstone flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 17-3 Site Name Island 2
U.S. Corps of Engin. & F.W.S.

Feature Number _____ Site Number 47 Lc 212

Horizontal Location Transect 3 S.P. 3 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics 1 grit-tempered sherd

Lithics 4 small silicified sandstone flakes

Rough Rock 1 piece chert

Bone

Charcoal

Historic

Other

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS:

Soil Description

Associations

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 17-4 Site Name Island 2
U.S. Corps of Engin. & F.W.S.

Feature Number _____ Site Number 47 Lc 212

Horizontal Location Transect 4 S.P. 2 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 2 flakes silicified sandstone

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 17-5 Site Name Island 2
U.S. Corps of Engin. & F.W.S.

Feature Number _____ Site Number 47 Lc 212

Horizontal Location Transect 4 S.P. 3 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 1 silicified sandstone flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 17-6 Site Name Island 2
U.S. Corps of Engin. & F.W.S.

Feature Number _____ Site Number 47 Lc 212

Horizontal Location Transect 4 S.P. 4 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics 1 tiny piece grit-tempered pottery

Lithics 2 silicified sandstone flakes

Rough Rock 1 small piece sandstone

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 18-1 Site Name Island 3
U.S. Corps of Engin. & F.W.S.

Feature Number _____ Site Number 47 Lc 213

Horizontal Location Transect 4 S.P. 3 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 1 silicified sandstone flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 18-2 Site Name Island 3
U.S. Corps of Engin. & F.W.S.

Feature Number _____ Site Number 47 Lc 213

Transect 5
Horizontal Location S.P. 2 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics 1 grit-tempered pottery

Lithics _____

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-1 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc-160

Horizontal Location Transect 1 S.P. 1 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 6 silicified sandstone flakes

Rough Rock 4 pieces

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-2 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 1 S.P. 2 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics 2 pieces grit-tempered pottery

Lithics 1 silicified sandstone flake

Rough Rock 1 FCR spall

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-3 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 1 S.P. 3 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics 1 small piece exfoliated grit-tempered sherd

Lithics 2 silicified sandstone flakes; 2 chert shatter

Rough Rock 3 pieces granitic; 1 FCR spall

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-4 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 1 S.P. 4 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 2 chert shatter

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-5 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 2 S.P. 2 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 2 silicified sandstone flakes

Rough Rock 2 FCR; 1 sandstone

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-6 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 2 S.P. 3 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics _____

Rough Rock 1 FCR

Bone _____

Charcoal _____

Historic 1 square nail

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-7 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 2 S.P. 4 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics 1 tiny exfoliated sherd

Lithics 1 silicified sandstone flake

Rough Rock 2 tiny pieces

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-8 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 3 S.P. 4 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics 4 tiny pieces

Lithics 1 silicified sandstone flake

Rough Rock 1 FCR spall; 3 tiny pieces

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-9 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 4 S.P. 2 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 1 chert flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-10 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 4 S.P. 3 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics 1 exfoliated-grit-tempered sherd

Lithics 1 silicified sandstone flake

Rough Rock 1 FCR spall

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-11 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 4 S.P. 4 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics 1 grit-tempered sherd

Lithics _____

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-12 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 5 S.P. 3 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 1 silicified sandstone flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

AD-A167 050 ARCHAEOLOGY AND GEOMORPHOLOGY OF RED OAK RIDGE ISLAND NAVIGATION POOL 7 U.. (U) GREAT LAKES ARCHAEOLOGICAL RESEARCH CENTER INC WAUWATOSA WI D F OVERSTREET ET AL. 3/3

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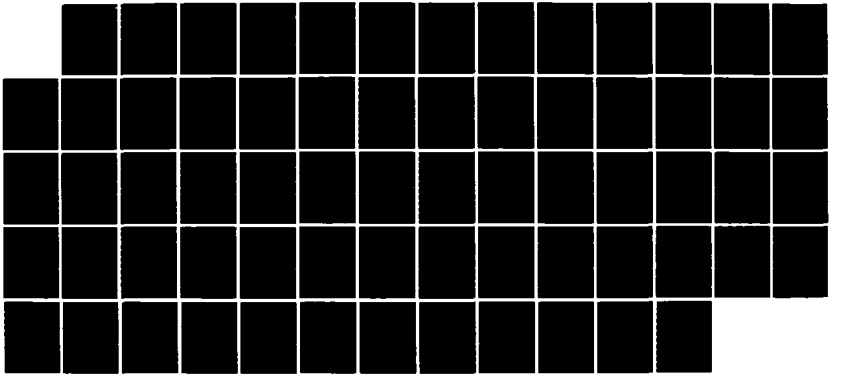

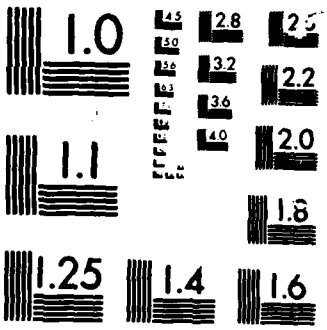

LOT CHECK LIST

Lot Number 19-13 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 5 S.P. 4 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics 1 cord-impressed grit-tempered sherd

Lithics 1 chert flake

Rough Rock 1 small piece sandstone

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-14 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 6 S.P. 1 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 1 silicified sandstone flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-15 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 6 S.P. 2 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 1 tiny silicified sandstone flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-16 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 6 S.P. 4 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics _____

Rough Rock 1 R.R. spall

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-17 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 7 S.P. 1 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 1 tiny chert flake

Rough Rock 1 FCR spall

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-18 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 7 S.P. 2 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 1 silicified sandstone flake; 4 small pieces chert shatter

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-19 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 7 S.P. 3 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 1 silicified sandstone flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 19-20 Site Name McIlvaine

Feature Number _____ Site Number 47-Lc 160

Horizontal Location Transect 8 S.P. 2 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Offshore water screened shovel probe

CONTENTS:

Ceramics _____

Lithics 2 pieces chert shatter; 1 silicified sandstone flake

Rough Rock 1 piece sandstone

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By L.A.B. Sorted By L.A.B. Labeled By L.A.B.

Date 9/3/85 Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 20 Site Name Area 1 R.O.R.I. Fish and Wildlife

Feature Number _____ Site Number 47 Lc 210

Horizontal Location Transect 2 S.P. 1 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations (E-W) shovel probe

CONTENTS:

Ceramics 1 tiny exfoliated sherd

Lithics 1 chert shatter

Rough Rock

Bone

Charcoal

Historic

Other

Washed By _____ Sorted By L.A.B. Labeled By L.A.B.

Date _____ Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS:

Soil Description

Associations

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 21-1 Site Name Area 1 R.O.R.I. Fish and Wildlife

Feature Number _____ Site Number 47 Lc 210

Horizontal Location Transect 4 S.P. 13 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations (E-W) shovel probe

CONTENTS:

Ceramics 3 tiny pieces exfoliated grit-tempered pottery

Lithics 1 chert shatter; 1 silicified sandstone flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By _____ Sorted By L.A.B. Labeled By L.A.B.

Date _____ Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 21-2 Site Name Area 1 R.O.R.I. Fish and Wildlife

Feature Number _____ Site Number 47 Lc 210

Horizontal Location 5m west of S.P. 13 Transect 4 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations (E-W) shovel probe

CONTENTS:

Ceramics _____

Lithics 1 tiny chert flake

Rough Rock _____

Bone _____

Charcoal _____

Historic .22 shell

Other _____

Washed By _____ Sorted By L.A.B. Labeled By L.A.B.

Date _____ Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 22 Site Name Area 1 R.O.R.I. Fish and Wildlife

Feature Number _____ Site Number 47 Lc 210

Horizontal Location Transect 7 S.P. 1 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations S.P. 1 along east shore

CONTENTS:

Ceramics 1 grit-tempered, cord-impressed rim sherd

Lithics 2 chert flakes; 7 silicified sandstone flakes

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By _____ Sorted By L.A.B. Labeled By L.A.B.

Date _____ Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 23 Site Name Area 1 R.O.R.I. Fish and Wildlife

Feature Number _____ Site Number 47 Lc 210

Horizontal Location Transect 7 S.P. 3 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations 1 tiny grit-tempered exfoliated sherd

CONTENTS:

Ceramics _____

Lithics _____

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By _____ Sorted By L.A.B. Labeled By L.A.B.

Date _____ Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 24 Site Name Area 1 R.O.R.I. Fish and Wildlife

Feature Number _____ Site Number 47Lc 162

Horizontal Location Transect 10 S.P. 2 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations S.P. 2 from west shore

CONTENTS:

Ceramics _____

Lithics 1 silicified sandstone flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By _____ Sorted By L.A.B. Labeled By L.A.B.

Date _____ Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 25 Site Name Area 1

Feature Number _____ Site Number 47-Lc-162

Horizontal Location Cutbank Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations _____

CONTENTS:

Ceramics 5 grit-tempered sherds, 2 exfoliated and 1 cord-impressed and 1 net-impressed

Lithics 1 silicified sandstone flake

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By _____ Sorted By L.A.B. Labeled By L.A.B.

Date _____ Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

LOT CHECK LIST

Lot Number 26 Site Name Area 1 R.O.R.I. Fish and Wildlife

Feature Number _____ Site Number 47 Lc 209

Horizontal Location Transect 7 S.P. 1 Meters N S _____ Meters E W _____

Vertical Location _____ Cm. below Surface. Date Collected _____

Associations Shovel probe 1 at east shore (to the south)

CONTENTS:

Ceramics _____

Lithics 2 silicified sandstone flakes

Rough Rock _____

Bone _____

Charcoal _____

Historic _____

Other _____

Washed By _____ Sorted By L.A.B. Labeled By L.A.B.

Date _____ Date 9/3/85 Date 9/3/85

FLOTATION INVENTORY

CONTENTS: _____

Soil Description _____

Associations _____

Collected By _____ Date _____

Sorted By _____ Date _____

APPENDIX E

Particle Size Data & Organic Carbon Worksheets

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/27/85
Initial P.L.

Site Red Oak Island BA 1 **Depth** 0-5 cm

1. a. If sample has low O.M., weigh out 40g _____

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ✓

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	8.50	20.5
4 min	8.00	20.5
8 min	8.00	20.5
15 min	8.00	20.3
30 min	7.00	20.3
(1hr) 60 min	7.00	20.3
(2hr) 120 min	7.00	20.5
(4hr) 240 min	7.00	20.5
(7hr) 420 min	7.00	20.5

8. Wet sieve:

#40 sieve 10.04g #60 sieve 12.11g #230 sieve 03.34g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/27/85
Initial P.L.

Site Red Oak Island BA 1 Depth 13-17 cm

1. a. If sample has low O.M., weigh out 40g _____

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ✓

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	8.00	20.5
	4 min	8.00	20.5
	8 min	8.00	20.5
	15 min	8.00	20.3
	30 min	7.50	20.3
(1hr)	60 min	7.00	20.3
(2hr)	120 min	7.00	20.5
(4hr)	240 min	7.00	20.5
(7hr)	420 min	7.00	20.5

8. Wet sieve:

#40 sieve 11.31g #60 sieve 12.03g #230 sieve 03.67

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/27/85
Initial P.L.

Site Red Oak Island BA 1 **Depth** 25-30 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ✓

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	8.00	20.5
	4 min	8.00	20.5
	8 min	8.00	20.5
	15 min	8.00	20.3
	30 min	7.00	20.3
(1hr)	60 min	7.00	20.3
(2hr)	120 min	7.00	20.5
(4hr)	240 min	7.00	20.5
(7hr)	420 min	7.00	20.5

8. Wet sieve:

#40 sieve 09.12g #60 sieve 14.47g #230 sieve 04.09g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/27/85
Initial P.L.

Site Red Oak Island BA 1 Depth 40-45 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	8.00	20.5
	4 min	8.00	20.5
	8 min	8.00	20.5
	15 min	8.00	20.3
	30 min	7.00	20.3
(1hr)	60 min	7.00	20.3
(2hr)	120 min	7.00	20.5
(4hr)	240 min	7.00	20.5
(7hr)	420 min	7.00	20.5

8. Wet sieve:

#40 sieve 11.16g #60 sieve 12.89g #230 sieve 03.36

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/27/85
Initial P.L.

Site Red Oak Island BA 1 Depth 62-67 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	8.00	20.5
4 min	8.00	20.5
8 min	8.00	20.5
15 min	8.00	20.3
30 min	7.00	20.3
(1hr) 60 min	7.00	20.3
(2hr) 120 min	7.00	20.5
(4hr) 240 min	7.00	20.5
(7hr) 420 min	7.00	20.5

8. Wet sieve:

#40 sieve 11.37g #60 sieve 13.58g #230 sieve 03.19g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/27/85
Initial P.L.

Site Red Oak Island BA 1 Depth 77-82 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	8.00	20.5
4 min	8.00	20.5
8 min	8.00	20.5
15 min	8.00	20.3
30 min	7.00	20.3
(1hr) 60 min	7.00	20.3
(2hr) 120 min	7.00	20.5
(4hr) 240 min	7.00	20.5
(7hr) 420 min	7.00	20.5

8. Wet sieve:

#40 sieve 14.15g #60 sieve 11.85g #230 sieve 03.02g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/27/85
Initial P.L.

Site Red Oak Island BA 1 Depth 91-95 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	7.00	20.5
4 min	7.00	20.5
8 min	7.00	20.5
15 min	7.00	20.3
30 min	7.00	20.3
(1hr) 60 min	7.00	20.3
(2hr) 120 min	6.50	20.5
(4hr) 240 min	6.50	20.5
(7hr) 420 min	6.50	20.5

8. Wet sieve:

#40 sieve 15.03g #60 sieve 11.57g #230 sieve 02.29g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/27/85
Initial P.L.

Site Red Oak Island BA 1 **Depth** 117-122 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	7.50	20.5
4 min	7.50	20.5
8 min	7.50	20.5
15 min	7.50	20.3
30 min	7.00	20.3
(1hr) 60 min	7.00	20.3
(2hr) 120 min	7.00	20.5
(4hr) 240 min	7.00	20.5
(7hr) 420 min	7.00	20.5

8. Wet sieve:

#40 sieve 11.34 g #60 sieve 14.43 g #230 sieve 03.48 g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/27/85
Initial P.L.

Site Red Oak Island BA 1 Depth 147-151 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	7.00	20.5
	4 min	7.00	20.5
	8 min	7.00	20.5
	15 min	7.00	20.3
	30 min	7.00	20.3
(1hr)	60 min	7.00	20.3
(2hr)	120 min	6.00	20.5
(4hr)	240 min	6.00	20.5
(7hr)	420 min	6.00	20.5

8. Wet sieve:

#40 sieve 10.23g #60 sieve 15.52g #230 sieve 03.44g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/27/85
Initial P.L.

Site Red Oak Island BA 1 **Depth** 178-182 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	7.00	20.5
4 min	7.00	20.5
8 min	7.00	20.5
15 min	7.00	20.3
30 min	7.00	20.3
(1hr) 60 min	7.00	20.3
(2hr) 120 min	6.00	20.5
(4hr) 240 min	6.00	20.5
(7hr) 420 min	6.00	20.5

8. Wet sieve:

#40 sieve 07.54g #60 sieve 17.52g #230 sieve 04.35g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/27/85
Initial P.L.

Site Red Oak Island BA 1 Depth 197-201 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	8.00	20.5
4 min	8.00	20.5
8 min	8.00	20.5
15 min	8.00	20.3
30 min	7.00	20.3
(1hr) 60 min	7.00	20.3
(2hr) 120 min	7.00	20.5
(4hr) 240 min	7.00	20.5
(7hr) 420 min	7.00	20.5

8. Wet sieve:

#40 sieve 14.10g #60 sieve 13.06g #230 sieve 02.16g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/30/85
Initial PL/

Site 47 Lc 160 Red Oak Ridge Island BA2 Island 3 Depth 2-7 cm

1. a. If sample has low O.M., weigh out 40g _____

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ✓

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	9.00	20.5
	4 min	9.00	20.5
	8 min	8.50	20.5
	15 min	8.50	19.5
	30 min	8.50	19.5
(1hr)	60 min	8.00	19.5
(2hr)	120 min	7.00	19.5
(4hr)	240 min	7.00	19.3
(7hr)	420 min	7.00	19.5

8. Wet sieve:

#40 sieve 03.18g #60 sieve 17.25 g #230 sieve 05.57 g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/30/85
Initial PL

Site 47 Lc 160 Red Oak Ridge Island BA2 Island 3 Depth 12-17 cm

1. a. If sample has low O.M., weigh out 40g _____

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ✓

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	9.00	20.5
	4 min	9.00	20.5
	8 min	9.00	20.5
	15 min	9.00	19.5
	30 min	9.00	19.5
(1hr)	60 min	8.50	19.5
(2hr)	120 min	8.00	19.5
(4hr)	240 min	8.00	19.3
(7hr)	420 min	8.00	19.5

8. Wet sieve:

#40 sieve 03.56g #60 sieve 14.13g #230 sieve 09.37g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/30/85
Initial PL

Site 47 Lc 160 Red Oak Ridge Island BA2 Island 3 Depth 32-36 cm

1. a. If sample has low O.M., weigh out 40g _____

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ✓

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	8.50	20.5
4 min	8.50	20.5
8 min	8.50	20.5
15 min	8.50	19.5
30 min	8.50	19.5
(1hr) 60 min	8.00	19.5
(2hr) 120 min	8.00	19.5
(4hr) 240 min	8.00	19.3
(7hr) 420 min	8.00	19.5

8. Wet sieve:

#40 sieve 02.26g #60 sieve 14.07g #230 sieve 10.99g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/30/85
Initial PL

47 Lc 160
Site Red Oak Ridge Island BA2 Depth 57-61 cm
Island 3

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	9.00	20.5
4 min	9.00	20.5
8 min	9.00	20.5
15 min	9.00	19.5
30 min	9.00	19.5
(1hr) 60 min	8.00	19.5
(2hr) 120 min	8.00	19.5
(4hr) 240 min	8.00	19.3
(7hr) 420 min	8.00	19.5

8. Wet sieve:

#40 sieve 02.74g #60 sieve 15.56g #230 sieve 08.93g

G.L.A.R.C. INC. Geomorphology Lab
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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/30/85
Initial PL

Site 47 Lc 160 Red Oak Ridge Island BA2 Island 3 Depth 75-79 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓ (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓ (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	9.00	20.5
4 min	9.00	20.5
8 min	8.50	20.5
15 min	8.50	19.5
30 min	8.50	19.5
(1hr) 60 min	8.00	19.5
(2hr) 120 min	8.00	19.5
(4hr) 240 min	8.00	19.3
(7hr) 420 min	8.00	19.5

8. Wet sieve:

#40 sieve 02.86g #60 sieve 15.21g #230 sieve 08.76g

G.L.A.R.C. INC. Geomorphology Lab
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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/30/85
Initial PL/JB

Site 47 Lc 160 Red Oak Ridge Island BA2 Island 3 Depth 80-84 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	9.00	20.5
	4 min	9.00	20.5
	8 min	9.00	20.5
	15 min	9.00	19.5
	30 min	9.00	19.5
(1hr)	60 min	9.00	19.5
(2hr)	120 min	8.50	19.5
(4hr)	240 min	8.50	19.3
(7hr)	420 min	8.00	19.5

8. Wet sieve:

#40 sieve 02.86g #60 sieve 13.91g #230 sieve 10.32g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/30/85
Initial PL/JB

Site 47 Lc 160 Red Oak Ridge Island BA2 Island 3 Depth 94-98 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	8.00	20.5
	4 min	8.00	20.5
	8 min	8.00	20.5
	15 min	8.00	19.5
	30 min	7.50	19.5
(1hr)	60 min	7.00	19.5
(2hr)	120 min	7.00	19.5
(4hr)	240 min	7.00	19.3
(7hr)	420 min	7.00	19.5

8. Wet sieve:

#40 sieve 03.30g #60 sieve 17.39g #230 sieve 07.86g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/30/85
Initial PL/JB

47 Lc 160
Site Red Oak Ridge Island BA2 **Depth** 104-108 cm
Island 3

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	7.00	20.5
4 min	7.00	20.5
8 min	7.00	20.5
15 min	7.00	19.5
30 min	7.00	19.5
(1hr) 60 min	7.00	19.5
(2hr) 120 min	7.00	19.5
(4hr) 240 min	7.00	19.3
(7hr) 420 min	7.00	19.5

8. Wet sieve:

#40 sieve 03.88g #60 sieve 16.24g #230 sieve 08.63g

G.L.A.R.C. INC. Geomorphology Lab
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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/30/85
Initial PL

Site 47 Lc 160 Red Oak Ridge Island BA2 Island 3 Depth 135-139 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	70.00	20.5
4 min	70.00	20.5
8 min	67.75	20.5
15 min	67.75	19.5
30 min	67.75	19.5
(1hr) 60 min	67.75	19.5
(2hr) 120 min	67.75	19.5
(4hr) 240 min	67.75	19.3
(7hr) 420 min	67.75	19.5

8. Wet sieve:

#40 sieve 02.68 g #60 sieve 16.69 g #230 sieve 09.32 g

G.L.A.R.C. INC. Geomorphology Lab
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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/30/85
Initial PL

Site 47 Lc 160 Red Oak Ridge Island Island 3 Depth 151-155 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ____

2. Oven dry overnight ✓

3. Break or grind into small pieces ____
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ✓ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	9.00	20.5
4 min	9.00	20.5
8 min	9.00	20.5
15 min	9.00	19.5
30 min	9.00	19.5
(1hr) 60 min	9.00	19.5
(2hr) 120 min	9.00	19.5
(4hr) 240 min	9.00	19.3
(7hr) 420 min	8.00	19.5

8. Wet sieve:

#40 sieve 02.37g #60 sieve 17.86g #230 sieve 07.76g

G.L.A.R.C. INC. Geomorphology Lab
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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 9/30/85
Initial PL

Site 47 Lc 160 Red Oak Ridge Island BA2 Island 3 Depth 199-203 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ____ g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	9.00	20.5
4 min	9.00	20.5
8 min	9.00	20.5
15 min	9.00	19.5
30 min	8.00	19.5
(1hr) 60 min	8.00	19.5
(2hr) 120 min	8.00	19.5
(4hr) 240 min	8.00	19.3
(7hr) 420 min	8.00	19.5

8. Wet sieve:

#40 sieve 07.86 g #60 sieve 15.56 g #230 sieve 05.15 g

G.L.A.R.C. INC. Geomorphology Lab
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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Ridge Island Unit 1 **Depth** 8-12 cm

1. a. If sample has low O.M., weigh out 40g _____

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any 0.06 g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	9.25	18.9
4 min	9.00	18.9
8 min	8.75	18.9
15 min	9.00	19.0
30 min	8.00	19.0
(1hr) 60 min	8.00	19.0
(2hr) 120 min	7.00	19.3
(4hr) 240 min	7.00	19.3
(7hr) 420 min	7.00	19.3

8. Wet sieve:

#40 sieve 13.88g #60 sieve 09.67g #230 sieve 03.20g

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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Ridge Island Unit 1 **Depth** 18-22 cm

1. a. If sample has low O.M., weigh out 40g _____

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ✓

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any ____ g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	8.00	18.9
	4 min	8.00	18.9
	8 min	7.75	18.9
	15 min	7.00	19.0
	30 min	7.00	19.0
(1hr)	60 min	7.00	19.1
(2hr)	120 min	7.00	19.2
(4hr)	240 min	7.00	19.2
(7hr)	420 min	6.50	19.2

8. Wet sieve:

#40 sieve 13.89g #60 sieve 09.72g #230 sieve 03.05g

G.L.A.R.C. INC. Geomorphology Lab
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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Ridge Island Unit 1 **Depth** 28-32 cm

1. a. If sample has low O.M., weigh out 40g _____

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ✓

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any 0.54 g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	8.75	18.9
	4 min	8.75	18.9
	8 min	8.75	18.9
	15 min	8.50	19.3
	30 min	8.00	19.3
(1hr)	60 min	8.00	19.3
(2hr)	120 min	8.00	19.3
(4hr)	240 min	7.75	19.3
(7hr)	420 min	7.75	19.3

8. Wet sieve:

#40 sieve 13.50g #60 sieve 09.94g #230 sieve 03.06g

G.L.A.R.C. INC. Geomorphology Lab
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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Island Unit 1 **Depth** 38-42 cm

1. a. If sample has low O.M., weigh out 40g _____

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ✓

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any 0.10 g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	7.75	19.0
4 min	7.50	19.0
8 min	7.50	19.0
15 min	7.50	19.3
30 min	7.00	19.3
(1hr) 60 min	7.00	19.3
(2hr) 120 min	7.00	19.4
(4hr) 240 min	7.00	19.4
(7hr) 420 min	7.00	19.4

8. Wet sieve:

#40 sieve 13.20g #60 sieve 10.51g #230 sieve 03.16g

G.L.A.R.C. INC. Geomorphology Lab
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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Ridge Island Unit 1 **Depth** 48-52 cm

1. a. If sample has low O.M., weigh out 40g ✓
   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____
2. Oven dry overnight ✓
3. Break or grind into small pieces ✓
   (except for large individual clasts)
4. Weigh out 30.00g ✓
5. Shake overnight w/100ml sodium hexametaphosphate ✓
6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any 0.15 g)
7. Hydrometer readings:

	Reading	Temp (c)
2 min	6.75	19.0
4 min	6.75	19.0
8 min	6.75	19.0
15 min	7.00	19.4
30 min	6.50	19.4
(1hr) 60 min	6.00	19.4
(2hr) 120 min	6.00	19.5
(4hr) 240 min	6.00	19.5
(7hr) 420 min	6.00	19.5

8. Wet sieve:

#40 sieve 13.30g #60 sieve 10.51g #230 sieve 03.25g

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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Ridge Island Unit 1 **Depth** 67-71 cm

1. a. If sample has low O.M., weigh out 40g ✓
   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____
2. Oven dry overnight ✓
3. Break or grind into small pieces ✓
   (except for large individual clasts)
4. Weigh out 30.00g ✓
5. Shake overnight w/100ml sodium hexametaphosphate ✓
6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any [illegible] g)
7. Hydrometer readings:

	Reading	Temp (c)
2 min	7.00	19.1
4 min	7.00	19.1
8 min	6.75	19.1
15 min	7.00	19.4
30 min	7.00	19.4
(1hr) 60 min	6.00	19.4
(2hr) 120 min	6.00	19.5
(4hr) 240 min	6.00	19.5
(7hr) 420 min	6.00	19.5

8. Wet sieve:

#40 sieve 13.28 g #60 sieve 10.89 g #230 sieve 03.42 g

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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Ridge Island Unit 1 **Depth** 82-86 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any 1.08 g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	7.25	19.1
4 min	7.25	19.1
8 min	7.00	19.1
15 min	7.00	19.5
30 min	7.00	19.5
(1hr) 60 min	7.00	19.5
(2hr) 120 min	7.00	19.5
(4hr) 240 min	7.00	19.5
(7hr) 420 min	6.00	19.5

8. Wet sieve:

#40 sieve 15.05g #60 sieve 08.99 g #230 sieve 03.42 g

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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Ridge Island Unit 1 **Depth** 100-105 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any 0.54 g)

7. Hydrometer readings:

	Reading	Temp (c)
2 min	5.75	19.1
4 min	5.50	19.1
8 min	5.50	19.1
15 min	5.00	19.5
30 min	5.00	19.5
(1hr) 60 min	5.00	19.5
(2hr) 120 min	5.00	19.5
(4hr) 240 min	5.00	19.5
(7hr) 420 min	5.00	19.5

8. Wet sieve:

#40 sieve 21.71g #60 sieve 05.96g #230 sieve 00.95g

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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Ridge Island Unit 1 **Depth** 138-143 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any 0.88g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	60.00	19.2
	4 min	60.00	19.2
	8 min	60.00	19.2
	15 min	60.00	19.4
	30 min	60.00	19.4
(1hr)	60 min	60.00	19.4
(2hr)	120 min	60.00	19.5
(4hr)	240 min	60.00	19.5
(7hr)	420 min	60.00	19.5

8. Wet sieve:

#40 sieve 18.05g #60 sieve 08.79g #230 sieve 01.59g

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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Ridge Island Unit 1 **Depth** 184-188 cm

1. a. If sample has low O.M., weigh out 40g ✓
   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____
2. Oven dry overnight ✓
3. Break or grind into small pieces ✓
   (except for large individual clasts)
4. Weigh out 30.00g ✓
5. Shake overnight w/100ml sodium hexametaphosphate ✓
6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any 0.74g)
7. Hydrometer readings:

	Reading	Temp (c)
2 min	6.75	19.3
4 min	6.75	19.3
8 min	6.75	19.3
15 min	6.00	19.4
30 min	6.00	19.4
(1hr) 60 min	6.00	19.4
(2hr) 120 min	6.00	19.4
(4hr) 240 min	6.00	19.4
(7hr) 420 min	6.00	19.4

8. Wet sieve:

#40 sieve 24.42g #60 sieve 03.94g #230 sieve 00.58g

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PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Ridge Island Unit 1 **Depth** 223-228 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces _____
   (except for large individual clasts)

4. Weigh out 30.00g

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any 0.20 g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	7.00	19.3
	4 min	7.00	19.3
	8 min	7.00	19.3
	15 min	7.00	19.3
	30 min	7.00	19.3
(1hr)	60 min	7.00	19.3
(2hr)	120 min	6.00	19.3
(4hr)	240 min	6.00	19.3
(7hr)	420 min	6.00	19.3

8. Wet sieve:

#40 sieve 15.43 g #60 sieve 11.62 g #230 sieve 01.79 g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Ridge Island Unit 1 **Depth** 265-269 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops _____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any 0.03 g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	7.25	19.3
	4 min	7.00	19.3
	8 min	7.00	19.3
	15 min	7.00	19.3
	30 min	7.00	19.3
(1hr)	60 min	7.00	19.3
(2hr)	120 min	7.00	19.3
(4hr)	240 min	7.00	19.3
(7hr)	420 min	7.00	19.3

8. Wet sieve:

#40 sieve 24.83g #60 sieve 04.24g #230 sieve 00.32g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

PARTICLE SIZE CHECKLIST & DATA SHEET

Date 10/2/85
Initial PL/JB

Site Red Oak Ridge Island Unit 1 **Depth** 320-324 cm

1. a. If sample has low O.M., weigh out 40g ✓

   b. If sample has high O.M., weigh out 60g, treat w/20ml H_2O_2 until reaction stops ____

2. Oven dry overnight ✓

3. Break or grind into small pieces ✓
   (except for large individual clasts)

4. Weigh out 30.00g ✓

5. Shake overnight w/100ml sodium hexametaphosphate ✓

6. Pour through #10 sieve and funnel into settling tube ✓
   (Record weight of granules in sieve, if any 0.00g)

7. Hydrometer readings:

		Reading	Temp (c)
	2 min	7.75	19.1
	4 min	7.75	19.1
	8 min	7.75	19.1
	15 min	7.00	19.3
	30 min	7.00	19.3
(1hr)	60 min	7.00	19.3
(2hr)	120 min	7.00	19.3
(4hr)	240 min	7.00	19.3
(7hr)	420 min	7.00	19.3

8. Wet sieve:

#40 sieve 24.94g #60 sieve 04.16g #230 sieve 00.37g

G.L.A.R.C. INC. Geomorphology Lab
(Anderson & Bendix 1985)

ORGANIC MATTER DATA SHEET

G.L.A.R.C. INC., GEOMORPHOLOGY LAB 1985

Site Red Oak Island 3 Bal Date 10-1-85 Inital PL

Sample depth (cm)	$FeSo_4$ normality	Initial volume $FeSo_4$	Ending volume $FeSo_4$	Volume $FeSo_4$ used	Sample weight (g)	Organic carbon %	Organic carbons %
standard	0.98	0.0	10.2	10.2			
2-7	"	10.2	18.8	8.6	0.5	1.14	1.96
12-17	"	18.8	28.2	9.4	"	0.57	0.98
32-36	"	28.2	37.8	9.6	"	0.43	0.74
57-61	"	37.8	47.6	9.8	"	0.29	0.50
75-79	"	47.6	57.2	9.6	"	0.43	0.74
80-84	"	57.2	67.2	10.0	"	0.16	0.28
94-98	"	10.0	20.0	10.0	"	0.16	0.28
104-108	"	20.0	30.0	10.0	"	0.16	0.28
135-139	"	30.0	40.2	10.2	"	0.00	0.00
151-155	"	40.2	50.2	10.0	"	0.16	0.28
199-203	"	50.2	60.4	10.2	"	0.00	0.00

ORGANIC MATTER DATA SHEET

G.L.A.R.C. INC., GEOMORPHOLOGY LAB 1985

Site Red Oak Island Unit 1 Date 10/6/85 Inital PL

Sample depth (cm)	$FeSo_4$ normality	Initial volume $FeSo_4$	Ending volume $FeSo_4$	Volume $FeSo_4$ used	Sample weight (g)	Organic carbon %	Organic carbons %
Standard	0.98	0.0	10.2	10.2			
8-12	"	10.2	18.8	8.6	0.50	1.14	1.96
18-22	"	18.8	27.8	9.0	"	0.86	1.48
28-32	"	27.8	36.8	9.0	"	0.86	1.48
38-42	"	36.8	46.2	9.4	"	0.57	0.98
48-52	"	46.2	5	9.0	"	0.86	1.48
67-71	"	55.2	65.2	10.0	"	0.16	0.28
82-86	"	65.2	75.2	10.0	"	0.16	0.28
100-105	"	75.2	85.2	10.0	"	0.16	0.28
138-142	"	85.2	95.2	10.0	"	0.16	0.28
184-188	"	0.0	10.2	10.2	"	0.00	0.00
223-228	"	10.2	20.4	10.2	"	0.00	0.00
265-269	"	20.4	30.6	10.2	"	0.00	0.00
320-324	"	30.6	40.8	10.2	"	0.00	0.00

ORGANIC MATTER DATA SHEET

G.L.A.R.C. INC., GEOMORPHOLOGY LAB 1985

Site Red Oak Island Bal Date 9/29/85 Inital PL

Sample depth (cm)	$FeSo_4$ normality	Initial volume $FeSo_4$	Ending volume $FeSo_4$	Volume $FeSo_4$ used	Sample weight (g)	Organic carbon %	Organic carbons %
Standard	0.98	0.0	10.2	10.2			
0-5	"	10.2	16.5	6.3	0.5	2.78	4.79
13-17	"	16.5	24.8	8.3	"	1.36	2.34
25-30	"	24.8	34.2	9.4	"	0.57	0.98
40-45	"	34.2	43.6	9.4	"	0.57	0.98
62-67	"	43.6	53.6	10.0	"	0.16	0.28
77-82	"	53.6	63.0	9.4	"	0.57	0.98
91-95	"	63.0	73.0	10.0	"	0.16	0.28
117-122	"	73.0	83.2	10.2	"	0.00	0.00
147-151	"	83.2	93.4	10.2	"	0.00	0.00
178-182	"	60.0	69.6	9.6	"	0.43	0.74
192-201	"	69.6	79.8	10.2	"	0.00	0.00

APPENDIX F

Wisconsin Archaeological Codification

File Entries

TYPE OF SITE:

Mounds ☐ Village ☐ Campsite ☒ Garden Beds ☐
Petroglyphs ☐ Worksite ☐ Cemetery ☐ Cache ☐
Quarry ☐ Cave or Rockshelter ☐ Other:

47 La 704
CODE NUMBER

Name of site	County	Township and range	Location in section	Present owner
	La Crosse	Campbell T16.. ...	SW¼,SE¼, SE¼,SE¼ Section 2	U.S. Army Corps of Engineers
Reported by: GLARC, Inc. 6/21/85	**Date**			

Geographical Location Southeast part of ...OUL land, on ridge approx. 50m from east shore of Red Oak Island

DESCRIPTION OF SITE: Small scatter of grit-tempered pottery, with chert and hixton flakes.

CULTURE: multi-component possibly archaic through woodland

REFERENCES:

Wisconsin Archeologist	Series	Vol.	No.	Page

Boszhardt, R 1983 A comparison of the floodplain archaeology of navigation pools 7 and 8 at La Crosse with pools 10, 12 and 16 of the Upper Mississippi River

SPECIMENS FROM SITE IN POSSESSION OF: GLARC, Inc.

REMARKS:

WISCONSIN ARCHEOLOGICAL CODIFICATION FILE

TYPE OF SITE:

Mounds ☐ Village ☐ Campsite ☒ Garden Beds ☐

Petroglyphs ☐ Worksite ☐ Cemetery ☐ Cache ☐

Quarry ☐ Cave or Rockshelter ☐ Other:

47 La 205
CODE NUMBER

Name of site	County	Township and range	Location in section	Present owner
	La Crosse	Campbell T16n R6W	SW¼,NW¼, SE¼,SE¼, Section 2	U.S. Army Corps of Engineers

Reported by: GLARC, Inc. **Date** 6/21/85

Geographical Location Southern toe of high ridge(660) on the west central side of Red Oak Island

DESCRIPTION OF SITE: Large piece of fire-cracked rock and small lithic scatter

CULTURE: indeterminent

REFERENCES:

Boszhardt, R. 1983 A comparison of the floodplain archaeology of navigation pools 7 and 8 at La Crosse with pools 10, 12, and 16 of the Upper Mississippi River

Wisconsin Archeologist Series Vol. No. Page

SPECIMENS FROM SITE IN POSSESSION OF: GLARC, Inc.

REMARKS:

WISCONSIN ARCHEOLOGICAL CODIFICATION FILE

TYPE OF SITE:

Mounds ☐ Village ☐ Campsite ☒ Garden Beds ☐

Petroglyphs ☐ Worksite ☐ Cemetery ☐ Cache ☐

Quarry ☐ Cave or Rockshelter ☐ Other:

47 La 206
CODE NUMBER

Name of site	County	Township and range	Location in section	Present owner
	La Crosse	Campbell T16N R6W	NE¼, NW¼, SE¼, SE¼ Section 2	U.S. Army Corps of Engineers

Reported by: CLARC. Inc. **Date** 6/21/85

Geographical Location East central side of Red Cap Island, on ridge near waters edge.

DESCRIPTION OF SITE: Scatter of Fire-cracked Rock, grit-tempered pottery, and chert flakes.

CULTURE: multi-component, possibly archaic through woodland

REFERENCES: **Wisconsin Archeologist** **Series** **Vol.** **No.** **Page**

Boszhardt, R. 1983 A comparison of the floodplain archaeology of navigation pools 7 and 8 at La Crosse with pools 10, 12, and 16 of the Upper Mississippi River

SPECIMENS FROM SITE IN POSSESSION OF: GLARC, Inc.

REMARKS:

WISCONSIN ARCHEOLOGICAL CODIFICATION FILE

TYPE OF SITE:

Mounds ☐ Village ☐ Campsite ☒ Garden Beds ☐

Petroglyphs ☐ Worksite ☐ Cemetery ☐ Cache ☐

Quarry ☐ Cave or Rockshelter ☐ Other:

47 La 207
CODE NUMBER

Name of site	County	Township and range	Location in section	Present owner
Reported by: **Date** GLARC, Inc. 6/21/85	La Crosse	Campbell T14N R8W	SE¼,SE¼, NW¼,SE¼ Section 2	U.S. Army Corps of Engineers

Geographical Location Southern Toe of ridge on Northwest side of Red Oak Island, on the south edge of the fallowed field

DESCRIPTION OF SITE: Large scatter of Fire-cracked rock, grit tempered pottery, and Hixton and chert flakes

CULTURE: Multi-component possibly archiac through woodland

REFERENCES:

Wisconsin Archeologist Series Vol. No. Page

Boszhardt, R. 1983 A comparison of the floodplain Archaeology of Navigation Pools 7 and 8 at La Crosse with Pools 10, 12, and 16 of the upper Mississippi River

SPECIMENS FROM SITE IN POSSESSION OF: GLARC, INC.

REMARKS:

WISCONSIN ARCHEOLOGICAL CODIFICATION FILE

TYPE OF SITE:

Mounds ☐ Village ☐ Campsite ☒ Garden Beds ☐

Petroglyphs ☐ Worksite ☐ Cemetery ☐ Cache ☐

Quarry ☐ Cave or Rockshelter ☐ Other:

47-LC-209
CODE NUMBER

Name of site	County	Township and range	Location in section	Present owner
F.&W.S. R.O.R.I. #1	LaCrosse	T.16N R8W Campbell	NW¼ NE¼, NE¼ NE¼ Sec. 11	U.S. Fish and Wildlife Service

Reported by: GLARC Date: 9/3/85

Geographical Location: The site is located along the east bank approx. 10'-15' above the water approx 25m South of the East. Line between sections 2 & 11

DESCRIPTION OF SITE:

Cultural material is distributed along the east bank for an approx distance of 75 M (N-S) and approx 30 M (E-W). The material recovered from shovel probes includes chert and silicified sandstone flakes and small sherds of possibly Late Woodland grit-tempered pottery

CULTURE: Late Woodland?

REFERENCES: Wisconsin Archeologist Series Vol. No. Page

GLARC Reports of Investigation No.

SPECIMENS FROM SITE IN POSSESSION OF: GLARC.

REMARKS:

WISCONSIN ARCHEOLOGICAL CODIFICATION FILE

TYPE OF SITE:

Mounds ☐ Village ☐ Campsite ☒ Garden Beds ☐

Petroglyphs ☐ Worksite ☐ Cemetery ☐ Cache ☐

Quarry ☐ Cave or Rockshelter ☐ Other:

47-Lc-210
CODE NUMBER

Name of site	County	Township and range	Location in section	Present owner
F & W.S RoRI #2	La Crosse	T16N R8W Campbell	SE¼, SW¼, NE¼, SE¼ Sec. 2	U.S Fish and Wildlife Service
Reported by: GLARC Date 9/3/85				

Geographical Location The site is located along the east bank approx 5'-10' above the water.

DESCRIPTION OF SITE:

Cultural material limited to 2 silicified sandstone flakes were recovered from a shovel probe.

CULTURE: Undetermined

REFERENCES: Wisconsin Archeologist Series Vol. No. Page

GLARC Reports of Investigation No. 1653

SPECIMENS FROM SITE IN POSSESSION OF: GLARC

REMARKS:

WISCONSIN ARCHEOLOGICAL CODIFICATION FILE

TYPE OF SITE:

Mounds ☐ Village ☐ Campsite ☒ Garden Beds ☐

Petroglyphs ☐ Worksite ☒ Cemetery ☐ Cache ☐

Quarry ☐ Cave or Rockshelter ☐ Other:

47-LC-211
CODE NUMBER

Name of site	County	Township and range	Location in section	Present owner
U.S. C. of E. and F.W.S. Island 1	La Crosse	T16N R 8W CAMPBELL Town	NE¼, SW¼, SE¼, NE¼ Sec. 2	U.S. Corps of Engineers & U.S. Fish and Wildlife Service
Reported by: GLARC Date: 9/3/85				

Geographical Location: This site is located off the west shore at the south end of this 100 M. long Is. approx. 250 M NE of the NE side of Red Oak Ridge Is.

DESCRIPTION OF SITE:

Water screening of Lake bottom, 5', 10', 15' and 20' off the west shore near the southern tip of the island yielded three large pieces of silicified sandstone.

CULTURE: Undetermined

REFERENCES: Wisconsin Archeologist Series Vol. No. Page

G.L.A.R.C. Reports of Investigation No.

SPECIMENS FROM SITE IN POSSESSION OF: G.L.A.R.C.

REMARKS:

WISCONSIN ARCHEOLOGICAL CODIFICATION FILE

TYPE OF SITE:

Mounds ☐ Village ☐ Campsite ☒ Garden Beds ☐

Petroglyphs ☐ Worksite ☐ Cemetery ☐ Cache ☐

Quarry ☐ Cave or Rockshelter ☐ Other:

47-LC-212

CODE NUMBER

Name of site	County	Township and range	Location in section	Present owner
U.S. C. of E and F.W.S. Island 2	LaCrosse	T16N R8W Campbell	SW¼, NW¼ SE¼, NE¼ Sec. 2	U.S. Corps of Engineers & U.S. Fish & Wildlife Service

Reported by: GLARC Date: 9/3/85

Geographical Location: This site is located off the west shore of this 80 M. long island approx. 300 M NE of the NE side of Red Oak Ridge Is.

DESCRIPTION OF SITE:

Water screening of lake bottom along west shore of the island yielded 11 sm. silicified sandstone flakes and 3 sm. pieces of grit-tempered pottery

CULTURE: Late Woodland ?

REFERENCES: Wisconsin Archeologist Series Vol. No. Page

G.L.A.R.C. Reports of Investigation No.

SPECIMENS FROM SITE IN POSSESSION OF: G.L.A.R.C.

REMARKS:

WISCONSIN ARCHEOLOGICAL CODIFICATION FILE

TYPE OF SITE:

Mounds ☐ Village ☐ Campsite ☒ Garden Beds ☐

Petroglyphs ☐ Worksite ☐ Cemetery ☐ Cache ☐

Quarry ☐ Cave or Rockshelter ☐ Other:

47-LC-213
CODE NUMBER

Name of site	County	Township and range	Location in section	Present owner
U.S. C. of E. and F.W.S. Island 3	La Crosse	T17N R8W Onalaska	SW¼, NE¼ SW¼, SE¼ Sec. 35	U.S. Corps of Engineers & U.S. Fish and Wildlife Service

Reported by: GLARC Date: 9/3/85

Geographical Location: This site is located off the west shore of this 100 M long island approx. 900 M North of Red OAK Ridge Es

DESCRIPTION OF SITE:

Waterscreening of lake bottom along the west shore of the island yielded 1 silicified sandstone flake and 1 sm. piece of grit-tempered pottery.

CULTURE: Undetermined

REFERENCES: Wisconsin Archeologist Series Vol. No. Page

G.LARC Reports of Investigation No.

SPECIMENS FROM SITE IN POSSESSION OF: G.LARC

REMARKS:

WISCONSIN ARCHEOLOGICAL CODIFICATION FILE

END

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