

**SHPO MANUAL
FOR ARCHAEOLOGICAL PROJECTS
IN MINNESOTA**

Scott Anfinson
National Register Archaeologist



MINNESOTA HISTORICAL SOCIETY

**State Historic Preservation Office
345 Kellogg Blvd. W.
St. Paul, MN 55102
651-296-5434
FAX 651-282-2374
E-MAIL mnshpo@mnhs.org**

July 2005



TABLE OF CONTENTS

INTRODUCTION

Purpose of the Manual	1
The Role of the Minnesota SHPO	1
The Role of the Minnesota State Archaeologist	2
The Role of Agencies	3
The Role of Native Americans	3
SHPO Visitor Protocols and Resources	4

GENERAL GUIDELINES FOR ARCHAEOLOGICAL PROJECTS

Introduction	7
Research Designs	8
Field Procedures	9
Laboratory Analysis and Curation	11
Reporting	12
Annual Reports	15
Public Reporting	15
Site Inventory Forms	15
Radiometric Dates	16
Quality Assurance	17

SPECIAL CONSIDERATIONS

Historical Archaeology	17
Geomorphology	19
Predictive Locational Modeling for Precontact Sites	22
Professional Obligations	24

GUIDELINES FOR LITERATURE SEARCHES

Introduction	25
Basic Sources	26
Other Sources	27
Reporting	27

GUIDELINES FOR RECONNAISSANCE (PHASE I) SURVEYS

Introduction	27
Research Design	28
Literature Search	29
Field Procedures	29
Laboratory Analysis	33
Reporting	33



GUIDELINES FOR INTENSIVE (PHASE II) SURVEYS

Introduction 35
Research Design 36
Literature Search 39
Field Procedures 39
Laboratory Analysis 40
Reporting 40

GUIDELINES FOR TREATMENT (PHASE III) ACTIVITIES

Introduction 41
Data Recovery Plans 42
Research Design 42
Literature Search 43
Field Procedures 43
Laboratory Analysis 44
Reporting 46

GUIDELINES FOR MANAGEMENT PLANS

Introduction 46
HRMP Sections 47

PROFESSIONAL QUALIFICATIONS

Introduction 48
Principal Investigator 49
Other Project Personnel 50

APPENDICES

A. Minnesota Archaeological Site Form 52
B. Minnesota Absolute Dating Form 56
C. Minnesota Archaeological Regions 57



INTRODUCTION

Purpose of the Manual

This manual outlines State Historic Preservation Office (SHPO) expectations for archaeological projects in Minnesota. These are projects sponsored by the SHPO, projects reviewed by the SHPO under Section 106 of the National Historic Preservation Act (NHPA), and projects complying with Minnesota laws with respect to the role of the Minnesota Historical Society (MHS) as carried out by the SHPO. The manual replaces an earlier version issued by the SHPO in 1993.

The purpose of the manual is not to create another layer of regulation, but to clarify existing regulations, to promote consistency in methods, and to assist agencies and contractors to carry out their legal responsibilities with regard to archaeological sites and to satisfy the management needs of both agencies and the SHPO. The manual describes standard procedures for Minnesota archaeological projects, but adherence to these procedures does not necessarily fulfill all the requirements of sponsoring agencies, Tribal Historic Preservation Offices (THPOs), or the State Archaeologist.

For federal Section 106 projects and projects funded by the federal Historic Preservation Fund (HPF), the manual is a supplement to the Secretary of the Interior's Standards and Guidelines (SISG). The manual does not review the SISG nor does it go into any detail regarding the Section 106 process, although if this manual is followed the SISG should be satisfied and the archaeological requirements of Section 106 should be met. The implementing regulations for Section 106 (36 CFR 800) can be found at the web site (www.achp.gov) of the Advisory Council on Historic Preservation (ACHP). The SISG as well as other federal regulations and laws can be found on the National Park Service web site (www.cr.nps.gov).

This manual was developed in consultation with agencies and archaeologists who work in Minnesota. It utilized manuals from adjacent states especially with regard to field techniques, geomorphology, and underwater archaeology.

The Role of the Minnesota SHPO

The Minnesota SHPO is within a department of the Minnesota Historical Society. While the SHPO's principal responsibilities are defined in the NHPA, the SHPO also has historic preservation duties under Minnesota state law. The SHPO acts for the MHS for the review of state agency projects which may affect state archaeological sites as required in the Minnesota Field Archaeology Act of 1963 (Mn Statutes 138.40), the review of state agency projects which may affect sites listed on the State or National Register of Historic Places under the Minnesota Historic Sites Act (Mn Statutes 138.665, Subd.2), and for projects that need to complete an Environmental Assessment Worksheet (EAW) as required by the Minnesota Environmental Rights Act (Mn Statutes 116B; Minnesota Rules 1987, 4410.0200-4410.7800).

Under Section 101 of the National Historic Preservation Act, the duties of the SHPO are as follows:

- 1) Implement a statewide survey and maintain an inventory of historic properties.
- 2) Identify and nominate properties to the National Register of Historic Places.
- 3) Implement a statewide historic preservation plan.
- 4) Administer a federal grants program.



- 5) Assist federal, state, and local governments with historic preservation duties.
- 6) Work with state and federal agencies to ensure historic properties are considered by planning and development.
- 7) Assist with education and training for federal historic preservation programs.
- 8) Help local governments carry out local historic preservation programs.
- 9) Consult with federal agencies regarding undertakings and management plans.
- 10) Review rehabilitation proposals involving federal assistance.

As defined in 36 CFR 800, the SHPO plays a “central role” in the Section 106 process and “advises and assists federal agencies in carrying out their 106 responsibilities.” The SHPO insures that agencies make “a reasonable and good faith effort” to consider the effects of their undertakings on historic properties. *Historic Properties* for the purposes of Section 106 are defined as sites, districts, buildings, structures, or objects that are included in or are eligible to the National Register of Historic Places. In a larger sense, however, historic properties can also be defined as any locations that are part of the historic fabric of the state; this includes unevaluated properties and, under state law, even properties that may not be eligible for the National Register. The SHPO has no official role in other federal historic preservation legislation such as the National Environmental Policy Act (NEPA), although 36 CFR 800 encourages federal agencies to coordinate their NHPA compliance with NEPA.

The SHPO uses similar review procedures and standards for both federal and non-federal projects. For instance, Minnesota archaeological laws do not set standards for site significance and do not discuss integrity, but the SHPO evaluates affected sites using National Register Criteria and suggests treatments of significant state sites that are consistent with Section 106.

The Role of the Minnesota State Archaeologist

The duties of the State Archaeologist are outlined in the Minnesota Field Archaeology Act in Chapter 138.31 - .42 of state law and in the Minnesota Private Cemeteries Act (MS 307.08). These statutes can be viewed at the Minnesota Legislature’s web site (www.leg.state.mn.us/leg/statutes.htm).

Under the Field Archaeology Act, the Office of the State Archaeologist (OSA) shares some duties with the Minnesota Historical Society (MHS), but the OSA is not affiliated with the MHS or the SHPO. The OSA and the MHS/SHPO operate independently but cooperatively with regard to their shared duties. The Minnesota State Archaeologist is an employee of the Department of Administration.

As defined in the Field Archaeology Act, the State Archaeologist approves licensing of qualified individuals to engage in field archaeology on state sites. The MHS Director’s Office (not the SHPO) then issues the licenses. *State sites* are defined as non-federal public land or water areas that contain evidences of archaeological interest. Archaeologists need to apply to the OSA to obtain a license. (The address of the OSA is: Office of the State Archaeologist, Fort Snelling History Center, St. Paul, MN 55111.) State agencies are required to submit project plans to the OSA and the MHS/SHPO when known or suspected state sites on their lands may be affected by the implementation of these plans.

The OSA assigns official site numbers to archaeological sites and then provides copies of the numbered forms to the SHPO. The SHPO enters the sites in its database and shares the database with the OSA.



The OSA is also charged with authenticating burial sites in Minnesota under State Statutes 307.08. The MHS has no role in the authentication process. When a known or suspected burial is involved with a development project under review by the SHPO, the SHPO copies the OSA with appropriate correspondence.

The Role of Agencies

The responsibilities of federal, state, and local agencies with regard to archaeological sites are outlined in a variety of laws, regulations, and guidelines. Under Section 106 of the NHPA, federal agencies take the lead in the consideration of potential impacts of their undertakings to historic properties, but must consult with the SHPO/THPO, recognized Indian tribes, and the public regarding these impacts. It is the agencies' responsibility to insure that "a reasonable and good faith effort" is made to identify, evaluate, and appropriately treat all historic properties that may be affected by their activities. Several federal agencies have professional cultural resource management staff in Minnesota. These agencies include the Federal Highway Administration, the Army Corps of Engineers, and the National Park Service.

State or local agencies utilizing non-federal funds, undertaking projects on non-federal land, or implementing projects not subject to federal licenses/permits are not required to follow the procedures outlined in Section 106 of the NHPA. Under Minnesota's Field Archaeology Act, state agencies must supply the Minnesota Historical Society and the State Archaeologist with their development plans when known or suspected sites on their lands may be affected by the implementation of these plans. The Minnesota Environmental Quality Board (EQB) submits copies of Environmental Assessment Worksheets (EAWs) to the MHS/SHPO for comment on potential effects to historic properties by a great variety of privately funded developments in Minnesota.

Several state agencies have full-time cultural resource management staff to assist with their historic preservation responsibilities. The Minnesota Department of Transportation (MnDOT) has three staff archaeologists and a long-standing commitment to considering impacts of road building activities on archaeological sites. Three divisions of the Minnesota Department of Natural Resources (DNR) support full-time archaeological programs; State Parks, Forestry, and Trails and Waterways.

The Role of Native Americans

Minnesota currently has three formally defined Tribal Historic Preservation Offices (THPOs): Leech Lake, Mille Lacs, and White Earth Bands of Ojibwe. The THPOs have assumed 106 responsibilities for archaeological sites and traditional cultural properties as well as other duties, however the SHPO has retained Section 106 responsibility for buildings, structures, and landscapes within these reservations. Agencies and contractors need to consult both the THPOs and the SHPO about federal undertakings within these reservations.

Minnesota has four other Ojibwe reservations and four BIA-recognized Dakota communities. Under 36 CFR 800, agencies are required to consult Native American tribes at all stages of project development if an undertaking may affect a historic property that has religious or cultural significance to a group even if the undertaking is outside reservation boundaries.

For the purposes of state actions, Indians in Minnesota are also represented by the Minnesota Indian Affairs Council (MIAC). The State Archaeologist works with the MIAC with regard to Indian-related state sites and burials. The MIAC has no official role in the federal



Section 106 process, however, and consultation with the MIAC alone does not constitute adequate Native American consultation under Section 106.

SHPO Visitor Protocols

The SHPO is located on the A Level of the Minnesota History Center in St. Paul. Normal business hours are 8:30 – 4:30 Tuesday through Friday. The office is currently closed to visitors on Mondays. When entering the Minnesota SHPO, all visitors must sign in. SHPO staff will explain the file system. More specific information on the files can be received from other staff especially from the Inventory Coordinator, the Historian, or the Archaeologist. Files cannot be removed from the SHPO office and should not be re-filed by occasional users.

Requests for computer database searches are made to the Inventory Coordinator for historic properties or reports. The SHPO will not make complete electronic copies of the databases for public or contractor use, although limited searches are occasionally given out. Phone or mail requests can also be made for database searches, but only for limited information such as inventory data for several sections or a rural township. The SHPO's phone number, fax number, and e-mail address are listed on the cover of this manual.

There is a photocopy machine located in the SHPO office for both staff and public use. Non-staff use of this machine should be limited to ten minutes at a time and no more than one hour per day. Staff must always be given priority access to the photocopy machine. As a rule, visitors should avoid attempting to photocopy large sets of files or numerous long reports and complete essential research while in the office. The inventories are constantly being expanded or revised, so attempts to build independent inventories are futile because they may be out of date within days. SHPO staff are not available to perform research for contractors or agencies and are not able to handle requests for photocopying large files or lengthy documents.

Inventory files can contain copies of historic black and white photographs or frames from contact sheets. Most of these are from the MHS audio/visual collection and the negative number or photograph inventory numbers are written on the SHPO copy. Prints of MHS photographs can be ordered through the main reference library at the History Center.

Availability of SHPO Staff

SHPO staff members are available for individual conferences and larger meetings, but appointments should be set up several days in advance. Non-complicated Review and Compliance projects should not require a SHPO meeting for project initiation or to discuss survey results. These can be addressed through written submissions. Most meetings should be held at the SHPO offices to reduce staff travel time unless something needs to be illustrated at another office, another agency is sponsoring the meeting, or a project or property needs to be reviewed in the field.

SHPO Inventories

The Minnesota SHPO has five major sets of inventory files: History/Architecture Inventory, History/Architecture Reports, Archaeological Sites, Archaeological Reports, and Review and Compliance. The paper records of these files are stored in several large banks of file cabinets in the main work area of the SHPO office. The Minnesota SHPO also has a number of miscellaneous files that are available to researchers. These include Shipwreck files, Ghost Town files, Fur Trade Post files, Property Type files, and Historic Contexts files. Staff also maintain files based on research interests and current projects. For example, the SHPO Archaeologist has



files on the history and archaeology of the Minneapolis and St. Paul riverfronts, flour milling, urban archaeology, and underwater archaeology.

The SHPO maintains the official inventory of historic properties in Minnesota as specified in the NHPA and Minnesota Statutes 138.081. This inventory is physically housed in two separate sets of files: the History/Architecture files contain records of buildings, structures, and landscapes and the Archaeological Site files contain records of archaeological sites.

A statewide, county-by-county survey undertaken by the SHPO between 1977 and 1988 largely compiled the History/Architecture files. While SHPO surveyors visited every city in the state, the SHPO's standing structure inventory is far from complete as it was largely based on drive-by surveys and there was no attempt to comprehensively survey rural areas. The Archaeology files were initially based on the University of Minnesota's/State Archaeologist's site files first compiled in the 1960s. These files were re-organized and significantly expanded by the SHPO's statewide archaeological survey between 1978 and 1981 and by a major SHPO computerization initiative in the mid-1990s. The SHPO site files contain both officially numbered sites and sites that have been reported but have no official site form.

The inventory files were fully computerized during 1995-96 with the assistance of funding from the Minnesota Department of Transportation (MnDOT). The computer files are maintained using ACCESS database software. Computer searches of the inventories allow for rapid and comprehensive indexing based on fields such as location and historic context. It also assists in locating reports associated with particular projects. The inventory files are GIS-compatible with UTM locational information. Meta data regarding the electronic files can be obtained from the SHPO Inventory Coordinator.

Historic property locational information is also maintained on a set of 7.5' USGS maps that are organized by county. Archaeological sites appear on these maps in red and buildings/structures appear in brown. These maps are not open to public browsing, but may be accessed by contractors or other researchers upon request.

Public access to the inventory files is unrestricted with regard to History/Architecture, but access to the Archaeology files is restricted because they contain sensitive information. Generally, a legitimate research interest must be demonstrated for access to the Archaeology files. SHPO staff monitor use of the Archaeological files.

As of July 2005, the SHPO databases had the following totals: 16,596 Archaeological Sites; 51,971 Structures/Buildings; 4,447 Archaeological Reports; 1,007 History/Architecture Reports; 1,534 National Register properties. Only 104 archaeological sites (7% of the Minnesota listings) are listed on the National Register. Officially numbered sites account for 9,751 (59%) of the total sites.

History/Architecture Inventory and Reports

The History/Architecture files are organized by county and city/township, although properties listed on or determined eligible for the National Register of Historic Places (NRHP) are in alphabetical order at the beginning of each county. Pink labels designate NRHP-listed properties and NRHP-eligible properties have green labels; these files contain the NRHP forms, correspondence, research materials, and photocopies of black-and-white photographs. Inventoried properties that haven't been evaluated for the NRHP are contained within city or township files. Information for most of the properties in the History/Architecture files is limited to the original survey form. History/Architecture survey reports were originally integrated into



the inventory files, but are now being moved into separate file cabinets utilizing the same numbering and filing system as the Archaeological Reports.

Archaeological Site Inventory

Unlike the history/architecture survey, the SHPO's statewide archaeological survey conducted fieldwork in only 24 of 87 counties and only small portions of the investigated counties were examined in any detail. Other archaeological surveys have been more localized, except for the Hill/Lewis and J.V. Brower surveys of the late 19th century that focused on mapping earthworks throughout the state as summarized in Newton Winchell's *The Aborigines of Minnesota* (1911). The lack of a comprehensive statewide archaeological survey means that only a small fraction of archaeological sites in Minnesota have been recorded.

The Archaeological Site files are organized by county and within the county by the alphanumeric Smithsonian system site number. By convention this "official site number" in Minnesota is issued by the OSA. The numbered folders in the SHPO files for the most part duplicate the OSA's files, although different materials may be added to each set of files over time. Pink and blue labels designate the same type of NRHP files as in the History/Architecture files, but Archaeological files are organized by site number not National Register status or site name. At the beginning of each county, a set of general files has miscellaneous information on sites in that county and Lloyd Wilford's University of Minnesota field notes (1935 - 1960).

Unlike the OSA files, the SHPO archaeological site files contain sites that either have not been confirmed by formal archaeological survey or have no official site form completed. Folders for these sites have information contained in survey reports, maps, historic documents, or correspondence. These sites are designated by one-up alphabetic designations for each county (e.g., 21BKa) and are referred to as "alpha" sites. These folders are in the file drawers after the officially numbered sites for each county.

Archaeological Reports Inventory

A third major set of file cabinets contains archaeological reports. The majority of these reports have been completed for surveys conducted for projects completed in compliance with federal or state historic preservation laws over the last 30 years. The files are organized by county, and the reports are assigned inventory numbers by county and year of the report (e.g., AK-99-01). Reports that involve surveys in more than one county are placed in multiple county drawers and are assigned a one-up number preceded by the year of the report (e.g., MULT-99-01). There are also separate drawers for annual reports of long-term, multi-county surveys such as the Trunk Highway program (1968-93), the County/ Municipal Highway program (1975-93), the Office of the State Archaeologist (1964 - Present), Department of Natural Resources archaeology programs, and National Forest cultural resources management programs. The electronic index file for the Archaeological Reports is updated quarterly.

Review and Compliance Files

The SHPO also maintains extensive Review and Compliance (R&C) files containing details on the thousands of development projects the SHPO reviews each year under Section 106 and a variety of state laws. These files contain construction plans, staff comments, correspondence, and other pertinent review information. Three years worth of R&C paper files are kept in the SHPO office. Older files are sent to the MHS-maintained State Archives where



they can be retrieved within several days. The R&C files are not open to public browsing, although staff will retrieve selected files upon request.

Contractor Lists

The SHPO maintains lists of contractors for archaeology and history/architecture projects. These lists are sent to agencies and project sponsors when surveys are recommended by the SHPO. Individuals or firms are added to the list upon request by mail. Principal Investigator resumes or *curriculum vitae* should accompany the request and these are kept on file at the SHPO. The contractor lists are provided for information purposes only to those who may require the services of an archaeological or historical consultant. Inclusion on the list does not constitute endorsement by the SHPO of the consultant's professional qualifications or past performance. It is recommended that work references be checked and multiple bids obtained before contracting with a consultant. SHPO staff will not recommend specific contractors, but may be able to comment on the quality of a consultant's previous work.

GENERAL GUIDELINES FOR ARCHAEOLOGICAL PROJECTS

Introduction

Projects in this manual are classified as five basic types: **Literature Searches**, **Reconnaissance Surveys (Phase I)**, **Intensive Surveys (Phase II)**, **Treatment Activities (Phase III)**, and **Management Plans**. Each type of project is dealt with in detail in its own section. Some general guidance applies to all archaeological projects, however, as outlined in this section of the manual. The Minnesota SHPO requests that terminology used in this manual be used when referring to archaeological projects undertaken in Minnesota. For example, do not use terms like "Class III CRM Inventory."

The **Registration** process for the National Register, the State Register, or even for local historic sites registers could also be defined as a type of archaeological project. Registration is dealt with by numerous National Register bulletins and in the SISG, so the SHPO manual does not cover this type of project in detail. National Register Bulletin 36 and its recent successor explicitly deal with registering archaeological properties. Some supplemental guidance is presented in the manual pertaining to evaluating archaeological sites for National Register eligibility.

As part of the Review and Compliance process associated with Section 106 of the National Historic Preservation Act and various Minnesota laws, the SHPO can recommend archaeological surveys when sites may be present within a project area. The SHPO's recommendation is only a recommendation. In other words, the agency to whom the recommendation is made can choose to not require the survey, although they need to justify this decision.



Research Designs

Before an archaeological project can proceed, the investigator must prepare a research design. Briefly stated, a research design should define the objectives of the proposed work and carefully consider the methods to be used in both the field and the lab. The research design provides the focus for an archaeological project to ensure that the project efficiently and adequately fulfills management needs and research objectives.

For any archaeological project, the research design, field procedures, laboratory analysis, and reporting must be clearly linked as a whole. The research design is critical to choosing the appropriate field methods. The materials gathered in the field must be analyzed in such a way as to address the questions posed in the research design. Reporting must describe the procedures in enough detail to demonstrate that the research design was properly followed and clearly describe the results of the research.

The SISG do not provide consistent guidance on constructing research designs for the various phases of archaeological projects. The SISG Inventory section has a fairly detailed discussion suggesting a research design have three sections: Objectives, Methods, and Expected Results. The SISG Evaluation section does not even discuss the need for a research design. The SISG Documentation (Treatment) section states that a research design consists of a definition of goals and the methodology for reaching them.

For Minnesota SHPO purposes, research designs at all phases of archaeological work should contain the following:

Objectives. Research designs must address the objectives of an archaeological project usually outlined in a **scope of work** or a **request for proposals (RFP)**. A research design must define clearly the project's research problems, the specific research questions to be addressed, and the expected results. The research questions should not simply be a laundry list of potential questions, but include only *important* and *answerable* questions that focus the fieldwork and analytical methods to obtain necessary information. Questions should not be trivial, but anticipate answers that will add significant insight to our understanding of the past. The objectives must also include a critical assessment of the relevant historic contexts and property types in the project area, the physical extent of the area to be investigated, and the amount and kinds of information to be gathered.

Methods. The project's research methods must be clearly related to the research question(s) identified in the Objectives section. Any proposed archival research, field techniques, or analytical methods should be carefully explained so that others using the gathered information can understand how and why the information was obtained. The methods selected should be compatible with the geographical area, historical contexts, and the kinds of properties most likely to be present. The type of personnel to be used must also be carefully considered in order to insure that appropriate expertise is available to attain the objectives. Every project must have a Principal Investigator who should meet the Secretary of the Interior's Professional Qualifications Standards. Other project personnel should be determined by the project's objectives and the methods required carrying them out. The more complex the project, the more extensive the qualification requirements and experience for project personnel. For instance, the personnel for Phase I surveys need not have extensive experience in identifying particular cultural/historical



index types of artifacts, but this kind of expertise may be critical in Phase II and III projects.

The SHPO generally does not pre-review research designs for Literature Searches or Reconnaissance (Phase I) archaeological surveys unless the proposed methods deviate significantly from standard procedures outlined in this manual or the project is especially complex. Final reports for all archaeological projects, however, must contain a section clearly labeled “Research Design.” Intensive surveys (Phase II) that are addressing site eligibility or gathering detailed information for developing treatment plans do not necessarily need pre-reviewed research designs either unless there are complicated issues involved or the methods deviate significantly from the standard archaeological procedures outlined in this manual. Phase III research designs should always be submitted to the SHPO before excavation begins usually as part of a data recovery plan.

Once the project begins, investigators are expected to follow the methods and objectives outlined in the research design. Deviations from the research design should be discussed with or submitted to the SHPO if prior consultation with the SHPO had assisted in constructing the research design. This is especially important with regard to data recovery projects subject to a Memorandum of Agreement (MOA).

Field Procedures

Because field conditions and historical contexts vary greatly nationwide, the SISG do not provide guidelines for field methods. Archaeological field schools, which are usually run by academic institutions, tend to focus on large scale, site-specific data recoveries rather than reconnaissance and evaluative surveys and often reflect the preferred methods of a single individual. Site types and site exposure also vary by geographic area. Traditional archaeological field methods therefore vary from state to state, especially with regard to applicability to CRM projects.

In 1977, the Council for Minnesota Archaeology (CMA) issued brief guidelines for CRM-focused field methods in the state. State agencies, private contractors, and the SHPO have generally followed these guidelines, but they are now inadequate to deal with the complex situations and new methods of CRM archaeology. MnDOT’s MnModel project also developed a set of recommended field procedures. Some of these methods have applicability to the SHPO manual, but overall they were explicitly focused on parcel surveys used to gather data for site locational modeling.

The SHPO manual presents a set of field procedures that are recommended for most CRM and research archaeology projects in Minnesota. These methods cannot, however, anticipate every field situation so some innovation is expected.

Field methods will vary by project scope, survey phase, environmental conditions, and research objectives. Detailed guidance by survey phase is provided in the sections that follow. In general, field methods must be appropriate to address management needs and to answer the questions posed in the research design.

- *Phase I* surveys attempt to identify the presence or absence of sites and initially define site limits so the field methods must reasonably maximize the vertical and horizontal sampling of the project area.



- *Phase II* surveys attempt to evaluate the importance of sites, refine the site limits both vertically and horizontally, and provide enough understanding for developing and implementing Phase III research designs. Field methods must provide critical details with regard to the depositional setting, cultural contexts, site integrity, artifacts and feature densities, and the potential of the site to answer important research questions.

- *Phase III* projects gather enough data from important sites or portions of sites to mitigate adverse effects from development activities or fulfill research objectives by answering important research questions. Field methods must carefully but efficiently locate, define, and recover data from use-areas, artifact concentrations, and features. Provenience data must be recorded in detail.

Construction monitoring is not an appropriate reconnaissance or evaluative field procedure in Minnesota except in rare instances where it is impractical to perform pre-construction sub-surface testing (e.g., beneath an existing building). Construction monitoring often does not allow for options such as project re-design or preservation in place, options that must be considered by most environmental protection regulations. Monitoring may be an appropriate part of a treatment (Phase III) activity. This would include monitoring machine stripping of the plowzone to expose features.

Most fieldwork in Minnesota is undertaken during the warm season when the ground is not frozen and snow cover is absent. **Winter fieldwork** is occasionally necessary, however, but such work is expected to follow the same standards as warm season work.

Carefully documenting fieldwork while it is in progress is critical for proper analysis and reporting. Documentation needs vary by the phase of the archaeological project, but daily logs describing archaeological work should be kept during all phases. Sketch maps should be prepared for all work carried out within archaeological sites; these maps should show known site boundaries, significant landforms/cultural features, and locations of excavation units. Maps should be tied into the real world through project stationing, addresses/legal locations, or GPS coordinates. Photographs should be taken to document site conditions and significant features. Photographic logs should record the subject, date, direction of view, and photographer.

For all phases of research, *artifacts must be collected and retained* unless prior approval is obtained from the SHPO and the regulating agency or if a private landowner objects to their removal. Artifacts are the keys to understanding site function, historical context, and research potential. Field personnel are often inadequately trained to undertake complex artifact analysis, especially when artifacts have not been properly cleaned or when comparative collections or experts are not readily available for consultation. Furthermore, artifacts are often the only physical evidence that a site exists and they may be needed to convince officials that additional work or site avoidance is required. Not all artifacts from surface surveys need to be collected and retained, however, as described on page 32 of this manual.

Artifacts collected on private property technically belong to the landowner, but every effort should be made to encourage private landowners to donate the artifacts to public repositories or at least permit temporary removal for analysis. Artifacts from federal land are federal property and artifacts from non-federal public land in Minnesota are the property of the state. Archaeological materials collected from public sites should not be discarded without the approval of the land management agency.



The Principal Investigator is responsible for obtaining landowner permission to enter land. It is against the law in Minnesota to enter private property without landowner permission. The Principal Investigator is also responsible for obtaining all required federal, state, and local permits to undertake archaeological work on public property.

Laboratory Analysis and Curation

The level of artifact analysis will vary by the project phase. The methods selected should be consistent with the research questions identified in the project's research design. While a focused orientation should be addressed in the initial phases of the analysis, it should not preclude a flexibility of approach to the data as the project proceeds. In selecting analytical methods, the analyst should consider continuity of research by reviewing data resulting from previous work in the area. All levels of archaeological projects must basically classify and tabulate recovered artifacts. For example, basic prehistoric ceramic classification should include vessel portion (e.g., rim, body), temper, surface treatment, and historical index type if possible. A concise, tabular record of specimens and their provenience must be prepared during the analysis.

Artifact cleaning techniques should be used that are appropriate to the material. Care should be taken to not remove or destroy coatings or encrustations that may contain important information (e.g., pigment on ground stone tools, charred organic matter on sherds). Preservation of unstable or fragile materials must begin in the field. If treatment in the field is not possible, preservation should be performed immediately upon conclusion of fieldwork. Long-term curation of materials should be planned for in the research design and the requirements of the final repository should be considered before the materials are processed. At a minimum, all materials must be stored in a manner that preserves provenience, ensures conservation, and allows access to other researchers.

A complete inventory must be maintained during the cataloging process. All written records, including field notes, must be curated at the same institution as the archaeological materials. The use of acid-free paper is encouraged. Any data recorded on an electronic medium must also be printed and included with the other material. All photographic documentation must be catalogued in a manner appropriate for curation. Photos should be cross-referenced on both photo logs and site forms and on all pertinent field and laboratory records. Developing and storage techniques for film must consider long-term curation. The SHPO has detailed guidelines for photographic procedures associated with SHPO-sponsored projects and National Register nominations. Laboratory records must also be maintained for materials requiring special or intensive analysis.

Before SHPO or OSA-reviewed archaeological projects can proceed in Minnesota, the contractor must arrange with an appropriate institution for the curation of the archaeological artifacts and the associated inventory information (notes, photographs, maps, catalogue sheets). Long-term curation responsibilities must be acknowledged and agreed upon in writing prior to the beginning of fieldwork. Collections obtained from public lands or obtained with federal funds must meet the curation requirements specified in the Curation of Federally-Owned and Administered Archaeological Collections, *Federal Register*, Volume 55, No. 177, September 12, 1990, pp. 37630-37639 (36CFR79). Approved institutions include the Minnesota Historical Society, the Science Museum of Minnesota, and the University of Minnesota-Duluth.

Reporting



Project sponsors, regulating agencies, or Principal Investigators can submit project completion reports to the SHPO. In the case of Section 106, it is the agency's responsibility to insure that the report is completed and agencies should submit the final report to the SHPO along with an accompanying letter that states the overall Section 106 finding (No Historic Properties Affected, No Adverse Effect, or Adverse Effect) as well as eligibility/significance opinions regarding any involved sites.

Only *one copy* of a Review and Compliance archaeological report needs to be submitted to the SHPO unless History/Architecture information is also included; then two copies need to be submitted. *Do not submit draft reports* for Review and Compliance project reviews unless special circumstances apply and these have been discussed with the SHPO archaeologist in advance. The SHPO does not edit R&C reports. *Do not stamp* the SHPO copy with statements like "Privileged Information - Do Not Release." SHPO files are open to the public with some restrictions to protect sensitive information.

Letter reports for Literature Searches and Reconnaissance Surveys may be submitted in lieu of formal reports if the project under review involves a relatively small area (less than 40 acres) that does not contain archaeological sites. The letter report should contain a detailed description of the project (location, acreage, type of project), a description of the current land use, the date of the survey, a description of the archaeological survey methods, the names of the personnel involved in the survey, and the results of the survey. A photocopy of a USGS 7.5' map with the project area clearly depicted must accompany the letter report. The letter report does not need to contain regional environmental histories, regional culture histories, lengthy references, or lengthy background discussions. Letter reports should be signed by the Principal Investigator.

Agency survey reporting forms are generally not accepted by the SHPO in lieu of formal archaeological reports unless the forms are consistent with the SISG reporting guidelines or the individual surveys are comprehensively summarized in an annual report. Inventory forms should be submitted to the SHPO along with annual reports or approved reporting forms if Minnesota site numbers are unassigned. Some agency submittals may meet the requirements of a letter report listed above.

Each formal report should consist of the following sections: **Cover/Title Page**, **Management Summary/Abstract**, **Report Body** (main text), and **References Cited**. **Appendices** may be added if needed. The report should be written as much as possible in non-technical language so it is understandable by the project sponsors and the general public. Contractors should also review the reporting requirements of the contracting agency, THPOs, and the State Archaeologist to insure compliance with their standards.

Cover/Title Page

Make the *title as short as possible* because titles need to be entered into the SHPO report database and long titles make this process more difficult and use of the database more cumbersome. In general include the following items in the title: the **level of the archaeological work**, the **name of the project**, the **county** (and **city** if applicable), and **Minnesota**. For example, "An Archaeological Reconnaissance Survey of County Road 37 in Beltrami County, Minnesota." If the project sponsor or agency requires additional information such as a more exact location or contract/project numbers, put this in a sub-title.

Do not use "Cultural Resource Management Survey" in the title unless the report addresses *all* potential historic property types including archaeological sites, buildings, structures, landscapes,



and traditional cultural properties. Do not use just “An Archaeological Investigation...” without being specific about the level of the investigation.

Other items that need to be on the title page are the report authors, Principal Investigator, institutional affiliation of the archaeologists, the SHPO Review and Compliance Number if applicable, and the date of the report (month and year).

Management Summary/Abstract

The management summary or abstract needs to appear as a separate page. *It should not exceed one page in length.* The basic information it contains is generally what goes into the various fields of the SHPO archaeological reports database and what is needed to make a Review and Compliance finding. It should contain a *brief* summary of the project including:

- type of project (e.g., highway construction, pipeline) and basic scope
- level of archaeological work (e.g., reconnaissance survey)
- name of Principal Investigator and institutional affiliation
- survey dates (days, months, and year)
- location: county, township, range, sections (if large project use county only; if in multiple counties, list all counties)
- the SHPO region and sub-region where the project is located (see Appendix C)
- number of acres surveyed or length of survey in miles and corridor width
- the project sponsor and government agency involved
- brief description of methods employed (e.g., shovel testing)
- the use of any special analytical techniques (e.g., C14 dating)
- a brief description of located sites: number, type, contexts, and state site number
- site eligibility recommendations if applicable
- management recommendations (e.g., effect finding, project alternatives)

Report Body

The report body is the main text of the report that presents a detailed description of the project, the archaeological methods employed, and the results. In most cases, the report body should be divided into the following sub-sections: **Project Description, Research Design, Literature Search, Work Summary, Results, and Recommendations.**

The **Project Description** should:

- describe the project
- define the project APE (Area of Project Effect)
- briefly describe the environmental setting (expand for Treatment Activities)
- provide a photocopy of a 7.5' USGS map clearly showing the project boundaries and noting the map name and date; for large projects include a county index map or use a larger scale USGS map
- list the project location by legal description (Section, Township, Range) and UTM (For projects less than 40 acres in size, a single UTM point at the approximate center is sufficient. For larger projects and projects with complicated boundaries (e.g., roads), multiple UTM points should define the survey limits.

The **Research Design** should:

- consist of two parts: Objectives and Methods



- address research questions that are *important* and *answerable*
- suggest methods that are appropriate to answer the research questions
- include both field and laboratory methods
- address SHPO historic or thematic contexts

The **Literature Search** should:

- list sources examined
- list institutions visited or individuals consulted and the date of visit/consultation
- note the SHPO region and sub-region where the project is located
- list recorded sites and previous archaeological work in project vicinity
- provide a brief environmental history of the project area within its regional context
- provide a brief culture history of the project area within its regional context

The **Work Summary** should:

- identify the key project personnel (e.g., Principal Investigator, Field Director)
- give actual dates when activities were performed
- describe pertinent field conditions (e.g., percent of surface visibility)
- describe areas surveyed and why
- describe and justify methods and techniques used in field
- if appropriate include a sketch/project map showing survey areas/transects and excavation units; include a north arrow and scale
- describe and justify laboratory methods and techniques
- note curation arrangements

The **Results** should:

- discuss sites located and materials observed/collected
- provide 7.5' USGS map photocopy showing site locations
- if appropriate include a sketch/project map clearly showing site limits

The **Recommendations** should:

- present a brief summary of survey findings
- state an opinion as to the potential National Register eligibility of involved sites
- state an opinion as to the appropriate Review and Compliance finding
- present management recommendations or suggestions for additional work

References Cited/Bibliography

The References Cited or Bibliography section of the report should follow the *American Antiquity* (57:749-770, October 1992) style guide.

Appendices

Reports for literature searches, reconnaissance surveys, and evaluation surveys generally do not need appendices. Copies of negative shovel test forms, personnel vita, project correspondence, site forms, and artifact catalogue forms do not need to be included in the SHPO copy of these reports. Descriptions of typical sections of negative shovel tests and pertinent soil profile information should be included in the body of the report. Management level personnel should be named in the body of the report, but their *vita* should already be on file at the SHPO. Site forms need not be included if state site numbers have been assigned and should be submitted



unbound if numbers have not been obtained. Important artifacts should be discussed and presented in tabular form and illustrated in the body of the report.

Appendices are appropriate in reports of some intensive surveys and for reports of major excavations and other treatment activities. Appendices for these reports can include copies of reporting sheets from radiocarbon laboratories and reports of supporting information that has been summarized in the report body. Once again, there is no need to include the items listed in the paragraph above. Reports are not evaluated by their length, but by their ability to serve management and basic informational needs.

Annual Reports

Certain programs and agencies produce annual reports that summarize their cultural resource management activities. Annual reports need to be clearly titled as to whether they summarize programs, projects, or surveys. These reports should follow the general reporting guidelines summarized in this section. Annual reports usually do not need to go into the detail individual project or site reports provide, unless they are the only reports being written for a program, project, or site. If annual reports are being widely distributed, care should be taken to avoid providing sensitive site locational information accessible to the general public. The SHPO copy, however, must have this information.

Public Reporting

For large survey projects and most Phase III mitigations, some form of public reporting is expected. All archaeologists need to be aware that they have a professional obligation to make important information widely accessible to a variety of audiences, especially other professionals. The SHPO encourages agencies to include some form of public reporting in their project scopes when important sites are involved. Public reporting considerations not only include the form the report takes but its method of distribution. A well-written public report or pamphlet is only useful if it is disseminated to a widespread, interested audience. The Internet has greatly facilitated public reporting and its use is encouraged. Other public reporting venues include giving copies of reports to local libraries, making local presentations, holding news conferences, having an open house at a site, and publishing summary reports in professional or avocational journals.

Site Inventory Forms

Archaeological sites in Minnesota are defined as “any location containing evidence of past human activity that holds significance for archaeologists.” A site can contain a single artifact or feature. Site boundaries should contain multiple artifacts and/or features that are less than 100 meters apart or contained within distinct topographic features such as an island or a hilltop.

If an archaeological project is on non-federal land, Minnesota Archaeological Site Forms (see Appendix A) must be completed for each previously unrecorded Precontact or Contact period site that is documented by the project and for all previously recorded sites where significant additional information is gathered (e.g., expanded site limits, additional context definition). A photocopy of a 7.5' USGS map with the site clearly shown must be attached. For Precontact (pre-1650) or Contact (1650-1837) period sites, site forms need to be filled out even if only a single artifact is found. See the Historical Archaeology section of this manual (pp. 18-20) for information on when inventory forms need to be completed for archaeological sites assigned to the Post-Contact Period (post 1837).



If the site was previously unnumbered, an official site number should be obtained from the State Archaeologist prior to report submittal. Site numbers are needed to link reports to sites in the SHPO databases. Occasionally, a site number cannot be obtained in time to complete a Phase I report if there is some urgency to project development. Site numbers must be obtained for Phase II reports, data recovery plans, and Phase III reports.

Remember to include both legal locations (1/4, 1/4, 1/4-Section-Township-Range) and UTM designations for the site. For non-linear sites under 10 acres in size, a single UTM point at the approximate site center is sufficient. For larger sites and sites with complicated boundaries (e.g., linear features like trails), multiple UTM points should define the site limits. The non-centroid UTM points can be included in the Other Locational Information section of the site form. The method of determining the UTM coordinates should also be listed (GPS, USGS map manual plot, computer conversion program). The NAD 27 datum should be used to figure UTM points or if NAD 83 is used, it should be clearly listed. UTM data is essential to Geographical Information System (GIS) applications.

Site forms for Review and Compliance survey projects need not be submitted to the SHPO if a site number has been obtained from the OSA and that number is included in the report. The State Archaeologist sends copies of all site forms to the SHPO once a number has been assigned. If a state site number has not been obtained, unbound copies of site forms should be submitted to the SHPO with the report. If a project is cancelled or an archaeological report is not submitted to the SHPO for some other reason, archaeologists have a professional obligation to submit site forms to the OSA and the SHPO. Such data is essential to site preservation, predictive modeling, and archaeological understanding.

For archaeological projects on federal lands, it is strongly recommended that state site forms be filled out and an official number be obtained from the OSA. If the state form is not used and an official number not obtained, inventory forms must be submitted for projects reviewed by the SHPO or for activities covered by agreement documents with the SHPO. Inventory forms must meet the database and management needs of the SHPO.

Radiometric Dates

Absolute dating, principally using the radiocarbon method, is critical to our understanding of the state's Precontact archaeological history and where individual sites fit into this history. Every effort should be made to obtain and properly conserve datable materials at all levels of archaeological investigation. Phase II and III investigators are encouraged to obtain several radiometric dates if appropriate materials are recovered. Agencies should budget for radiometric dates in their scopes of work and investigators should assume they will obtain dates for materials with firm archaeological contexts when this information is important to assessing site significance or implementing a data recovery.

Reported radiocarbon dates should be listed with their uncorrected BP date along with the standard deviation and lab number. The corrected BC/AD date can also be listed using the CALIB program (version 4.2 or higher) that is available over the Internet (depts.washington.edu/qil/cailib/). This program not only calibrates dates, but also can run a test for contemporaneity and average dates.

In order to keep track of radiometric dates from Minnesota and make them widely available to researchers, investigators are asked to fill out the form in Appendix B of this manual and submit it to the Minnesota SHPO after radiocarbon dates are received from the laboratory. Copies of the



original laboratory date sheets should also be bound into reports as an appendix. As of June 2001, the SHPO had 306 records in its radiometric database.

Quality Assurance

In order to assure that archaeological projects meet the professional standards outlined in this manual and the SISG, the Principal Investigator needs to monitor all stages of archaeological work. Standardized forms, the use of appropriate specialists, and the use of qualified personnel all contribute to quality assurance.

SPECIAL CONSIDERATIONS

Historical Archaeology

Prior to 1980, historical archaeology in Minnesota was largely confined to sites associated with the fur trade, frontier forts, and/or historic sites owned by the Minnesota Historical Society. Over the last 20 years, the field of historical archaeology has greatly expanded both in Minnesota and nationally. Archaeologists are now studying sites from the more recent past in city and rural settings. Historical archaeology includes sub-fields such as Industrial Archaeology, Urban Archaeology, and Underwater Archaeology.

Every city, every town, every house, every farmstead, every industrial site, every trash dump, and every transportation feature could be defined as an archaeological site. This means that tens of thousands of building sites in the SHPO History/Architecture files could also be included in the Archaeological Site files. If all farmsteads in Minnesota were considered archaeological sites, we could add 204,000 sites (the peak number of active farmsteads in 1935) sites to the database. Almost every lot on every city block could be considered to be an archaeological site. With 854 cities in Minnesota, the number of potential sites is considerable.

Historical archaeological sites from the recent past are becoming a major management issue because of their great numbers, widespread distribution, and their high visibility on maps and in written records. They create concerns on many different levels: what types of sites should we pay attention to in literature searches, when should inventory forms be filled out during surveys, what sites do we add to the database, what artifacts should be collected, when are sites worthy of formal evaluation, how do we evaluate them, and how do we treat the eligible sites?

The Minnesota SHPO has made a major effort over the last 10 years to encourage the survey, evaluation, treatment, and nomination of historical archaeological sites dating to the recent past. This effort has been undertaken within the Review and Compliance, Survey and Inventory, and National Register program areas. SHPO-sponsored surveys have been undertaken on shipwrecks and logging sites. The shipwrecks project resulted in eight National Register nominations and two Multiple Property Documentation Forms (MPDF). The logging project resulted in one nomination and an MPDF. Other historical archaeological sites recently placed on the National Register include the Buena Vista townsite in Beltrami County and the Ramsey



Mill in Dakota County. Extensive additional information including archaeological information has been added to the St. Anthony Falls Historic District nomination for Minneapolis.

Numerous Review and Compliance surveys have been recommended by the SHPO to assess potential impacts to Post-Contact historical archaeological sites. Mitigation projects have been undertaken at the new Science Museum site in St. Paul, at several locations near St. Anthony Falls in Minneapolis, and at the Miller Brothers Store in Eden Prairie. While some of these projects may not have answered *important* research questions, they have clearly been given widespread civic support and resulted in beneficial publicity for historic preservation and archaeology.

Historical archaeological sites from the recent past have conceptual and practical differences from other kinds of archaeological sites in Minnesota. Because Precontact sites can only be discovered through archaeological survey and because archaeological examination of these sites is the principal way we learn about the prehistoric past, any information about such sites can provide information we otherwise would not have. Inventory forms must be filled out for all Precontact sites located by archaeological surveys and all these sites are added to the database no matter how small, how disturbed, or how significant.

The same inventory requirements are followed for Contact Period (1650-1837) sites. These sites are sometimes shown on early maps, but rarely with enough detail to place firmly on a modern map and information about activities that took place at them is limited. Furthermore, in terms of numbers, Contact Period sites are relatively rare when compared to Post-Contact sites.

Historical archaeological sites dating to the Post-Contact Period (after 1837) do not always need inventory forms and, even if forms are filled out, they may not be added to the SHPO site database, although all sites assigned official site numbers by the OSA are added to the database. Most Post-Contact sites can be discovered through an intensive literature search. Data redundancy is most commonly associated with sites from the Post-Contact Period due to the information explosion that occurred near end of the 19th century. Most of these sites can be classified into a functional property type and assigned to a historic context that is relatively well understood through written records alone. Most of these sites will not be eligible to the National Register because the information they can provide usually can be more easily and more accurately obtained from sources other than archaeological excavation and analysis.

Literature searches and field surveys should pay attention to all sites older than 50 years that are located within the project area, but inventory forms for Post-Contact historical archaeological sites should be filled out only on sites that will need additional and justifiable archaeological work, on sites that have been subjected to intensive survey, on sites that are clearly eligible for the National Register, or burial sites not located in a well-documented cemetery. The only historical archaeological sites that will be added to the SHPO database are those sites where intensive archaeological work has been performed, sites that are considered eligible by the SHPO for the National Register, and sites given official site numbers by the State Archaeologist.

Archaeological sites of the Post-Contact Period can be eligible under all four National Register criteria, but most often will be associated with Criterion A (historical patterns or events), Criterion B (important person), and/or Criterion D (research potential). Eligible sites can be significant at the national, state, or local level, but they must have *demonstrated integrity* to convey their association and significance.

National Register eligibility for Post-Contact sites under Criterion D is applicable only when *important* research questions have a *high probability* of being answered. In almost all



cases, a site eligible under D will also be eligible under A, B, or C because most important research questions are related to events, people, or design. It is important for archaeologists to consider criteria other than D as they have implications for the definition of areas of project effect (APE), site impact avoidance, and potential treatments. For example, archaeological sites described as ruins may not have significance under Criterion D due to a lack of research potential, but may be eligible under Criterion A as tangible remnants of important buildings or structures.

Foundational remnants and dense scatters of artifacts do not automatically have historical significance and important research potential. If a site is to be determined eligible under any criteria, the archaeological aspects of the site need to be confirmed by field survey. It is not just what the site was, but what it is. Significance *and* integrity must be considered in every evaluation. Archaeologists often fail to fully consider integrity when they suggest a site is eligible under criteria other than D.

In the case of Criterion D, subsurface testing is usually required, although the presence of archaeological materials in test units may not be enough to confirm eligibility. These materials not only must be present in sufficient quantity and quality to suggest that they can be used to answer *important* research questions, but the materials must also retain sufficient locational integrity within the site. The question of “importance” needs to be addressed carefully and should also be phrased “Important to whom?” If the site is important to just one historical archaeologist or to just a few members of a community, its eligibility for the National Register will be difficult to justify.

Based on extensive Review and Compliance surveys, evaluations, and treatments done over the last 10 years, the SHPO can now better assess the need for survey, the adequacy and methods of evaluation, and the types of treatment activities that best suit significant historical archaeological sites from the recent past. Just as we have taken a hard look at Precontact lithic scatters, we are taking a hard look at historical archaeological sites to see if agencies are undertaking reasonable and good faith efforts to consider impacts to such sites and which such sites even need Section 106 consideration.

While most historical archaeological sites from the recent past are not eligible for the National Register, some ineligible sites are valuable for other reasons. Some may serve as training sites for students. Some may be excavated as demonstration projects to encourage communities to re-discover their past. Such projects often result in very positive publicity for archaeology and historic preservation in general. It must be stressed, however, that only *eligible* sites need to be considered under the Section 106 process and to be eligible sites must have more than some vaguely stated and undemonstrated value to archaeological research.

Geomorphology

Geomorphology is the study of the earth's surface and how it has evolved. Geomorphologists examine soils and sediments and determine their depositional history. Geomorphological investigations aid project reviews and archaeological research by helping us better understand where sites may be located, the depositional environment of sites, and the condition of the archaeological horizons. They are often essential in determining whether surveys are necessary, suggesting how deep test units need to go, assessing integrity of sites for eligibility determinations, and helping to design and fulfill data recovery plans.

Some level of geomorphic assessment is necessary for most archaeological field projects. Archaeologists who serve as Principal Investigators should have some experience with



geomorphology since soils are the basic medium of archaeology. In most reconnaissance (Phase I) and many evaluation (Phase II) survey situations, the Principal Investigator can provide adequate geomorphological insight without consulting a geomorphologist. Where complex soil histories exist within a project area, a geomorphologist should be consulted on even Phase I or Phase II surveys, unless the archaeological Principal Investigator can justify that his/her geomorphological expertise is sufficient to adequately perform the survey or the project APE involves impacts to near-surface soils only. Professional geomorphological assistance may be necessary on many data recoveries, but only if research questions require their input. Agencies may have their own requirements concerning the use of geomorphologists so investigators should not rely on guidance provided in this manual alone.

Most soils in Minnesota that might contain archaeological materials date to the post-glacial or Holocene Period (last 10,000 years) and most soils that include archaeological materials are less than one meter deep. Sites in most of these situations can be discovered and evaluated through standard archaeological field practices. In other words, artifacts are either exposed on the surface or they are within the reach of shovel testing and standard hand-excavated test units. It is only when complex depositional settings are anticipated or encountered within the vertical and horizontal limits of a project that the SHPO deems it necessary for archaeologists to consult a professional geomorphologist. Such complex settings include areas of extensive alluvial, colluvial, or eolian deposition or areas where the natural soils have been subjected to complicated modern disturbances.

MnDOT's MnModel project included extensive geomorphological analysis to develop "landscape suitability models" for Precontact archaeological sites. "Suitable landscapes" are sediment assemblages that could contain archaeological materials based on assessments of age, depositional environment, and post-depositional environment. For instance, post-settlement alluvium refers to the massive influx of sediment into river valleys associated with erosion caused by modern farming practices. Landforms built of post-settlement alluvium have low potential to contain significant archaeological sites. When the MnModel report becomes widely available, investigators are encouraged to examine the landscape suitability models to assist in developing field strategies with regard to when survey is needed and if professional geomorphological assistance is advised.

Geomorphology should not become the primary object of a cultural resource investigation. Section 106 is concerned with impacts to historic properties only, no matter how interesting or scientifically valuable sediment studies may prove. Geomorphological studies must be closely coordinated with archaeological investigations in order to maximize research value and minimize harm to significant archaeological deposits. Sites can be damaged or money misspent in order to pursue geomorphological investigations that have little practical bearing on cultural resource management needs.

The scopes of geomorphological investigations vary according to the depositional complexity of the landscape. The following general rules can be used to plan geomorphological investigations:

- A. If all post-glacial soils are within one meter of the surface an assessment of the presence or absence of archaeological deposits can usually be made using traditional archaeological methods. These deposits are usually found in the following settings: 1) uplands that do not contain areas of significant eolian sediments and are not along the margins of large valleys; 2) areas with shallow depth to bedrock (< 1m); 3) sandy-surface terraces where the depth to gravel is within 1 meter of the surface; 4) valley slopes where glacial till or bedrock is within 1 meter of the surface. In addition to surface survey of these areas, subsurface testing should be performed if surface exposure is



minimal or is of a nature that would not bring artifacts from all archaeological horizons to the surface.

B. The archaeological evaluation of river valleys, valley margins, and other settings where deeply buried deposits might occur must incorporate subsurface geomorphic studies extending to depths where deposits are not likely to contain primary archaeological materials or will not be impacted by a project. These studies should be aimed at determining the origin and approximate age of the deposits and strive to identify buried land surfaces. Sediments retrieved from buried soils should be screened through fine mesh (e.g., 25 mm) to recover microartifacts. This information will enable archaeologists to devise plans for subsurface testing. Assessing the potential of deeply buried archaeological deposits is one of the greatest challenges facing archaeological investigations. *It must be stressed, however, that if a development project will not directly impact a deep horizon or there are no deeply buried sites documented in the APE, there is no need for deep testing.*

When geomorphological work is necessary on an archaeological project, it is expected that the geomorphologist will have sufficient regional knowledge to work with the archaeologist to develop an appropriate investigation strategy and methodology. The research design for the project must include geomorphological considerations. In order for geomorphological investigations to be most effective, some fieldwork may need to precede archaeological investigation to determine where traditional archaeological survey methods will suffice and if there are areas that will need deep subsurface testing.

After the geomorphological reconnaissance, the Principal Investigator should devise a plan for assessing the cultural resources of the area in light of the known depositional context. If parts of the project area are deemed to have potential for disturbing deeply buried cultural deposits, they should be more thoroughly evaluated with the goal of determining the depositional context of the deposits, stratigraphic details, mapping the deposits extent with the APE, and arriving at the approximate age of the deposits. Absolute dating of geological horizons is not necessary, however, unless it is important to assessing the eligibility of an archaeological site or integral to research questions posed in a data recovery plan.

Investigation of the subsurface sediments may involve several methods with various levels of effectiveness and destructiveness:

A. Sediment cores obtained using either manual soil probes or hydraulic coring. Depending on the diameter of the tool, the degree of sample disturbance, and the experience of the analyst, and other variables, detailed geomorphological information can be obtained using this method. Sediment cores have little destructive impact on most archaeological deposits. Augers cause greater disturbance and the degree of stratigraphic interpretation possible is less than with cores, but large diameter augers, such as the mechanical Seymore auger or a manual 4-inch bucket auger, may provide a sample size suitable for archaeological sampling in addition to basic information on soil deposits.

B. Archaeological test excavations can provide excellent geomorphological information from analysis of the exposures in test units. These can be directly related to the cultural deposits encountered. Typically such exposures are of limited depth and other



geomorphological sampling techniques may be needed to put these exposures into their stratigraphic context.

C. Backhoe trenches can also provide excellent geomorphological information. Backhoe trenches are more time-effective to a geomorphologist than manual excavations, but they can be very destructive to significant archaeological horizons and are often inappropriate for use in archaeological projects except to remove sterile or highly disturbed overburden. Backhoe trenches have other disadvantages such as the potential for wall collapse, and are not possible in some investigations where private landowners will not grant permission for their use. Although backhoe trenches provide a good view of deposits to depths usually greater than available with manual excavations, there are many depositional environments in valleys where, because of a high water table or greater thickness of deposits, even backhoe investigations cannot sample the entire depth that may contain cultural deposits.

D. Examination of existing exposures, both natural or artificial, such as river cuts or road cuts often provide excellent views of strata. These exposures are non-destructive in the sense that the exposures are there regardless of the cultural resources study.

E. Remote-sensing methods can also be used to study subsurface deposits. These methods are nondestructive and allow rapidly scanning of some areas to detect "anomalies." Methods include soil resistivity, magnetometers, and ground penetrating radar. These methods vary in their effectiveness depending on local conditions such as soil type and ultimately require physical examination of deposits for accurate interpretations. If these methods are used, they must be shown to be effective through either previous investigations in similar settings and/or some subsurface sampling that validates results.

Standard methods should be used to describe and analyze deposits. Standardized schemes are available for description of colors, deposit textures, and grain size composition. The method selected should be referenced. A summary of the geomorphological investigations should appear in the main body of the archaeological report integrated into the archaeological discussion. A more detailed geomorphology report can be included as an appendix. Personnel qualifications for project geomorphologists are listed in the Professional Qualifications section of this manual.

Predictive Locational Modeling for Precontact Sites

There is no 100% coverage archaeological survey. Every survey relies on sampling as demonstrated by the selection of areas to be examined, transect spacing, shovel test intervals, excavation unit size, and recovery methods (e.g., screen size). Surveys of small parcels of land or short transects can visually scan the entire surface of the APE, but not the sub-surface. Large area surveys usually need to decide where in the APE to do any survey. This decision is based on analyzing differential potentials of site presence/absence according to environmental (e.g., distance to water, landform suitability) or cultural factors (e.g., proximity to known sites or transportation routes). Constructing a predictive model for site locations is a critical aspect in the assessment of a development project's potential to harm archaeological sites and in determining survey costs.



In the late 1970s, the Minnesota SHPO made an explicit effort to develop a predictive model for Precontact site locations in the state. The SHPO obtained funding for a Statewide Archaeological Survey (SAS) from the Minnesota legislature. Archaeological surveys were undertaken in 25 counties from 1977 to 1981. Initially, a random sampling technique was applied, but this proved politically unsatisfying because few sites were found. The research design was gradually modified, and by the end of the project, it had moved to a survey largely based on archaeological intuition and informant leads. Regardless of the methods used, the SAS located hundreds of sites. In 1991, the SHPO funded an archaeological survey of Traverse County to continue the objectives of the SAS.

The SHPO archaeologist has constructed an Archaeological Regions map of Minnesota (Appendix C) using the SAS data, other site location information in the site inventory, and a detailed analysis of the Precontact environment. This map is used to help make survey recommendations when reviewing the thousands of development projects submitted to the SHPO each year in compliance with Section 106 of the NHPA and various state laws. The SHPO regions are not used to predict what cultural manifestations are present or absent in a given area, but to help predict Precontact site locations based on regional resource availability and positioning. They can also help assess where *significant* archaeological sites may be located

While most archaeologists understand the usefulness and potential flaws of the SHPO survey recommendation process, engineers and project planners, lacking extensive archaeological knowledge, cannot assess archaeological potential early in project development without consulting archaeologists. Recognizing great advances in computer technology as applied to Geographic Information Systems (GIS) in the 1990s, agencies have attempted to utilize this technology to produce less subjective and more widely available site prediction models.

In 1993, the SHPO submitted a proposal to the Minnesota Legislature to fund archaeological survey in six counties to assist with the development of a GIS-based predictive model. At the same time, the Minneapolis engineering firm of BRW, Inc. submitted a similar survey proposal to survey and develop a predictive model for the Minnesota River Valley. The Legislature put the two proposals together due to their similar research objectives, but then decided not to fund the joint project.

Although the combined SHPO-BRW survey and modeling project was not funded, the Minnesota Department of Transportation (MnDOT) recognized the value of such a project and decided to undertake a major effort to develop a *statewide* predictive model. Called the MnModel Project, it received almost five million dollars in federal and state assistance from 1995 to 1999. BRW, Inc. was hired to complete the project. The BRW team consisted of archaeologists, GIS-specialists, computer programmers, statisticians, geomorphologists, and engineers.

The first step in developing MnModel was to input highly accurate layers of environmental information into a computer database utilizing GIS-based locational parameters. This required considerable effort, and regardless of the accuracy of the site prediction model that was the final step, the assembly and quality-controlled input of this data alone was of great benefit to many levels of project planning and review. Some critical data layers still have major problems, however, such as surface water distribution that relies on the National Wetlands Inventory thus not accounting for the full extent of many drained lakes and misinterpreting modern reservoirs.



MnModel involved some archaeological fieldwork to gather additional site locational data. Stratified random archaeological surveys were undertaken in seven counties. Considerable geomorphological fieldwork was also performed to gather detailed stratigraphic information from many river valleys and the Big Bog region in north central Minnesota to develop landscape suitability models as discussed in the previous section. No archaeological examination was made of the recovered soil cores, however, thus somewhat limiting the usefulness of this data to predicting where Precontact archaeological sites will be rather than where they cannot be.

The environmental information was then coupled with archaeological information to produce the site prediction model. Certain environmental parameters in particular regions were emphasized. For example, in southwestern Minnesota distance from lakes is a critical factor in determining Precontact site locations, while in the Red River Valley nearness to major rivers and glacial beach ridges are important. MnModel does not currently attempt any significance evaluation, however, thus small lithic scatters that are often ineligible for the National Register are not distinguished from large habitation sites that are often eligible.

The SHPO archaeological regions were used in the first two versions of MnModel, but they were abandoned in the third and current version. Ecological Classification System (ECS) sub-sections promoted by the Department of Natural Resources (DNR) were substituted. While more widely recognized, the ECS sub-sections are more variable in size, have more complicated boundaries, often are very narrow, have limited time depth, and, most importantly, were not designed for archaeological reasons. The use of the ECS regions for MnModel makes comparisons with accuracy assessments of the SHPO regional model more difficult.

The site prediction modeling of MnModel has produced mixed results. It is still not accurate enough to make refined, highly reliable assessments of where Precontact sites are and aren't, but it has allowed MnDOT engineers to obtain some assessment of site probability early in the planning process. This alone should help MnDOT do a better job of cultural resources management and, in the long run, save money. MnDOT plans to extensively test MnModel using surveys of road projects.

No final report has been published for the MnModel project as of June 2001, but it should be available soon. The computerized version of the model itself may be available to the SHPO or other non-MnDOT researchers in the near future. When and if the model becomes widely available, agencies and researchers are encouraged to consult it to help assess site potentials in project areas. Because of timeliness and accuracy considerations, the SHPO will not rely on MnModel in its current form to make day-to-day survey recommendations or assess project effects, but may consult it on complicated projects to help guide the cultural resource management process.

Professional Obligations

To be listed on the Minnesota SHPO's archaeological contractors list, archaeologists in Minnesota do not need to be members of the Register of Professional Archaeologists (RPA). The Minnesota SHPO, however, supports the objectives of that organization: to establish universal standards of professional conduct. Professional archaeologists have obligations that go beyond fulfilling agency and contract requirements. Some of these obligations are outlined here.

When the SHPO recommends an archaeological survey, it does not mean that the entire project area must be surveyed. It only means that the project area in general is thought to have some site potential based on known site locations or predictive models. Occasionally, the SHPO may specify certain areas within a development parcel that have the highest site potential, but



which areas to actually survey is usually left up to the discretion of the archaeologist in the field. Survey archaeologists should only survey those areas that they deem to have moderate to high site potential unless the research design specifies otherwise or the agency or client so requests.

When conducting a survey, it is the responsibility of the field archaeologists to obtain landowner permission to enter private land or to obtain agency permission to enter public land. Archaeologists surveying non-federal public land in Minnesota must obtain a license from the Minnesota Historical Society and the Office of the State Archaeologist. Archaeologists surveying federal land must obtain an ARPA permit from the land management agency.

Principal Investigators are professionally obligated to complete written reports of their archaeological work and publicly report significant archaeological discoveries to a wider audience than the sponsoring agency and the SHPO. This reporting can involve the presentation of papers at professional conferences or the publication of articles in scientific journals or avocational periodicals. Significant discoveries include radiocarbon dates, artifacts analyses of important sites, and regional survey data that assist with site locational modeling.

State site forms must be filled out for all sites located during licensed surveys in Minnesota, but archaeologists are also obligated to fill out site forms or otherwise report sites located outside of project boundaries or based on informant reports. Archaeologists involved with privately sponsored research also should share site information critical to improving locational models, promoting site preservation, and understanding the past.

If a development project is cancelled prior to the completion of an archaeological report, but subsequent to the initiation of the field survey, the Principal Investigator should minimally submit inventory forms for any located sites and ideally submit some form of report describing the location and methods of the survey.

GUIDELINES FOR LITERATURE SEARCHES

Introduction

A literature search examines standard references in order to summarize what has been written or what is known about a given area or topic. Literature searches are performed prior to undertaking fieldwork. Literature searches are used to: assess the need for field survey, determine known sites within a project area, develop site locational models, determine areas of previous terrain disturbance to guide survey, provide historic context background to help evaluate site significance, provide background information for developing survey research designs and data recovery plans, and to provide sufficient background information for National Register nominations. A literature search is synonymous with a records search or archival research, although literature searches can and should involve oral interviews with knowledgeable people where appropriate.

While a literature search is required as part of all survey and treatment activities, it can be a stand-alone document that by itself may fulfill all historic preservation needs for a particular project. It could demonstrate that an area or site has been documented well enough by past work to eliminate the need for a field survey or that an area has little potential to contain significant archaeological resources.



The Minnesota SHPO does not set an absolute time limit as to how long a literature search is valid with respect to adequately assessing the presence or eligibility of known sites within a project area. However, if a significant time period has passed within which pertinent inventoried properties or studies were added to our databases, we may determine that the literature search portion of a survey report is inadequate.

Basic Sources

Before an archaeological project is initiated, it is essential that the files located in the SHPO office be consulted. The important Minnesota SHPO databases for archaeological projects are Archaeological Sites and Archaeological Reports. For small projects, a database search can be requested over the phone, by mail, by e-mail, or by fax at the addresses listed on the cover of this manual. A visit to the SHPO office is recommended for all projects involving large areas or complicated descriptions.

The Archaeological Sites database is a list of all the recorded archaeological sites in the state. It includes all sites with official state site numbers and reported sites that have not been verified by archaeological survey or for which an official state site form has not been completed. The database contains locational information utilizing County, City, Section-Township-Range, and UTM formats. It includes management information such as level of archaeological examination, site condition, and National Register status. There are also research fields including context association, ceramic and lithic types, and landform classification. As of March 2001, there were 15,678 sites in the Site database.

The Archaeological Reports database is a list of survey or excavation reports done in Minnesota that are present in the SHPO files. It does not contain journal articles, theses/dissertations, or published books. Many of the fields are compatible with the National Archaeological Database (NADB). The Reports database contains locational fields similar to the Site database as well as fields for report titles, authors, level of survey, number of sites located, agencies involved, and Review and Compliance findings. As of March 2001, there were 3,217 reports listed in the Reports database.

Following examination of the Sites and Reports databases, copies of any pertinent site files or archaeological reports should be examined. Site files contain not only the site form, but any correspondence or additional information relating to the site. Phase I and II archaeological reports provide details with regard to previous surveys in a given area. Phase III archaeological reports provide bibliographies and regional culture histories.

Researchers should consult the Historic Context notebooks. Each context consists of a written narrative defining the context's broad historical patterns, temporal limits, and geographical boundaries. Goals and priorities have been developed for many contexts. In addition, a summary of the identified property types associated with each context is provided. The context notebooks provide a basic bibliography of Minnesota archaeology.

Examining SHPO files constitutes the *minimum* standard for literature searches on SHPO reviewed or sponsored archaeological projects in Minnesota. These files will document known sites and archaeological work that has been completed in the project vicinity. The files are updated almost daily, so each new project in a given area should involve a search of the most current information available in the SHPO files.

Other Sources



The journal *The Minnesota Archaeologist* has been published since 1935 by the Minnesota Archaeological Society (MAS) and is available at most major libraries. The MAS also has an occasional publication series with archaeological titles, as do the Minnesota Historical Society and the University of Minnesota's Anthropology Department. The *Minnesota Archaeologist* and the various occasional series publications form the core of Minnesota's synthetic archaeological literature.

Information on the natural environment in Minnesota is widely accessible and detailed. Paleoenvironmental studies and quaternary geology studies are particularly abundant due to the leadership of Herb Wright at the Limnological Research Center at the University of Minnesota. These studies are available in numerous books and in journals such as *Quaternary Research*. Soils atlases are available for most counties in Minnesota; the SHPO maintains a full set of these.

Information on the Contact and Post-Contact Periods can be found at both the Minnesota Historical Society's Research Center in St. Paul and at local repositories such as municipal libraries, county courthouses, and county historical societies. These repositories have county histories, manuscripts, research files, and maps. Maps are especially useful sources. Two key map references are the Trygg Maps based on the Government Land Office (GLO) survey notes and the Andreas Atlas of 1874. The MHS also has an excellent map library that includes county atlases and city insurance maps dating from the late nineteenth and early twentieth centuries. Systematic aerial photographs were first taken of Minnesota in the mid-1930s. These are available at the University of Minnesota's Borchert Map Library in Minneapolis.

Reporting

The general guidelines for reporting stand-alone literature searches should be followed as outlined on pages 12-15 of this manual. Be sure to list all repositories visited and the date of the visit. Include management recommendations if applicable.

GUIDELINES FOR CONDUCTING RECONNAISSANCE (PHASE I) SURVEYS

Introduction

Reconnaissance or **Phase I Surveys** determine if sites exist in a particular area and define the vertical and horizontal boundaries of any sites. Such surveys can also make preliminary assessments as to a site's archaeological nature (e.g., context, function, condition). Phase I surveys can involve the use of a great variety of archaeological field techniques including visual inspection, surface walkover, controlled surface collection, shovel testing, augering, coring, and electronic remote sensing. A Phase I survey provides enough information to allow consideration of avoidance if a site is to be impacted by an undertaking and to gather enough information to allow for reasonable recommendations for more detailed work should it be necessary.

The SISG partially blends what this manual (and most archaeologists) consider Phase I and Phase II surveys. The SISG divides Identification level field survey into "reconnaissance" and "intensive" categories based on the types of field methods employed and geographical scope of a project rather than management objectives. Reconnaissance surveys according to the SISG "result in the characterization of a region's historic properties" and intensive surveys "permit the



identification and description of specific historic properties in an area." The Minnesota SHPO Manual divides survey types by management objectives. Phase I surveys utilize basic reconnaissance techniques to locate sites within project areas. Effects to these sites may be avoided by projects and this eliminates the need for intensive survey.

With respect to development projects reviewed by the SHPO in compliance with federal and state laws, the SHPO Archaeologist rarely visits the areas the SHPO recommends for survey. SHPO survey recommendations are often based on plotting the project area on USGS topographic maps. Because maps may be over 20 years old, the project area may have been dramatically altered by recent developments unknown to the SHPO. It is the responsibility of the archaeological contractor to honestly re-assess the need for detailed survey based on a **visual examination** of the project area. If the area is so extensively disturbed that any archaeological sites would have been destroyed or damaged to the point of poor integrity, the contractor should inform the project sponsor and the SHPO of these findings so the need for more detailed survey can be re-evaluated.

The horizontal extent and depth of proposed terrain disturbance also need to be considered. If project disturbance will be limited to a small area or is confined to an upper soil horizon with little archaeological potential (e.g., recent alluvium), survey coverage generally need not include unaffected areas like undeveloped portions of the property or deeply buried strata. However, future impacts to possible sites in the project area must be considered if federal funds are used to purchase land or land is coming out of federal ownership; future development activities on this land may not be subject to additional Section 106 review. Covering over a large portion of a significant archaeological site in a manner that would unreasonably prevent future archaeological access to the site may be considered an effect, so any known sites or high potential areas in extensive fill sections need to be carefully assessed.

Research Design

SHPO pre-survey review of research designs is not necessary for most Phase I archaeological projects. Phase I surveys answer basic and repetitive research questions, most importantly: "Is there an archaeological site within the Area of Potential Effect?" Research designs involve justifying methods to reasonably insure that sites were not missed, however, so Phase I surveys need to include formal research designs in the final report. In some instances on large or complicated projects, the Principal Investigator may want to submit a preliminary research design to the SHPO Archaeologist for consultation to confirm that adequate strategies are being employed.

Determining the Area of Potential Effect (APE) is the first objective of research designs responding to development projects. In most cases for archaeological assessments, the APE is assumed to be the project's construction limits. These limits need to be carefully defined, however, and should not be automatically equated with rights-of-way or project sponsor land ownership. Temporary slope easements, construction bypasses, equipment storage areas, and temporary access roads can all harm sites. The integrity (e.g., setting, feeling) of sites eligible under Criteria A, B, or C can also be harmed by adjacent developments that do not physically disturb a site.

The most complicated aspect of Phase I survey research designs is the development of **site locational models** to determine where field efforts will be focused. The only time full-



coverage surveys are performed on projects is when relatively small areas of land are involved, no deeply buried soils are present, and surface exposure approaches 100% (e.g., weathered agricultural fields plowed to till). Because pedestrian survey is relatively quick and inexpensive, limited survey in areas of low and moderate site potential with good soil visibility is easy to justify in order to test biases in site locational models. Shovel testing is labor intensive and expensive, however, so careful thought must be given to the extent of coverage. When designing site locational models for Phase I surveys, archaeologists need to be familiar with known site locations in the project vicinity and the results of previous surveys in the region. (Also look at the site locational modeling discussion on page 23-25 of this manual.)

Research designs for Phase I surveys need to give careful thought to transect spacing both in terms of the distances between transects and the frequency of subsurface testing along transects. How the soils removed from the subsurface are examined also needs careful consideration; screening is generally the only acceptable practice.

Literature Search

The purpose of a literature search varies by the level of archaeological survey it is associated with. Literature searches are not undertaken just to provide bulk to a report, but to help refine the research design and to help answer questions posed by the research design. In the case of reconnaissance surveys, the literature search is aimed at helping to discover all sites in the project area by determining what kinds of sites are expected, where they tend to be located, and what field methods are most appropriate to find them.

Literature searches for reconnaissance surveys should follow the general guidelines previously described in this manual. In addition, they should examine standard culture histories for the Upper Midwest and archaeological studies within the project region including contract completion reports, articles on recent work at nearby sites, and up-to-date regional historic context overviews. Studies that include predictive models for site locations in the same region are of particular importance, especially on projects that involve large land areas or long horizontal corridors (e.g., roads, pipelines).

Field Procedures

Adequate field methods for discovering terrestrial archaeological sites will vary according to the extent of soil exposure, the geomorphic setting, and topographic factors such as degree of slope, amount of bedrock exposure, and presence of surface water. In general, soils that are usually inundated or are located on slopes greater than 20 degrees, need not be examined by pedestrian survey or shovel testing. Areas of bedrock exposure should be examined for pictographs, petroglyphs, rockshelters, and caves. Submerged sites present special discovery problems and are discussed at the end of this section.

In general, shovel testing will be required if soil exposure is less than 25% of the area being examined, the area has good to moderate potential to contain archaeological sites, and the upper 1 meter of soil has the potential to contain archaeological remains. Shovel testing is standard practice in non-cultivated areas of Minnesota and out-of-state archaeological contractors not accustomed to working in Minnesota should expect to utilize this technique where appropriate. If shovel tests cannot go deep enough to sample the entire Holocene soil column, such as areas where modern fill has buried soils, deep testing may be necessary. Removed deep soil should be screened through ¼" mesh.



Backhoes and other large earth-moving equipment should not be used as an initial Phase I site discovery method except under the following conditions: 1) Their use may be appropriate if geomorphological examination has demonstrated the presence of extensive modern fill covering deeper layers and this fill has no potential to contain significant archaeological materials. 2) They can be employed if preliminary and sufficient small unit archaeological testing (e.g., augering) has failed to discover deeply buried archaeological materials and yet deep cultural horizons have a moderate to good possibility of being present.

Winter fieldwork is expected to follow the same standards as warm season work. If surface reconnaissance is the principal artifact discovery method, soil exposure should be adequate to document site presence/absence. If there is inadequate soil exposure due to snow cover, agricultural debris, or insufficient weathering, shovel or auger testing will have to be performed even in cultivated areas. Testing intervals and unit sizes should be the same as warm season work. Excavated soil must be screened through ¼” mesh. Auger sizes should be 12” or greater. If low relief features are expected to be present in the survey area, a light snowfall often makes them more visible. Heavy snowfall will obscure low features, however, so surface reconnaissance will have to wait until after the snow has melted. This is especially important for suspected burial mounds where intrusive testing must be avoided. Human remains discovered during fieldwork should be left *in situ* and immediately reported to the State Archaeologist and local law enforcement authorities.

Field documentation should include daily log forms, photographic logs, and sketch maps of any sites. Detailed sketch maps do not have to be prepared for surveyed areas that were not determined to contain sites. Shovel test forms do not need to be completed for every shovel test in areas where the stratigraphy is consistent. Descriptions of soil columns should use standard techniques such as Munsell color charts and familiar texture/material/grain size compositions (e.g., % silt, clay, or sand).

Surface Reconnaissance

Personnel experienced in recognizing artifacts and surface cultural features should perform surface reconnaissance. Surface reconnaissance attempting to find artifacts should be conducted on exposed soils that have been washed by rainfall or that have been exposed for a long period of time (i.e., months). Artifact visibility in freshly plowed or recently graded soils is usually poor. Significant rainfall is the best method of increasing artifact visibility, although long-term exposure to wind in sandy or silty soils is also very beneficial. Soil features in graded areas may only become visible after becoming wet or in some cases drying out.

Transect spacing in high potential areas should insure that the entire exposed surface is scanned; five meters is a reasonable minimal distance. In high potential areas containing row crops that have grown high enough to obscure wide scanning, spacing may have to be tightened. Spacing in areas of lower potential can extend to 10 or 15 meters or be limited to a single transect down the center of a narrow project corridor. In non-corridor surveys of areas of modest to low site potential, a single meandering or zigzag transect across the area may be appropriate. If convenient, some examination of low potential areas is always helpful to help test and refine site locational models.

When sites are encountered by surface reconnaissance, the amount of material collected and saved for laboratory analysis will be dependent on the artifact density and artifact variety. All obviously diagnostic artifacts (e.g., rim sherds, projectile points) and formed tools must be collected and saved as well as representative samples of lithic debitage, body sherds, bone, and



other kinds of artifacts. Piece plotting of individual artifacts is not necessary in a Phase I survey unless specified in the research design, although areas of artifact concentration or artifact differentiation should be noted. Important surface features need to be mapped.

Reconnaissance surveys in areas of exposed bedrock need to carefully examine rock surfaces for the presence of petroglyphs or pictographs. If rock art is discovered, care should be taken to avoid damaging the art by inappropriate documentation methods. Rubbings or application of highlighting materials should not be employed. Sketches and photographs are the most appropriate methods of recording rock art.

Shovel Testing

Shovel tests should be between 30 - 40 cm (12"- 15") in diameter, should have approximately vertical sides to full-depth, and if possible should penetrate all post-glacial soil layers. Larger shovel tests can inappropriately damage archaeological sites unless they are excavated in a controlled fashion like formal test units. Square as opposed to round shovel tests are more difficult and time consuming to excavate. The soil excavated from shovel tests must be screened through mesh not greater than ¼-inch square. Troweling back soils in lieu of screening is not an adequate site discovery method for Precontact or Contact period sites in Minnesota.

When shovel testing encounters archaeological materials, field notes should record the approximate depths of the materials and their stratigraphic context. Typical profiles of some shovel tests in non-site areas should also be recorded. All shovel tests need not be profiled unless significant archaeological materials are encountered and no adjacent larger test units are excavated and profiled. Investigations that encounter extensive modern fill should not assume the fill extends to glacial soils or bedrock. However, if the vertical disturbance caused by a project will be confined to existing fill, deep archaeological testing may be unnecessary unless a large area of land with good site potential will become unavailable to future archaeological examination.

The use of coring or augering devices in lieu of shovel tests in shallow (< 1 meter), unfrozen soils is not recommended. If these devices are used, all removed soils must be screened and some attempt must be made to record typical sections of the stratigraphy. If archaeological materials are encountered, approximate cultural horizon depths should be determined.

There is no hard and fast standard for the spacing between or orientation of shovel test transects within large areas or wide corridors, but enough should be utilized to confidently assess an area's site potential. For project corridors up to 15 meters (50') wide, a single transect down the middle of the corridor in areas of high to moderate site potential is usually sufficient unless a previously recorded site is in the immediate vicinity or the area has particularly high site potential. Shovel test transects in wide corridors need not follow a standardized spacing, but all areas having high to moderate site potential should be adequately sampled and the procedures need to be justified in the report. In large, polygon-shaped project areas, shovel tests should be concentrated in areas of highest site potential as identified in the research design.

Shovel test spacing along a transect should not exceed 15 meters (50') in areas of high to medium site potential. If an area has particularly high site potential based on the literature search, informant reports, or regional predictive models, shovel test spacing of 5 or 10 meters may be appropriate. In areas of dense woods, intermittent bedrock or other features that prevent regular shovel test spacing, irregular spacing is acceptable as long as overall total numbers of units remain about the same.



If survey demonstrates a relatively high density of sites in the project area, locations initially thought to have only moderate site potential should also be shovel tested if surface soil exposure in these locations is poor. The research design for a Phase I survey needs to carefully define and justify assignments of area site potential, especially when surface visibility is poor in the project area and expensive, time-consuming shovel testing in lieu of surface reconnaissance is required.

All artifacts recovered by shovel testing must be saved for analysis and curation so horizontal provenience needs to be carefully maintained. The exact locations of artifact bearing shovel tests and adjacent negative shovel tests must be recorded and shown on sketch maps in the report. Global Positioning System (GPS) technology has greatly simplified this. Sketch maps showing unit locations need to include recognizable surface features, be tied into project plans, or the area depicted on USGS maps.

Deep Testing

Deep testing may be required if soils with high or moderate potential to contain significant archaeological materials exist below 1 meter and are located within an area that may be impacted by a project. The assessment of site potential should be based on known deeply buried sites in the project vicinity or landform suitability analysis such as that used by the MnModel project discussed on page 25 of this manual.

Techniques such as augering, coring, or machine excavation to penetrate overburden may be necessary as site discovery techniques. Auger holes or cores should be of sufficient diameter and spacing to approximate shovel test soil removal. The use of small diameter holes may require tightening intervals between samples. Excavated soils must be screened through ¼” or smaller mesh or scanned under low power magnification for micro-artifacts. As discussed earlier, if machine testing is used to remove overburden, care must be taken not to harm near-surface or deep sites that may be significant.

It may also be necessary to consult a geomorphologist to confirm the fact that deeply buried soils may exist and at what depths. For more information on deeply buried sites, consult the Geomorphology section in this manual.

Remote Sensing

The use of electronic remote sensing devices to document the presence of and extent of buried terrestrial archaeological sites during a reconnaissance survey is generally not acceptable in lieu of soil removal/screening except in soil conditions where such techniques have proven reliable. For example, in the Anoka Sand Plain north of the Twin Cities, ground-penetrating radar has been demonstrated to find features and artifacts as confirmed by subsequent excavation. Remote sensing has also been used to confirm the presence and extent of features in urban settings. Reconnaissance surveys relying on remote sensing need to physically document the presence and character of archaeological materials if such are suggested.

Underwater Surveys

In cases when archival research indicates the presence of or high potential for **submerged cultural resources** within a project area, an underwater reconnaissance using divers or a remote-sensing survey of the project area should be conducted. Divers are best employed when visibility is fair to good, the project area is relatively small, resources are likely not to be completely buried in sediments, and depths and water conditions permit safe diving practices



(e.g., less than 100 feet deep). Inundated areas too shallow for diving can be examined using terrestrial sampling methods (e.g., shovel testing) or coring through frozen surfaces.

Marine remote-sensing survey of the project area should employ dual instrumentation that will detect both buried and exposed cultural remains. In large bodies of water (e.g., Lake Superior), the following shipboard equipment is typically employed for underwater surveys: a positioning system, a depth recorder, and a marine magnetometer or a side-scan sonar. A shallow seismic (sub-bottom) profiler may be required where significant quantities of overburden are present in the project area.

Initial survey transects for underwater surveys should be spaced no greater than 50 meters for magnetometer survey and no greater than 150 meters for acoustic (side-scan sonar) survey. Intrasite delineation transects for magnetometer should be 15 meters or less (as required by anomaly size and duration). All analogue records should be manually annotated with position coordinates every 200 feet along a transect, unless remote-sensing/positioning data correlation is provided automatically through a shipboard computer interface.

Exposed underwater cultural remains located by remote sensing should be ground-truthed by visual inspection if safety and visibility conditions permit. Sub-bottom anomalies should be ground-truthed by manual or hydraulic probing, and if necessary, test excavation using induction dredge, airlift, or water jet, as appropriate to bottom conditions. Ground-truthing should include documentation by measured sketches, verbal description, and photography/video if feasible.

Laboratory Analysis

All recovered artifacts should be carefully examined and described in order to make a preliminary assessment of historic context and site function. Cleaning and labeling techniques should be pre-approved by the curational institution. Diagnostic artifacts used to suggest cultural-temporal affiliation should be classified according to standard historical index types or, in the case of historical artifacts, manufacturers or places of origin. Human remains discovered during analysis should be immediately reported to the OSA.

Reporting

Formal reports for reconnaissance surveys are required for any project over 40 acres in area, over 1 mile in length, or for surveys that result in the discovery or documentation of potentially significant archaeological materials. For small, negative surveys, a **letter report** will suffice. The letter report must include the following elements: 1) a date, 2) the SHPO Review and Compliance file number if known, 3) the agency sponsoring the project, 4) a good description of the project and project area, 5) the date of the field survey, 6) the field methods used, 7) survey result, and 8) management recommendations. The Principal Investigator should sign the letter. Include a photocopy of a USGS map showing the project location with boundaries clearly defined. Be sure to include the name and year of the base map.

The general guidelines for reporting the results of Reconnaissance Surveys are outlined on pages 12-15. The report for a reconnaissance survey must document: 1) the boundaries of the area surveyed, including the number of acres examined, 2) the scope of the survey with regard to general class of property types involved, 3) a detailed explanation of the methods employed by the survey, 4) the kinds of archaeological properties located in the surveyed area, and 5) management recommendations.

Boundaries - The boundaries of the project area and any survey areas must be clearly explained and clearly outlined on a 1:1 scale photocopy of a 7.5' USGS map. If the project



involves a very large area or long linear corridor, a county index map or a large-scale USGS map should also be used to show general project location. Areas of intensive reconnaissance within large or long projects should be shown on USGS map photocopies. Some projects will require more than one map to cover the survey area. The survey map must depict and identify, by inventory number or field number, all inventoried properties. All non-USGS maps must have a scale and north arrow. All USGS maps must have the base map name clearly indicated and scale noted if not the same as the original scale. A UTM center point should be recorded for all projects less than 40 acres. For linear projects and areas over 40 acres, multiple UTM points defining the survey boundaries should be included.

Scope - If the survey involved a search for archaeological sites only, this should be stated in the Abstract and Research Design. If other types of properties are involved, such as buildings, structures, cultural landscapes, or traditional cultural properties, this should also be stated.

Methods - The report must describe and justify the methods used. For example, why or why not the archaeologist did or did not conduct subsurface tests or survey particular areas. The percentage and character of surface visibility throughout the survey area must be described. The exact locations of pedestrian survey or shovel tests need not be documented on negative surveys involving large areas, but areas of intensive survey should be plotted on maps or described in enough detail to relocate.

Properties Located - The report must discuss all Precontact and Contact period sites located and all potentially significant Post-Contact sites as discussed in the section on Historical Archaeology (pages 18-20). Comparison to similar sites in the region is helpful in determining potential.

Management Recommendations – This section must include a recommended finding (e.g., No Historic Properties Affected) for Review and Compliance surveys and recommendations for additional archaeological work if sites are encountered and cannot be avoided by a development project. Preliminary site significance evaluations of any properties examined are also appropriate for Phase I surveys as they will help justify and direct additional archaeological work and assist project sponsors in planning.

When making even preliminary eligibility recommendations, investigators must support these recommendations by applying National Register significance criteria and integrity considerations. Some sites can be determined Eligible or Not Eligible based on the results of a reconnaissance survey alone. The presence of features, artifact density, historic context association, site disturbance, and site location can be used to support eligibility determinations based on even limited fieldwork.

For example, if a surface reconnaissance of a cultivated field that has clearly been plowed to glacial till and possesses excellent surface visibility yields only a few undiagnostic artifacts (e.g., lithic waste flakes), the site is probably not eligible for the National Register. A site documented by shovel testing in a relatively undisturbed area that has yielded diagnostic artifacts in numbers that could be used to answer important research questions could be determined eligible without intensive testing. It is always the right of the landowner or sponsoring agency to challenge any eligibility determination, but this would generally require additional archaeological work.

Reconnaissance surveys of large areas or long transects that utilized site locational models in their research designs should evaluate the validity of the models in the report management recommendations. This may assist future surveys in the same region in locating sites and assessing the need for new surveys based on project locations.



Site inventory forms (Appendix A) must be completed that contain precise locations for all identified properties, including a USGS map (1:1 photocopy) of each site separate from the map provided in the report text. Locational information must include a legal description (Section, Township, Range) down to at least the quarter, quarter section.

For sites under 10 acres in size, a single UTM point at the approximate site center also needs to be listed on the inventory form. For larger sites and sites with complicated boundaries (e.g., linear features), multiple UTM points should define the site limits. The non-centroid UTM points can be included in the *Other Locational Information* section of the state site form. The method of determining the UTM coordinates should also be listed (GPS, USGS map manual plot, computer conversion program).

Refer to the section on Historical Archaeology (pp. 18-20) regarding when to fill out site forms for historical archaeology sites from the recent past. Projects that involve History/Architecture surveys will also need to fill out appropriate inventory forms as described in the SHPO History/Architecture project manual.

GUIDELINES FOR CONDUCTING INTENSIVE (PHASE II) SURVEYS

Introduction

Intensive or Phase II Surveys can incorporate two basic objectives: to evaluate the importance/eligibility of a site and to gather detailed site information to help design a data recovery plan should treatment be necessary. Such surveys can also better define the vertical and horizontal limits of a site. Intensive survey requires extensive fieldwork that usually involves the excavation of formal units (1x1 m or larger) and a level of analysis not expected in reconnaissance surveys. Information from a Phase II survey could also be used to complete a National Register of Historic Places (NRHP) nomination.

As discussed at the beginning of the Phase I survey section, the SISG has slightly different definitions for the various stages of archaeological projects. Intensive survey is part of the identification stage in the SISG where enough information about a site is gathered to complete an evaluation. According to the SISG, evaluation is not a survey but an application of basic principles for significance determination to already gathered data. The survey phases in the Minnesota SHPO manual are designed to meet management needs for projects and intensive survey may not be necessary if identified sites are avoided by project impacts.

The SHPO requires that NRHP criteria be used to evaluate a site's importance. This means that a site must be evaluated under one or more of the four NRHP significance criteria (A, B, C, D) and NRHP integrity conditions must also be applied. The only exception is a local project where local criteria may be developed to list a site on a local historic register when state



or federal historic preservation laws do not apply. The SHPO does not require that an NRHP form be filled out to evaluate eligibility.

In order to evaluate eligibility, a representative sample must be obtained from the site or at least the limits of the site within the project area. This does not mean, however, that the entire site must be sampled utilizing intensive recovery techniques. If the Phase I survey, the site topography, and the site's land-use history suggest that a relatively uniform pattern of artifact distribution and integrity exists throughout much of the site, a limited number of test units may serve to evaluate a large site as well as a small site.

Although any archaeological survey on human burial sites needs to be carefully coordinated with the State Archaeologist and, in the case of Indian burials, with the Minnesota Indian Affairs Council, burial sites potentially affected by federal undertakings must also be assessed for National Register eligibility. These assessments must take care to limit disturbance to burials so detailed literature searches, land-use histories, and field method selection are especially important for these types of sites.

If a site is determined to be not eligible or if effects to an eligible site can be completely avoided by a development project, then there is no need to better characterize the site for the purposes of a data recovery plan. If a potentially eligible site cannot be reasonably avoided by a project or if not enough information has been gathered for completing a required NRHP nomination, additional archaeological work may be necessary to properly characterize the site for the purposes of developing a treatment plan or completing the nomination. In rare cases, the characterization survey may produce enough information to mitigate the adverse effects caused by a project.

If there is any question as to the eligibility of the site following the evaluative stage of the survey, the SHPO archaeologist should be consulted prior to the characterization stage. Although the SHPO will give considerable weight to the Principal Investigator's and/or agency recommendations regarding a site's National Register eligibility, those recommendations must be supported by data and the SHPO may disagree with the Principal Investigator's and/or agency findings. If a site is considered to be not eligible by the SHPO and the regulating agency, there is no need for characterization. If a characterization survey of an eligible site further suggests that preservation in place is clearly warranted or that a data recovery would be unreasonably expensive, project alternatives may be explored. If a site is determined to be eligible, the preferred management recommendation is always avoidance of adverse impacts.

It is usually inappropriate to recommend archaeological monitoring of an archaeological site during construction activity as a site discovery, site evaluation, or site characterization technique. If no sites have been found by a survey employing reasonable methods or if reasonable methods fail to justify a site's eligibility, then the review process is at an end and the project can proceed if there are no other objections. If unanticipated archaeological materials are encountered during construction projects, the sponsoring agency should consider the importance of these materials and treat them accordingly as specified in 36 CFR 800.13.

Research Design

Evaluation

The first objective of most intensive archaeological surveys is to evaluate a site's importance with respect to National Register eligibility. Eligibility is based on a combination of the site's inherent significance and its current integrity. Without carefully examining both these factors, eligibility cannot be assessed.



Ideally, the entire site should be assessed for eligibility, not just the portion in the project area. This often causes difficulties when a project's APE does not include the entire site and the sponsoring agency is unwilling to fund survey of any areas outside of the APE, especially off its property. If survey of the entire site is not possible and important areas of the site are suspected to exist in unsurveyed areas, assume that the entire site may be eligible if the portion in the APE is eligible unless integrity has been severely and obviously compromised in the unsurveyed areas. If the surveyed portion of the site is clearly not eligible, treat the surveyed portion as a non-contributing element of an eligible site rather than suggest the entire site is not eligible unless this is obvious based on integrity factors.

Any researcher investigating the eligibility of a site must be familiar with National Register criteria of significance, the seven aspects of integrity (see below), and all applicable National Register bulletins. If a researcher is willing to declare a site eligible for the National Register, that researcher should be able to write a National Register nomination for the property. The researcher should also be aware of applicable Multiple Property Documentation Forms (MPDFs). MPDFs define historic contexts, property types, and registration requirements. The Minnesota SHPO has completed MPDFs for Precontact Earthworks, Native American Rock Art, Shipwrecks, and Logging properties. A draft Lithic Scatter MPDF is also available

Evaluation of an archaeological property is most efficiently made using the following sequence: 1) classify the property as a district or a site; 2) determine the associated historic context(s) of the property; 3) determine if the property is significant within Criteria For Evaluation A, B, C, and/or D; 4) determine whether the property retains sufficient integrity; and 5) determine if the property represents a type of property usually excluded from the National Register because of Criteria Considerations (e.g., cemetery). If a property has obvious and considerable integrity problems, however, the other steps in the evaluation process can be bypassed.

Significance cannot be determined without considering the site's historical or thematic context and without having a firm understanding of the regional environment, the regional cultural/historical sequence, traditional historical index artifact types, previous archaeological work in the vicinity, the general number of sites of the same historic context and type, and National Register requirements for specific property types.

Generally, archaeological properties are found significant under Criterion A (historical events or patterns) and/or D (research potential), although sites associated with the Post Contact Period should also consider Criterion B (important person). Criterion C (design) is rarely used with Precontact archaeological sites, but notable exceptions are sites containing earthworks or rock art. Different significance criteria can lead to different effect assessments and treatment options. Most eligible archaeological sites should be significant under both criterion A and D because research potential is mostly clearly demonstrated when a site is related to particular historic contexts.

If Criterion A is used to justify eligibility, the investigator must be especially familiar with Minnesota's historic contexts. A single component Precontact site is often more valuable to archaeology than a multiple component site because extensive bioturbation in most areas of the state tends to vertically mix artifacts so it is difficult to ascribe particular artifacts to their original context. Where bioturbation is not a major problem, multi-component sites can be invaluable for determining regional sequences.

If Criterion D is used to justify eligibility, it is not enough to state that a site has research potential. The site must clearly contain recoverable information necessary to answer *important*



research questions. In order to frame the research topics, the investigator should consider: What kinds of information is the site known to contain? How could this information be used to answer important research questions? Can archaeological examination recover a sufficient quantity and quality of information to answer important research questions?

A Precontact site lacking ceramics and other temporally diagnostic artifacts, could indeed have been left by Paleoindian or Archaic inhabitants of Minnesota, but without datable materials or temporally definitive artifacts there is little support for declaring the site eligible for the National Register unless it possesses exceptional qualities such as extensive exotic raw materials or an especially high density of artifacts. If a reasonable effort has been made to archaeologically examine a site and the site cannot be firmly assigned to a historic context or time period, then additional work at the site cannot be justified for Review and Compliance purposes even if it will be destroyed by a development project.

Even sites that can be assigned to a historic context are not inherently eligible to the National Register. If the site will only produce redundant information or if preliminary research has suggested that the materials or features needed to answer important research questions are simply not present, then the site should not be considered eligible.

The evaluation of **integrity** is somewhat subjective, but it must be grounded in an understanding of a property's physical features and how they relate to its significance. The retention of integrity is fundamental for a property to convey its significance. The seven kinds of integrity are: 1) location; 2) design; 3) setting; 4) materials; 5) workmanship; 6) feeling; and 7) association. To retain sufficient integrity to be eligible a property must possess several, and usually most, of these qualities. With regard to archaeological sites significant under Criterion D, the most critical aspects are location, materials, and association. For Criterion A, setting and feeling are also important.

In general, eligible archaeological sites need diagnostic artifacts, features, and intact cultural horizons where artifacts and features retain some vertical and horizontal locational integrity. A surface site could be eligible if it was associated with a rare property type or poorly understood context, especially if original horizontal patterning was still evident. This patterning could be demonstrated by a controlled surface collection. The impact of past surface collecting by avocational archaeologists should also be considered especially with respect to the removal of diagnostic artifacts.

For more common property types and better-known contexts, sites lacking features are less likely to be eligible than sites with recognizable features. Precontact features that are especially valuable are hearths with datable charcoal, trash pits with diverse and abundant materials, and post-molds suggesting structures. For most Post-Contact sites, features such as wall ruins tend to have little research value and are better assessed under Criterion A.

Once significant archaeological materials with sufficient integrity have been found at a site then detailed and *important* research questions can be framed. These questions are developed by considering how the site data could contribute to the general understanding of the history or prehistory of the United States, Minnesota or a particular region, how these data might contribute to the resolution of research questions raised by the statewide comprehensive historic preservation plan, or how detailed examination of the site could make a significant contribution to the study of archaeology.



Characterization

If the purpose of the Phase II survey is to better characterize a site in order to develop a treatment strategy or to complete a National Register nomination, the research design should focus on the following aspects:

- A. What are the contributing and non-contributing areas of the site?
- B. What areas of the site will yield the best archaeological information? (i.e., what are artifact densities vertically and horizontally, where are features located)
- C. What recovery methods will yield the best information and be cost effective? (e.g., unit sizes, screen mesh sizes, numbers of units, specialized techniques)
- D. What types of *important* research questions can be most effectively addressed? (e.g., subsistence, seasonality, cultural affiliation, chronology, technology)
- E. What difficulties will treatment activities encounter? (e.g., deeply buried horizons, difficult to screen soils, high water table, utility lines, etc.)

Literature Search

Literature searches for intensive surveys should follow the general guidelines previously discussed in this manual. As previously noted, the purpose of a literature search is to help frame and answer the questions posed by the research design. In the case of evaluation surveys, the literature search is aimed at helping to discover the site's significance and its ability to convey that significance through its integrity. Because significance is based on context association, an evaluative literature search should examine standard culture histories for the region as well as contract completion reports and articles on recent work at local or regional sites. Studies that include other site evaluations in the same region should be of particular importance. Evaluation surveys must use and cite the appropriate National Register bulletins, Multiple Property Documentation Forms, and the appropriate Minnesota Statewide historical contexts.

Characterization of eligible sites for the purposes of constructing a data recovery plan or completing a National Register nomination usually needs to expand the scope of the literature search as well as expanding the scope of the fieldwork. Previous data recoveries in the region should be examined to help determine appropriate field methods and research questions.

Field Procedures

Intensive or Phase II survey usually requires the use of formal test units that allow the investigator to better assess the soil stratigraphy, types of artifacts present, vertical artifact densities, potentials for features, site extent, and site condition. The minimal test unit size is generally one meter square. Controlled surface collections of sites with sufficient soil exposure to discover horizontal patterning, remote sensing survey to find features, and coring to better document deeply buried horizons are also standard field techniques on intensive surveys. If more than 10 square meters of formal units are proposed for evaluation alone, the SHPO should review the research design prior to the initiation of fieldwork.

The use of tight-grid ($\leq 5\text{m}$ interval) shovel testing should also be carefully considered because it can inappropriately damage the integrity of a site. This is especially true if the purpose of the intensive survey is just to assess eligibility. Shovel testing generally does not allow for precise vertical control or discerning particular types of features. During the characterization phase of an intensive survey or a data recovery, however, tight-grid shovel testing may be needed to locate features or find artifact concentrations.



The number of test units will vary by the contextual association of the site, size of the site, the site's condition, and the survey objective. A single unit may be enough to determine a site eligible if that unit clearly demonstrates a site's research potential and the site appears to possess sufficient and uniform integrity. In general, however, most archaeological sites will need several test units to assess eligibility. Additional units may be necessary to characterize the site for the purposes of developing a data recovery plan. Characterization surveys need to fully assess the kinds, quantity, and quality of archaeological materials a site is capable of yielding. If soil samples are removed, they should be processed using fine screening and flotation to determine if small animal bones and plant remains are present.

Test units must be mapped with respect to a datum that can be readily re-established. The datum should be located outside of the construction limits and it should be tied into a permanent local landmark, construction plans, or an accurate GPS fix.

No heavy equipment should be used to evaluate or characterize a site without consultation with the SHPO and, in the case of state sites, the OSA. Inappropriate testing of a site will be considered an adverse impact on the site and may require Advisory Council involvement. Excavators must also be aware of OSHA regulations with regard to the safety of deep test units, especially when heavy equipment is being used.

Human remains discovered during fieldwork should be left *in situ* and immediately reported to the State Archaeologist and local law enforcement authorities.

Field documentation should include daily log sheets, photographic logs, and sketch maps. Soil profiles should be recorded for each formal test unit and include color, texture, and structure. Level forms can be used to record information on each arbitrary or natural level in formal units and recovered artifacts should be placed in provenience labeled bags by level or feature. Feature forms should describe features within formal units.

Laboratory Analysis

Cleaning and labeling techniques should be pre-approved by the ultimate curatorial institution. Individual artifact numbering and artifact reconstructions (e.g., ceramic vessels) should be avoided.

The level of artifact analysis depends on the objectives stated in the research design and whether or not the purpose of the intensive survey is to assess the eligibility or to characterize the site for possible treatment. All recovered artifacts should be carefully examined in order to make an accurate assessment as to site context and function. Diagnostic artifacts (e.g., rim sherds, projectile points) used to determine cultural/temporal affiliation should be classified according to standard historical index types or in the case of historical artifacts, manufacturers or places of origin. Lithic raw material types based on source locations should be suggested. Preliminary examinations of floral and faunal material need not attempt to identify each species, but suggest what general categories are present (e.g. large mammals, small mammals, fish, birds, mussels) and the state of preservation. Analysis for characterization purposes should go into more detail with regard to types, quantity, and quality of artifacts at the site.

Human remains discovered during laboratory analysis should be immediately reported to the State Archaeologist.

Reporting

Reporting should follow the general guidelines discussed earlier in this manual. An intensive evaluation survey should focus on the kinds of properties identified, the boundaries and



appearance of the properties, survey and excavation methods, including the number of acres surveyed and square meters excavated, and the significance and integrity of the resources. The report must also contain updated inventory forms, a photocopy of a USGS map showing the property's location, a sketch map showing site boundaries, the exact location of excavation units, and locations of proposed disturbances or other project effects. Include a north arrow and scale.

For evaluating the eligibility of a site, it is important to discuss the major physical characteristics of the property. Discuss the land use history of the property and assess its impact on site preservation. Discuss the various impacts that have either served to enhance or detract from the integrity of the site. Note non-project related threats to the site.

Discuss the archaeological nature of the site. What are the types of artifacts found? Where were they located? Does the site contain a subsurface component not manifested on the surface? Are there noteworthy artifact concentrations? Does the site contain contributing or non-contributing features (i.e., outbuildings, depressions, trash dumps, etc.)? Include these features on the site map and as part of photographic documentation of the site.

Discuss the methods used for the survey. Which methods were most effective for evaluation and characterization? What is the general cultural history of the site and how does the site relate to the historic contexts in the state comprehensive plan for historic preservation? Are there datable materials and can they be used to help establish a time frame for the site's occupation? What types of written, oral, or photographic documentation are known for the site?

Is the site eligible for inclusion on the National Register of Historic Places? Whether it is or is not eligible, justify your conclusion. If eligible, state the applicable National Register criteria and the historic contexts that the site is addressing. Carefully evaluate the site's integrity and state what National Register aspects of integrity the site retains (e.g., setting, feeling, materials, etc.). Clearly identify any non-contributing areas of the site and justify why they are non-contributing.

If characterization was completed for a possible data recovery, provide a preliminary research design including research themes to be addressed, field and laboratory methods to be employed, and personnel required. Some preliminary suggestions as to the number of units needed to mitigate adverse effects should be stated. Justify the recommended methods and techniques.

GUIDELINES FOR CONDUCTING TREATMENT (PHASE III) ACTIVITIES

Introduction

For the purposes of this manual, a **Treatment Activity** is considered to be the same as a **Phase III** archaeological project. In this sense, treatment of archaeological sites involves data recovery following a carefully developed plan. Treatment can also include non-excavation alternatives such as preservation easements and National Register nomination, but these options are not discussed in this manual.



The SISG do not have a section devoted exclusively to archaeological treatment activities, but discusses them under Archaeological Documentation. In May of 1999, the ACHP published "Recommended Approach for Consultation on Recovery of Significant Information from Archaeological Sites" (*Federal Register* Volume 64, No. 95, pp. 27085 - 27086 May 18). This was published in conjunction with the issuance of new 36CFR800 regulations. Investigators for Section 106 projects are encouraged to review these guidelines.

Archaeological Phase III investigations are usually carried out to examine a site in detail and recover extensive data in order to mitigate the adverse effects of a construction project. Such investigations most often involve excavating extensive formal units, employing fine-scale recovery techniques, and subjecting recovered artifacts to detailed analysis. Phase IIIs can also include completing controlled surface collections when only horizontal integrity remains at an eligible site. Archaeological monitoring of construction activities at eligible sites can be part of a treatment activity if called for in a data recovery plan.

On projects reviewed by the SHPO under federal or state laws, data recoveries and other treatment activities cannot proceed until the SHPO has reviewed a detailed treatment plan. On federal Section 106 projects, a Memorandum of Agreement (MOA) first should be signed by the federal agency and the SHPO and before a final treatment plan is even submitted for review.

Data Recovery Plans

Data Recovery Plans (DRPs) for treatment activities are usually stand-alone documents that are submitted by the sponsoring agency to the SHPO prior to the initiation of fieldwork. This is often specified in a Memorandum of Agreement (MOA) that is required under Section 106 when there is an adverse effect to an eligible property. The DRP is generally written in response to a Scope of Work or Request for Proposals (RFP) issued by a regulating agency.

Data Recovery Plans must not only contain the standard elements of a Research Design discussed earlier, but the following elements as well: a project description, a description of all affected properties, the results of previous research relevant to the project, a justification of the cost-effectiveness of the field and laboratory methods, procedures for evaluating and treating unexpected finds (e.g., human remains), curation arrangements, methods to keep Indian tribes, local governments and other interested parties informed, a reporting schedule, and methods to present the final results to the public and professional peers in a timely manner.

Research Design

The research design for a data recovery should follow general recommendations listed on pages 8 - 9 of this manual and address any specific requirements listed in the project MOA. The research objectives of the treatment activity must be clearly defined. Is the purpose to mitigate adverse effects of a project upon an eligible archaeological site or is it just to explore the archaeological value of a site?

Once the objectives have been defined, methods must be discussed and justified. Clarification of any specialized or unique archaeological methodologies must be detailed in the research design for the project. The best research designs are innovative and flexible in order to deal with initial field findings and unanticipated field conditions. They may also involve phasing to eliminate excessive fieldwork or analysis if recovery expectations are unfulfilled. Recovered materials that are not being addressed by project research questions should not be discarded without careful consideration of their future research value.



Literature Search

Literature searches should follow the general guidelines discussed earlier in this manual. An extensive References Cited section is expected because a detailed understanding of the regional cultural and environmental history as well as archaeological method and theory is necessary. Standard culture histories for the region and the Upper Midwest should be examined, as well as contract completion reports and journal articles on recent work at other relevant sites. Studies that include treatment activities should be of particular importance. The literature search for a treatment activity significantly differs from those associated with reconnaissance and evaluation surveys in that the Principal Investigator must demonstrate not only a familiarity with the region, but with the scientific method and sound archaeological practices.

Field Procedures

Field methods for the treatment of archaeological sites exhibit the most diversity and are the most expensive to implement. There is no standard formula for the amount of excavation based on the area of the site being affected, although this is a factor in determining the number and type of excavation units. Other factors include the depth of the site, artifact densities, the presence of and type of features, the cultural context, soil type, and nature and extent of the adverse effect.

Human remains discovered during fieldwork should be left *in situ* and immediately reported to the State Archaeologist.

Field documentation should include daily log sheets, photographic logs, and sketch maps. Soil profiles should be recorded for each formal test unit and include color, texture, and structure. Level forms can be used to record information on each arbitrary or natural level in formal units and recovered artifacts should be placed in provenience labeled bags by level or feature. Feature forms should describe features.

Formal Unit Excavation

If excavation of formal units is the principal data recovery technique, these units should be no smaller than 1-meter square and should be laid out on a grid system tied into a permanent GPS-defined datum. The datum should be located outside of the construction area and tied to construction plans. Vertical and horizontal measurements should be metric.

When features or artifact concentrations are encountered, contiguous meter square units should be opened and taken down together to obtain a better “window” into the site and to maximize data recovery. Configuration of the units is best determined by the Principal Investigator following the excavation of a number of initial test units. The use of soil balks between units or in the corner of units is also the decision of the Principal Investigator, although the use of balks is unnecessary if the site lacks a complex soil stratigraphy.

In Minnesota, many sites do not exhibit visually obvious cultural stratigraphy so excavations often utilize arbitrary levels to maintain vertical control. Phase II examination of the site should have ascertained appropriate excavation level thicknesses or if obvious stratigraphic layers exist. For arbitrary levels, five or 10-centimeter levels are the most commonly used.

In settings where the upper horizon of a site has been severely disturbed (e.g., cultivated), it is permissible to remove the disturbed horizon as a single layer, but this needs to be specified in the data recovery plan. Some consideration may need to be made of the artifacts within this disturbed horizon (e.g., controlled surface collection), unless they are clearly non-contributing to the site’s eligibility.



If an archaeologically insignificant modern fill deposit overlies intact archaeological deposits, mechanical removal of the overburden may be necessary. If used, this technique should be described and justified in the research design. Artifacts within fill layers determined to be originally from the site being excavated may still have value in answering research questions, however, and they should not be discarded without proper consideration and justification.

One-quarter inch mesh should be the maximum screen size used to sift excavated soil. Deviations from this must be well justified in the research design. Smaller screen sizes are encouraged if soil conditions permit. Fine-mesh screening and flotation of features should be done, utilizing water separation methods. The size of the mesh should be specified in the research design and related to expected results. Standard nested screens can be used early in the process to determine appropriate sizes. Whether or not soil samples are to be retained should be described in the data recovery plan. A discard protocol should also be developed for items like fire-cracked rock.

Detailed field notes accompanied by black-and-white photographs, color slides, and/or digital images are expected during Phase III excavations. Photographs should include mortarboards listing the site number, unit, level, view direction, and date. The vertical and horizontal provenience of recovered artifacts must be carefully maintained in the field and in the laboratory. Features as well as typical sections of the stratigraphy should be sketched and photographed. Level forms should be carefully and consistently completed.

Other Techniques

If the site is largely an artifact scatter in a cultivated field, **controlled surface collection** followed by **grading monitoring** are the most cost-effective techniques for data recovery. Two controlled surface collections are recommended with soil turnover intervening and adequate weathering preceding each collection. If a controlled surface collection was completed as part of the Phase I or II survey, this will suffice for one. Transect spacing should not exceed two meters. Artifact locational controls should utilize exact piece-plotting when artifacts have low or moderate densities and grid squares for high density sites. Control grids should not exceed 5 square meters. For especially dense sites, sampling is permitted, although all potentially diagnostic artifacts should be recovered. A few formal test units should be excavated to better assess overall artifact density.

When archaeological **monitoring of heavy equipment stripping** of the site during or prior to construction is required, a monitoring plan should be submitted as part of or as a supplement to the data recovery plan. The monitoring plan can be altered following the completion of the archaeological controlled surface collection or excavation. The monitoring plan should include timing of the survey, methods of grading and surface reconnaissance, and data recovery strategies if significant materials are encountered. Wheeled vehicles (e.g., graders, belly scrapers) are recommended rather than tracked vehicles (e.g., bulldozers) to complete the stripping as they leave a cleaner surface, although tree roots in some areas may require the use of a tracked vehicle.

Laboratory Analysis

The purpose of a data recovery is to recover data, but data are not the same as artifacts. Artifacts are of little value unless they are carefully analyzed. Once they are analyzed they become data. Regardless of the formal research questions, some basic analysis should be performed for all recovered artifacts, although analytical techniques should be focused on answering questions outlined in the research design. Cleaning and labeling techniques should be pre-approved by the ultimate curatorial institution.



Ceramics are generally the most useful artifacts for determining cultural/temporal affiliation (context) from Precontact archaeological sites. Basic counts and weights of sherds by size grades and analytical categories (e.g., rims, near-rims, body sherds) should be presented in tabular form according to provenience. Sherds used to determine cultural/temporal affiliation should be carefully described and classified according to standard historical index wares, types, and varieties, although new types can be defined. Manufacturing techniques (e.g., thickness, temper, surface treatment, vessel form) and decorative modes should be carefully described. The number of vessels present should be determined. Sherds should be carefully examined for charred encrustations useful for dating or dietary analysis.

Lithic artifacts are the most commonly recovered items from Precontact archaeological sites in Minnesota. Projectile points are the most useful stone tools for determining cultural/temporal affiliation so they should be carefully described and classified according to standard historical index types. Other formed tools should also be carefully described and classified by function or type. Broken to complete tool ratios should be presented or fracture analysis undertaken to suggest use-phase or life cycle. Lithic raw material types and percentages based on source locations should be determined. Debitage should be examined to determine basic technology (e.g., core, blade) and be size graded and examined for cortex presence. Cores should be identified. Ground stone tools should be categorized by function and/or standard typologies. Ground stone should be carefully examined for pigments and other residues prior to washing.

Faunal analysis should identify what species and elements are present. Minimum numbers of individuals and amounts of edible meat for each species should be determined. Epiphyses, teeth, and fish scales should be examined to help determine seasonality. Weight percentages of burned versus unburned bone based on provenience should be determined. Bone should be carefully examined for butchering marks and polishing suggesting tool use.

Floral analysis should attempt to determine species, especially for charred seed remains of cultigens. Species identification of wood charcoal is not necessary unless it has direct bearing on research questions. Organic materials suitable for radiocarbon dating should be handled carefully to avoid contamination. Pollen survival in terrestrial environments is usually poor, but investigators should be aware of its applicability to some research questions. Opal phytolith analysis is also a research option.

Other artifacts such as copper, bone tools, and shell tools should be carefully described and classified using standard typologies. Determining the source for the copper may have bearing on research questions. Fire-cracked rock (FCR) may be discarded in the field, but its location and raw material type should be carefully recorded; weighing prior to discarding is recommended. Some FCR can be used as expedient tools, a fact which may escape casual field inspection so the retention of some sample of the FCR is advised. Reasons should be presented why rock is assumed to be fire-cracked.

Historical artifacts such as ceramics and bottles are important in determining the absolute age of Contact and Post-Contact sites if manufacturers or places of origin can be ascertained. These artifacts are also useful for determining site function, assigning historic context associations, and answering other research questions. Curatorial needs of artifacts made of ferrous metals or organics need to be given careful considerations, especially if removed from wet environments. Historical artifacts include a wide range of artifact types that need to be carefully considered by research questions and the appropriate level of analysis applied.

Human remains discovered during laboratory analysis should immediately be reported to the State Archaeologist.



Reporting

The general guidelines for reporting should be followed as outlined earlier in this manual. In addition, Treatment Activity/Phase III reports need to include detailed overviews of the regional environmental and cultural history and a summary of previous archaeological research in the region as well as detailed analyses of artifacts and features. The analysis should focus on questions posed in the research design, but discussion of unexpected results and additional questions that were developed during the excavation should also be included. Synthetic analysis of how the site fits into the regional culture history should be an important part of the conclusions.

Extensive use of illustrations is encouraged depicting site morphology, excavation techniques, diagnostic artifacts, and explanatory aids such as charts, tables, and graphs. The References Cited section is expected to be robust. It is especially important to follow the *American Antiquity* style guide for Phase III reports.

Phase III reports need not be burdened with excessive appendices. If agencies require detailed artifact catalogues or field notes, they can be submitted separately. Appendices should include copies of reporting sheets from radiocarbon laboratories and analytical specialty reports that have been summarized in the report body.

Some form of public reporting is strongly recommended for all archaeological data recoveries. Public reporting refers to making important information easily accessible to the general public and to other professional archaeologists. The most convenient and cost effective way of accomplishing public reporting is on an internet web page.

GUIDELINES FOR MANAGEMENT PLANS

Introduction

Historic Resources Management Plans (HRMPs) provide guidance to agencies and other landowners as to how to best consider, protect, and, in some cases, interpret historical and archaeological properties that exist on their lands. These plans are often called Cultural Resources Management Plans or CRMPs, but technically a CRMP would have to include consideration of all culturally significant information such as non-historic sacred sites and language that are not considered under Section 106 of the NHPA and thus are not an official concern of the SHPO. Some HRMPs are responses to specific undertakings while others simply represent general management strategies.

HRMPs establish standardized procedures that landowners or managers can follow without being CRM professionals. The plan should avoid the use of overly technical language or historic preservation jargon. Plan writers should remember that the most important element of a well-written management plan is careful consideration of the ability of the agency or landowner to carry it out.

Careful and comprehensive consultation with interested individuals and groups is a critical part in developing HRMPs. The SHPO, OSA, THPO, Indian communities, members of



the public, and other groups who have concerns for the preservation of historic resources need to be contacted early in the process and should stay involved throughout the development and implementation of the plan.

Prior to the completion of an HRMP some inventory of potential historic properties should be completed in order to anticipate the scope of historic contexts, site conditions, and property types involved. A complete reconnaissance survey is not necessary prior to drafting the HRMP. Evaluations of sites need not be completed prior to the completion of the HRMP, although the plan should anticipate such work.

The HRMP should include consideration of all potential historical resources not just archaeological sites, therefore more than archaeologists should be on the planning team. Team members should be familiar with the mission and operations of the landowner or agency, historic preservation laws and practice, the types of historic properties which may be considered, and the management and treatment issues specific to the properties included in the HRMP. Team members should meet the SISG's professional qualifications standards for the various areas of expertise.

HRMP SECTIONS

Introduction

Begin with a statement of purpose describing whom the plan is for, what it will cover, how it will be used, and why it is being done. This is the planning context. Discuss whether it is part of the agency's or landowner's mission to consider impacts to archaeological sites or it is simply a regulatory requirement. State the agency's mission and list the legal and regulatory basis for the plan. Identify all potentially interested parties who were consulted and state why they were consulted. The contents of the HRMP should be briefly summarized.

Background Information

Establish and justify the Area of Project Effect (APE) if the HRMP is based on a particular undertaking. APE definition is relatively simple when it just involves a parcel of land owned by a particular agency, but when project effects extend beyond the managing agency's ownership lines, defining the APE is more complicated. Remember if archaeological sites are eligible under National Register criteria other than D, project effects can involve impacts occurring outside of the site limits. Include a map clearly showing project, ownership, or management boundaries.

Provide a description of the various types of historic properties known or expected to occur within the project boundary. Explain why these properties are important. List the historic contexts that the properties represent. Describe the surveys that have been completed and assess their quality. Describe how inventory information is stored and accessed by the agency.

Identify a staff position at the management agency that has been given the responsibility for implementing the plan, assuring that it is properly carried out, and making any necessary updates. This person should be on the planning team that develops the plan.

Management Goals

Provide the preservation goals, priorities, constraints, and standards that will guide the implementation of the plan. Pay particular attention to historic resources that are listed on or have been determined eligible for the National Register of Historic Places. Describe the



philosophy guiding the management of historic properties within the project area and how it relates to management decisions made by the agency or landowner. Note which survey standards will be followed for inventory, evaluation, and treatment activities.

Management Measures

Identify the activities and practices that are subject to management review because they may have effects on historic properties. Also list and describe activities that are exempt. Describe procedures that will be used to assess project effects on archaeological sites. Include monitoring protocols with schedules and who will perform the work. Anticipate responses to emergency situations both with regard to site stabilization and minimizing harm to sites caused by emergency responses.

If identification and evaluation surveys need to be done, provide a reasonable strategy for their completion. For large land areas with considerable unsurveyed land, develop a predictive model for site locations. Establish monitoring procedures to regularly update the status of vulnerable sites. Suggest conservation techniques that will help preserve sites (e.g., shoreline stabilization measures). If artifacts are recovered or exposed, include curation measures. If reconstruction or rehabilitation activities are planned, describe them. Have an unanticipated discoveries section.

Highlight elements in the plan that will help minimize harm to archaeological sites and promote proper utilization of known resources. Develop records management procedures so known sites in harm's way can be quickly determined (e.g., a GIS database). Consider public interpretive and educational opportunities.

Implementation Procedures

Designate a historic resources manager or coordinator. Include training procedures to make sure the agency or the landowner understand what the plan is attempting to do and how it should be done. Identify who needs to be consulted for the various actions in the plan. Outline internal decision making processes. Include procedures for dispute resolution.

Remember that the best plans anticipate change. Include a contingency for periodic updates or assessments of the HRMP. Continue to involve the various consultation parties in the implementation and updating of the plan.

Appendices

Include any executed Memorandum of Agreement (MOA) or Programmatic Agreement (PA). Include correspondence with the consulting parties.

PROFESSIONAL QUALIFICATIONS

Introduction

The Professional Qualifications Standards presented in the SISG are widely accepted as a basic requirement for Principal Investigators on archaeological projects. The State of Minnesota



has cited these standards in statute (138.31, Subd. 14), using them to define the basic qualifications for a “qualified professional archaeologist.” The State Archaeologist requires that Principal Investigators (PIs) meet these standards in order to obtain a license to work on non-federal public property in Minnesota.

The Minnesota SHPO requires the PI to meet the SISG qualifications standards for projects it sponsors and recommends these standards for PIs on other projects. For government-sponsored projects being reviewed by the SHPO under Section 106 or state laws, it is the sponsoring agency that must accept or reject archaeological work if the PI does not meet the SISG qualifications. The SHPO, however, assesses the professional qualifications of project personnel when it reviews agency projects and considers them under "reasonable and good faith effort" provisions.

The SHPO has some additional professional qualifications for doing specific kinds of archaeological work in Minnesota and also suggests minimum qualifications for other key personnel not covered by the SISG.

Principal Investigator – Basic Qualifications Standards

All archaeological projects must be carried out under the professional direction of a qualified Principal Investigator. The Principal Investigator is expected to complete the research design, assure that other project personnel meet minimal requirements, direct the various stages of the project, and assure that an adequate report is completed. In general, it is the responsibility of the Principal Investigator to assure the quality of the entire archaeological project. Actual participation in fieldwork and report writing can vary according to the scope of the project. The Principal Investigator need not directly supervise all fieldwork on Phase I surveys, but is expected to spend extensive time in the field on Phase II surveys and considerable time in the field on Phase III projects. The Principal Investigator need not be a co-author of Phase I reports, but should be a co-author on all Phase II and Phase III reports. The Principal Investigator’s name should always appear on the cover or title page of the report. Principal Investigators should sign letter reports.

The Principal Investigator must have a **graduate degree** in archaeology or a closely related field with a specialty in archaeology (e.g., anthropology) plus:

- at least one year's full-time professional experience in archaeological research or cultural resource management involving archaeology, and
- at least four month’s supervised (by a qualified professional) field and analytical experience in North American archaeology, and
- demonstrated ability to carry research to completion.

In addition, projects involving particular archaeological specialties must meet the Principal Investigator qualifications listed above and may be required to meet the additional specialty qualifications listed below. For terrestrial Phase I surveys, a Prehistoric Archaeologist or Historical Archaeologist can serve as the overall Principal Investigator, but for Phase II or Phase III work, the Principal Investigator should meet the additional qualifications standards if sites related to those specialties are involved. Underwater surveys must have an Underwater Archaeologist serve as Principal Investigator even at the Phase I level.



The archaeological Principal Investigator can also undertake preliminary assessments as to whether or not potentially eligible buildings, structures, or landscapes may exist within the Area of Project Effect. Only qualified historians, however, can perform complete History/Architecture surveys even at the Phase I level. If formal History/Architecture surveys are part of a cultural resource management project, the project historian should be listed as the co-PI.

Because most American archaeologists have degrees in Anthropology, archaeological Principal Investigators with such degrees can also undertake Phase I surveys for Traditional Cultural Properties (TCPs). This should be done with careful consultation with the appropriate cultural groups potentially associated with any TCPs. Principal Investigators for Phase II or Phase III TCP projects will need to demonstrate appropriate additional qualifications.

Principal Investigator – Specialty Qualifications Standards

For Prehistoric Archaeology:

- at least one year's supervisory experience in prehistoric site research, and
- at least three-month's experience at prehistoric sites in the Midwest.

For Historical Archaeology:

- at least one year's supervisory experience in historical site research, and
- at least three-month's experience at historical sites in North America.

For Underwater Archaeology:

- at least one year's supervisory experience in underwater archaeological research, and
- three-month's experience at underwater sites in North America.

Other Project Personnel

The Secretary of the Interior has not established standards for archaeological project personnel other than Principal Investigators. The Minnesota SHPO suggests the following minimum standards.

Field Supervisor - For Phase I surveys, a Bachelor's Degree in archaeology or a closely related field, along with one-year's supervised experience in the archaeology of the appropriate specialty and three-month's experience in a supervisory role. For Phase II and III projects, at least one year's experience in a supervisory role is required for the Field Supervisor.

Field Crew - Completion of an undergraduate archaeological field school or at least three month's field experience supervised by a qualified Principal Investigator.

Analytical Specialists - Demonstrated training and experience in the appropriate area of expertise. For example, **geomorphologists** should have sufficient training to evaluate the sedimentology, stratigraphy, and pedology of deposits in the field and be able to describe and analyze the deposits using standard terminology and methods. The geomorphologist should have completed or be near completion of a graduate degree in an earth science (geology, physical geography, pedology, Quaternary Studies), and have demonstrated expertise in geomorphology through experience and publications. Previous field experience in the Upper Midwest is recommended.



Appendices

- A. Minnesota Archaeological Site Form
- B. Minnesota Absolute Dating Form
- C. Minnesota Archaeological Regions



Rev.: 03.31.97

MINNESOTA ARCHAEOLOGICAL SITE FORM

OFFICE OF THE STATE ARCHAEOLOGIST
Fort Snelling History Center, St. Paul, MN 55111 (612) 725-2411

STATE HISTORIC PRESERVATION OFFICE
345 Kellogg Boulevard W., St. Paul, MN 55102 (651) 296-5434

OSA License #:

SHPO RC #:

Date(s) of Fieldwork:

New Site

Site Update

SITE #: 21-

Site Name:

Field #:

LOCATIONAL INFORMATION (*attach USGS topographic quad and sketch map with site location outlined*)

County:

City/Twp. Name:

SHPO Region:

USGS 7.5' Quadrangle Map (*name and year*):

Township:	Range:	Section:	¼ Sections (at least 2):
Township:	Range:	Section:	¼ Sections (at least 2):
Township:	Range:	Section:	¼ Sections (at least 2):

UTM Site Coordinates (*use 1927 datum; identify center point only*):

Zone	Easting	Northing
------	---------	----------

Other locational information:

SITE CHARACTERISTICS

Acreage: Site Dimensions (*both horizontal and vertical/depth, in metric*):

Features (*√all that apply*): earthwork depression foundation other none
describe:

Site Description (*√all that apply and describe*):

<input type="checkbox"/> single artifact	<input type="checkbox"/> artifact scatter	<input type="checkbox"/> lithic scatter	<input type="checkbox"/> earthwork/mound
<input type="checkbox"/> structural ruin	<input type="checkbox"/> rock alignment	<input type="checkbox"/> rock art	<input type="checkbox"/> cemetery/burial
<input type="checkbox"/> standing structure (SHPO structure # if known): _____			<input type="checkbox"/> other:

describe:

Inferred Site Function (*must specify*):

Current Land Use (*√all that apply*):

<input type="checkbox"/> cultivated	<input type="checkbox"/> woodland	<input type="checkbox"/> commercial	<input type="checkbox"/> unknown
<input type="checkbox"/> fallow	<input type="checkbox"/> recreational	<input type="checkbox"/> industrial	<input type="checkbox"/> other:
<input type="checkbox"/> grassland	<input type="checkbox"/> road	<input type="checkbox"/> residential	

Surface Visibility

excellent good fair poor none

Degree of Disturbance (*√and describe*):

minimal moderate heavy destroyed unassessed

describe disturbance type(s):

Current Threats to Site:

erosion development agricultural none known other:



SITE #: 21-

Site Name:

Field #:

Major Exotic Materials (*i.e.*, "exotic" relative to local area; √all that apply):

- catlinite native copper Hixton orthoquartzite
- Knife River Flint obsidian other:

Diagnostic Type/Information (*e.g.*, Brainerd ceramics, machine-cut nails; describe decoration, function, manufacturer, etc.):

- Ceramic
- Lithic
- Glass
- Metal
- Other

Additional information:

ENVIRONMENTAL DATA

Major Drainage System

- Cedar River Des Moines River Lake Superior Minnesota River
- Mississippi River (*N of MN River*) Red River Rainy River
- Mississippi River (*S of MN River*) Missouri River St. Croix River

Watershed Index Map no. (MnDNR, Division of Waters):

Distance to Existing Water Source (*per USGS topographic map, in feet or miles*):

Ancient/Formal Water Feature (*name, type and distance to such feature*):

Topographic Setting (√all that apply):

- | <u>Upland</u> | <u>Riverine</u> | <u>Lacustrine</u> |
|--|---|---------------------------------------|
| <input type="checkbox"/> general upland | <input type="checkbox"/> alluvial fan | <input type="checkbox"/> inlet/outlet |
| <input type="checkbox"/> bluff edge | <input type="checkbox"/> terrace | <input type="checkbox"/> peninsula |
| <input type="checkbox"/> hilltop | <input type="checkbox"/> stream-stream junction | <input type="checkbox"/> island |
| <input type="checkbox"/> glacial beach ridge | <input type="checkbox"/> bluff-base | <input type="checkbox"/> isthmus |
| <input type="checkbox"/> wetland | <input type="checkbox"/> cave/rockshelter | <input type="checkbox"/> shoreline |
| <input type="checkbox"/> other: _____ | <input type="checkbox"/> other: _____ | <input type="checkbox"/> other: |

HISTORIC SITES ONLY:

- Historic setting: rural urban other:
- Type(s): industrial commercial domestic government other:
- Historic transportation route (*e.g.*, road, waterway, rail); identify type, direction & distance:

OWNERSHIP INFORMATION

Ownership Type (√all that apply):

- federal state local tribal private unknown

Land Owner (*name and address*):

Significant historic owner(s) and period(s) of ownership, if known:

Year and Source of Ownership Information (*e.g.*, plat map, recorder's office, etc.):



SITE #: 21-

Site Name:

Field #:

INVESTIGATOR/REPORTER INFORMATION

Type(s) of Investigation (√*all that apply*):

reconnaissance evaluation data recovery other:

Methods/techniques employed (√*all that apply*):

informant report small diameter soil coring (\approx 1" diameter)

surface survey geomorphological survey (*specify*): _____

shovel testing geophysical survey (*specify*):

excavation units other(s):

Informant Name and Address:

Artifact Repository (*name and accession nos.*):

Report Citation:

Major Bibliographic Reference(s) to Site:

Principal Investigator (*name and affiliation*):

ADDITIONAL NOTES (*use space below or attach extra sheets, as needed*)

MAPS (*attach USGS topographic quad and sketch map with site location outlined*)

Form Completed by (*name and date*): _____



Minnesota Absolute Dating Form

SHPO 10/28/98

Site Number _____ Site Name _____ County _____

Type of Site (e.g., Mound) _____ Cultural Context _____

Material Dated: wood charcoal bone shell pot scraping wood
 other: _____

Site Context: pit hearth other feature general soil level sherd/artifact
 other: _____

Type of Date: Regular c14 AMS c14 OCR Thermoluminescence
 other: _____

Date BP _____ Standard Dev. (+/-) _____ Calibrated Age (2s) _____

Lab Number _____ Year Material Recovered _____ Year of Dating _____

Excavator/Principal Investigator _____ Institution _____

Submitted By _____ Date _____

Publication Reference _____

Comments:

Please attach photocopy of laboratory report form.

Return Form To: Scott Anfinson
State Historic Preservation Office
345 Kellogg Blvd. W.
St. Paul, MN 55102 651/296-5434 scott.anfinson@mnhs.org



Appendix C

