CULTURAL RESOURCES ARCHAEOLOGY

An Introduction

Second Edition

Thomas W. Neumann, Robert M. Sanford, and Karen G. Harry

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A Division of Rowman & Littlefield Publishers, Inc.
Lanham • New York • Toronto • Plymouth, UK

Published by AltaMira Press
A division of Rowman & Littlefield Publishers, Inc.
A wholly owned subsidiary of The Rowman & Littlefield Publishing Group, Inc.
4501 Forbes Boulevard, Suite 200, Lanham, Maryland 20706
http://www.altamirapress.com

Estover Road, Plymouth PL6 7PY, United Kingdom

British Library Cataloguing in Publication Information Available

Library of Congress Cataloging-in-Publication Data

Neumann, Thomas William.
Cultural resources archaeology : an introduction / Thomas W. Neumann, Robert M. Sanford, and Karen G. Harry. -- 2nd ed.
p. cm.
Includes bibliographical references and index.
ISBN 978-0-7591-1845-4 (cloth : alk. paper) -- ISBN 978-0-7591-1846-1 (pbk. : alk. paper) -- ISBN 978-0-7591-1847-8 (electronic)
1. Archaeology--Vocational guidance--United States. 2. Archaeology--Methodology. 3. Excavations (Archaeology)--Evaluation. 4. Historic sites--United States--Management. 5. Compliance--Evaluation. 6. Historic sites--Conservation and restoration--United States. 7. Historic preservation--United States. 8. United States--Antiquities--Collection and preservation. 9. Archaeology and state--United States. I. Sanford, Robert M. II. Harry, Karen G. (Karen Gayle) III. Title.
CC107.N48 2010
930.1--dc22

2009038593

∞ The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI/NISO Z39.48-1992. Printed in the United States of America

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PREFACE

Most archaeologists do not work in an academic setting, although they received their initial training there. Rather, most archaeologists work in the private sector or the government, either conducting or reviewing compliance work—some aspect of managing cultural resources. This text is a short, general summary of what that archaeological work involves and is meant to be a supplement to introductory archaeology and method-and-theory classes. It gives some sense of what a person needs to know—in addition to the standard classroom, field, and laboratory courses—to do archaeology after he or she gets out of college. It also serves as a guide for those who need to hire, work with, or review the work of archaeologists. It reflects what we have found to be useful in professional practice. A lot of that was never explained to us in college and still seems to be left out of textbooks. It is in response to that neglect that this text was written.

We have been doing Section 106–mandated archaeology for over a quarter-century. While we have taught in university settings, much of our careers have been spent either in archaeology firms or in government agencies overseeing environmental and historic preservation regulations. We have been fortunate to be natives of both the academic and the extra-academic worlds. Being members of those two cultures has also given us insight on what each needs from the other.

Within the university, students have told us numerous times how much they want to know where archaeology jobs are, what such work involves, and what they need to know to work in such settings. Outside of the university, employers and government regulators have time and again bemoaned the lack of exposure their new hires have to the professional

archaeology workplace. Recent graduates who are hired can, indeed, excavate; and they often do recognize how to apply processed archaeological data to research problems using the latest theoretical concepts. But they are in a fog about how to set up a survey, how to respond to a bid request and structure a budget, or how to allocate organizational resources. We find the majority of our students have never heard of the Section 106 Process, while those who have rarely understand it.

One recurring theme we have heard from our professional colleagues has been how much they would like to have their prospective employees know how extra-academic archaeology works. There are many things that full-time archaeologists need to be aware of—if not know—to work in the day-to-day compliance world. There are many wonderful method-and-theory texts and many field and laboratory method texts that explain how to do archaeology itself. However, left out of all of that is how the majority of people doing archaeology go about translating that course material into the professional workplace. And that, of course, is what we go over here.

Similarly, environmental professionals, developers, public officials, and interested citizens often have asked us to explain just what it is that a professional archaeologist does. Sure, they may know generally that a targeted development area "needs a Phase I," but they also want to know what that entails. This text also addresses that need for an explanation of how archaeology is done in service to environmental and historic preservation laws that affect development.

Last, we did not come to know about compliance archaeology and professional practice all at once. It has been quite a learning experience, believe us. We have certainly made our share of mistakes—and the best mistakes are worth making more than once! It only seems right that others benefit from our errors.

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Robert M. Sanford
Karen G. Harry

ACKNOWLEDGMENTS

Our editor at AltaMira, Jack Meinhardt, encouraged us to revise this book, providing instant and durable support. Assistant editor Marissa Parks guided us through the process. We greatly appreciate the external reviewers, especially Dr. Paul Demers, RPA, of the University of Nebraska, Lincoln. Thanks to Sebago Brew Pub (where Maine archaeologists gather). We thank the following:

- Dr. Nathan D. Hamilton, associate professor of archaeology and director, Summer Archaeology Program, University of Southern Maine. A number of Dr. Hamilton's current and former students also provided comments and suggestions for this revised edition.
- Dr. Mary Spink Neumann (behavioral scientist, Centers for Disease Control and Prevention, Atlanta)
- Robin Sanford (librarian, University of New England)
- Mark Slaughter, archaeologist, Bureau of Reclamation, Boulder City, Nevada
- Sarah Haugh, archaeologist, Tetra Tech
- Kevin Clark, archaeologist, R. Christopher Goodwin & Associates

For the first edition:

We greatly appreciate advice and assistance from the following people: Dr. Mitch Allen, Chad Braley, Dr. Paul Brockington, Jennifer Carden,

Angela Cronan, Dr. Dave D. Davis, Hester Davis, Thomas Gresham, Scott Hoffeld, Connie Huddleson, Dr. Benjamin Z. Freed, Dr. Nathan D. Hamilton, Dr. Joseph W. Joseph III, Amy Judd, Dr. Thomas F. King, David Lacy, Dr. Samantha Langley-Turnbaugh, Jerald Ledbetter, Dr. Francis P. McManamon, Paul F. Miller, Dr. Mary Spink Neumann, Paul Nordman, Peggy Nordman, the late Dr. James Petersen, Dr. Adrian Praetzellis, Robin Sanford, Dr. Richard S. Sanford, Virginia Wallace, and Thomas Wheaton.

Credits

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Photographs pp. 204, 206, and 207 (figures 7.1, 7.3, 7.4) provided courtesy of Paul Brockington and Brockington and Associates, Inc., Norcross, Georgia.

CHAPTER ONE
AN OVERVIEW OF PROFESSIONAL ARCHAEOLOGY

Introduction: Purpose and Overview

Archaeology in the United States has recently moved beyond the realm of universities and museums.[1] Today, about 80 percent of people employed as archaeologists work in private industry or as government regulators who often oversee the archaeological work of the private sector (Neumann and Sanford 2001:2–3). What caused this shift from an academic-based field to a government-regulated industry? Why should archaeologists be working outside of university or museum settings?

The answers to these questions rest in a series of historic preservation laws and mandates, beginning with the National Historic Preservation Act (NHPA) of 1966. Compliance with these laws and mandates often requires archaeological studies to be done as part of the construction and development process. The culmination of nearly a century of legislation and court rulings, the NHPA and subsequent laws require that archaeological work be done whenever Federal moneys, lands, or permits are involved in land-alteration projects (termed "undertakings"). For example, before a road could be widened using Highway Administration funds, or before a water treatment plant could be built in a floodplain where a U.S. Army Corps of Engineers 404 permit (issued under the Clean Water Act for dredge and fill activities in waters of the United States) is required, a Federal Agency is expected to check to see whether archaeological sites or other cultural resources important to the United States would be lost.

States eventually followed with counterpart legislation. In time, many counties and local municipalities also set up statutes and regulations that required an area to be checked for surface and subsurface

cultural remains before construction was done. Archaeology became an integral element in the maintenance and expansion of the physical infrastructure of the United States. This text explores what this profession of archaeology involves.

This first chapter briefly summarizes how what was once primarily a university- and museum-based field came to be an extra-academic profession in the United States.[2] The events of the past 150 years helped mold the relationship among the three archaeology realms—the academic sector, the private sector, and the government/public sector—as well as establish how and why things are done the way they are now.

Chapter 2 contains a brief summary of key environmental and historic preservation laws and how they work on an everyday basis in terms of practiced archaeology. Of necessity, we have glossed over many important aspects of these complex pieces of legislation but do refer the reader to appropriate sources that provide a much fuller treatment. We do include some aspects of contract and bid issues in this chapter, since these derive from compliance requirements.

Chapter 3 treats preparation of project backgrounds for any archaeological study. This is the first "methods" chapter. Well-developed background narratives on the environment and culture history are required parts of the overall archaeological compliance process.

Chapters 4, 5, and 6 discuss archaeological assessment steps in regulatory compliance. We use the commonly recognized terms Phase I, II, and III.[3] Phase I is a resource identification step that uses field reconnaissance and intensive survey in addition to historic documentation to examine the project area. Phase II (testing and evaluation) and Phase III (full excavation, data recovery, or mitigation) procedures are similar to testing and formal excavation covered in university field and methods courses. Here we focus on how these procedures work in regulatory and corporate contexts. These chapters give a fair amount of attention to documentation, with emphasis on durable "hard-copy" records. Similarly, we emphasize the use of common, low-cost, traditional field equipment such as tape and compass. We do this in full awareness of computer technology applications, which can facilitate field, mapping, and record-keeping tasks. However, mastery of basic field equipment and techniques will facilitate the use of more technologically advanced equipment and is an essential part of practicing archaeology.

Chapter 7 covers the final stages of the project: laboratory analysis and report production. The first involves processing, analysis, and curation issues. The second looks at how to set up and produce an archaeological site report. The report must comply with agency administration of applicable legislation and meet stringent contract requirements.

A Brief History of Extra-Academic and Professional Archaeology

Archaeology performed in response to statutory mandates is variously referred to as "cultural resource management," "contract archaeology," "consulting archaeology," "private-sector archaeology," or "public archaeology." Cultural resource management, or CRM (the most common appellation),[4] is the latest stage in the evolving relationship of archaeology and government.[5] The very term summarizes the overall approach formalized by government statutes: cultural materials represent resources that need to be managed. The perception of cultural materials as resources and the protocols for their management developed along with the growth of archaeology in the United States.

National identity plays a key role in archaeology (e.g., Fagan 1997:8; Kohl and Fawcett 1996). Archaeological remains often are seen as the remains of national ancestors as well as evidence for the presence of a people in a particular territory. Thus, archaeology in Ireland, Israel, Mexico, China, Japan, and many other countries is an exercise in historical and national identity as well as scientific research. The emergence of cultural resources legislation in the United States and the distribution of funding for archaeological research are similar in their original justification and in the reasoning behind relevant laws.

Archaeology started in the United States with the idea that the people who produced the prehistoric mounds and associated artifacts east of the Rockies were culturally related to Euroamericans. Specifically, the prehistoric mound builders were seen by some to be the ten lost tribes of Israel, mentioned in Christian and Jewish scriptures, who disappeared with the Babylonian conquest. Thus, the remains of such people would be collaterally related to the Western intellectual tradition and therefore worthy of documentation.[6] Because of that possibility, there was a strong cultural interest in learning more about the mound builders, who many felt had

been overrun and displaced by ancestors of the people encountered by Europeans in the fifteenth and sixteenth centuries. Although the mound builder debate effectively ended with the demonstration that the mounds were made by ancestors of American Indians (Thomas 1894), the fuse of national interest had been lit.

There have been three episodes in public, in the sense of government, involvement in archaeology in the United States. Each resulted in a fundamental change in how archaeology was done.

The first episode was the congressional mandate that the Smithsonian Institution solve the mound builder question (Willey and Sabloff 1993:41). The research topic of "mound builder origins" had been formally introduced with the publication of Squier and Davis's *Ancient Monuments of the Mississippi Valley* in 1848. The ensuing debate over the next half-century prompted increasingly formal and precise excavation methods in response to a problem-oriented methodology.

The mound builder question was answered with the publication in 1894 of Cyrus Thomas's monumental study in the *Twelfth Annual Report of the Bureau of Ethnology 1890–'91*. Along with the answer came a lifting of the congressional mandate on spending, with funds redirected by the Smithsonian's director to archaeological and ethnographic work in the Southwest. There also was a shift from problem-oriented archaeology to a focus on improved descriptions of what was being found.

The second major episode involving the government and archaeology began in the 1930s with a series of New Deal programs. The best-known of these programs was the Works Progress Administration (WPA), which existed from 1935 to 1943. The WPA was not set up to do archaeology per se, but a great deal of archaeology was done as a part of it. The importance of WPA archaeology rests not only in the massive expansion of our understanding of the nation's archaeology, but also in its impact on how archaeological work, done at the behest of the government, should or should not be handled. It can be argued that the WPA experience was the central stimulus for making sure that modern archaeological research is problem oriented, results in processed and analyzed collections, and generates a final research report.

Also part of that second episode where archaeology was done as part of a Federal program was the Missouri River Basin Survey, which was administered through the Smithsonian Institution. The River Basin Sur-

vey, which lasted from 1945 to 1969, was a prototype of how professional archaeology now is done. How it was organized and handled was an outgrowth of what had been learned with WPA archaeology.

The third episode of government direct aid came with the National Science Foundation (NSF), which began its support of archaeological research in 1954, combined with nearly two decades of graduate student support through the National Defense Education Act of 1958 (NDEA; the NDEA supported anthropological and culture area studies along with mathematics and science education). The existence of NSF funding for faculty and doctoral research, combined with an expanding post–World War II economy and population, resulted in an enormous expansion of academic archaeology. That expansion also resulted in the cultural resources environment as well as the attitudes toward nonacademic, professional archaeology, much of which was a direct response to the archaeology that came out of the 1930s.

Initial Involvement in Cultural Resources

Aside from the Smithsonian investigation of the mound builders, the early role of the government in archaeology was slight. The concept that archaeological and built-environment materials are resources of importance to society emerged gradually as national attention started to focus on houses and battlefields associated with historical figures and events.

In the first major incident of public involvement, the Mount Vernon Ladies' Association of the Union purchased the remaining 550 acres of George Washington's Mount Vernon estate in 1853, including the residence, outbuildings, and tomb, for the purpose of preservation. This was socially important in that members of the upper classes had taken it upon themselves to protect what was seen as an important element in the nation's emergence and identity.[7] The preservation of the Washington estate set a social precedent and, while not statutory, it was politically powerful (see Hosmer 1981:184–185, 525–527).

Court action prevented demolition of Independence Hall in 1876. Again, this was prompted by the social importance of preserving places where nationally important events took place, preservation that held precedence over the private interests of any one individual or small group of individuals.

A third major incident in the emergence of cultural resources legislation was the Supreme Court ruling that prevented a railroad from

cutting through the Gettysburg Battlefield; this suit was brought by veterans in 1896 [*United States v. Gettysburg Electric Railway Co.* 160 U.S. 668]. The Supreme Court approved compensated Federal appropriation of lands for the Gettysburg National Military Park. The result was that the taking of privately owned lands of national historic value could be construed as a valid application of the government's powers of eminent domain.

These three incidents involved two of the ways in which the past is preserved. Buildings represent physical structures where important persons lived or events transpired. Battlefields represent areas where important events occurred, even though the traces of those events may no longer be visible or even present. The third category is areas where only the traces of past activities exist—the popular conception of "archaeological site"—and includes prehistoric archaeological sites, referred to in nineteenth- and early twentieth-century literature as "antiquities."

Antiquities legislation emerged quite slowly, perhaps because of the cultural distance demonstrated to exist between pre-Columbian populations and the current Euroamerican-dominated population. In 1889, we see the beginnings of site-specific legislation when law was passed to protect a late prehistoric Puebloan ruin, Casa Grande, in Arizona. Concern over other threatened prehistoric sites—especially ruins—in the Southwest, as well the desire to protect Civil War battlefields, led to more-encompassing legislation in the form of the Antiquities Act in 1906 (see also Rosenberg 1981; Fowler 1982).

The Antiquities Act of 1906 (34 Stat. 225) provided for the protection of historic or prehistoric remains, "or any object of antiquity," on Federal lands. Further, it established regulations and sanctions regarding disturbance of or damage to those remains, while authorizing the president to designate National Monuments on Federal lands. Conservation-minded president Theodore Roosevelt played a significant role in bringing about this legislation and ensuring significant authority for the executive branch. The designation of national monuments was the first official attempt to achieve a national policy on antiquities as a class.

The next major piece of legislation, the Historic Sites Act of 1935 (49 Stat. 666), created a Federal policy encompassing historic structures, battlefields, and antiquities. It went beyond the Antiquities Act, and it foreshadowed the National Historic Preservation Act of 1966.

The Historic Sites Act was aimed at preserving objects, buildings, sites, and antiquities of "national significance" by declaring a national policy of preservation "for the public use . . . inspiration and benefit of the people of the United States" [Section 1]. This followed from the chief of the National Park Service having designated "uniqueness" as a determining characteristic of "significance" in 1934. The act was a direct precursor of the National Historic Preservation Act (NHPA, discussed in chapter 2). The Historic Sites Act dealt with historic properties as the NHPA would; it established the equivalent of the Advisory Council on Historic Preservation, with a composition similar to the present one. The major differences were affected properties and enforcement: the act established the National Historic Landmarks program (the precursor to the National Register of Historic Places) but essentially only allowed federal properties to be listed. The act also levied fines for violations.

WPA Archaeology and Its Influence on Modern Professional Archaeology

New Deal agencies and programs, such as the Civilian Conservation Corps (CCC) and the Tennessee Valley Authority (TVA), also involved archaeology, but the most extensive program that included archaeology was the Works Progress Administration (WPA). "WPA archaeology" has come to be the phrase most often used to describe the period and the associated work, both of which contributed greatly to modern professional archaeology and the structure of the NHPA.[8] The people who would lobby and structure the archaeological preservation mandates in the 1960s either worked as part of the WPA archaeology program or were trained directly under archaeologists who had been involved in and were reacting to it (see Patterson 1995).

The WPA existed from 1935 through 1943 as part of President Franklin D. Roosevelt's New Deal launched to help bring the United States out of the Great Depression. The idea behind programs like the WPA was to get money back into circulation by using public funds to support labor-intensive projects in areas suffering the highest unemployment. Archaeology was a labor-intensive field that could accommodate a sizable population of unskilled labor.

WPA archaeology represented the first large-scale interaction between the government as sponsor and regulator and the academic archaeological community. It was a learning experience for both. WPA archaeology was a "make-work" program whose purpose was primarily to employ people. Because of that priority, the archaeology was often perceived—from the vantage of the archaeologists involved—to be of secondary interest to the government (Wauchope 1966:vii).

WPA archaeology had a lasting impact on archaeology in the United States, especially in the Southeast, where projects were most common. The intellectual legacy was extensive and profound, including a gigantic advance in overall knowledge about the nation's prehistory in some regions, a large sample of large-area village and mound excavations, the building of the basic cultural-historical sequences, and the establishment of professional networks and reputations that would last—in direct or, through students, secondary form—well into the early twenty-first century. Some archaeologists of this period, including A. V. Kidder, W. K. Morehead, and W. S. Webb, set standards for professionalism and scientific measurement that still guide modern archaeologists.

There are four aspects of WPA archaeology in particular that raised concern about the growth of the profession:

1. a perception that government regulators and administrators imposed inappropriate bureaucratic expectations;
2. the occasionally slovenly work that took place under deadline conditions;
3. excavation for the sake of excavation and not for solution of research problems; and
4. the lack of analysis and publication.

The American archaeology that emerged in the 1960s and 1970s did so very much in response to those four aspects. It is useful to look more closely at these aspects to appreciate why we do things now the way we do.

Government Regulation versus Academic Independence

> Not the least of our burdens was the enormous amount of work that the government required. Much of it was meaningless: "How many

> artifacts excavated during the period? How many linear feet of trenches excavated?" . . . It was criminally time-consuming nonsense, imposed on already harried archaeologists who urgently wanted to devote more attention to the research itself. At frequent intervals I had to submit the following reports: major purchase requisition for sponsor, balance sheet, petty cash account, report of sponsor expenditures other than payroll . . . laboratory time sheets, field party's time sheets, mileage records for each vehicle, equipment inventories, equipment transfer sheets . . . accident reports, equipment receiving reports, and monthly budget requests for WPA-furnished supplies (Wauchope 1966:viii).

After the Smithsonian's work in the 1880s on the mound builder question, the next major interaction between government-funded and government-regulated archaeology and the archaeological community occurred in the context of WPA archaeology. How that interaction was perceived and the issues raised can be sensed from comments made by Robert Wauchope. Robert Wauchope was a young archaeologist at the University of Georgia when called upon to manage WPA archaeology projects. The preface to his 1966 study of north Georgia archaeology helps to demonstrate how things were viewed in the 1930s and how that experience influenced the way things are done today.[9]

Much of WPA archaeology was seen as involving requirements that took away from time and energy better spent on archaeological research. Managing large public archaeological projects required archaeologists to learn new business skills. For example, Wauchope (quoted above) complained about basic business accounting issues: payroll, time sheets, purchases, care for employees. All of these are essential elements in any managerial situation. Patterson (1995:73) identifies how these managerial problems, endemic to WPA archaeology, were associated with a lack of business experience. Many research archaeologists had little time or interest in business issues; archaeology viewed itself as an academic field.

The friction was not universal: TVA archaeology came out of the experience quite well under the direction of W. S. Webb. However, the poor image of government expectations fueled two sets of attitudes that continue to affect the practice of archaeology today:

1. the idea that strict statutory requirements somehow limited legitimate archaeological research and therefore should, in some cases, be ignored by concerned archaeologists; and

2. the notion that the literature submitted to and eventually passed by government reviewers was somehow of lesser quality than that literature reviewed by academic archaeologists themselves.

It is easy to see that if one thinks the archaeological process is "watered down" by meeting extraneous demands, then perhaps the reports are suspect, too. Still today, academic archaeologists do not always recognize the research reports produced as part of the compliance archaeology process as "peer reviewed," even though the government review process is done by experienced, doctoral-level archaeologists.[10]

Quality of Work under Deadline Conditions

> This was not a fair dilemma with which to confront archaeologists. We should not have to choose between two evils: either failing to employ the needy and, incidentally, not getting archaeology done at all, or employing too many and getting it done in a slovenly way. The system bred false values. Big efficient operations became the symbols of the successful archaeological director, as some projects employed enormous laboratory staffs to process the hundreds of thousands of artifacts that poured in from several large field parties operating concurrently (Wauchope 1966:viii).

The second aspect of WPA archaeology that raised—and continues to raise—concern among archaeologists involved deadlines: The archaeology had to be done within a limited time. WPA archaeology was performed under conditions and on a schedule that was not of the principal investigator's choosing. This was very different from traditional university field work, where one had the time—and a trained or trainable crew—to do the work.

From the WPA experience came the impression that any archaeological work done under deadline pressure would not only be incomplete, it would be rushed and thus sloppy. Since modern professional archaeology is based on deadlines, it is vulnerable to this perception.

Reasons for Excavation: Chosen Research Problem versus Circumstantial Research Problem

> The main thing to recall is that although WPA was interested in archaeology, it was more concerned with giving employment to a great many

> people, and that whenever those two aims clashed it was archaeology that suffered. . . .
>
> Perhaps even worse was the violence we knew our archaeological materials were being subjected to. When several hundred unskilled men, with sparse supervision, dug up artifacts, dropped them into boxes, passed unusual specimens around from hand to hand (and, I might add, from hand to pocket), tied them up and labeled the containers, packed them on trucks and unpacked them at headquarters, washed them, and re-boxed them—all this in what was often a spirit of light-hearted irresponsibility and incomprehension—the chances are that provenences were garbled, if not deliberately falsified. My confidence in the system was not increased by my chief foreman's jocular tales of how, on previous WPA projects, he had often decided that the day's take in sherds at one site was not impressive enough, and he therefore sent his men, when the boss was away, to fill up their pottery bags at some richer site nearby (Wauchope 1966:vii).

WPA archaeology presented a new situation to archaeologists: Sites were selected as much because of the local unemployment rate as they were for research potential. This required that the data from the site be wrapped around pre-existing research questions. To use an analogy: instead of choosing which book to read, the archaeologist was having many of the books handed to him or her, or at least having the selection sharply limited. A lot of this appeared to be driven, and in some cases was driven, by excavation for the sake of excavation and not for the sake of scientific research. And archaeologists were very concerned about that.

Professional archaeology on the surface seems to share some of these features. The site excavated is chosen by circumstances, not by the archaeologist. It looks not unlike what happened with WPA archaeology, and as a result there long has been a concern that the excavation done was more pro forma than actual research. While not true, that concern draws on a memory of WPA archaeology.

WPA archaeology also was restricted in who could be hired to do much of the work, as Wauchope's remarks indicated. The issue of training and qualifications grew in part from this, influencing current regulations on who may or may not do archaeology as part of the compliance process. As a result, the lowest level of education and training acceptable for doing archaeology on behalf of some agencies is a college degree and prior supervised field experience.

Analysis and Publication

> Having published the main factual results of the survey in journal articles, I did not feel under too great a pressure to rush the final report, and it is a good thing, for there were many materials to study, and my duties after leaving Georgia, interrupted still further by World War II, left me little time to devote to them: a few weeks out of every summer vacation, plus evenings during the school year (Wauchope 1966:ix).

One of the lasting complaints about WPA archaeology that continues to influence modern professional archaeology was the dismal record of analysis and dissemination. Much of the excavated material never was analyzed; even less was ever written up.

There were any number of reasons for this: Lack of time, lack of supplemental funding, even lack of interest. In addition, there was little incentive for those who came after to analyze those WPA data. In archaeology, as in the rest of anthropology, there has always been the expectation that students generate their own data from their own field work, instead of working on someone else's. Better to excavate a new site and do so with a better-trained crew and a detailed, chosen research problem than to use possibly flawed data.

It is from the WPA record of poor project curation, analysis, and reporting that many of the modern professional requirements come. Archaeology done under mandates requires specific curation settings, set out in Federal code. It requires that materials be analyzed. And it requires a final report that has been reviewed by state and Federal archaeologists.

Postwar Formulation of Professional Archaeology

After World War II, the pace of academic life in general and archaeological research in particular quickened. With the postwar academic and industrial expansion came massive projects, especially in the western United States. Along with those projects came increasing support for preparatory archaeological work.

Since it was the first large-scale involvement of archaeology with Federal sponsorship and requirements, WPA archaeology set the tone for such future relationships, not only in terms of successes and failures, but also in terms of specific provisions placed in future legislation and regulations. There were other, large-scale Federal exercises—TVA and the

Missouri Basin Project/River Basin Survey—that survived or emerged after the 1930s programs ended. The success of these was due in part to the learning that took place during WPA archaeology, both by the academic archaeologists who provided the service and by government managers.

The Missouri Basin Project

If WPA archaeology set a tone for what to do or not do with large-scale, Federally assisted archaeological work, the Missouri Basin Project (1945 to 1969, known toward the end as the Smithsonian's "River Basin Survey") helped establish all of the pieces that would emerge in professional archaeology at the national level. This included National Park Service coordination, the subcontracting with nongovernmental archaeologists to perform the work, the formation of joint academic-government committees to draft memoranda of agreement and memoranda of understanding, the initial forays into formal legislative lobbying, and formal legislation. In a way, it represented in miniature what would happen twenty years later at the national level. It also helped pave the way for an extra-academic cultural resources industry.

The Missouri Basin Project, like WPA archaeology before it, established many professional reputations while greatly expanding knowledge of the area in which the work was done. However, it also continued to encounter the same kinds of problems that were exposed with the WPA projects: budgetary limits forcing decisions between administrative support and actual field work, variation in reporting rates, and finding acceptance as legitimate by the academic community.

The Missouri Basin Project began in early 1945, even before World War II had ended, with the planning for the postwar development of the Missouri River as a series of reservoirs under the jurisdiction of the U.S. Army Corps of Engineers and the Bureau of Reclamation. During that planning stage, those agencies were contacted by representatives from the Society for American Archaeology, the American Anthropological Association, and the American Council of Learned Societies, with the initial coordination of those societies coming from archaeologists in the Smithsonian (Lehmer 1971:1–7). From those three academic societies would come the Committee for the Recovery of Archaeological Remains (Johnson, Haury, and Griffin 1945), which functioned essentially as an advisory and lobbying group, testifying formally before congressional

committees and working informally to provide much-needed information to the public.

The National Park Service (NPS), which already had responsibility for natural and cultural resources within Federal parks (Hosmer 1981:926 *passim*), and the Smithsonian Institution were seen as the natural coordinators of any salvage archaeology that would be necessitated by the proposed reservoir project. Under a 1945 Memorandum of Understanding between the NPS and the Smithsonian Institution, NPS provided planning, funding, and administration, especially in dealing with non-Federal agencies actually performing archaeological work (at this time, private-sector archaeology did not exist; "non-Federal archaeology" essentially meant museums, historical societies, and university anthropology departments). For its part, the Smithsonian Institution would serve as an advisor as well as another archaeology provider. In the end, most of the actual field work was done by the Smithsonian Institution.[11]

The Missouri Basin Project was notable for several things:[12] professional archaeologists involved at the outset and at all levels of the organization; the use of staff historians and a historical research program; and association with legislation, specifically the Antiquities Act of 1906, the Historic Sites Act of 1935 and over the last nine years, the Reservoir Salvage Act of 1960 (74 Stat. 220). The Missouri Basin Project generated an efficient site numbering system; it issued more final reports than WPA archaeology and did so in a timely fashion. However, for archaeology in general, the reporting of results continued to be a problem until the emergence of nonacademic professional archaeology in the late 1960s.

Legislation, Expansion of Government, and Academic Growth

Following World War II, three things happened that molded modern archaeology, especially professional archaeology: new legislation was passed that took archaeological resources into account; direct Federal support of archaeological research was made possible by the National Science Foundation; and higher education was expanded.

Important new legislation included the Federal-Aid Highway Act of 1956, which authorized a rather limited salvage archaeology in the context of highway planning and construction, and the Reservoir Salvage Act of 1960, which provided for the salvage of archaeological sites threatened by dams and reservoirs.[13] Together, the Federal-Aid Highway Act and

the Reservoir Salvage Act made provisions to recover data from archaeological sites before certain types of Federally sponsored land-alteration activities destroyed them, something now covered by the National Historic Preservation Act (NHPA) and eventually expanded by 1974 to include all Federally enabled activities. The Reservoir Salvage Act probably covered the majority of sites that such activities would endanger, simply because prehistoric and many historic archaeological sites in many parts of the United States frequently are found on relatively level land within one hundred meters of streams and rivers.

One result of World War II was a "social contract" between science and the public. That contract held that, in exchange for research support, science would try to provide benefits to society. To enable research, the National Science Foundation (NSF) was established in 1950. NSF underwrote everything from student training and dissertation research to research done by established faculty.

The legacy of NSF and other Federal-level funding initiatives was one of expanded research, exploration of new approaches to archaeological field work and analysis, increased training opportunities, and perhaps most important, a requirement on the part of the person doing the field work to have a well-planned and scheduled research project in place *before* going into the field. Combined with the surge in college enrollments in the 1960s (brought on by the baby boom), this resulted not only in a major expansion in higher education but in a proportionately equal expansion of faculty.

Origins of Modern Professional Archaeology

Beginning in the middle 1960s, a second kind of archaeology, one outside of the academic/museum world, began to emerge in the United States. This came about with the passage of the National Historic Preservation Act of 1966 (NHPA). The NHPA required, through its Section 106, that all Federal agencies consider the effects of their actions on any cultural resources—including archaeological sites—eligible for listing on the National Register. In little more than a decade, starting in 1966 and continuing through 1979, a flurry of acts, amendments, and executive orders protecting cultural resources—including archaeological sites—was implemented.

The legislation of the 1960s and 1970s accompanied a period of increased national interest in social issues. That interest resulted in a surge in interest among the social sciences, especially anthropology, as well as

an interest in archaeology (helped greatly by its being a subfield of anthropology), historic preservation, ecology, the environment, and similar social/environmentalist activist topics.

With the surge in majors and increasing interest in archaeology, combined with legislation calling for archaeology to be done, it was inevitable that archaeology would expand into the newly emerging arena of the environmental compliance industry.

Current Structure of Archaeology in the United States

Regardless of where it is practiced, anthropological archaeology is concerned with understanding how and why human cultures changed their structure over time. Refinements in field technique, analytical procedures, or even how archaeological research questions are asked all represent means of learning about the "why" of cultural change. Recognition of the importance of the answers to questions about culture change is one of the reasons why archaeological sites in the United States are classified by the government as limited and nonrenewable resources. They are treated in Federal law in much the same way as are other environmental resources (Neumann, Sanford, and Palmer 1992).

Archaeology within the Academic World

The demographic structure and research orientation of archaeology have changed since the passage of the National Historic Preservation Act in 1966. In the middle 1960s, virtually all archaeologists in the United States were found either in universities or in museums. Now, only one out of five archaeologists in the United States works in such settings (Neumann and Sanford 2001:2, 22).

What is that university world like? Who works there? How many people actually are involved in university or museum archaeology? Our students have always asked us about the demographic structure of the field, and it seems proper at this point to set out those figures along with the current research interests.

Archaeology in the United States is a subfield of anthropology. There are around 3,800 people in the United States who make a living as anthropologists working either in universities (about 3,100) or in nongovernment

museums (about 700) (Neumann and Sanford 2001:2, 22–25). Of those, something like 1,100 are archaeologists.

Anthropology is a fascinating and enthralling field; currently it ranks with English and philosophy as the most-preferred undergraduate major for corporate hiring (anthropology majors share with English and philosophy majors an ability to write clearly and an ability to read critically; anthropology majors also have a multicultural sensitivity that is now sought among corporations). Each year there are around 7,800 undergraduate degrees in anthropology, produced from the 372 degree-granting programs in the country (Neumann and Sanford 2001:19, 23). Of those, around 1,100 receive a master's degree. And of *those*, around 370 receive a doctorate, a number that has held constant since 1977. Maybe eighty of those new doctorates are focused in archaeology.

***We learned about archaeology from that . . .* Answering Student Questions on Employment in Archaeology**

We often receive phone calls from recent anthropology graduates who would like to work in archaeology. What, they ask, is available? Most archaeology positions are found in private industry, with some additional positions available in state or Federal agencies. These are accessible to individuals who have had field, method-and-theory, and laboratory courses and who have an undergraduate degree. Students with a training focus in North American archaeology are especially qualified; those with exposure to how the Section 106 Process works are prized.

A bachelor's degree is sufficient to obtain many entry positions. Individuals with master's degrees in anthropological archaeology are quite marketable. People with master's degrees are often hired before those with doctorates, perhaps because they are seen to be better team players who do not expect to be paid as much. Such a hiring preference may or may not be right, but it is the way the extra-academic employment world works. It has been well documented every year since September 1990 when the "Career" segments in *Science* first started to appear.

We also remind the new graduates that private-sector firms are not in the business of training students to do archaeology: that was the responsibility of their colleges and universities.

We have also found in answering their questions that rarely have students been told what the demographic and workplace structure of the field is, much less where jobs are located and what employers expect of their new hires. One of the reasons we have included that kind of information here is to help answer those commonly asked questions.

Each year since the middle 1990s, there have been around 220 new faculty positions in anthropology. About a fourth of those new positions have been for archaeologists. On average, 75 percent of those newly hired faculty will receive tenure, meaning that they will be allowed to work for the hiring institution pretty much until they retire. Thus, of 7,800 undergraduate degrees in anthropology, 165 (2.1 percent) will become tenured anthropology faculty in the recent cohorts.

Five doctoral programs out of ninety in the United States account for about a third of all university faculty in anthropology: Michigan, Chicago, Harvard, Columbia, and University of California, Berkeley. There are another five that together with that set account for about half of all anthropology faculty. Source of doctoral degree is an important consideration in faculty hires.

Research interests also are important. That is, what is going on in the field? What do people work on? Archaeologists think of their research both geographically and topically. Geographically, a little over 43 percent of all university archaeologists work outside of the United States, with the bulk working in Mesoamerica. Of those working within the United States, about 40 percent have primary interests in the American Southwest, at least based upon the distribution of recent dissertation topics.

Topically, research interests focus on questions about how past cultures worked, as well as how our studying of those past cultures influences *our* interpretations of how they worked. Thus, issues include examining cultural idiosyncrasies like sexual differences in culturally sanctioned behavior, class structure and how that contaminates our interpretation of culture history, critical archaeology, cognitive archaeology in the sense of cosmological/ideological reconstruction, and how the social dominance hierarchies within the university dictate acceptance of scientific conclusions (see Patterson 1995, Fagan 1997; cf. Gross and Levitt 1994, Fox 1996). Over this has been spread a postmodernist interpretive framework, at least in a sense of relativistic epistemology.

Many university archaeologists no longer have much in the way of direct contact with field archaeology in the United States. Some of this is due to interest; more is due to lack of research funding (which would include institutional support of local field schools). Native American objections and other factors can make it hard for field schools to get permits to work on state, tribal, or Federal lands. Most of the field research done

in the archaeology of the United States occurs outside of the university, either in corporate settings or in government settings.

Archaeology outside the University

In the United States, about 80 percent of archaeologists work in industry or government (Neumann and Sanford 2001:2). Thirty percent of archaeologists work in government regulatory positions at the Federal or state level; 50 percent work in engineering or historic preservation firms. Based upon where the bulk of archaeologists work and where most of the field work is performed, archaeology in the United States can be said to be an environmental compliance, extra-academic, government-regulated field.

University and college archaeologists normally are required to hold faculty or research appointments. While a large number of professional archaeologists also have doctorates, they are outnumbered by professional archaeologists at the master's and baccalaureate levels. Thus, not only is it true that half of all anthropologists who make a living as anthropologists are archaeologists working outside of a university setting, it is also true that professional archaeology is one of the few social sciences where a person with a bachelor's degree can get professional employment in his or her major.

We have not seen any figures on just what proportion of those 5,400 or so archaeologists have earned what degree, but an off-the-cuff proportion for people working in the private sector—based on firms we work with along with others listed in the American Anthropological Association's *Guide to Departments*—would be about 25 percent with doctorates, 46 percent with master's, and the balance with bachelor's degrees. The number with bachelor's degrees probably is greater since a large number work independently, moving from project to project and firm to firm.

Archaeologists having only a B.A. are quite employable, but generally they will work as crew members, often moving from project to project. Archaeologists wishing to acquire steady work with one firm and to be able to direct projects and help with report writing will likely need to acquire an M.A. degree.

Those with doctorates and master's degrees will serve as project directors or principal investigators, depending on the firm. Federal code requires that a person serving as a principal investigator on a Federal Sec-

tion 106 project have at least a master's degree and substantial supervisory experience. Individuals with master's degrees and growing experience may be found as field directors or crew chiefs, as may well-seasoned people

Qualification Requirements for Archaeologists

The qualifications required to work as a professional archaeologist can vary, depending on the role of the archaeologist, the nature of the project, and where the work occurs. Most archaeologists get their start working as members of an archaeological crew. Although there are seldom any legal requirements to work as a crew member, in practice most agencies and companies require that such workers have at least an undergraduate degree in archaeology, anthropology, or a closely related field. Demonstrated field experience, such as participation in an archaeological field school, may also be required.

In order to direct projects, archaeologists must meet certain professional guidelines. Federal guidelines are put forth in the Code of Federal Regulations, 36 CFR Part 61, and include a graduate degree in archaeology, anthropology, or a closely related field; at least one year of full-time professional experience in archaeology; at least four months of supervised archaeological experience in North American archaeology; and a demonstrated ability to carry research to completion. Nearly all states and Federal agencies require that the archaeologist in charge meet these guidelines, but many have additional requirements as well. Several states require that the archaeologist have a specified amount of experience working in the state or region where the project will occur. For example, New Mexico requires at least twelve months of experience in Southwestern archaeology, Maine requires at least one year of experience working in northern New England, and Indiana requires at least four months working in Indiana. If the project is on Federal land, Federal Agency requirements must be considered as well. For example, the Bureau of Land Management requires that the archaeologist in charge have at least four months of experience working in the geographic or cultural area involved.

Some states have different requirements, depending on whether the project involves survey, testing, or mitigation. In Maine, to serve as principal investigator on a survey project, in addition to the Federal requirements listed above, one must have at least one year of supervisory experience in the archaeology of northern New England. To direct excavation projects, at least two years of supervisory experience in North American archaeology are needed, one of which must be in the northern New England region. Some states also have requirements for archaeologists serving as crew chiefs and field directors. Because of the wide variability in the qualification requirements to work as an archaeologist, individuals should always check with the responsible permitting agency before initiating a field project.

with undergraduate degrees. We have found that nearly everyone in charge of a firm's archaeology lab has a master's degree or higher.

Better figures than these are hard to come by. For example, Zeder (1997), in a carefully prepared report on the status of archaeology in the United States, was hampered by having her figures restricted to the membership of the Society for American Archaeology (SAA). After noting that limitation, Zeder went on to state that many professional archaeologists were missed in her study because they did not belong to SAA. This is particularly true for those people with bachelor's degrees who work for several different firms as part of a "project-hire" population. However, most archaeologists with master's degrees tend to belong to the state or regional archaeology societies and often attend local, state, or regional conferences.

TIP: Where and How Positions in Archaeology Are Announced

Positions are announced in many ways. The most convenient for the student are bulletin boards in anthropology and archaeology departments. Both national and local searches tend to be posted. Often, regional firms will send around notices of positions. Occasionally, such a notice will be in the form of a phone call made to faculty.

The American Anthropological Association (AAA) *Anthropology News* carries national as well as regional searches. It is published monthly, September through May, for members and subscribers. However, most position notices are for faculty positions. The Society for American Archaeology (SAA) lists job opportunities on its website (http://www.saa.org/careers/). The AAA *Guide to Departments* lists academic departments that run contract archaeology programs and thus may hire "CRM archaeologists." Members can search AAA's *E Guide* online at http://www.aaanet.org/.

Major newspapers, such as the *Washington Post*, regularly carry regional position announcements under "archaeology," "cultural resources," "engineering," and/or "environmental." Announcements can be regional or national and are usually private-sector in nature. These announcements can usually be searched online.

The Internet is frequently used for archaeological position announcements. Archaeologic Communications lists jobs (http://archaeologic.com/jobs_in_archaeology.htm). The American Cultural Resources Association (ACRA) provides information and workshops on wages, contracting, and other aspects of consulting archaeology (http://acra-crm.org/). Shovel Bums claims to maintain the largest listing of archaeological jobs, using *Yahoo! Group* (http://www.shovelbums.org/).

Archaeology Fieldwork maintains forums and job listings (http://www.archaeology-fieldwork.com/forums/index.php). *About.com* lists archaeology jobs and provides links to other resources (http://archaeology.about.com/).

Announcements for Federal government jobs are available in the nongovernment publication *Federal Jobs Digest* (*FJD*). The *FJD* is available at http://www.jobsfed.com/. The National Park Service can be searched online for jobs (http://www.nps.gov/). Federal agencies may list information on their own Web pages.

States and local governments each have their own advertising patterns. The quickest way to find out about them is to search online.

Finally, for those interested in working in private-sector archaeology, remember to look in the phone book: many archaeology firms or divisions are listed in the Yellow Pages or through online sources and are approachable even if they do not have a current vacancy. It is a good strategy to make contact with the firms and agencies that may be hiring and to check with them regularly.

Most of the work that the graduating student will do as an archaeologist will be outside of an academic setting, either as a government regulator or as a private-sector archaeologist working because a client is required to satisfy preservation statutes. Although a wide assortment of sites will be faced, including industrial-scale, monumental architecture sites in urban settings, the vast majority of sites encountered will be small, partially disturbed prehistoric or rural historic sites found as a result of the Section 106 Process. The new archaeologist will find the emphasis to be less on choosing a research question and digging a site to answer that question than it will be to work out how a site chosen by circumstances can answer pre-existing questions.

The nature of government-mandated work varies widely. Many projects will be small in size and involve only a limited amount of field work and write-up. Other projects may be quite large, require months in the field, and result in substantive write-ups. On larger projects, it is becoming increasingly expected that public outreach and dissemination of results to a professional audience will be incorporated into the work.

Compared with an academic archaeologist, the archaeologist working outside the university setting is very much a general practitioner. He or she will be expected to have the same methodological and theoretical skills as the academic archaeologist since, in order to evaluate and recover data from sites to be impacted by development, the government or contract-

TIP: Women in Archaeological Careers

Archaeology traditionally has been viewed as a male-oriented field. With its emphasis on physically demanding work conducted in rugged outdoor settings, the profession embodies what are typically perceived as stereotypical masculine values. Perhaps not surprisingly, then, in its early years professional archaeology was overwhelmingly dominated by men. Although this is no longer the case, the traditional association of archaeology with men (and—in our stereotyped view—with dominant, adventurous men at that) has resulted in a professional atmosphere in which so-called masculine attitudes and behavior are rewarded over more "feminine" ones.

Although no data are available regarding the numbers of women working in the field of archaeology today, anecdotal evidence suggests that they now make up about one-half of the workforce. Despite these numbers, women often fare less well than men professionally. Studies have shown that women tend to make less money than their male counterparts, even when age and experience are factored in (Whittlesey 1994; Zeder 1997). Additionally, they are less successful in obtaining contract and grant funding (Gero 1994; Zeder 1997) and are less likely to lead large field projects.

There are several reasons why these discrepancies might exist. Although sexism and family conflicts undoubtedly contribute to these trends, a third factor may be the way in which women present themselves. In our society, women are often enculturated to be less aggressive and less assertive than men. Deni Seymour, former owner of Lone Mountain Archaeological Services, Inc., reports that in her experience, many women archaeologists do not effectively present their abilities. Although experience and skills should never be embellished, women should exude confidence in their own capabilities. Dr. Seymour further observes that many women do not understand the protocol of the male business world, for example, that they can (and often should!) negotiate their salary and request pay raises, or how to assertively request additional responsibilities (personal communication 2009). Archaeologist Sarah Haugh advises other women to be direct and speak up when volunteers are requested: "Always offer to drive the boat—you are probably as good or better than the guy who speaks right up" (personal communication 2009).

Women who wish to have children and raise families face another hurdle typically not faced by men. Field work in contract archaeology often requires lengthy stays in the field. Although many women do manage to raise children and remain active as field workers, such work is often incompatible with at least the early years of motherhood. Many women who have children are able to remain employed as archaeologists by developing other special skills, such as writing, artifact analysis, or geographic information system (GIS) mapping.

Becoming a successful archaeologist requires individuals to learn a wide variety of skills and rules—not only the obvious archaeological ones but, often, the unspoken

ones that guide the socially expected behavior of the workplace. For newcomers to the field, it can be difficult to know what is expected. Knowing what to wear, how to handle difficult people and situations, how to juggle family and job responsibilities, and when and how to promote oneself is not always self-evident. Networking with other women is one way that women can gain understanding of these issues. As part of preparation, be sure to look at SAA's Committee on the Status of Women in Archaeology (COSWA) and the "COSWA Corner" of the *SAA Bulletin*.

sector archaeologist must know how to apply data to interesting research questions. At the same time, however, he or she must be prepared to work with a variety of site types and to draw upon additional skills needed in the business world, such as managerial ones and the ability to negotiate with clients and other interested individuals. It is that variety, combined with being able to do archaeology full-time—along with the constant opportunities to work in the field—that make private practice especially attractive to many.

Chapter Summary

Archaeology in the United States is now done mainly outside of university and museum settings. This work, which engages 80 percent of all people who make a living in archaeology, came about as a result of the NHPA. One part of NHPA, Section 106, requires that any land-alteration activity made possible by the Federal government be evaluated to determine its effect on any properties eligible for listing on the National Register of Historic Places.

The process that led to American archaeology's shifting from an academic field to a profession did not happen at once, nor did it start with archaeology. It began instead in the mid-nineteenth century with an increasing concern about preserving those things associated with the emergence of the United States. Eventually that preservation effort would be expanded to archaeological sites, including those associated with American Indians.

The Works Progress Administration, or WPA, represented the first extensive interaction between the Federal government and archaeology. Some of that interaction was good, but some had problems. Much of

the way in which modern archaeology is done comes from responding to the problems that appeared with WPA archaeology. Indeed, the way in which the NHPA Section 106 governing code is written can be seen as overwhelmingly influenced by that WPA experience. The government archaeology relationship that came out of the Missouri River Basin Survey (1945–1969) would rank just behind the WPA experience in its influence on professional archaeology. This interaction represented, in miniature, the entirety of what would come to be called the Section 106 Process.

After World War II, the nation's universities expanded, in part because of the baby boom, in part because of a fear of being overwhelmed scientifically by the Soviet Union, and in part because of a huge infusion of Federal funding, mainly through the National Science Foundation, for all kinds of scientific research. By the 1960s, the Federal law regarding the physical remains associated with the nation's history and prehistory had been rewritten. The National Historic Preservation Act of 1966, in its Section 106, declared simply that anytime a land alteration or land control project was made possible by the Federal government (that is, made possible by the joint action of the citizens of the United States), then the possible destruction of physical remains that might be considered important to the nation's past had to be taken into account. That is, we, as citizens, are enabling something to be done; we, as citizens, want to make sure that action is not going to destroy something we want to know more about first. It is our money, or permit, or piece of land; it is also our past: It is reasonable for us as citizens to expect that what is ours will be taken care of beforehand.

Although a number of other historic preservation laws have been enacted since NHPA, it is NHPA's Section 106 that is responsible for the shift in American archaeology from an academic to a professional field. Approximately 20 percent of all American archaeologists work within a college or university setting, usually within anthropology departments. Archaeological research conducted in university settings often focuses on areas outside of the United States, with most of the research conducted within the nation focused on the Southwest. Because of the difficulties in obtaining research grants and approvals for field work, some universities are venturing into the world of compliance or contract archaeology.

The other 80 percent of American archaeologists work outside of a university setting, in the compliance world that emerged to satisfy the requirements of the Section 106 Process. Most of the archaeology now

done in the United States is conducted by professional archaeologists working in one of the myriad private-sector firms that exist to bring those doing construction into compliance with the governing historic preservation regulations. As archaeology continues to grow as a professional field, the perception of such government-mandated archaeology is slowing beginning to change from one of "mere" compliance to one that is able to contribute substantially to the growth of archaeological knowledge. Because the vast majority of field work conducted today occurs within the contract archaeology setting, today's aspiring contract archaeologist can look forward to making substantial contributions to the field.

Additional Reading of Interest

American Anthropological Association (AAA). *AAA Guide to Departments*. American Anthropological Association, Washington, D.C. An *E Guide* is available online at http://www.aaanet.org/. The AAA website lists numerous publications and resources. The *Guide to Departments* is, when a few volumes have been accumulated, the single most insightful source for social dynamics and trends in American anthropology. The *Guide* gives not just names, interests, and degree dates/sources for all faculty, it also gives enrollment figures by department and even lists dissertation titles for each and every doctoral dissertation in anthropology by the listed departments.

Kehoe, Alice Beck. *The Land of Prehistory: A Critical History of American Archaeology*. New York: Routledge, 1998. This book provides an interesting perspective on American archaeology by a respected scholar.

Larking, Robert. *Fabjob.com Guide to Become an Archaeologist*. Seattle, Wash.: fabjob Inc., 2001.This e-book for high school students and others interested in careers in archaeology is available at http://www.fabjob.com/archaeology.asp.

Lehmer, Donald J. *Introduction to Middle Missouri Archeology*. Anthropological Papers 1. National Park Service, U.S. Department of the Interior. Washington, D.C.: Government Printing Office, 1971. Primary summary for the archaeology done as part of the Missouri River Basin Survey.

Patterson, Thomas C. *Toward a Social History of Archaeology in the United States*. Fort Worth, Tex.: Harcourt Brace College Publishers, 1995. A refreshingly insightful study of the social and class dynamics of academic archaeology.

Sabloff, Jeremy A. *Archaeology Matters: Action Archaeology in the Modern World*. Walnut Creek, Calif.: Left Coast Press, 2008. Case studies show the relevance of archaeology in current political climates.

Willey, Gordon R., and Jeremy A. Sabloff. *A History of American Archaeology*. 3rd ed. New York: W. H. Freeman, 1993. Comprehensive and readable summary of how anthropological archaeology emerged.

CHAPTER TWO
LAWS, REGULATIONS, AND GUIDELINES

Purposes and Objectives

Archaeological laws, regulations, and guidelines set up processes for defining what is or is not important, including various agency procedures for managing archaeological resources and accessing the information that cultural remains can provide.[1] In general, the purposes of the regulations serve to

- set forth the criteria for assessing the relative importance of cultural remains (that is, defining *significance*);
- outline the procedures for reviewing assessments;
- delineate the responsible parties involved in making such assessments;
- identify and then define the extent of jurisdiction and responsibility of each party in the evaluation process;
- set forth the criteria for making *a determination of significance*, as well as indicating which party can or cannot make such determinations;
- set forth the criteria for the archaeological and historic preservation work performed; and
- set forth the criteria for who can perform the archaeological and historic preservation work.

Inherent in this process are assessments for decision making. These assessments include what should be saved or not saved, where the respon-

sibilities of the government agencies begin and end, where the responsibilities of the private corporation receiving the funds or permits begin and end, and what should be expected as minimal documentation. These judgments are difficult. For example, what should be saved of an archaeological site imperiled by construction? Just how is such a decision made? Who makes it? What criteria are used? What about the costs?

For the entire process to work, those questions and many others have to be worked out. The trick, of course, is not to provide an answer for every situation, but instead to set up a procedure that guarantees the best-balanced answer for every situation. This is what the laws, regulations, and guidelines attempt: they describe a process and the rules for its execution. They also engage stakeholders in the process by giving them authority to participate. The process allows the involved Federal Agency, in consultation with other parties, to say whether a cultural resource really is important, that is, *to make a determination of eligibility* for listing on the National Register of Historic Places.

The National Register of Historic Places is a listing, maintained and updated by the National Park Service, of archaeological sites, buildings, and other what are termed "properties" that are seen to be extremely important based upon their association with past people or events, their design, or their scientific-data potential. The National Register was originally set up as a kind of planning document. Having a master list available of important archaeological sites or buildings would then help Federal agencies in planning construction projects or permitting, and that list could be checked well in advance of any action that might damage what the country might like to preserve. Although the Register is maintained at the national level, most of what is listed on it is important only at the state or local level.

The *eligibility* for listing on the National Register (and state/tribal equivalents) is the principal issue for cultural resources work generally, and compliance archaeology specifically. This is because even if a property is only considered eligible for such listing—regardless of whether or not it has been formally listed or nominated—it is to be treated as if it actually is so listed. Federal code spells out the criteria that must be met to be eligible for listing on the National Register. Much of the archaeological work at the Phase I and Phase II stages involves dealing with the issue of Register eligibility.

One other point here before getting into details: note that the entire compliance process comes into play *only* if public funds, permits, or lands are involved in some sort of land-alteration/property-alteration activity. For example, the Federal Section 106 Process will be activated only if the project is made possible by some kind of Federal involvement, be it Federal funding, permitting, or land. If those conditions are not present, then the Section 106 Process does not apply. Similarly, the jurisdictional basis at the state level generally applies only if there is state funding and/or permitting or if the project occurs on state land. Some municipal governments may have a similar jurisdictional basis for review and authority if the local government has a nomination-process historic preservation system.

Private development still operates under a comparatively great deal of freedom. Unless there are local statutes in place saying otherwise, privately funded construction activity on private land does not automatically mean that archaeological sites are conserved or protected. Phrased another way, the presence of an archaeological site or a historically important building does not automatically mean that a construction project or similar land disruption activity will stop. And even if archaeological sites do exist on private—or on public—land, they may still be destroyed if it is in the public interest to allow this.

The Section 106 Process

Several interrelated Federal statutes, along with an assortment of counterpart legislation at the state and local levels, regulate different aspects of archaeology and its performance in the United States. The most important of these is the National Historic Preservation Act of 1966 (NHPA), as amended. It was Section 106—a single paragraph in the NHPA—that made it possible for archaeology to become a compliance industry.

Section 106 of the NHPA requires that a Federal Agency that enables—through funding, or a permit, or just access to Federal land—some kind of activity must first take into account the effect that that activity will have on anything present that could be listed on the National Register of Historic Places. The procedures that emerged to deal with this requirement are collectively referred to as the "The Section 106 Process" and apply only to Federally enabled projects. These procedures are spelled out in 36 CFR 800 of the Federal Code of Regulations.

All of this is done to make sure that cultural remains that the society would like to preserve—or at least document—are not inadvertently lost. Reinforcing that societal interest, the Process involves the public along with aboriginal cultures having a special interest or stake in those cultural remains. This requirement to make sure that properties eligible for the National Register would not be lost helped establish archaeology as an extra-academic profession in the United States.

NHPA serves, to a certain degree, to unify the previous statutes and legislation concerning historic preservation. Of importance to us here, the NHPA

- required that all Federal agencies check to see whether actions enabled by their agency would *potentially* threaten properties, including archaeological sites, that could be listed on the National Register of Historic Places;
- required that each governor appoint a State Historic Preservation Officer, who would develop state preservation plans and coordinate historic preservation activities in the particular state or territory;
- established the Advisory Council on Historic Preservation (ACHP or "Council"), which would advise the president and Congress and on occasion serve an active role in the 106 Process; and
- required each Federal Agency to establish procedures for identifying, inventorying, and evaluating the Register eligibility of historic properties.

The Concept of "Significance"

"Significance" is a key concept in the application of Federal law to cultural resource assessments. In the Section 106 Process, a property must have "significance" to be eligible for listing on the National Register of Historic Places. In 36 CFR 60.4, "the quality of significance" means having "integrity" while also being associated with events, people, or information considered "important." More broadly and in somewhat looser usage,

Category of Property: How Cultural Resources Are Grouped

There are five categories of properties or cultural resources used in determining eligibility for the National Register (*National Register Bulletin #16: Guidelines for Completing National Register of Historic Places Forms*, pp. 41–42): object, site, building, structure, and district.

Objects are things like monuments, mileposts, statues, fountains, and similar location-specific items whose significance is related both to where they were placed and the purpose they served. Generally, relocated objects, because they have been moved, lose any Register eligibility. However, this would not apply to the objects that are by nature mobile (e.g., vessels like the *Delta Queen*, which is listed on the National Register).

Sites represent locations of significant events, prehistoric or historic occupations or activities, buildings, or structures. The buildings or structures can still be in place, can be in ruins, or can survive only as archaeological traces.

Sites can range from the standard archaeological site, inclusive of burial mounds and structure ruins, through battlefields, to rock carvings, petroglyphs, and even locations where historically significant events occurred. Archaeologists (except maybe in the Southwest) tend to think in terms of subsurface remains. The procedural definition of "site" for Section 106 purposes is broader.

Buildings refer to structures that shelter human activities: houses, barns, outhouses, businesses, churches, and similar structures. A "compound" (like a farm compound or a parish compound) is considered to be a "building," provided all structures are essentially unchanged and part of the original group that functioned as a unit. Otherwise, the complex of structures, some of which may be intact and some of which may be absent or substantially altered, are considered a "district," with "contributing elements" (that is, essential parts of the overall district) or "noncontributing elements" (extraneous elements physically present).

Structures refer to elements of the built environment that do not include "buildings." A bridge would be a structure, as would a highway, a railroad tunnel, a Civil War breastwork, an aqueduct, a subway, or a canal, among others.

Districts refer to collections of "buildings, sites, structures," or even "objects" that all have a unifying theme. These all are concentrated in space and have a continuity in terms of time, aesthetics/style, historical association, or other unifying theme.

Districts may be continuous or discontinuous. In a continuous historic district, everything within the geographic boundaries of the proposed district falls under a unifying principle, such as historic association or architectural style. Discontinuous districts refer to situations where many of the buildings and structures that made up a unified whole still remain, but interspersed are elements that do not belong with that set, such as buildings or other intrusive elements built later or in a style inconsistent with the unifying theme.

For example, the Oxford Historic District in Oxford, Georgia, is a discontinuous historic district (figure 2.1). It consists of eight structures, one monument, and a Civil War cemetery located on the campus of Emory University's Oxford College, along with eight residences, the Old Church, a community cemetery, and the Yarbrough Oak, all spread over an area about a mile and a half north to south and a half-mile east to west. The structures and buildings are associated with the founding of the Emory College community in the 1830s and 1840s. The church is allowed because of its architecture and because it was a contributing element in the overall community. The community cemetery was part of the original town plan and also a contributing element.

However, there are several buildings and objects located within that 0.75 square mile area that are not part of the District: the newer campus buildings, for example, or the post–World War II residences. Those would be "intrusive elements."

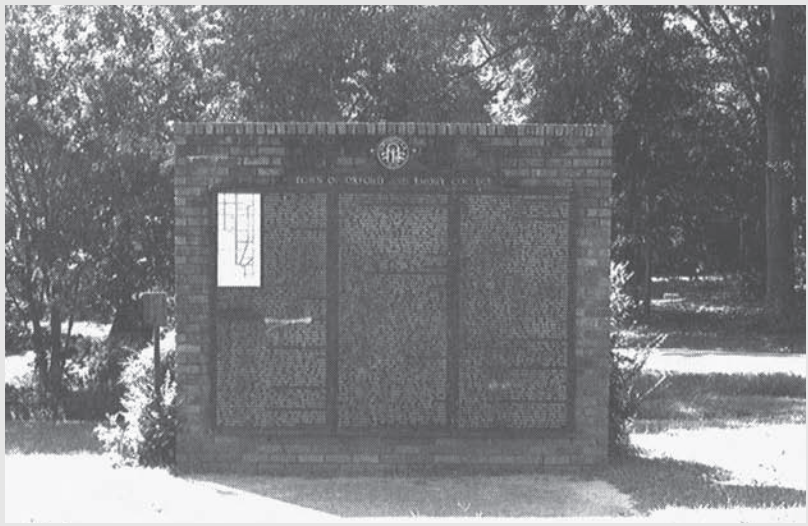


Figure 2.1. Monument plaque describing Oxford, Georgia, historic district. The area has served as the setting in recent years for movies and television series.

Sites, especially subsurface remains, within the bounds of a district are considered to be a part of the district unless specially *excluded*. This holds even if the sites are currently unknown. This automatic inclusion of subsurface remains as part of the district is important to remember and is one of the reasons for conversing with the SHPO and ACHP in dealing with districts.

"significance" has come to mean being eligible for listing on the National Register, since a cultural resource eligible for such listing has the "quality of significance."

The criteria for listing on the National Register of Historic Places are listed in 36 CFR 60.4 *criteria for evaluation* [a–d] and *criteria considerations* [a–g]. The 36 CFR 60.4 *criteria for evaluation* [a–d] states that "the quality of significance . . . is present" if a property "has integrity" and also satisfies one of the following:

(a) association with events that have made a significant contribution to the broad patterns of our history; or

(b) association with the lives of persons significant in our past; or

(c) embodiment of distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) having yielded, or likely to yield, information important in prehistory or history [usually the major reason for prehistoric archaeological sites to qualify].

"Integrity" is a complex concept linked to significance and the condition of the site (see the box on p. 37; for detailed consideration, see also Neumann and Sanford 2001:34–35). Broadly, it means remaining as physically true as possible to the reasons why (per 36 CFR 60.4 [a–d]) the property is eligible for listing on the National Register. For archaeological sites whose significance is based on criterion (d), the presence of integrity means that the site is sufficiently intact that the relevant (or "important") information can be recovered. There are no across-the-board criteria for determining how intact a site must be in order to be eligible for the National Register. Rather, it depends on what is already known and what other, similar sites might exist. For example, a plowed Mississippian site probably would not have sufficient integrity for listing on the National Register, since there are a large number of less-disturbed Mississippian sites already known and excavated. However, a plowed Paleoindian site in

the eastern United States may well be seen as having sufficient integrity to retain its significance, since examples of such sites, plowed or not, are not common (see also National Park Service 1995a).

The 36 CFR 60.4 *criteria considerations* sets forth criteria for what can and cannot be listed. For example, a church as a religious property normally cannot be listed, nor can a cemetery. But such may be eligible if they have "distinctive characteristics of a type." Properties "that have achieved significance within the past 50 years" are also excluded unless "of exceptional importance" (see 36 CFR Part 65, NHPA Section 110 [f], and 36 CFR 800.10).

If something is eligible for listing or actually is listed on the National Register, it is not automatically protected. In fact, it can still be destroyed. However, an opportunity to collect sufficient information about the structure or site usually will be made before it is destroyed. Further, such a site may have religious or cultural value that becomes damaged through loss of the site.

The Section 106 Process, and procedures similar to it, were never intended to stop construction or development. Rather, they are meant to provide enough of a pause where cultural resources can be assessed and, if found to be of interest to society writ large, recorded in sufficient detail for posterity *before* being compromised. The National Register of Historic Places is specifically intended to serve as a planning document, alerting Federal agencies to the existence of historic properties that may come under their jurisdiction.

The Parties in the Section 106 Process

The Federal Agency—that is, the agency that controls the land or provides the permits or funds for the project—is responsible for ensuring that the Section 106 Process is followed. Under Section 106, the decision-making authority rests with the Federal Agency. That is, it is ultimately up to the agency to determine the level of effort required to identify, evaluate, and—if there are National Register–eligible properties—mitigate any adverse effects of the undertaking. Although the final decision ultimately rests with the Federal Agency, the Section 106 Process is designed to ensure that the viewpoints of others are considered through a carefully spelled out consultation process.

Integrity

For a property to be eligible for listing on the National Register, it must have integrity as well as satisfy the criteria of significance listed in 36 CFR 60.4 (a)–(d). 36 CFR 60.4 lists seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. The best definitions for these are given in the National Park Service's (1995a) *How to Apply the National Register Criteria*, which are paraphrased below.

Integrity of location refers to the particular place where an event happened, a building was built, or an object was placed. Archaeologists would think of the term "context" here, and their term would not be too different from how the location functions as an aspect of integrity. When we discussed objects as a type of historic property and what rendered them potentially eligible for listing on the National Register, it was integrity of location that was most important.

Integrity of design has to do with how true the building, structure, or element is to the original way in which it was conceived and then produced.

Integrity of setting involves the match between present conditions and the original *character* of the place. Thus, topography, vegetation, and relationships among other features, natural or artificial, all pertain to setting. Setting is considered particularly important for historic districts and when structures such as flood walls or levees are built.

Integrity of materials refers to the match between materials on the property or structure now and the original building materials, or the original deposit materials.

Integrity of feeling involves the ability of the property to capture a sense of period or aesthetics (including things related to historical figures, events, craftsmen, or even potential data) under the criteria of Register eligibility, even if this sense is unrelated to the property's origins. Thus, Eisenhower's house in south-central Pennsylvania may be extensively remodeled from the eighteenth-century farmhouse, but it retains its sense of feeling for the 1950s and the 1960s, which was the period during which the president was associated with it.

Integrity of association holds if "the place where the event or activity occurred . . . is sufficiently intact to convey that relationship to the observer." "Sufficiently intact" becomes subject to documentation, since the verb "convey" implies a lack of objective criteria.

Neither feeling nor association are sufficient by themselves to support eligibility for listing on the National Register.

Integrity and Archaeological Sites

The potential of an archaeological site to yield information important in history or prehistory is the most commonly cited reason for assigning "significance" (36 CFR 60.4). This means that the archaeological deposits must be conducive for yielding such information.

The archaeologist faces two issues. The first is the site's capacity to address research questions. Under ideal conditions, could the site yield information that is important in addressing research questions? There are many ways to determine this, including a review of literature, exploration of where research questions stand relative to the nature of the archaeological site encountered, and examination of the State Historic Preservation Plan (a comprehensive planning document required under NHPA).

The second issue concerns integrity: how intact is the deposit relative to its information potential? An archaeological site represents a three-dimensional information storage matrix. Its capacity to address research questions depends in large measure on how intact—how uncorrupted, to use the computer engineering term—that memory storage system is. This involves, in archaeological parlance, context and association. *Context* is where things were last deposited or left relative to the behavior that caused their leaving; *association* has to do with whether things are found with the other things they were dropped with. For archaeological sites, it is the *context* in which things are found combined with the *associations* among those things that enable questions about the past to be answered. In short, does the stuff belong together or not?

Archaeologists are more concerned with the *patterns* in physical remains than in the remains themselves. Artifacts that are "out of context" normally are so compromised in their ability to yield information that the archaeologist will consider them worthless scientifically. Thus, looting, erosion, and other site disturbances can destroy the context and association so vital to information retrieval from a site, rendering the artifacts recovered virtually worthless scientifically. The artifacts lack context and association. For the archaeological site, this means that it lacks integrity.

For archaeological sites, especially those being considered under 36 CFR 60.4 (d), evaluation of integrity will involve location (e.g., stratigraphic context), association (e.g., being able to be dated to, that is associated with, a particular period or culture), material (e.g., preservation of organic artifacts), and design (e.g., a toolkit that remains essentially intact).

See:

Advisory Council on Historic Preservation. 1991. *Treatment of Archeological Properties: A Handbook*. Washington, D.C.: Advisory Council on Historic Preservation.

National Park Service. 1995a. *How to Apply the National Register Criteria.* National Register Bulletin. Washington, D.C.: National Park Service, http://www.nps.gov/nr/publications/bulletins/nrb15/.

National Park Service. 2000. *Guidelines for Evaluating and Registering Archeological Properties.* National Register Bulletin. Washington, D.C.: National Park Service, http://www.nps.gov/nr/publications/bulletins/arch/.

Parker, Patricia L., and Thomas F. King. 1995. *Guidelines for Evaluating and Documenting Traditional Cultural Properties*. National Register Bulletin.

Washington, D.C.: National Park Service, http://www.nps.gov/nr/publications/bulletins/nrb38/.

King, Thomas F. 2000. *Federal Planning and Historical Places: The Section 106 Process*. Walnut Creek, Calif.: AltaMira Press.

———. 2008. *Cultural Resources Laws and Practice: An Introductory Guide*. 3rd ed. Lanham, Md.: AltaMira Press.

In addition to the Federal Agency, the Section 106 Process [36 CFR 800.2 (c)] identifies six sets of "consulting parties" who must be included by the Federal Agency in the Section 106 Process. Consulting parties include the State Historic Preservation Officer (SHPO); the Tribal Historic Preservation Officer (THPO) if tribal lands are affected; any Indian tribe or Native Hawai'ian organization that attaches religious or ceremonial importance to a Register-eligible property affected by the undertaking; the local government within whose jurisdiction the undertaking will occur; the applicant for Federal funding or permit that may be setting off the undertaking; and any others with demonstrated legal or economic interest.

Of those, the most important usually will be the SHPO (pronounced "ship-oh"). The SHPO, as much a regulatory office as an officially designated individual, is responsible for implementing national historic preservation programs at the state level. This includes reviewing and keeping a list of Register-eligible properties at the state level. The SHPO in most states actually serves as the apologist for the state's cultural resources. It is the SHPO's job to review the reports and recommendations submitted by the practicing archaeologist to the Federal Agency and to comment on any decisions made by the Federal Agency pertaining to the identification, evaluation, or mitigation of adverse effects to cultural resources. The SHPO conducts these tasks with an eye toward what is in the best interests of protecting the cultural resources of the state. Although the Federal Agency is not legally bound to follow the recommendations of the SHPO, in practice most SHPOs wield a great deal of power, and agencies are generally reluctant to disregard the SHPO's opinion without a very compelling reason. In those instances where the Federal Agency and SHPO do not agree, consultations between the two entities will usually continue until a concurrence is reached. In some states, the SHPO also reviews nonfederal projects required by state or local regulations, depend-

TIP: Working with Indian Tribes

As of 2008, the U.S. Congress had recognized 562 Indian tribes, each with its own treaty with the U.S. government. Consequently, there may be quite a variety of land use regulation and jurisdictional authority on tribal lands. For example, some tribes have autonomy over their resources and employ a comprehensive set of land-use regulations. Other tribes defer most of the regulatory authority to state or Federal agencies. Thus, planning for any project on Indian land requires careful checking; it also benefits from the cultivation of long-term relationships.

Federally recognized tribes are considered sovereign nations that have a government-to-government relationship with the United States. Consultations should be carried out in a manner that respects this relationship and should be initiated at the highest level (usually the tribal chairman) of the tribe. A list of official tribal contacts can be found online at the National American Consultation Database (http://home.nps.gov/nacd).

Many tribes object to divulging information about the sacred and ceremonial importance of a site. When consulting with tribes, the archaeologist should be sensitive to these concerns and take care not to disclose confidential information to the public.

Some tribes do not have Federal recognition but do have state recognition. The environmental protection agencies at the state level may therefore have special agreements with these tribes. Primarily in the West, one finds Tribal Environmental Protection Acts at the state level, based on a Federal initiative. Accordingly, archaeologists still need to go through official channels when talking to tribal members.

ing upon how the laws in the given state work. The THPO serves in an analogous role on tribal lands.

It should be noted that the regulations that went into effect in 1999 make considerable allowance for the input of consulting parties. The Federal Agency is charged with involving those parties in the Section 106 Process. However, as with the pre-1999 Section 106 Process, in most cases two parties—the Federal Agency and the SHPO/THPO—wield the greatest power in determining what is to be done. This is reflected in the later stages of the Process, where the agency and the SHPO/THPO, or the ACHP as a substitute for one of those, are the only parties required to sign off on plans to resolve any adverse effects.

Given the relatively recent (1999) changes to the Section 106 regulations contained in 36 CFR Part 800, in which public participation of vari-

ous cultural groups is encouraged, the increased role of consultations, and the greater accountability of the overall evaluative exercise, the practicing archaeologist should pay close attention to who is a consulting party. It is essential to be aware of the public's possible involvement in the Section 106 Process. This is especially true in situations where the local government or Native American tribes are consulting parties in the Process. In most situations, the archaeologist will be dealing with the Federal Agency and at least one consulting party, the SHPO/THPO.

In some instances, the ACHP may also serve as a consulting party. The ACHP can enter the process in a couple of ways. For example, if the Federal Agency and the SHPO/THPO disagree and cannot resolve the disagreement, the ACHP will review the decision and issue its formal comments to the Agency head. If one of the consulting parties, especially a tribal or native group, disagrees with the Agency finding, then that party can request the ACHP to step in. Historically, around 3 percent of Section 106 cases have required ACHP review in a given year. Otherwise, the ACHP is a passive party that monitors overall policy. The Keeper of the National Register deals with disputes about actual nominations to the National Register.

Steps along the Way: The Process

36 CFR 800.3–800.5 sets out the following steps for the Section 106 Process (see figure 2.2.):

1. The Agency first needs to determine whether there is an undertaking and, if so, whether there is any chance it could affect historic properties. If there is no such chance, the Process ends here.

2. If the undertaking has potential to cause effects, then the Agency needs to:
   a. Identify the appropriate SHPO/THPO and other consulting parties;
   b. develop a plan to involve the public;
   c. review existing information on historic properties (properties eligible for National Register listing) potentially affected by the undertaking, as well as the likelihood of encountering unknown properties; and

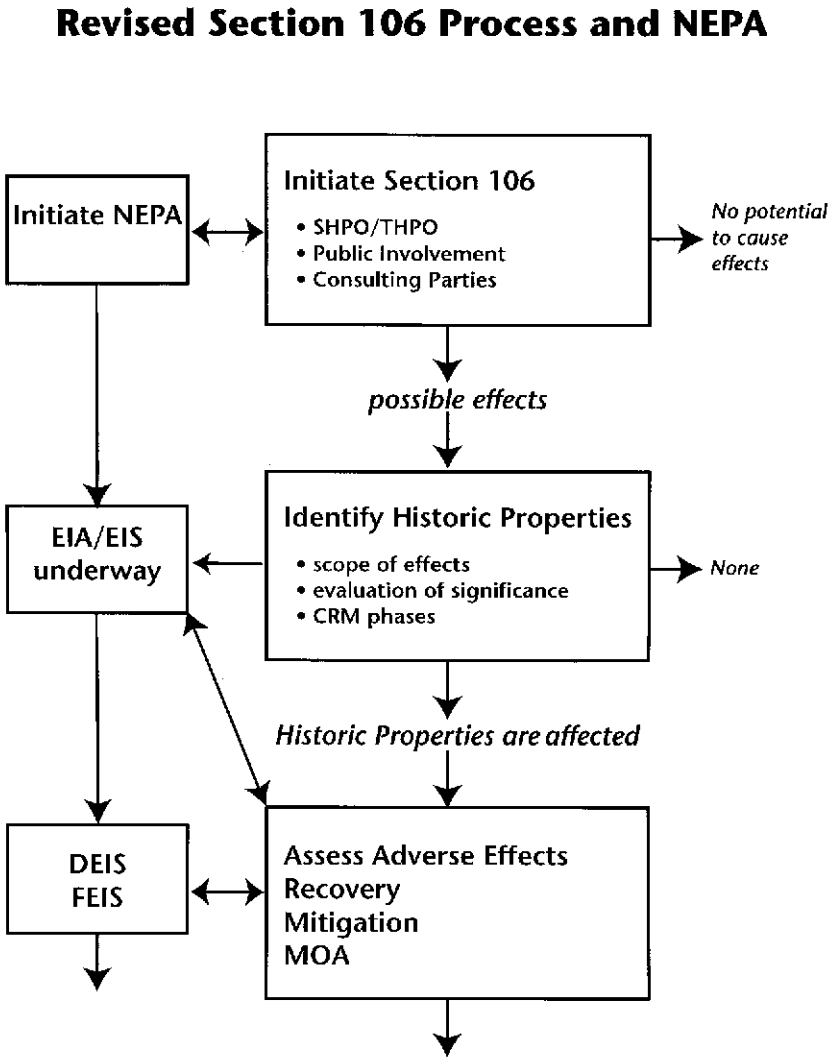


Figure 2.2. Revised Section 106 Process and NEPA.

d. consult with the SHPO/THPO on other background information that may be needed.

3. Next, the Agency develops the scope of identification efforts needed, which includes identifying the area of potential effects.

Indian tribes or Native Hawai'ian organizations are to be contacted about possible properties of "religious or cultural significance," even if those are located off of tribal or native lands.

4. If at this point it seems a good idea to physically check the project area, then the Federal Agency, in consultation with the SHPO/THPO, will "make a reasonable and good faith effort to identify historic properties that may be affected by the undertaking" [36 CFR 800.4 (b)(1)]. For the practicing archaeologist, this would be part of the Phase I identification process.[2]

5. If cultural resources are identified in step 4, those properties are to be evaluated by the Federal Agency in consultation with the SHPO/THPO, along with any Indian tribe or Native Hawai'ian organization that attaches religious or cultural significance to the resource, to see whether they are eligible for listing on the National Register. This corresponds to an archaeological Phase II investigation.

6. If no cultural resources were identified during step 4, or if the cultural resources identified were not considered eligible for listing on the National Register in step 5, documentation of those results is given to the SHPO/THPO. The SHPO/THPO has the opportunity to agree or disagree.

7. If cultural resources eligible for listing on the National Register (that is, "historic properties" in Federal terminology) were identified during step 5, then the effects of the undertaking on the properties will be determined (that is, the Criteria of Adverse Effect [36 CFR 800.5 (a)] will be applied). The regulations provide procedures to help resolve differences in interpretation between the Agency, the SHPO/THPO, and other consulting parties [36 CFR 800.6].

It is the Agency (and *not* the practicing archaeologist working on behalf of the lead agency) that makes a determination: "Evaluation is completed with a written determination that a property is or is not significant based on provided information" (*Federal Register* 48 [190]:44724). The lead Agency will submit a report and conclusions to the SHPO/THPO.

We learned about archaeology from that . . . The Transco Incident

The "Transco Incident" refers to a $35.5 million settlement reached between the Federal Energy Regulatory Commission (FERC) and the Transco Energy Company (Transco) for cultural resources and pricing violations. Failure to execute the procedures in proper order, regardless of good faith, can result in enormous penalties.

In the late 1980s, Transco, a gas pipeline firm based in Houston, sought permits from the Federal Energy Regulatory Commission (FERC) to build a natural gas pipeline from Tampa to Texas. The corridor project was a Federal undertaking subject to Section 106 requirements. FERC, the lead agency, required Transco to see that the actual Section 106 work was done.

Transco contracted an archaeology firm to conduct an assessment on a corridor that went through five states: Florida, Alabama, Mississippi, Louisiana, and Texas. Each state's SHPO reviewed the cultural resources investigation of the proposed pipeline corridor (area of potential effects) through its jurisdiction.

The archaeology firm made determinations of eligibility without consulting with the Alabama SHPO (or with FERC archaeologists). Having made its own determinations, it structured a Phase II program and again made its decisions. Next, it conducted Phase III studies on some sites, all without consulting with the Alabama SHPO. The firm had flagrantly exceeded its authority. The Alabama SHPO, as defender of the state's cultural resources, filed suit against FERC for failure to comply with NHPA Section 106. FERC turned around and charged Transco with noncompliance with the NHPA.

On May 29, 1991, FERC approved a $35.5 million settlement between Transco and the FERC enforcement section of its Office of General Council. The settlement found that Transco began construction of the pipeline before properly completing National Register eligibility surveys and that forty-eight of the seventy-seven Register-eligible sites were lost as a result (Rogers 1991:37).

Of the final settlement, $10 million represented fines associated with marketing and pricing violations unrelated to the historic preservation issues. Another $12 million represented civil penalties ($11 million) and investigation fees associated with the NHPA violations ($1 million). The remaining $13.5 million was paid to Alabama for "remediation and future environmental and cultural resource research and protection" (Rogers 1991:37).

There are several lessons here, but the basic one is this: Professional, Section 106 archaeology is a no-nonsense world. Mistakes, even procedural errors, carry serious consequences.

Rogers, Lori M. 1991. FERC hears gas industry concerns, announces Transco settlement. *Public Utilities Fortnightly*, July 1, 1991:36–37.

Transco settles claims in Alabama. *New York Times*, May 31, 1991:D4.

The report contains sufficient information for the SHPO/THPO reviewer to assess independently whether the cultural resource does or does not satisfy criteria for listing on the National Register (see also "We learned about archaeology from that . . . The Transco Incident").

For the practicing archaeologist, one outcome from step 7 may be a determination that the only way to mitigate the adverse effect on the archaeological site is to recover data from the site prior to its destruction. Avoidance of cultural resources is preferred, but it is not always practical. In the context and wording of the statutes, full-scale archaeological excavation of a National Register–eligible site is seen as one way to mitigate an adverse effect. This would be Phase III data recovery or mitigation.

(Ironically, the archaeological excavation of a site is considered in Federal guidelines to also be an "adverse effect." This underscores not only that any archaeological excavation really is controlled destruction, but also how full-scale data recovery is to be considered only as a final alternative. The irony then is that such archaeological work becomes an adverse effect that offsets another adverse effect.)

The Section 106 Process contains a series of checks and balances. If the archaeologist does inadequate work, this will likely be caught by agency or SHPO/THPO reviewers when the submitted report is examined. If there are disagreements about the determination of adverse effect, the ACHP may be invited to join the consultation upon proper notification [36 CFR 800.5 (c) and 800.6 (a)(1)]. Even if an agency is tempted to ignore or undervalue the importance of the cultural resources in a project area, the SHPO/THPO has intimate knowledge of cultural-historical patterns within the state and normally will catch such an irregularity. In some states, the SHPO intentionally maintains an adversarial relationship with agencies in order to better execute its role as an apologist for the state's cultural resources.

Additional Factors and Agency Regulations

There is a series of controls on the Section 106 Process to handle individual situations (see also ACHP [1991], *Treatment of Archaeological Properties: A Handbook*, which should be updated). Agencies have developed specific management guidelines and policies to implement Section 106. The 106 regulations themselves contain review and notification deadlines

Professional Certification

Archaeology is at an interesting point in its development as a field in the United States. Historically an academic and museum field, it has become an extra-academic, practiced profession. This raises questions of credentialing and certification.

Most fields that involve a commitment of public resources or public well-being to an individual's professional judgment are licensed. Thus, engineers, architects, geologists, nurses, physicians, accountants, land surveyors, beauticians, lawyers, and so on are required by different states to obtain a license.

Archaeology is not a credentialed, certified field—at least, not yet. However, the qualifications of archaeologists to do Federally reviewed archaeology are stipulated in 36 CFR 61 and in the Secretary of the Interior's Guidelines [48 FR 44738–44739]. Many states use Federal criteria of qualifications, which equates to eligibility in RPA (Register of Professional Archaeologists, see http://www.rpanet.org), to help potential clients determine whether an archaeologist is competent to do professional work. Proto-certification programs have emerged in different states, requiring archaeologists to demonstrate past experience in order to get on a list of archaeologists deemed qualified by the SHPO. The intent is to make sure that the professional archaeologist is familiar with the state's archaeology and therefore is responsive to the needs of the resource.

designed to help keep the process moving along. For example, an SHPO/THPO has thirty days to object to a determination that there are no historic properties or that no adverse effects on historic properties will occur [36 CFR 800.4 (d)(1)].

The qualifications of archaeologists are stipulated in 36 CFR 61 and in the Secretary of the Interior's Guidelines [48 FR 44738-44739]. Under some Federal contracts, field workers must have a B.A. or B.S. in anthropological archaeology or a closely related field. However, Section 106 projects must be led by a principal investigator ("professional archaeologist") who possesses at least an M.A. or M.S. in anthropological archaeology or a closely related field in addition to significant amounts of supervised field training and experience in North American archaeology. Many states use the Federal criteria to determine who is qualified to do archaeology for state-level programs.

The expectations, guidelines, and requirements for archaeological field work and reporting are outlined in *Archaeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines* [48 FR 44716–44742]

and the Advisory Council on Historic Preservation *Manual of Mitigation Measures* (*MOMM*), as well as other documents.

Curatorial standards for Federal archaeological collections are set out in 36 CFR Part 79. These arose from concern over the need to provide continuing professional-quality curation of materials recovered during Federally sponsored projects (see especially Trimble and Meyers 1991).

In essence, the statutes and guidelines for reporting of archaeological data should lead to archaeological documents that would allow someone entirely unfamiliar with the culture history and environment of the project area to make sense of the work that was done. Further, this person should, given the material recovered and the field records (including both notes and photographs), be able to pick up where the original investigator left off, even two centuries from now.

Additional Regulations and Requirements

The Section 106 Process and the National Environmental Policy Act

Non-archaeologists often confuse the cultural resources work expected under NHPA with requirements that come from the National Environmental Policy Act. This confusion sometimes is even found in advanced archaeology textbooks, where what is the Section 106 Process is thought to be a part of a larger effort to do environmental impact statements. Some clarification is in order.

The National Environmental Policy Act of 1969 (NEPA) declares a national policy to protect the environment through evaluating proposed Federally enabled actions. The environment is defined to include both natural and cultural resources, giving a valid role for aesthetic considerations in evaluating the quality of the environment (e.g., visual resources, settings). NEPA is administered by the Council on Environmental Quality (CEQ), which the Act established. The implementing regulations for NEPA were issued in response to Executive Order 11991 by the CEQ in 1978 as 40 CFR Parts 1500–1508 and were binding as of July 30, 1979. The procedures for implementing NEPA relative to NHPA are contained in 36 CFR Part 805.

Those regulations included guidelines for conducting environmental assessments (EA) and preparation of environmental impact statements (EIS) (Council on Environmental Quality 1978, and revised periodically

thereafter). Essentially, NEPA sets out a process by which potential impacts of a project are subject to public scrutiny. It added fairly comprehensive environmental accountability to the mission of every agency. NEPA complemented the NHPA through encouragement of impact assessment and evaluation of archaeological sites that may have local or regional importance even if there is no direct national significance (Rosenberg 1981:768).

Early EISs often assumed that satisfying NEPA requirements would also satisfy NHPA Section 106 requirements. However, all that a NEPA EIS required was identifying previously known sites within the impact area (Scovill, Gordon, and Anderson 1977:43), a requirement a lot less thorough and rigorous than making a good-faith effort to see whether Register-eligible properties were present in a broader area of potential effects, regardless of whether they were already known or not. However, there was also a concern that both statutes—NHPA and NEPA—required what we could call cultural resources to be documented and taken into account before a given land alteration project continued. NHPA had—and has—statutory precedence over NEPA, meaning that its requirements, as set forth in 36 CFR 800, must be satisfied regardless of what happens with NEPA compliance. However, the reality is that one event—a firm's given project—will need to take into account two laws and their codes. Accordingly, coordination of the two processes is beneficial so that all parties come out ahead.

In 1992, amendments to NHPA modified the Section 106 Process so that cultural resources work done under NEPA would mesh better with Section 106 requirements. However, those changes were not entirely effective in smoothing the interplay between satisfaction of Section 106 requirements and the work done as part of NEPA. In 1999, the ACHP revised the Section 106 regulations—36 CFR 800—yet again. While most of the changes involved how consulting parties work within the Process, an important part of the revision clarified NEPA coordination relative to Section 106 requirements. These changes allow satisfaction of historic preservation requirements under NEPA to also meet an agency's obligations for compliance with Section 106, provided the NEPA cultural resources work would satisfy the more rigorous documentation and survey requirements expected for any project that would come under Section 106 jurisdiction.

Set forth in 36 CFR 800.8, the revised code does allow the cultural resources aspect of a NEPA environmental assessment (EA) or environmental impact statement (EIS) to be substituted for Section 106 documentation, but only if it is done in a manner identical to the Section 106 Process [36 CFR 800.8 (c)(1) and (2)]. Thus, an EA or an EIS can substitute for the specific *steps* of the 106 process, but the process itself cannot be compromised. For example, under NEPA, an agency can designate a list of "categorical exclusions," actions that do not need to go through the NEPA EA/EIS process, but these actions are not automatically exempt from Section 106 and will get reviewed like any other undertaking [36 CFR 800.8 (b)].

In 2004, the Section 106 regulations were again amended to clarify that the ACHP could not force a Federal Agency to change its determination of effects of an undertaking on historic properties. The changes also underscored the exemption of state and local undertakings from Section 106 even if there is Federal delegation or approval of non-Federal undertakings. The changes specify a thirty-day window to file objections to "no adverse effect" findings (§ 800.5). Finally, the amendments allow the ACHP to propose an exemption to the Section 106 Process on its own initiative.

NEPA has led to a large amount of archaeological work on private property as a result of the need for Federal permits or licenses. NEPA has also inspired numerous states to create so-called little NEPAs. Many states ended up using NEPA legislation as a model for handling cultural resources, and the "cultural resources code," as it were, is embedded within the little NEPAs.

Other Legislation, Regulations, and Guidelines

In law, legislation provides authority, regulations set required procedure, and guidelines give the advice and guidance needed to accomplish the intent of the legislation on a day-to-day basis.

With the exception of the legislation aimed directly at American Indian concerns, much Federal historic preservation legislation deals with specific cases that might also be covered under Section 106 of the NHPA. This is recognized in several places within 36 CFR 800 where Federal agencies are urged to coordinate their activities so that the requirements of NHPA's Section 106 and those of the other statutes are not needlessly duplicated. Some of the more important of these acts are listed in table 2.1.

Table 2.1. Some Other Federal Legislation Governing Historic Preservation and Cultural Resources Archaeology

The Federal-Aid Highway Act of 1968. Section 4 (f) requires Secretary of Transportation to take into account the historic significance of sites or public lands affected by a proposed project; includes exploring all feasible and prudent alternatives to highway design and other transportation projects that would otherwise adversely affect those cultural resources.*

Coastal Zone Management Act of 1972 (CZMA). Important to protect and manage coastal areas as natural and economic resources, including their aesthetic qualities such as scenic, cultural, and historic values. Evaluate coastal archaeological sites.

Housing and Community Development Act of 1974. Department of Housing and Urban Development may delegate its Section 106 responsibilities to the local government receiving the Community Development Block Grant [36 CFR 800.12 (c)].

Archaeological and Historic Preservation Act of 1974 (AHPA).** Requires proper planning and surveying to avoid the loss of archaeological data. Authorizes spending Federal funds up to 1% of the overall budget to recover data from sites facing destruction and to conduct surveys in threatened areas.

American Indian Religious Freedom Act of 1978. Federal agencies must preserve religious rights of American Indians with respect to religiously/ceremonially important sites and objects. Provides structure for involvement of American Indians in cultural resources matters—key to complying with Native American Graves Protection and Repatriation Act of 1990.

Archeological Resources Protection Act of 1979. Tennessee Valley Authority, Department of Interior, Department of Agriculture, and Department of Defense required to issue uniform regulations regarding treatment of archaeological resources on Federal and Indian lands, primarily in terms of permitting, ownership, and penalties. The regulations are repeated in the *Code of Federal Regulations* with a different title for each of the four agencies.

Abandoned Shipwreck Act of 1987. Allows recovery of shipwrecks and underwater sites consistent with the protection of the historical values and environmental integrity. Encourages states to manage underwater cultural resources, e.g., create underwater historic districts and parks.

Native American Graves Protection and Repatriation Act of 1990 (NAGPRA). Improved protection of American Indian graves and cultural materials on Federal and tribal land. Also led to return of funerary and other sacred items from Federal and Federally funded institutions to American Indian groups culturally affiliated with the human remains or artifacts. Affects treatment and disposition of burials and funerary objects encountered through archaeological assessments on tribal and Federal land in compliance with NHPA Section 106 (see the box "NAGPRA and Cultural Perspectives").

* Section 4(f) analyses, usually carried out in conjunction with NEPA, "are a major preoccupation of DOT agencies" (King 2000:11).

** Originally known as the Moss-Bennett Act. If an agency encounters archaeological resources after a project has been started, it can follow the AHPA and its regulations instead of the Section 106 Process [36 CFR 800.13 (b)(2)].

NAGPRA and Cultural Perspectives

The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) allows Indian tribes to take back human remains and associated funerary as well as ritual objects and to dispose of them in a manner consistent with their culture's current values. When NAGPRA was first seriously considered, many archaeologists were concerned about loss of scientific information. While much concern still exists, it is important to place NAGPRA in a comparative cultural context.

Americans use what is called the Eskimo kinship system for reckoning relationships and applying terms to classify relatives, e.g., mother, uncle, cousin, sister, nephew. Generational distance is recognized by adding the term "great" or "grand" to separate generations, such as great-aunt, grandson, and great-great-grandfather. English measures time, with connotations of distance and familiarity. Old things are far away and unfamiliar. Consequently, for an English speaker, someone who died generations ago has been dead a long time; they are "long gone." The language and the kinship terms result in a feeling of distance and lack of immediate relationship in a day-to-day sense.

People think in their languages and define reality based upon how that language organizes and implies relationships within the world. Of course, speakers think that *their* world is *the* world, as described by their language. Hence the problem: Every culture believes that *it* truly understands reality and the other guy is mistaken and superstitious.

American Indian cultures do not necessarily reckon relationships in the same way as other Americans. Other ways, such as the Crow and the Iroquois kinship systems, do not recognize great generational distances. Further, for many Indian languages, time is not a quantity that is, or can be, measured. Rather, time is a quality, like beauty: flowing, pervasive, and experienced. Distance in time is inconceivable. This view of time combined with their kinship system produces equal feelings of immediate family with a parent who died last year and with a relative who has been dead for centuries.

Appreciating this perspective helps us understand why American Indians, arguing with archaeologists or English speakers in general, will quickly go to the example of "How would you feel about having *your* grandfather exhumed and put into a warehouse for storage or on display in a museum?" For the speaker of that Indian language, this comparison is how the matter is felt, and there is no other way that the matter can be expressed. For the native English speaker, the example sounds bizarre, since human remains that are millennia old cannot possibly be those of close relatives. For the English speaker, the example—especially since it is being expressed by the other person in English, who is therefore assumed to be using those cultural ground rules—represents a false analogy and irrelevant argument. And therefore the English-speaking archaeologist or anthropologist, for whom such remains would have only marginal emotional importance, is frustrated that the American Indian uses—and is allowed to use by law—what seem to be illogical or impossible arguments to withhold objects of scientific value.

Nine sets of Federal regulations govern most of the implementation of cultural resources legislation (see King 2008 for details). These detail such things as applying National Register criteria, implementing the procedures required to satisfy NHPA's Section 106, and curating archaeological collections produced as a result of Federally enabled projects. Table 2.2 lists these regulations, with which professional archaeologists particularly—both in government and private practice—need to be familiar.

Guidelines are protocols; they do not have the force of law. However, the Federal regulatory agency is bound by the guidelines to the extent needed to avoid being "arbitrary and capricious," and the guidelines themselves usually address the circumstances by which they may be exceeded or modified. The Section 106 Process uses mainly two sets of guidelines:

- 47 FR 46374, "Guidelines for Exemptions under Section 214 of the National Historic Preservation Act." NHPA Section 214 (16 U.S.C. 470v) authorizes the ACHP, in consultation and concurrence with the Secretary of the Interior, to set out exceptions to the Section 106 Process; 47 FR 46374 provides specific guidance for doing this.
- 48 FR 44716, "Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines." See 36 CFR 800.2 (a)(1) and 800.4 (b)(1). After NHPA and 36 CFR 800, this is probably the most important document for the practicing archaeologist to understand.

Native American Graves Protection and Repatriation Act (NAGPRA)

The Native American Graves Protection and Repatriation Act (NAGPRA) was passed to affirm the right of tribes to the human remains and funerary objects of their ancestors. In terms of archaeological field work, this law holds that no Native American grave can be excavated on Federal land until consultations have been conducted with the appropriate tribe(s) and until a written plan of action has been completed stipulating how the excavations will be carried out. Once the remains have been removed, the ownership and control of the remains belongs to the appropriate Native American tribe.

Table 2.2. Core Federal Regulations

36 CFR Part 60, "National Register of Historic Places." This sets out the basic rules for the National Register, including what can and cannot be listed. Of import to professional archaeologists is 36 CFR 60.4, which sets out the criteria for evaluating the eligibility of a property for listing on the National Register.

36 CFR Part 61, "Procedures for Approved State and Local Government Historic Preservation Programs." This governs certification of local governments; see also 36 CFR 800.3 (c)(4) and NHPA Section 101 (c)(1). Appendix A details the training and experience required of archaeologists directing any Federal Section 106 project.

36 CFR Part 63, "Determinations of Eligibility for Inclusion in the National Register of Historic Places." This is directed toward Federal agencies to help them understand how to go about having determinations of Register eligibility made and what to do after such determinations are made (see also 36 CFR 800.4 [c]).

36 CFR Part 65, "National Historic Landmarks Program." National Historic Landmarks (NHL) are seen to be extraordinarily important to the nation as a whole (as opposed to just the state or locale) and command appropriate consideration and treatment. NHPA Section 110(f) sets out the policy for this. The additional requirements as they pertain to Section 106 are given in 36 CFR 800.10.

36 CFR Part 68, "Secretary of the Interior's Standards for the Treatment of Historic Properties." This sets out the standards for treatment of historic properties to be used by the National Park Service and the SHPOs for Federal grant-assisted preservation, rehabilitation, restoration, or reconstruction projects. See also 36 CFR 800.5 (a)(2)(ii).

36 CFR Part 78, "Waiver of Federal Agency Responsibilities under Section 110 of the National Historic Preservation Act." This allows suspension of the Section 106 Process in situations of immediate emergencies involving human life and health [36 CFR 800.12].

36 CFR Part 79, "Curation of Federally Owned and Administered Archaeological Collections." This sets out curatorial requirements required of facilities/institutions holding archaeological collections and associated records that have been generated by Federally enabled projects, especially Section 106 projects.

36 CFR Part 800, "Protection of Historic Properties." These are the basic regulations for the Section 106 Process discussed earlier in chapter 2.

43 CFR Part 7, "Protection of Archaeological Resources: Uniform Regulations." These regulations applied to the Department of the Interior; identical regulations exist for Agriculture, Defense, and the TVA. The regulations deal with the permitting process.

State Laws, Regulations, and Guidelines

State laws and the regulations drawn from them fall into three broad sets: (1) counterpart Section 106 statutes; (2) counterpart NEPA statutes ("little NEPAs"); and (3) other hybrid statutes such as focused burial legislation. Most require that any state-enabled land-alteration/jurisdiction

project be examined first for cultural resources. States also maintain a state equivalent of the National Register.

In many states, the SHPO has jurisdiction over actions enabled by state funding or permits or involving state property. Projects trigger a process that may be similar to Section 106 at the Federal level or a roughly equivalent process similar to NEPA EA/EIS reviews. All states and territories have an environmental assessment (EA) requirement of some kind or another, depending on where a project is located and the nature of the project. Some states, such as Vermont and Oregon, have a comprehensive environmental assessment requirement built into a permit process for all actions of a certain magnitude. Other states use a state-level EA/EIS process that is not as comprehensive as NEPA: Arizona, Delaware, Georgia, Louisiana, Michigan, New Jersey, North Dakota, Pennsylvania, Rhode Island, and Utah.

While procedures may vary by state or commonwealth, the regulations are quite accessible. The states and territories generally have the regulations, permit applications, and forms available on the Internet. Usually, there is also a statewide archaeological society with an Internet home page that includes links to state archaeological laws and assessment procedures. The National Association of State Archaeologists also has a Web page with links to each state and territory (http://www.uiowa.edu/~osa/nasa/). Federal agencies such as the NPS and professional societies such as SAA and RPA also maintain an Internet presence with links. The practicing archaeologist can get much information from the Internet but should also contact the SHPO of the given state for copies and clarification of regulations and procedures.

Municipal and County Regulations

Approximately 10 percent of the nation's 3,066 counties have counterpart Section 106 legislation, at least in a very broad sense of the term "counterpart." Most of this legislation and its statutory regulations are set within regulations for the review of proposed development. The issuance of a permit or license for a housing development depends in part on a developer's compliance with the county's equivalent of Section 106.

As at the state level, some of these regulations resemble Section 106, and some resemble NEPA. It depends entirely on the legislative history of the local area. Those that follow a Section 106 procedure will have a local archaeologist whose role will be similar to that of an SHPO. The entity

undertaking the project (be it a private developer or a public agency) will serve in the role of "lead agency."

The ability to monitor and enforce the process varies by locale. Some areas have municipal or county archaeologists who work with the planning commissions. The necessary permits for construction are not released until the archaeologist or equivalent historic preservation officer is satisfied that cultural resource compliance has occurred. In other areas, there may be a historic preservation commission that recommends zoning or permitting actions to the local planning board but which lacks statutory authority beyond social censure. These are usually found in situations lacking any counterpart historic preservation regulation or having a counterpart to NEPA.

The archaeologist is responsible for finding out what kinds of statutory regulations exist within the business domain of his or her organization. The best place to start is with the SHPO.

Chapter Summary

The legislation that most directly affects professional archaeology is the National Historic Preservation Act (NHPA). The NHPA established the State Historic Preservation Officer (SHPO), who coordinates historic preservation activities within the state. The NHPA also established the Advisory Council on Historic Preservation (the ACHP or Council). But most importantly, through its Section 106, NHPA required that any Federal Agency that makes a land-alteration activity possible, be it through funds or permits or just control of Federal land, must first take into account any properties present that could be listed on the National Register of Historic Places. Those properties can be standing buildings; they can also be archaeological sites. Regardless of what they are, if the project is Federally enabled, then the enabling agency is held responsible for seeing to it that such properties are accounted for before work begins.

Section 106 is a paragraph long and broadly written. The regulations for implementing Section 106 are contained in the *Code of Federal Regulations*. Although there are several parts of the code that are involved, two make up the basic elements for how Federal agencies are to comply with Section 106. The first is 36 CFR 800, which outlines how the Process is supposed to be done and who will be involved. The second is 36 CFR 60, which sets out the rules for listing properties on the National Register.

A particular note here, even in summary: When a property—a cultural resource, as it were—is seen to be eligible for listing on the National Register, it is said to have the *quality of significance* as defined in 36 CFR 60.4. This is where the term "significant" comes in when it is used to quickly summarize the importance of an archaeological site. "Significant" is a word that is in common use that also has, in professional practice, a more specific connotation. That more specific connotation is "eligible for listing on the National Register."

The Section 106 Process, presented in 36 CFR 800, requires that Federal agencies, enabling land-alteration or land-control projects, make a good-faith effort to take into account any property that could be listed on the National Register of Historic Places. The Federal Agency must first determine whether such a project exists. If it does, then that same agency must determine whether it would have any chance of damaging a Register-eligible property. If that is the case, then the Federal Agency is required to consult with the SHPO or the tribal equivalent THPO (Tribal Historic Preservation Officer), if tribal lands are involved, and other specified parties about what actions need to be taken to make sure Register-eligible cultural resources will be accounted for.

The first step in the Process is a good-faith effort to see whether Register-eligible properties are present. Archaeologically, this normally results in what is called *Phase I survey* or *Phase I identification*. This combines historic background research with field survey to see whether archaeological sites might be present.

If sites are present, the requisite good-faith effort continues with what is known archaeologically as a *Phase II evaluation*. The purpose of Phase II is to get enough information about the archaeological site so that the Federal Agency can determine whether it is eligible for listing on the National Register. Although the Federal Agency makes the initial determination, its decision can be challenged by the SHPO/THPO or by other involved consulting parties. In such disagreements, the ACHP will become involved and will issue its opinion to the Agency. The Agency must then consider the ACHP's opinion, though the Agency retains the final decision-making authority.

If it is determined that Register-eligible properties—including archaeological sites—are present, then a series of decisions will be made by the Federal Agency in consultation with the SHPO/THPO and others

about what the impact of the project will be on those properties, as well as what should be done to offset any impact. Once a course of action has been decided, a Memorandum of Agreement (MOA) is executed between the Federal Agency and the SHPO/THPO.

Sometimes the course of action is to have the project redesigned so that the Register-eligible cultural resource is not damaged. Often, though, such a change of plan would be impractical, and then the goal is to record as much about the resource as possible before it is lost. For archaeologists, this would be a *Phase III data recovery* or *mitigation*, the purpose being to mitigate the damage from the project by excavating and recording the threatened part of the site.

At the Federal level, the law with precedence in treating cultural resources like archaeological sites is the NHPA. This can result in some confusion, since the National Environmental Policy Act (NEPA) often is cited, even in college-level method and theory texts, as the law that drives compliance archaeology. The confusion comes because NEPA also takes cultural resources into account in its assessment of the impact of a Federally enabled project on an area. However, the NHPA and the Section 106 mandate must be satisfied by any project that is covered by NEPA, and the most recent revision of 36 CFR 800 addresses this in no uncertain terms.

What of cultural resources adversely affected by non-Federal activities? Many states and local governments have legislation and accompanying regulations to deal with cultural resources that could be lost through construction or similar land alteration activities. Sometimes the law and regulations are similar to the Section 106 Process; sometimes they are similar to NEPA and actually are embedded within the state's equivalent of NEPA (so-called little NEPAs).

One last item especially important in dealing with clients: neither the Section 106 Process, nor its local counterparts, is intended to stop construction. A site or building eligible for or actually listed on the National Register can still be utterly destroyed. Rather, the Process is intended to allow governments, Federal or local, time to evaluate the importance of cultural resources and to plan for handling them. If the resource will be lost, the Process provides a way in which that resource can be recorded so that the loss from its disappearance can be kept to a minimum. The idea is not to stop construction. Rather, the idea is, to use a metaphor, to give us

as a nation a chance to see whether we want to make note of what is going to get tossed out from the national attic or even whether we all might be better served by holding onto it.

Additional Reading of Interest

Advisory Council on Historic Preservation (ACHP). *Treatment of Archaeological Properties: A Handbook*. National Park Service, U.S. Department of the Interior. Washington, D.C.: U.S. Government Printing Office, 1991. Straightforward guide to handling archaeological sites in the broader context of the Section 106 Process.

———. *Federal Historic Preservation Case Law, 1966–1996*. National Park Service, U.S. Department of the Interior. Washington, D.C.: U.S. Government Printing Office, 1996. Available at http://www.achp.gov/book/COVER1.html.

———. *Federal Historic Preservation Case Law Update, 1996–2000*. National Park Service, U.S. Department of the Interior. Washington, D.C.: U.S. Government Printing Office, 2000. Available at http://www.achp.gov/book/COVER1.html.

Hutt, Sherry, Walter E. Stern, and Stan N. Harris. *Cultural Property Law: A Practitioner's Guide to the Management, Protection, and Preservation of Heritage Resources*. Chicago: American Bar Association, 2004.

Kanefield, Adina W. *Federal Historic Preservation Case Law, 1966–1996: Thirty Years of the National Historic Preservation Act*. A special report funded in part by the United States Army Environmental Center/Advisory Council on Historic Preservation. Washington, D.C.: U.S. Government Printing Office, 1996. Contains annotated summaries of important historic preservation cases involving the National Historic Preservation Act. Excellent reference for archaeologists, historians, and anyone interested in pursuing a law degree focusing on environmental or historic preservation issues.

King, Thomas F. *Federal Planning and Historical Places: The Section 106 Process*. Walnut Creek, Calif.: AltaMira Press, 2000. A comprehensive discussion of the Section 106 Process from the planning perspective, including detailed advice on assembling things like Memoranda of Agreement (MOAs).

———. *Saving Places That Matter: A Citizen's Guide to the National Historic Preservation Act*. Walnut Creek, Calif.: Left Coast Press, 2007. Useful general guide explaining Section 106 and related Federal actions and processes.

———. *Cultural Resource Laws and Practice: An Introductory Guide*. 2nd ed. Walnut Creek, Calif.: AltaMira Press, 2008. Readable primer on historic preservation law assembled by one of the true masters of the field.

National Park Service. *How to Apply the National Register Criteria*. National Register Bulletin 15. Washington, D.C.: National Park Service, 1995. Available at http://www.nps.gov/history/nr/publications/bulletins/nrb15/ (Jan. 1, 2009). Provides excellent instructions on how the criteria of evaluation given in 36 CFR 60.4 work in day-to-day life.

———. 2000. *Guidelines for Evaluating and Registering Archaeological Properties*. National Register Bulletin. Washington, D.C.: National Park Service, 2000. Available at http://www.nps.gov/history/nr/publications/bulletins/arch/nrb36.pdf (Jan. 1, 2009).

Stapp, Barby C., and Michael S. Burney. *Tribal Cultural Resource Management: The Full Circle to Stewardship* (Heritage Resources Management Series, Vol. 4). Walnut Creek, Calif.: AltaMira Press, 2002. Intended to guide archaeologists consulting with tribes.

CHAPTER THREE
PREPARING THE PROJECT BACKGROUND

Purpose and Objectives

At the Federal or state level, once it is decided a proposed undertaking could possibly damage cultural resources, the first formal step for the professional archaeologist is to conduct background research. This identification step is a comprehensive assembling of what is already known about the project and the project area. This information draws from history, archaeology, geology, soils, other environmental sciences, and other social and cultural background research. For Section 106 projects, this preparatory or background research is the first step required of the Federal Agency [36 CFR 800.4 (a)] after there is a determination of an undertaking. The Secretary of the Interior's Standards and Guidelines [48 FR 44716–44742] sets forth the standards expected for documentation, in effect using that background to establish clearly the criteria needed for any evaluation of significance.

The background research puts the project and associated archaeological research into the broader context of what is known and why the work is being done. In addition to the actual data gathered, the nature and thoroughness of the project background conveys credibility, informing the review agencies of the practicing archaeologist's preparation for the work that was undertaken.

Occasionally, the background research might even be a stand-alone document. This occurs when "preservation plans" or disturbance studies are done on behalf of agencies. "Preservation plans" refer to historic preservation plans prepared at the behest of a Federal Agency or installation. These tend to be miniature equivalents of state historic preservation plans

and are tied to the specific situation of the installation or agency property for which they are prepared.

Preservation plans contain a set series of information: the physical geography of the Federal property, a cultural history/cultural geography of that same property, a summation of work done to date, and a relation of the cultural history to the larger State Historic Preservation Plan. The jurisdiction for cultural resources on Federal land still rests in the Section 106 Process with the SHPO and therefore needs to be placed in the context of the state.

Preservation plans have two major components: (1) the core research questions/historic issues on cultural resources that might be within the project area, and (2) sensitivity determinations for the property. Sensitivity determinations refer to the likelihood that historic or prehistoric cultural remains will be located on/in various landscape types of the property.

Preservation plans include a synopsis of what already is known about historic and prehistoric sites and structures within the agency's jurisdiction. The synopsis addresses the possibility of National Register eligibility for those sites and structures. Potential resources, based upon historic documents, are mentioned. For example, early Spanish forts at Parris Island near Port Royal Sound in South Carolina (on the golf course) could be inferred from very early historic records. Similarly, skirmish sites in the Midwest can be inferred from military records.

"Disturbance studies" also are planning documents and summarize the past land use of a project area. They differ from preservation plans in that they focus on a given project area and look more at the probability of the project area still containing viable historic or prehistoric cultural remains.

Disturbance studies are more likely to exist in urban or semi-urban environments. However, this kind of work could be for any landscape. Generally, disturbance studies use historic documents—written histories combined with historic maps—to plot out the areas of a proposed undertaking that may or may not be severely disturbed. The threshold for disturbance is not always apparent.

The Camden Yards ball field, in Baltimore's Inner Harbor area, can serve as an example. We were involved in structuring the general probability that the landscape would be disturbed. Portions of the urban environment had been built over, including Babe Ruth's father's tavern, the 1915 or 1916 one in which Babe Ruth is pictured behind the bar

with his brother and his father (see Ward and Burns 1994:160–161). The tavern—built into a row house brownstone—had been torn down in the 1950s, and a warehouse built over it (the house footprint actually was under the warehouse's loading dock). Disturbance had not extended deeper than the second above-surface course of bricks of the building. The basement had been filled with rubble. However, the two-seat brick-lined privy remained full of artifacts and other household debris that could address how the family had lived. Using digitized maps as well as a sense of what the probable disturbance for that part of the urban area was, the firm was able to locate and eventually excavate what remained of the structure.

Disturbance studies give a qualitative statement on the likelihood of cultural resources remaining intact within the bounds of the project area. They do, though, include detailed histories and prehistories of that project area that allow for a sense of what *may* still survive within the project bounds.

Predictive modeling is another type of study that can provide information about the likelihood that archaeological sites will exist in an area. The development of predictive models for use in planning is related to the conduct of disturbance studies and the creation of preservation plans. This kind of work, which often combines state site file research with disturbance studies, results in a series of exercises that borders on what we call "actuarial archaeology" (see Neumann, Sanford, and Palmer 1992:122–123). Professional archaeology as a resource management discipline has worked its way into a situation where it is needed for planning. The development community and its associated regulators and planners seek a binary process, a yes or no. The flaws in creating such a process, based only on known information, are obvious. The solution has been to develop predictive models for whether or not an area is likely to contain sites, thus increasing the deductive aspects of professional archaeology.

For example, portions of Arizona (Osborne 2008), Colorado (Kvamme 1990, 1992), Maryland (Kavanagh 1982), Pennsylvania (Hay, Hatch, and Sutton 1987), and West Virginia (Neumann 1992) have used extant site file information to develop quantitative probability models of differing levels of resolution that help identify landscapes likely to contain prehistoric archaeological sites. These are by no means the first or the best such models, but all have in common development in immediate response to cultural resources planning needs. Early attempts were qualitative and

consisted of statements in the range of "level land near rivers on the inside of meanders have a good chance of having prehistoric archaeological sites." Later work quantified those physiographic variables, so that in eastern West Virginia it is known that about 95 percent of all prehistoric archaeological sites are on land with a slope under 10 percent within 200 meters of a stream with a flow rate of at least 12 cubic feet per second. Such studies grew out of the need by planners and state agencies to have some sense of just how likely it would be for archaeological sites to survive in a given area.

A good way to develop a risk-based probability statement for cultural resources on the landscape is to first record variables such as soil type, distance of the site from water, stream flow rate, current slope of the land, elevation above sea level, and cultural-historical affiliation. The next step is to do a cluster analysis using numerical classification for each cultural-historical set. It is likely that the sites will sort themselves into subsets. The third step is to work out the averages and other descriptive statistics for sites contained within each cluster. The last step depends upon the goal of the exercise. Results can be presented as a table, or as a map for a particular area.

Exercises like this are becoming increasingly easy with the conversion of site files to GIS (geographic information systems). GIS enables the next two steps in working out a hierarchy of site locations and then providing a probability statement for areas on the landscape where sites of given cultural-historic affiliation may be found. Traditionally, the results are given either as qualitative visual maps showing known presence of archaeological sites, along with descriptive statistics, or as data sets. Alternatively, using modern GIS software, density plots can be created that show what areas of the landscape have high probabilities of containing sites (see figure 3.1). Such maps are particularly useful to land managers needing to identify archaeologically sensitive areas for planning purposes.

To protect the location of archaeological sites, each state exempts some of its site file information from the public right to know, but qualified agency personnel, researchers, landowners, and contractors/cooperators can have access. Most states have a link to downloadable forms that include requests for site files searches.

Usually, the background research is part of the larger compliance report, be it Phase I survey, Phase II testing, or Phase III data recovery.

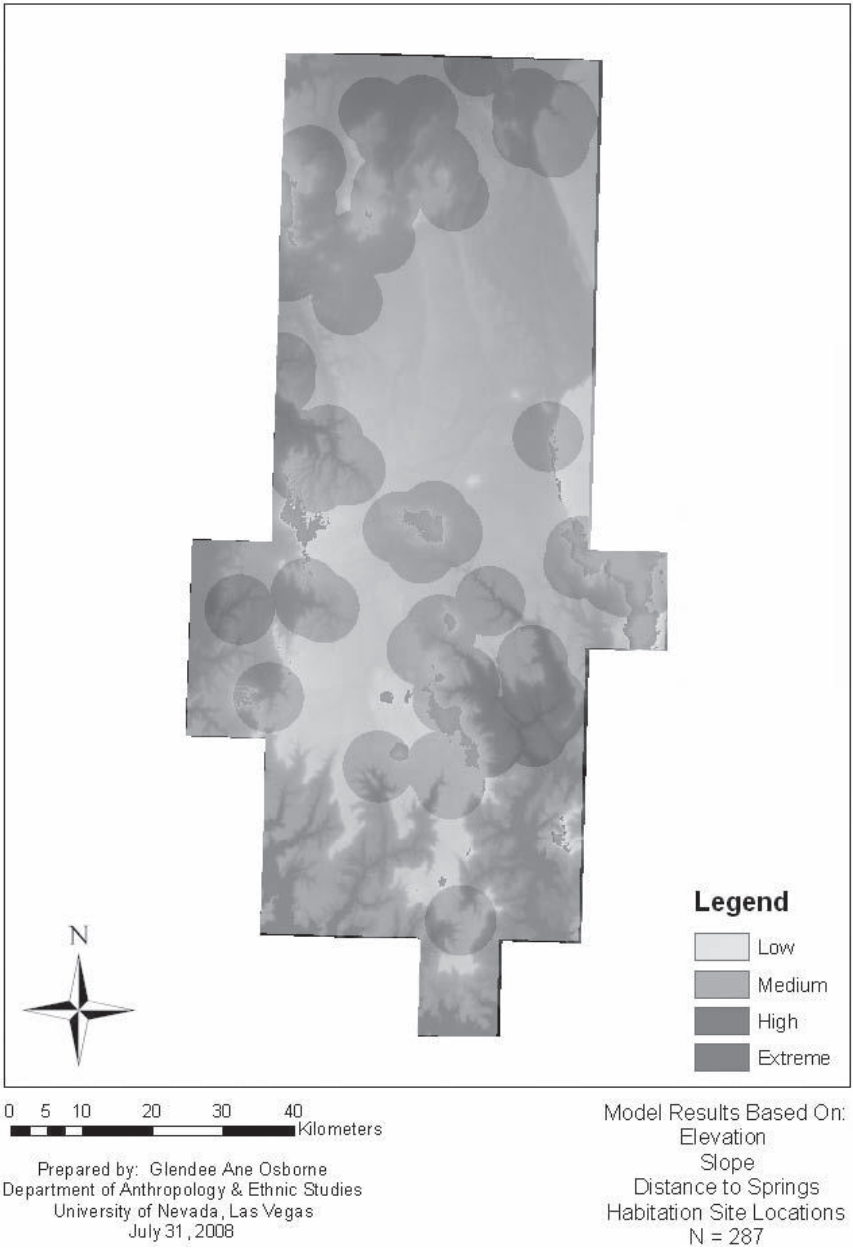


Figure 3.1. Predictive model created for the Shivwits Plateau of northwestern Arizona. The shaded areas show land managers where they can expect to encounter archaeological sites; the darker the shaded area, the higher the probability that sites will occur (reproduced from Osborne 2008).

The quality of the research background helps the SHPO or similar review agency evaluate the reliability and quality of the archaeological work. Regulations in most states urge that the historic and prehistoric background research for a project area be finished prior to the field work, but this does not always happen. The nature of some projects might result in the two tasks being done concurrently or in reverse order, particularly for Phase I projects. This is acceptable if the archaeologist has a sound understanding of the nature of the sites and archaeology of the region. However, for Phase I reconnaissance and survey projects, since their responsibility is identification, it is important to have advance knowledge of what archaeological sites have been recorded for the project area or corridor as well as in the area of potential effects that may extend well beyond the immediate construction zone. Failure to locate previously identified sites during field work will result in reviewers requesting additional testing to see whether the boundaries of the site were improperly recorded.

Project History

The project history has two aspects: the history of the undertaking itself, and the history of the project area, both in general and in terms of past research efforts.

History of the Undertaking

The history of the undertaking covers the nature of the proposed project, the reasons for the project, and what other options have been explored. Summarizing the history of the undertaking helps the client and the review agency in the event that mitigation or redesign becomes necessary as a result of encountering cultural resources. This enables the archaeological work to be integrated into the overall planning effort.

The information for the history of the undertaking usually comes from the scope of work (SOW or scope) as well as the original RFP (request for proposals).[1] This information should include detailed design and project maps showing just how the land will be altered, where buildings and roads will be sited, and similar specific indications of intended actions such as placement of buried utilities or septic fields. The archaeologist needs a detailed project map before the project can be planned and bid, if only to have a sense of scale and of terrain.

Additional information usually is supplied by the client after the project has been awarded to the archaeologist's firm. This can include earlier project design maps, previous studies conducted on the area (including percolation [perc] test data and similar engineering analyses), and even some historic background material. If the project has been controversial, then local newspapers will have carried stories. That information is available from the associated public library or from the newspaper's files.

A history of the undertaking needs to cover some specific details:

- What is it that is planned, and why is it going to be done?
- When was the project conceived, and what is the rough timetable?
- Who is doing the design work?
- Who will be doing the construction (that is, who is the general contractor)?
- What will be the extent of land alteration, in terms of both area and depth?
- Will the land alteration be construction only, or will there be road grading, tree removal, and other topographic changes?

For Phase III data recovery projects and for Phase II testing projects that look as if Register-eligible archaeological sites will be threatened, it is important to detail what other design options have been considered for the project and why those options were unacceptable. The reason for this kind of information is to set out why the project was not redesigned to avoid damaging the cultural resources. All of the players—especially the consulting parties if this is a Section 106 exercise—need to know what has been covered.[2]

In nearly all cases, the history of the undertaking will be presented in the first chapter of the report. In some Phase II testing and Phase III mitigation reports, the first chapter will contain an abbreviated summary of the undertaking's history, and the third chapter (treating the history and prehistory of the region) will contain a detailed synopsis of the undertaking.

History of the Project Area

The second part of a project history involves the history of the project area. This includes what has happened directly within the project area, along with describing any previous archaeological research. This background segment usually requires interviews of landowners, local historians, and area residents. It also includes research done at the state site files, contacting the SHPO/THPO to see whether any properties within the project area have been nominated for the National Register, historic research at the local libraries, map research, and working with local Indian tribes and other cultural groups. The history of the project area is presented as parts of the second and/or third chapter of the final report.

The history of the project area addresses basic questions:

- What has been the history of land use of the project area?
- Are archaeological sites recorded for the project area?
- Has anyone ever examined the project area for the presence of archaeological remains?
- Are National Register–eligible properties known to be present within the bounds of the project area?

Interviews

Two sets of individuals are interviewed: community historians and similar individuals who have particular knowledge of the area; and local residents and property owners, including representatives of any local tribes or native groups.

Every county and just about every community, no matter how small, has at least one community historian, and sometimes a local historical society. The role of historian may be an official position. More often, the community historian is a volunteer. These people are the community's equivalent of an elder in the anthropological sense and should be located if at all possible. How does the practicing archaeologist locate the community's historian or historical society? The easiest way is to either go to the information/reference desk of the public library and ask, or to go to the courthouse or town hall and ask. Local historians are almost always quite willing to assist with oral accounts and in finding additional information.

***We learned about archaeology from that . . .* Area History and Testing Expectations**

A history of a project area helps the practicing archaeologist to set bounds on testing and expectations for testing results. A good example of this is a New York State Department of Transportation (NYS-DOT) project we did in upstate New York.

The seven-mile road corridor project ran between the cities of Lowville and Glenfield, along the eastern base of the Tug Hill Plateau as it sloped toward the Black River Valley. This part of New York was settled in the late 1700s, and property arrangements were influenced by French custom: the original fields were long and narrow, at right angles to the general south-north flow of the river. The road itself was built in the 1930s without regard to where the farm field boundaries were, instead following the toe slope of the plateau and cutting diagonally across those fields. Prior to that time, travel between Lowville and Glenfield required zig-zagging back and forth since the roads followed the perimeters of the farm fields.

Knowing the road construction date and that much of it was built on fill (it ran mostly on a berm raised just out from the slope proper) allowed us to judge areas of fill, disturbance, and likelihood for the kinds of cultural resources that might be present. For example, there was only a small possibility of early historic sites being directly associated with the road, simply because the road was comparatively new; the only places to test were where the road incorporated the route of older roads. As a result, we were able to present an effective shovel-test strategy and come in under budget.

The local library is one of the most important sources of primary and secondary research information on the history of an area. Librarians are often focal nodes of information about communities and should be among the first people contacted in the search for leads on the history of the community and the project area (figure 3.2).

The questions asked of the community's historian should focus on the general history of the project area as well as sources available on that history. Sensitive or controversial projects (e.g., a contested pipeline or a military installation) may make it difficult to get into specific questioning or may require significant diplomacy. Some Federal and state contracts prohibit speaking about the undertaking with unauthorized nonproject personnel in certain situations. If the contract allows, always ask whether the historian is aware, personally or through hearsay, of any archaeological sites, historic roadways or other features, or historic structures located in or near the project area. At these times, it is very useful to have a map of the project

Figure 3.2. Virtually all county seats as well as many other small communities have public libraries, a legacy of Jefferson's vision for the country. These house not only local histories and special collections, but also reference librarians who are very aware of who is doing what historically in the community.

area relative to the greater community available. But again, showing such maps—especially planning maps—to nonproject personnel should be done only if the contract so allows and one is authorized to do so.

The second group to be contacted is the population of local residents. It is a basic field courtesy to speak with the property owner and with the property resident. This contact is extremely important if there is any intention of crossing the individual's property, and even more important if any subsurface testing is anticipated for that property. The need for interviews of local residents in the vicinity of a project area varies by the situation, although interviews may be required by state or local mandates.

Interviews with property owners and residents can indicate whether any cultural resources are known for the project area that may not have been caught by the more formal records of local history or of state site files. People resident on their land have a wealth of knowledge that comes from living there. Many will have information about cultural resources and area history that has never been solicited.[3]

Further, it is a simple matter of courtesy to speak with the people resident on the land that will be tested or examined. The interview is important even if the subject does not have a knowledge of the landscape history or previous land use: the subject lives there, and to enter into work is to enter into the person's home, territory, personal space. Proper interviews help the

archaeological crew gain the respect of the wider community, with whom the practicing archaeologist and associated crew must interact, sometimes rather intimately, on a daily basis for the duration of the project.

If the project is on tribal land or within an area of significance to Indian tribes, Federal regulations require that the tribe be consulted before the project is initiated. Although the job of consultation falls to the Federal Agency requiring the work, it sometimes is delegated to the contracting archaeologist. Even if this task is not delegated, the contracting archaeologist may wish to be present since these consultations provide a good opportunity to ask tribal members what they know about the project area. Often, Native Americans will have useful knowledge regarding what types of sites can be expected, why these sites might be important, and how the landscape was used or has changed over time.

State Site Files Search

The history of the project area includes previous archaeological investigations. This information is available from at least one of two sources: the state site files, and the SHPO/THPO. If the project is located on Federal lands, such as those managed by the Bureau of Land Management or National Park Service, separate files are also usually maintained by the land-managing agency. When applicable, all of these sources should be checked since information may or may not be duplicated by the different institutions.

All states and political equivalents maintain a file of previously identified archaeological sites. Those sites normally are given a trinomial site number, consisting of an initial number representing the alphabetic order of the state for the forty-eight continental states (Alaska is 49 and Hawai'i, 50), followed by a two-letter alphabetic abbreviation for the county, and then a site number based upon the order in which the site was recorded by the state site files. So, for example, the Paleoindian-Late Archaic site of 44FX1517 is (or was—there are houses on it now) located in Virginia (the forty-fourth state alphabetically), specifically in Fairfax County, and was the 1,517th site recorded in the county.

Not infrequently, sites will also have a colloquial name. For example, site 44FX1517 is also called the Hobo Hill Site. In documentation, the site should be referred to by number rather than name. This reduces ambiguity and makes keeping field notes much easier.

Site file searches are relatively easy. The site files are arranged by county. Most SHPO, agency, and state file offices have a master state map showing where sites have been identified or a series of USGS topographic maps upon which the bounds of the site have been penciled in. All that the practicing archaeologist needs to know is where—in map terms—the project area is; then the archaeologist goes to the site files and finds out whether any sites are recorded for that tract of land. Additionally, most site files will show what projects have been conducted in the area. This is useful because it lets you know whether your project area has been previously surveyed and, if so, when that survey took place and what methods were used. In some cases, you may find that a part of your project area has already been effectively surveyed. In most cases, however, you will find either that your project area has not been surveyed at all or that any previous surveys conducted involved techniques that do not meet current standards.

A number of states, such as Arizona, Maryland, and Georgia, have converted their site files to a computer-based GIS (geographic information system). Some states also are making access to that computerized site file available through the Internet, provided specific security protocols are observed. Usually, there is fee for digital access.

The background work done at the state site files results in the following information on every site within about two kilometers of the project area:

- site number and, if present, name;
- location of site;
- horizontal bounds of site;
- depth at which materials were found;
- presence or absence of features;
- cultural historical affiliation;
- when recorded;
- when, if ever, investigated;
- nature of investigation;
- where and in what form research results were published (that is, full citations); and

- National Register status if appropriate.

It is useful to have a photocopy of the United States Geological Survey (USGS) map or maps for the vicinity of the project area and to note where previously recorded sites are located; in some areas of the country, the final compliance report will include a copy of the portions of the USGS map where the project is located. (Inclusion of such a map depends greatly on how restricted public access is to site location information in the state; many states quite rightly do not want that kind of information accessible to the general public.) On that map segment will be shown the locations and bounds of known archaeological sites. Check with the particular office's protocol: Some site file offices and states do not allow transferring map information.

Site Records and Pot Hunting

Some clients and other members of the public may be surprised to find that access to the state's archaeological site files is restricted to those with legitimate research needs for the information compiled there. Archaeology in the United States is not only a private-sector endeavor, it also is a commercial endeavor. There is a considerable economic substratum dealing in prehistoric and historic artifacts. The individual values for artifacts vary greatly. Prehistoric projectile points average about forty dollars each in a proportionally small but ready market, although prices range from two dollars to four dollars for Savannah River points (a comparatively common five thousand-year-old point found in Atlantic coastal states from New Jersey to Florida; Overstreet 1997:507) to five hundred to seven thousand dollars for Clovis points (found throughout most of the nation and dating from around twelve thousand to eleven thousand years ago; Hothem 1999:14). Pottery from the Southwest can sell for mid-range four-figure sums. Bottle collectors and Civil War curio collectors can get two- to three-figure sums for things like entire bottles or excellent-condition belt buckles. A dozen arrowheads picked up during a weekend of site looting can, as often as not, be equal to a week's wages.

Most individuals who engage in this activity, labeled variously as "pot hunters" or "looters," have a very good idea of where archaeological sites are located. They tend to ignore legal statutes and may even view legal penalties as "business costs." For such people, anything that can help in locating profitable artifact deposits will be used. And of course site files, with their listing of where all of the known archaeological sites are and generally what those sites contain, would be a great resource. It is to prevent their use for such looting that state site files have restricted access and why site locations are generally exempt from state "right-to-know" and "open records" laws.

If sites are located within the project area, then obtain copies of all previous reports and journal articles on the site or sites. Full reports may be filed with the site files, with the SHPO or equivalent historic preservation office, or with the state archaeologist's office (which may or may not be an administrative unit separate from the SHPO within the given state). You may also wish to look at reports for adjacent areas and reports that address regional research questions.

Note from those reports the depth at which cultural materials were found and exactly what it was that *was* found. This includes whether or not features were present, since these are excellent signs of site integrity as well as sources of contextual information.

Site file information will be presented in two ways in the third chapter of the compliance report. The first way will be as a table and accompanying figure that summarizes the known archaeological sites in the vicinity of the project area. The second way will be in brief narrative form for well-researched sites that exemplify regional history or prehistory.

SHPO/THPO (State/Tribal Historic Preservation Office[r])

In most states, the SHPO or equivalent historic preservation office (e.g., on tribal lands, the Tribal Historic Preservation Officer or THPO) will have copies of all compliance reports. The reason for going to the site files first when the files are separate from the SHPO is to know just *what* reports need to be examined for the project area. It is usually wise to have budgeted funds for copying reports that seem relevant to the project. In time, this may not be an issue as states make more and more of the original compliance reports available through the Internet (e.g., Missouri and Georgia). Some reports may also be available for sale.

The SHPO/THPO will also be aware of any properties that are under consideration for nomination to the National Register.

Local History

The research into local history helps to place historic cultural resources in their general historic/cultural context, especially relative to the State Plan. Research can also identify potential resources in the project area.

That historic/cultural context is the evaluative element of 36 CFR 60.4 *criteria for evaluation* in assessing whether the site has the quality of significance in National Register terms (see Secretary of the Interior, "Standards for Historical Documentation" [48 FR 44728–44729]). This is especially true for criteria [a]–[c] (those dealing with associations with persons, events, or master craftsmanship). All of this must be considered in the context of the State Historic Preservation Plan.

Most local history searches begin with the local historical society or with the local public library. Each will have numerous source materials that might mention the project vicinity. In the eastern and midwestern United States, many counties compiled at least one county history in the late 1800s (sometime around the nation's centennial). Often there was a previous history, written around the 1860s, and a third, written around the time of the bicentennial in the late 1970s.

There often are local, specialized histories, as well as special collections in the local library. The library may have a room containing special primary sources on the history of the county and its communities. Another library might have some of the same books in its general circulation collection, making it advisable to check more than one place if a desired document has restricted access.

Local history research occasionally will also include deed research and an examination of the chain of title for the project property. A chain of title chronicles legal ownership for the property or parcels within the project area. Usually, a title search is done by a title company prior to any land transfer, although it rarely is more than a cursory check to make sure that the ownership is clear. The archaeologists' interest comes from how the resultant information contributes to the history and genealogy of previous occupants of the project area.

Chains of title normally are more tedious than complex, although it does depend upon the quality of the records involved. The courthouse is the usual repository for title information, although most local municipal offices retain some information in their assessor, permits, or planning departments. The tax map designation or a similar bit of locational information is needed. The current owner will have that information as a title abstract (which also may contain links in the chain of title), or it can be obtained from an overview map.

Armed with the location of the parcel, it is only a matter of working back through the previous owners until the records run out. Chain of title

is useful for historic purposes in connecting a piece of land with a family or a known individual, thus helping establish association of the property with "important" people (criterion [a] of 36 CFR 60.4, *criteria for evaluation*). Information on the property may even include a summary of the buildings and structures present and their assessed value, always useful if the buildings and structures are gone.

Map Research and Area Reconstruction

Maps are a major source of historic information in locating previous historic occupations and for understanding potential disturbance in a project area. The locations of structures at specified times can be interpreted from USGS topographic maps, county maps/county history maps, aerial photographs, orthographic projections of communities, Sanborn Fire Insurance maps, and USDA NRCS (Natural Resources Conservation Service, formerly the SCS or Soil Conservation Service) soil maps. Maps of the Past, Inc., has over ten thousand maps available through its website (http://www.historicmapsrestored.com/, Jan. 1, 2009). Historic Map Works has close to half a million digital maps (http://www.historicmapworks.com/, Jan. 1, 2009).

The entire country has been mapped by the U.S. Geological Survey, which began this job in 1879. Map information is generally presented in 7.5' topographic quadrangles ("7.5'" means "7.5 minutes of a degree"; each map covers 7.5' of latitude and 7.5' of longitude). Those maps include cultural features, such as residences, outbuildings, bridges, paths, old rail lines, and countless other features. All maps have a date for when they were compiled. The USGS topographic maps are periodically updated and thus become powerful sources for the history of an area. The maps can be ordered from the U.S. Geological Survey (http://www.usgs.gov/pubprod/, Jan. 1, 2009). Many firms will possess the maps digitized with software for CA/GIS work.

Mapping of the country became systematized in the late 1880s around Annapolis and has continued nonstop. The initial mapping was done as 15' quadrangles (maps that were 15' latitude and 15' longitude on a side, representing the area of four 7.5' quadrangles). Those maps were periodically updated through the 1930s before the system began focusing on 7.5' maps. The 15' map upgrades often neglected to indicate changes in the presence or absence of structures.

A sequence of USGS maps documents with some precision when buildings appeared or disappeared from the cultural landscape. A series of such maps becomes a chronicle of historic development in an area (see the box "Tip: Setting Up a Map Matrix"). However, it should be noted that areas of urban expansion no longer show individual structures, but rather a magenta-purple shading indicating a built environment. In coastal areas, draft and print versions of the Coast Survey charts (begun in the 1840s) may also be of use and supplement the USGS maps available.

Historic county maps provide a second major source of information about structures and ownership. Detailed county maps were made in many parts of the country around the same time that many of the county histories were produced in the nineteenth century. These maps are scaled, show the locations of residences, schools, major commercial structures, and some other buildings, and usually give the name of the structure or of the occupant of the residence. Such maps may be bound into published county histories but more often exist as large, rolled painted-canvas maps meant to be hung. The combination of a map date and names associated with structures makes these documents particularly powerful tools in reconstructing the historic landscape. Municipal offices often have one or more such maps and/or nineteenth-century orthographic projections—"bird's-eye views"—of the community framed and hanging on the wall. It is fairly easy to photograph these images in place.

A third and, for urban environments, one of the best, source of information is the Sanborn Fire Insurance maps, compiled, published, and updated for many municipalities between the 1880s and the 1930s. These maps, available digitally through various online services (e.g., Environmental Data Resources, Inc., http://www.edrnet.com/index.php) and on microfilm and microfiche, as well as in original hard copies, are extensive sources of information. The only drawback is that they tend to be limited to the built-up parts of the more populous communities that existed around the turn of the century.

The Sanborn Fire Insurance maps are color-coded maps of cityscapes, meant to give assessors a sense of fire risk for given areas. The scale is one inch per fifty feet, and the maps are usually remarkably detailed. The color coding indicates material from which the buildings and structures were

TIP: Setting Up a Map Matrix

In the 1980s, we did several Phase I surveys on behalf of the New York State Department of Transportation (NYS-DOT). The requirements for the Phase I surveys were a little different than those for strictly archaeological Phase I surveys, since we were charged with documenting architectural features along corridor right-of-ways. Highway construction could imperil structures, and it could also change the visual setting in which such a structure existed. If that structure was eligible for listing on the National Register, then that change could materially affect its eligibility and would constitute an adverse effect. To have a sense of what buildings had been present and for how long (and to know where historic sites might be), survey requirements included historic map documentation of all structures known to have existed in the project area.

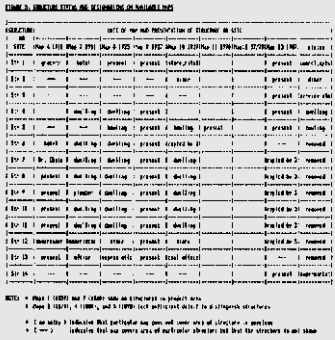


Figure 3.3. Example of a summary map figure used in a New York State Department of Transportation cultural resources survey in the 1980s.

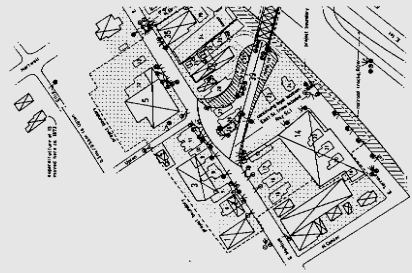


Figure 3.4. Example of project map showing the locations of the structures in figure 3.3.

We did this using a matrix, where the left-hand column listed the structures while the other columns were headed with the date and name of the map examined. The cells were filled in with the presence or absence (or rebuilding) of the feature in question. The result was a compact reference of where structures exist or existed, as well as when they were known to have been present.

Copies of the original maps were included in the report. Also present was a master line drawing of the project area showing locations of previous structures, each keyed to the matrix.

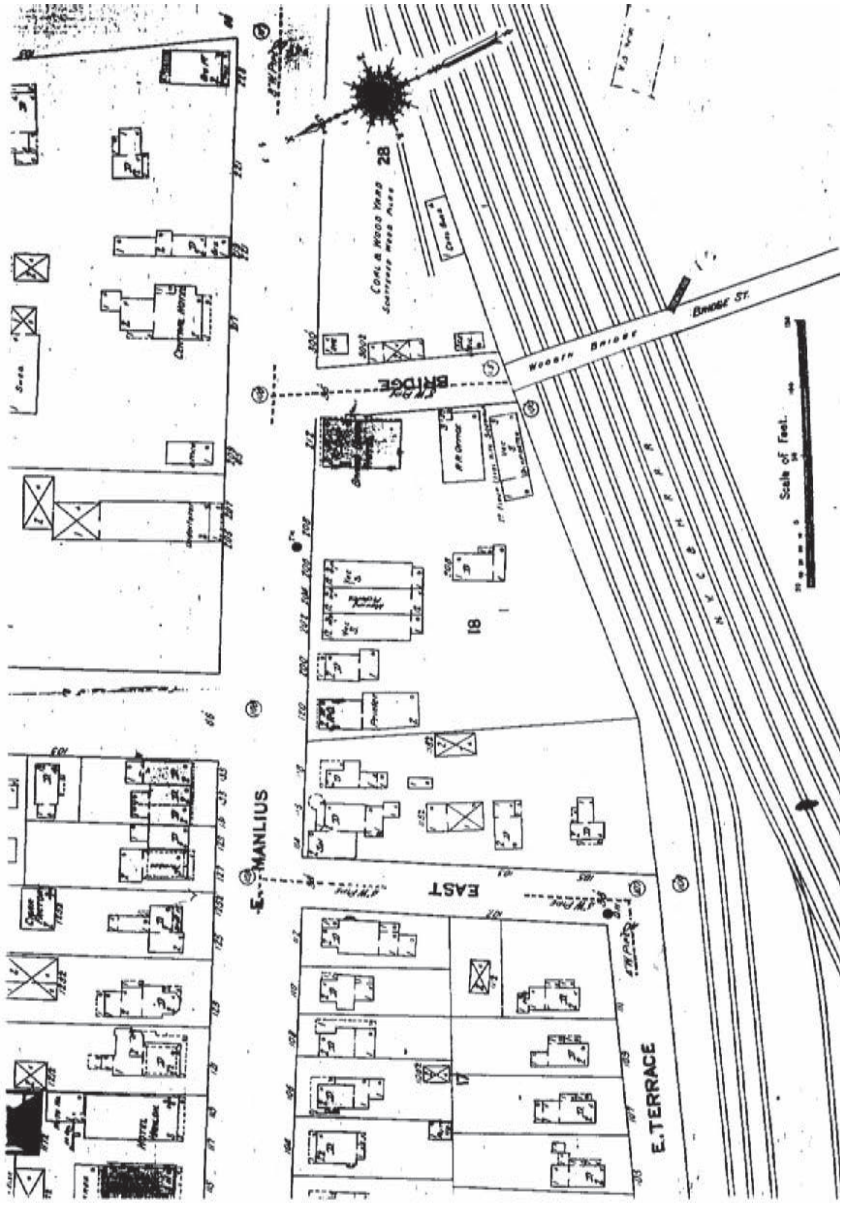


Figure 3.5. Example of a Sanborn Fire Insurance map.

made, and therefore their fire risk. The notations on the maps indicate the number of stories, whether business or residence, and very often the name of the family or the business occupying the building at the time the map was made or updated. In addition, the maps often show adjacent structures, including bridges, railroad corridors, roadways, and mill races.

Field work done in an urban setting should make use of the Sanborn Fire Insurance maps. The information from the maps can be digitized and then scaled, allowing the maps to be overlaid and used in conjunction with a map matrix. Such data can be a powerful cultural resources planning tool for a project area.

A fourth source of map information is county soil survey books. Around half of the 3,066 counties in the United States have had a soil survey done by the old USDA Soil Conservation Service (now part of USDA NRCS), with the soils classified and the extent of those classified soil bodies mapped. This information is presented in an 8 1/2 × 11-inch softbound booklet, at the back of which will be a series of aerial photographs with the bounds of the soil bodies lined in. The year of the aerial photographs will be given (often in the 1960s). The images are sufficiently clear to see structures, buildings, roads, and adjacent land uses. This information can help in reconstructing the landscape history and can provide useful information about the expected nature of the soils.

Environmental Background and Soil Survey

All cultural resource assessments summarize the physical geography and ecology of the project area and its immediate vicinity. This constitutes the second chapter of the compliance report. The purpose of the environmental background is threefold:

1. to recount how the ecological system has changed over time so that the prehistoric background and any prehistoric sites may be put into their proper environmental-resource context, along with historic sites;
2. to document how conditions exist now; to set out what the baseline ecological systems in which the project area is located are so that variations from these may be appreciated when the

We learned about archaeology from that . . . Maps and Insights into Community History: The Bridge Replacement in East Syracuse

An area that has been mapped frequently and in detail over the years provides not just a chronicle of who lived where or what buildings were around, but also insight into local community life. One such instance was a bridge replacement project we did for the New York State Department of Transportation (NYS-DOT) in the Village of East Syracuse.

East Syracuse grew up adjacent to a rail yard, expanding from a main street area that first formed along the north side of the tracks and then continued on the south side. Until 1927, vehicles would cross the tracks at grade. In that year, though, a new steel truss bridge was finished, which had enormous earthen ramps at either end that raised the bridge twenty-two feet to clear the rail lines. By 1987, the bridge needed to be replaced. We did the Phase I survey.

Thirteen maps, from 1859 to 1987, documented the changing streetscape of the areas north and south of the rail lines. The streets were on a grid. A few streets extended over the tracks as grade crossings into the 1920s. Those streets had comparatively few houses, all of which, judging from the Sanborn maps, were small and comparatively inexpensive. However, the new bridge did not go along those streets. Instead, it was placed diagonally relative to the street-grid and tracks in such a way that three of the most expensive residences were destroyed. The grade crossings were closed off, and the bridge became the only way to get across the tracks.

This was intriguing. Sanborn maps often tell what buildings were used for, and it was interesting that that the three structures taken out by the north ramp of the bridge consisted of a large house with a semidetached building shown as a "saloon" on the 1911 map but as a "dwelling" on the 1925 map and an adjacent building listed in 1911 and 1925 as a "store."

We wondered about the project decision made in 1927, at the height of Prohibition. The placement of the bridge did not fit existing streets and caused removal of several expensive buildings. The condition of the 1927 NYS-DOT design map itself further piqued our interest: an attempt had been made to erase a good deal of the design part of the drawing. Equally interesting was the major map error on the south side that showed a building directly in the way of the ramp, suggesting that residents both north and south of the proposed bridge location would be equally compromised. However, that house actually was about 100 feet farther east than shown on the map. When the map was enhanced, we found that the building had been drawn in the middle of a pre-existing and active four-way street intersection. Was the building drawn there to show the project was the ideal compromise?

Perhaps the three removed structures had represented a speakeasy or were related to illicit trade in liquor. Something went awry, and the bridge project was used to eliminate the structures, thus settling the matter.

field work and landscape conditions are discussed in the submitted report; and

3. to describe the expected soil/geological conditions.

The environmental background provides a temporal-environmental setting for any cultural remains encountered for the project area. This tells the conditions that affected past cultures. For example, different climatic regimes necessitated different adaptive techniques and behaviors and may well be reflected in the artifacts as well as regional site distribution. The background also provides a current-situation account of the condition of the physical deposit.

Some archaeological reports, especially compliance reports, portray the ecological system as it *might* develop in the absence of human interference. This does not make much sense because people must be present for this entire exercise to have any meaning, and the presence of people alters ecological systems in fundamental ways (e.g., Neumann 1985, 1989, 1995; Russell 1997; Krech 1998). Environmental background information to be collected includes the vegetation and animal community that might be expected in the absence of a resident industrial-agricultural population, along with the nature of the plant-animal community that really is there or, at least, has been present in recent history. The first is rather easy and actually will be a summary page or two in most county soil survey books. The second generally has to be constructed from a variety of sources involving landscape ecology and cultural ecology.[4]

Soils are equally as important; a failure to understand the basics will seriously jeopardize the work being done. The county soil survey indicates what soils and related conditions to expect in the project area and gives a sense of the extent to which the ground cover may have changed. Perhaps most importantly, soil surveys will provide information about when the uppermost sediment levels developed relative to the archaeological resources expected to be encountered. This information is important because it determines what field techniques will be needed to identify whether archaeological remains are present in the area. For example, in deflated areas or in areas with little sediment accumulation, subsurface testing may be unnecessary if vegetation is scarce and ground visibility is good. However, if substantial sediments have accumulated during the period of human occupation, deep trenching may be necessary to identify those deposits.

Historic Background Narrative

The historic background narrative is an abbreviated history of the region and the immediate vicinity of the project area. It identifies and describes the events and people that were important in the history of the region within which the project is located (including those related to aboriginal peoples) and then relates those people and events to the State Historic Preservation Plan. The people and events form part of the consideration in assigning significance to sites. The State Plan indicates what is important in this regard.[5] Thus, the archaeologist must address the context of the project to the State Plan and to the overall history. In doing research, considerable effort may be needed to make sure that references to the project area and areas near the project area are adequately handled in the research and in the resulting project report. Consideration of nearby past events and people helps to confirm in the review agency's mind that the archaeologist has been thorough.

The historic background uses the following sources:

- local and county histories, both primary and secondary sources;
- official archives and records in municipal and government buildings;
- map research;
- site file information; and
- oral histories from the local community.

In addition to the research themes identified in the State Historic Preservation Plan, the historic background narrative addresses previously identified archaeological sites and historic buildings/structures in or near the project area.

All information on sites, buildings, or structures within the project area needs to be included. The archaeologist must not overlook these types of built-environment resources. If an architectural historian is not normally part of the background research work, the SHPO/THPO may need to be consulted about the likely presence of such cultural resources.

An understanding of how the land was used by historic peoples is helpful. Much can be gleaned from the obvious use of land in large, clearly

We learned about archaeology from that . . . Identifying Deeply Buried Sites

In the Sonoran Desert of southern Arizona, vegetation is sparse and ground visibility is excellent. Artifact scatters can often be seen on the ground surface and can be used to identify the locations of archaeological sites. However, as archaeologists working in the Tucson and Phoenix Basins have learned, surface observations do not always accurately reflect what is beneath the surface.

In advance of a planned freeway expansion in the city of Phoenix, the Arizona Department of Transportation sponsored archaeological studies along the highway's corridor. Previous research within the project area had documented the presence of site U:5:33(ASM), identifiable from the surface as a low-density prehistoric artifact scatter with fire-cracked rock. Earlier test excavations conducted at this site had revealed the presence of subsurface remains extending some forty centimeters beneath the ground surface and dating to between 300 BC and AD 500.

Had the background research stopped at that point, the subsequent mitigation efforts probably would have been limited to these relatively recent cultural deposits found in the upper layers. However, the archaeologists hired to do the work elected to follow through with a series of geoarchaeological investigations. First, aerial photographs and soil maps were examined to define the landforms found in the vicinity of the site. These investigations determined that the site rested on an ancient alluvial fan, a finding confirmed through field reconnaissance. Based on this discovery, a series of trenches were excavated across the alluvial fan to determine the ages and depths of the subsurface sediments. These trenches revealed the presence of three distinct stratigraphic levels. The uppermost level, which contained materials dating to the Late Archaic period (i.e., 1500 BC to AD 1), consisted of sheetwash sediments deposited in the past four thousand years or so. Beneath this was a second layer, containing no cultural remains, that consisted of coarse sediments deposited by rapidly flowing waters. Finally, beneath this layer were sheetwash sediments that had been deposited by gentle, slow-moving waters. Initially, the trenches were excavated only to a depth of 1.10 meters, and no cultural materials were seen in this third layer. However, examination of these sediments suggested to the geomorphologist that they were relatively young (at least in geological terms), raising the possibility that additional cultural materials might exist beneath the bottom of the trenches. Accordingly, the trenches were further excavated to a final depth of 2.5 meters. Once the trenches were deepened, additional cultural materials were encountered at depths of between 1.10 and 1.4 meters. Radiocarbon dates obtained from features in these lower levels determined that they dated to the Middle Archaic period, or to between about 4800 and 1500 BC. Ultimately, 153 features from this time period were excavated. Because so few Middle Archaic period sites had previously been excavated in the Phoenix Basin, these findings were highly significant (Phillips 2001).

This project illustrates the importance of conducting thorough background studies of the geology, particularly in areas where the landscape has undergone dynamic changes during the Holocene period. In this case, the deposition of late Holocene-period sediments had deeply buried archaeological materials, creating a situation where the surface assemblage did not accurately reflect the abundance and nature of the features and materials found below. Had the geomorphological studies not been conducted, construction of the highway undoubtedly would have resulted in the destruction of the Middle Archaic component of the site, causing an irretrievable loss of knowledge regarding Phoenix Basin prehistory.

important ways, such as timbering, mining, or farming. But some uses are more subtle: backyard gardens, wells, outbuildings, paths, and the like. The field of *landscape archaeology* examines not just great formal gardens with known designers and histories, but also the daily domestic gardens and yard use so common for most of the history of the country (see Kelso and Most 1990; Yamin and Metheny 1996; examples of method through interpretation and reconstruction are found in A. Noël Hume 1974 and I. Noël Hume 1974; for bibliography, see Firth 1985).[6]

Prehistoric Background Narrative

Like the historic background narrative, the prehistoric background narrative does two things at once. It addresses the local prehistory as it relates to the overall trends in the prehistory of the region, and it does so with reference to the State Historic Preservation Plan. The prehistoric background is assembled differently from the historic background narrative. The process requires familiarity with the often disparate sources on prehistoric archaeology for the area. That information is located in a variety of sources:

- national summaries of prehistory that also mention the region where the project area is located;
- regional summaries that include the project area;
- local summaries of prehistory that include the project area;
- individual site reports, primarily previous compliance reports, filed with the SHPO or equivalent agency;

TIP: Civil War Battlefields

Immediately after the Civil War, the U.S. Army Corps of Engineers published a massive compilation of all of the battlefield maps used or made during the conflict. A facsimile of the map portion of the publication has been republished and is a treasure trove for cultural resources purposes. In many cases, the detail is surprising, and more to the point, the maps are scaled. Used in the field in conjunction with various summaries of ordnance (e.g., Coates and Thomas 1990; Thomas 1985), it is possible to plot with great resolution the troop movements over the battlefield for the duration of the engagement. The battlefield maps are useful both for documenting historic structures and other features of the landscape, just as they are for later working out the dynamics of battlefield engagements, a challenging and rewarding exercise in cultural resources work.

Davis, George B., Leslie J. Perry, and Joseph W. Kirkley. Compiled by Calvin D. Cowles. *Atlas to Accompany the Official Records of the Union and Confederate Armies*. Washington, D.C.: Government Printing Office, 1891–1895. Republished as *The Official Military Atlas of the Civil War*. New York: Gramercy Books, 1983.

See also:

Coates, Earl J., and Dean S. Thomas. *An Introduction to Civil War Small Arms*. Gettysburg, Pa.: Thomas Publications, 1990.

Thomas, Dean S. *Cannons: An Introduction to Civil War Artillery*. Gettysburg, Pa.: Thomas Publications, 1985.

These and similar publications provide detailed information on the ordnance and munitions issued and used by various Union and Confederate detachments.

- national, regional, or local journal series containing articles treating different facets of the prehistory; and
- the state site files.

The prehistoric background has somewhat less detail in terms of specifics compared with historic backgrounds, but it covers a much greater time range and involves substantially more extensive background reading and research. This is why many firms, if they can afford it, have prehistorians and historians/historical archaeologists on staff. Both can work in either area, but some state reviewing agencies expect an archaeologist to be either one or the other, plus it makes life simpler if the chores can be divided.

The preparatory work for the prehistoric background narrative involves reading the pertinent monographs and journal articles. Most of the relevant information is located in four places (some or all of which may be available online):

- the state site files;
- the compliance reports filed with the SHPO or the THPO;
- the conference papers delivered at the regional conferences; and
- the research articles published in the regional journals.

Local and regional studies become the primary sources of information.[7] The prehistoric background narrative is put together with an eye toward three things:

1. the overall chronology or prehistoric sequence (for example, Paleoindian-Archaic-Woodland-Contact);
2. gaps in our knowledge of the region (as outlined in the State Historic Preservation Plan or determined through other research); and
3. what is known and has been excavated within the immediate region/vicinity of the project area.

The intention behind the prehistoric background narrative is a bit different from that for the historic background narrative. With the historic background narrative, the idea is to have some sense of what had happened in or near the project area; the issue is less on the deposit or what the deposit might contain (not always, but often enough). With the prehistoric background narrative, there is also the issue of what objects are likely to be found in deposits, the conditions under which the deposits exist (including depth and nature of contents), and how those relate to the overall prehistory of the region.

Historic background narratives are more a matter of knowing what transpired and how deposits may fill in gaps in knowledge. Prehistoric background narratives are as concerned about the structure of the deposits and their likely contents as they are with what all of that stuff might mean.

Chapter Summary

The background research is an exercise in establishing context. This research is meant to gather together what is already known about the project area, specifically its history, prehistory, geology, soils, and basic ecology. It is the first step in that good-faith effort stipulated by 36 CFR 800 of identifying properties—cultural resources—that could be listed on the National Register of Historic Places. It is also the first step in putting the project area into a physical and cultural context of soils, animals, and plants, and of prehistoric and historic peoples. All of that information is needed so that the physical structure of any archaeological site can be correctly understood. It is also needed so that any question of Register eligibility based on association with events and people, on exemplifying master craftsmanship, or on research potential, can be judged for encountered cultural resources, in this case archaeological sites.

Background research is needed for all professional archaeological projects, Phase I, Phase II, or Phase III. That background research includes checking the state's site files to see whether any sites have been identified in the project area, checking with the SHPO/THPO to see whether any properties are listed or considered eligible for listing on the National Register, and checking with both the site files and the SHPO/THPO for any previous compliance reports that may have been filed. Previous compliance reports should contain most of the primary research information on an area's history and prehistory, but there is still a need to investigate further in case new or undiscovered information exists. The search for information and previous accounts of the project area includes written community histories found in public libraries; historic maps (especially the Sanborn Fire Insurance maps for older urban areas); soil survey books; and, at times, more detailed archival research, including photographs, tax records, and land titles. All of this will be in addition to examination of research journals, monographs, and scholarly books written about the area/region and associated history and prehistory. The Internet has made it much easier to research; maps, environmental and geographical information, and historical documents are being made available in ever-increasing numbers. But there are still odd treasures to be encountered through physical searches of libraries, museums, and other places.

There is a field component to background research. Some involves interviews with local people. A lot will include doing basic background research into the vegetation present in the project area and the nature of soil development under that vegetation. However, much of the field aspect of the background work will be done during the period when the Phase I survey work is done.

Additional Reading of Interest

Dalla Bona, Luke. *Volume 3: Methodological Considerations. A Report Prepared for the Ontario Ministry of Natural Resources*. Thunder Bay, Ontario: Lakehead University, Center for Archaeological Resource Prediction, 1994. This gives a summary of modeling used in cultural resource assessments.

Environmental Data Resources, Inc. http://www.edrnet.com/index.php (Jan. 1, 2009). This company specializes in environmental information services. According to its Internet site, EDR "provides fire insurance map search results based on a search of the complete holdings of the original Sanborn Library, which dates from 1866 and includes over 1.2 million Sanborn Maps. This essential Phase I historical information source tracks the changing landscape and property uses of approximately 12,000 American cities and towns since the late 19th century" (http://www.edrnet.com/reports/historical.html, Jan. 1, 2009).

Garreau, Joel. *The Nine Nations of North America*. Boston, Mass.: Houghton Mifflin, 1981. A somewhat dated but insightful and engaging synopsis of the different regions of North America, written by the *Washington Post* regional editor. One of the best primers on regional differences and issues we have ever come across, it is a blending of cultural geographic and emic-perspective ethnography that students will find of immediate service, particularly if they start working in another part of the country from where they grew up.

———. *Edge City: Life on the New Frontier*. New York: Doubleday, 1991. Garreau's *Edge City* explores the phenomena of extra-city-center urban centers, the so-called edge cities. Not as relaxing a read as *Nine Nations* (which can be read with pleasure time and again), but *Edge City* provides informant-like insight into the structure of the development community and the issues that developers and urban planners face. Anyone working in professional archaeology would benefit from going through this; anyone thinking of owning a house someday would benefit from Garreau's reporting on "shadow governments" and neighborhood associations.

GoogleEarth. http://earth.google.com/. (Jan. 1, 2009). This virtual globe site allows remote viewing of anywhere, using aerial, satellite, and GIS photographs and imagery.

Historic Map Works. http://www.historicmapworks.com/ (Jan. 1, 2009). This company has over 444,000 maps available digitally for various parts of the United States, and another 4,624 (as of January 2009) for other countries and continents. These maps include atlases, antiquarian maps, nautical charts, and bird's-eye views. The site also can provide historical images and directories.

Maps of the Past, Inc. http://www.historicmapsrestored.com/ (Jan. 1, 2009). Some maps can be viewed online at no cost—a great help in preliminary scoping of a project. Others can be purchased. Over 10,000 maps are available of all types from around the country.

Sanborn. Sanborn Fire Insurance Maps. http://www.sanborn.com/products/fire_insurance_maps.asp (Jan. 1, 2009). Sanborn contains updated maps as well as archives of over 1.2 million Sanborn maps covering approximately 12,000 American cities and towns. Sanborn also has digital orthophoto imagery and other mapping services.

Sturtevant, William C., general editor. *Handbook of North American Indians*. Washington, D.C.: Smithsonian Institution. Published beginning in 1978. Each volume of this ambitious project has its own subtopic and editor. The series is expected to run to twenty volumes, fifteen of which are already in print. The *Handbook* is a landmark encyclopedic source recommended for all researchers, students, and practitioners.

Hubka, Thomas C. *Big House, Little House, Back House, Barn: The Connected Farm Buildings of New England*. Hanover, N.H.: University Press of New England, 1984. A wonderful exercise in historic architecture and land use, Hubka's work provides a model for understanding how historic farm compounds were assembled by New England farmers. Since much of the West, especially the Pacific Northwest, was settled by people with the same architectural proclivities, the book has a somewhat broader appeal than might first be thought.

Kvamme, Kenneth L. *"Predictive" Modeling of Archaeological Distributions: Introductory Concepts*. University of Arkansas. 2003. http://www.cast.uark.edu/~kkvamme/mnmodel/mnmodel.htm (Jan. 1, 2009). Presents a summary of modeling, including a GIS model in Colorado. Includes links to a variety of current modeling projects.

McAlester, Virginia, and Lee McAlester. *A Field Guide to American Houses*. New York: Knopf, 1986. A thorough, well-illustrated, and comprehensive presentation of American residential house styles. Anyone doing architectural

history in the context of a Phase I background survey would benefit from this excellent volume.

Sloane, Eric. *American Barns & Covered Bridges*. New York: Harper & Row, 1954.

———. *Our Vanishing Landscape*. New York: Harper & Row, 1955.

———. *American Yesterday*. New York: Harper & Row, 1956.

———. *Eric Sloane's America*. New York: Promontory Press, 1982. This volume contains the above three books published together. Sloane wrote a large number of books focusing on the vanishing American historic life, of which these are a tantalizing sampling. The books treat the landscape, the passing technology, and a world—literally—of other things that are now largely forgotten. Throughout all of his volumes are detailed line drawings that teach as much as illustrate. Most compliance archaeology involves historic sites; reading through Sloane provides a sense of the world that produced those sites.

CHAPTER FOUR

THE PHASE I PROCESS

IDENTIFICATION OF POSSIBLE HISTORIC PROPERTIES

Identification of Possible Historic Properties

Phase I refers to the identification of archaeological resources through reconnaissance and intensive survey mentioned in the Secretary of the Interior's *Standards for Identification* [48 FR 44720–44721].[1] The Phase I survey represents "a reasonable and good faith effort to identify historic properties that may be affected by the undertaking" [36 CFR 800.4 (b)]. In practical terms, this means that the purpose of the Phase I survey is to see whether archaeological resources are present within the surveyed area ("reconnaissance survey" or "inventory"). If archaeological resources are present, the Phase I survey also seeks to get some sense of the horizontal extent of those resources and, to a lesser extent, the vertical extent as well as the cultural affiliation and integrity of the deposit ("intensive survey"). This information helps review agencies decide whether there might be a *chance* that the sites are "historic properties," that is, eligible for listing on the National Register. If that seems possible, the Phase II testing and evaluation process will be started.

The Phase I identification addresses the following:

- Are there artifacts or some kind of cultural materials present within the project area?
- If there are artifacts present, are they contained in an archaeological deposit that should be called a site, if it has not been so labeled already?
- What is the horizontal and, to a much lesser degree, vertical extent of the archaeological deposit?

- What is the general cultural affiliation of the archaeological materials?
- What is the likelihood of depositional integrity?

It is hard to overemphasize the importance of the work done for a Phase I survey. The results of the Phase I survey provide the starting point for all subsequent archaeological resource management decisions. The Phase I information helps decide whether there is any chance at all that the project area contains archaeological remains that satisfy criteria for listing on the National Register of Historic Places (36 CFR 60.4 [a–d]). Although the Phase I work is meant to be identification or survey work, it often serves as a kind of site evaluation step by suggesting what can be excluded. In situations where subsurface investigations are done, the Phase I survey often can give enough information to tell whether the integrity of the deposit has been compromised enough so that it could not be listed on the National Register. If further examination (Phase II testing) is needed, the testing program will be based upon the Phase I results.

Project Structure and Pre-Field Preparation

Phase I projects are far more common than are Phase II or III projects. Although most are small, Phase I projects often provide the bulk of income for a firm.[2] However, there is a lot of competition for Phase I projects, and to be competitive, they need to be budgeted tightly with very little margin for error. Success depends upon good pre-field planning and preparation.

Most firms and other organizations that conduct archaeological assessments have a standard procedure for Phase I investigations. Prior to entering the field, basic preparation includes:

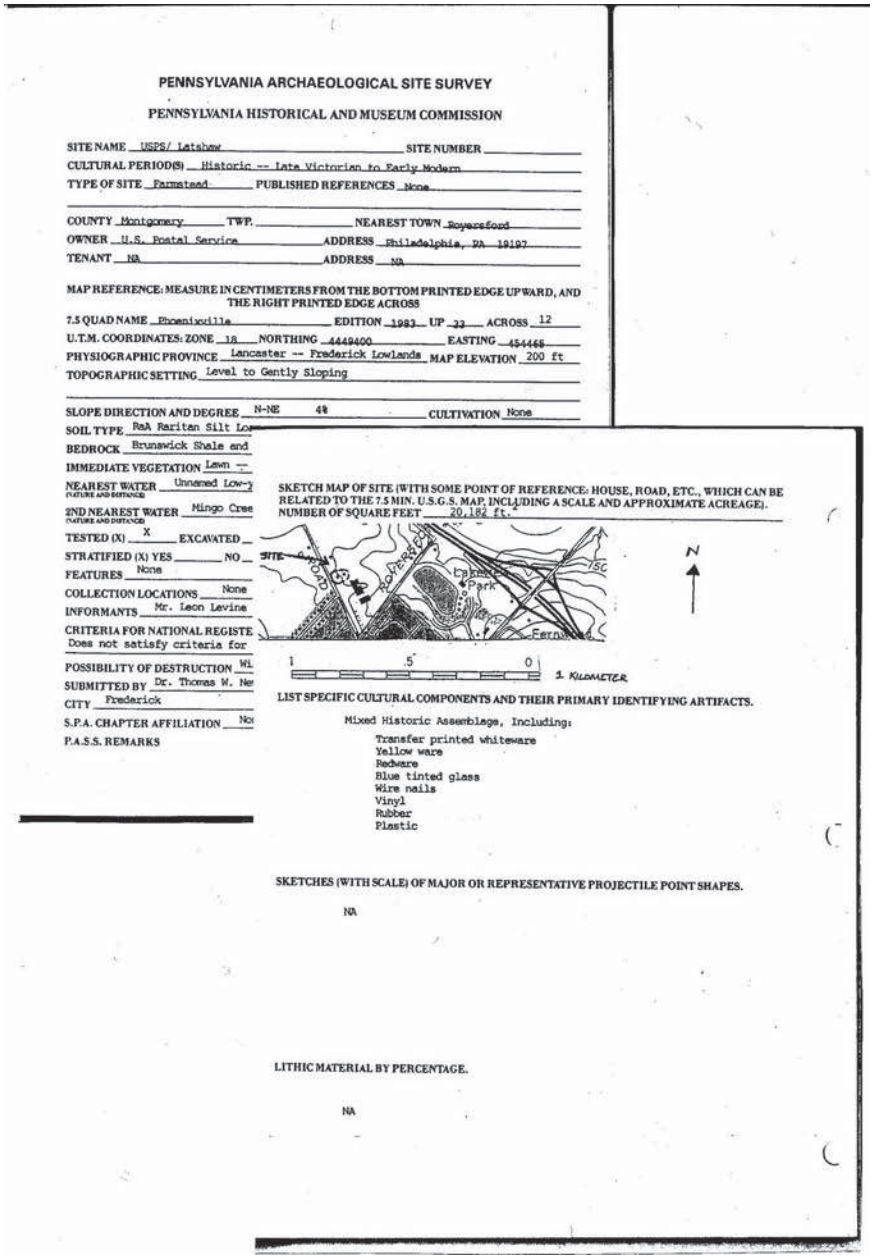
- obtaining a permit if on Federal lands or working in a state that requires one. Such permits can be obtained from the SHPO or from the Federal Agency that manages the land. (A common mistake of newcomers is to fail to investigate the need for a permit.)

- being sure any other agreements, special conditions, or other arrangements with the SHPO or Federal Agency are made in writing;
- obtaining a map with the project boundaries or corridor clearly marked;
- knowing what sites, especially National Register–eligible sites and properties, have been recorded within or near the project area;
- contacting landowners to ensure that permission and proper legal clearance have been received to conduct the field work;
- contacting "Dig Safe" and local utilities to ensure that subsurface cables, gas lines, water mains, and similar items are marked or are absent from the project area if subsurface testing will be done;
- knowing the allocation of labor;
- planning and scheduling personnel tasks for office, laboratory, and field;
- arranging logistics, including billeting, provisioning, and transport when needed;
- making sure that equipment is available for the needs of the project; and
- planning the actual testing or surface survey pattern.

Site and Regional Documentation

State and other applicable site files are checked to see whether any archaeological sites already have been recorded in the project area and within the general vicinity (figure 4.1). This check may already have begun if the archaeologist conducted the background research in preparing a bid on the contract to do the project.

The site information required for a Phase I project includes everything touched on or crossed by the project (or within the area of potential effects for Section 106 undertakings) and everything within a given distance, usually 2.0 kilometers or 1.6 kilometers (one mile), of the project



PENNSYLVANIA ARCHAEOLOGICAL SITE SURVEY

PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

SITE NAME USPS/ Latshaw SITE NUMBER

CULTURAL PERIOD(S) Historic -- Late Victorian to Early Modern

TYPE OF SITE Farmstead PUBLISHED REFERENCES None

COUNTY Montgomery TWP. NEAREST TOWN Royersford

OWNER U.S. Postal Service ADDRESS Philadelphia, PA 19197

TENANT NA ADDRESS NA

MAP REFERENCE: MEASURE IN CENTIMETERS FROM THE BOTTOM PRINTED EDGE UPWARD, AND THE RIGHT PRINTED EDGE ACROSS

7.5 QUAD NAME Phoenixville EDITION 1983 UP 33 ACROSS 12

U.T.M. COORDINATES: ZONE 18 NORTHING 4449400 EASTING 454468

PHYSIOGRAPHIC PROVINCE Lancaster -- Frederick Lowlands MAP ELEVATION 200 ft

TOPOGRAPHIC SETTING Level to Gently Sloping

SLOPE DIRECTION AND DEGREE N-NE 4% CULTIVATION None

SOIL TYPE RsA Raritan Silt Lo

BEDROCK Brunswick Shale and

IMMEDIATE VEGETATION Lawn --

NEAREST WATER (NATURE AND DISTANCE) Unnamed Low-

2ND NEAREST WATER (NATURE AND DISTANCE) Mingo Cree

TESTED (X) X EXCAVATED

STRATIFIED (X) YES NO

FEATURES None

COLLECTION LOCATIONS None

INFORMANTS Mr. Leon Levine

CRITERIA FOR NATIONAL REGISTE Does not satisfy criteria for

POSSIBILITY OF DESTRUCTION Wi

SUBMITTED BY Dr. Thomas W. Ne

CITY Frederick

S.P.A. CHAPTER AFFILIATION No

P.A.S.S. REMARKS

SKETCH MAP OF SITE (WITH SOME POINT OF REFERENCE: HOUSE, ROAD, ETC., WHICH CAN BE RELATED TO THE 7.5 MIN. U.S.G.S. MAP, INCLUDING A SCALE AND APPROXIMATE ACREAGE).
NUMBER OF SQUARE FEET 20,182 ft.²

LIST SPECIFIC CULTURAL COMPONENTS AND THEIR PRIMARY IDENTIFYING ARTIFACTS.

Mixed Historic Assemblage, Including:

Transfer printed whiteware
Yellow ware
Redware
Blue tinted glass
Wire nails
Vinyl
Rubber
Plastic

SKETCHES (WITH SCALE) OF MAJOR OR REPRESENTATIVE PROJECTILE POINT SHAPES.

NA

LITHIC MATERIAL BY PERCENTAGE.

NA

Figure 4.1. Site file form with map information. All site forms in the state site files provide information on where the site is located and include a map of some kind.

boundaries. This information may be presented in the final report as a map showing the location of the project area or corridor relative to known sites and as a tabulated list of sites.

Contacts, Public Relations

Prior to starting field work, two types of local contact may be needed: landowners and utilities. These can be quite extensive, as in the case of highway or pipeline corridors, where there may be many hundreds of individual property holders. Some states, such as Georgia and Oregon, require that written permission be obtained from the landowner and submitted to the SHPO prior to the start of field work, even if it is the landowner requesting the Phase I survey. It is good practice to always obtain written permission and to have a copy of that letter available in the field.

Publicity sometimes is augmented by public notice, such as the local newspaper, announcing that such work is starting. However, small, private projects usually require no notice. In other cases, a concentrated public relations effort may be appropriate, and there may be a public education component to the project. Further, for western and southern states, the project may involve lands culturally important to Indian tribes or other aboriginal peoples; an effort must be made in such situations to involve the parties concerned. Generally, though, publicity is not as much of an issue for Phase I projects as it is for Phase II or III.

If subsurface work is anticipated in urban or suburban areas, local utilities must be contacted. They, or a designated central clearinghouse, will identify buried cables, water lines, and gas lines. It is risky at best to rely on the landowner's knowledge to verify the existence and location of buried utility easements and infrastructure. In some states, the law requires checking first before any kind of digging is done.[3]

There are other underground risks that the public utilities might not have on record. There may be buried private utilities—water pipes, power cords, intercom lines—linking various structures and houses on the property. Some older houses in areas east of the Mississippi have antiquated storm-water or gray-water buried drainage systems that are still operational but are unmapped and separate from the more obvious septic system. Recent housing developments should have base maps that show the locations of private and quasi-private utilities, including septic systems, on file with the permitting agency at the county courthouse or equivalent.

We learned about archaeology from that . . . **The Scared Mom**

Every field worker should carry personal identification. The field supervisor should have a copy of the contract, right-of-entry letter, or the Phase I (or Phase II or III) archaeological permit if in a state that requires such. For example. . . .

In a small village near the Canadian border, we headed up the road after an unsuccessful attempt to interview a landowner adjacent to a state highway project near a prison. Our knocks went unanswered, although we saw a small shadow flitting about behind the curtains. We decided that the person must be overly shy about strangers. Not wishing to cause alarm, we left and went back to the field vehicle. Soon after starting to drive off, we suddenly found we were being followed and then practically forced off of the road by a stranger . . . male, at least six-foot-three and about three hundred pounds.

We were glad we were observing our rule about working in pairs, but we were still a little concerned. The man came over to our car door and demanded some identification. Apparently, the hamlet lacked an official police force and had simply delegated such tasks to the largest person in town. It was just our luck that the person who would not answer the door—that small flitting shadow behind the curtains—was this guy's mother. It took some convincing to get him to believe that we were not burglars casing his mother's house. We had our personal identification, but nothing official from the DOT. Finally, though, he accepted our story after we unfurled the twelve-foot-long highway realignment project map and showed that we could explain it.

Always be prepared to explain and verify the reasons for your presence.

Labor Estimates

Labor estimates are made at the time the bid is submitted to the client.[4] A Phase I project has five budget categories: start-up; field work; analysis (which may also include curation of in-field collections); draft report preparation and delivery; and final report delivery and turnover. Each category has three elements: the level or pay grade of the assigned personnel, the number of hours needed to complete a given task, and the hourly pay rate for task workers. The differences between companies among those three options is what makes the bid process so variable.

"Start-up" refers to the labor estimates needed to logistically prepare for field work. This includes arranging for field vehicles, equipment, accommodations, locations of surface reconnaissance or shovel-test transects, and (if applicable) backhoe placement and operation. Other preparatory

expenses are associated with the background investigation, including research, obtaining maps, reports, and interviews.

Field labor estimates vary by the scale of the project and the expectations of the reviewing agencies (usually the SHPO/THPO and/or the Federal Agency). Experience may lead to some rules of thumb for allocating labor time. For example, in the forested eastern United States, a twenty-hectare project requiring shovel testing in a mixed pasture-woodlot may take about eight person-hours to prepare a site-specific testing program and to set out equipment. Background historic research may range from eight to over forty person-hours, depending on the distance between the main office and each source, the presence or absence of previously known sites, prior project area background preparation, and the extent of associated background history.

Field data collection for Phase I projects usually fits into three categories: shovel testing, used in areas where ground visibility is not good; ground-surface reconnaissance, used primarily in western and southwestern states where surface visibility is good; and heavy equipment work, used both in urban settings and in areas with substantial overburden. Labor estimates can be complex and are figured on a project-by-project basis since they depend in large measure on SHPO/THPO or local agency testing protocols and the nature of the terrain. Some firms use a "fixed" per-acre (or per-hectare) Phase I rate for "normal" or expected field conditions.

Shovel-test costs are made on the basis of the estimated number of test units and the amount of time expected to complete them. Many, but not all, states have guidelines on how many shovel tests should be excavated for a given unit of land; these guidelines, however, can vary widely. For example, whereas Ohio recommends that shovel tests be placed no more than fifteen meters apart, Texas's guidelines call for such tests to be placed as much as one hundred meters apart, depending on the size of the project area. Further, some states require that shovel tests be screened, while others do not. Obviously, knowing the expectations of the state that you are working in is important before developing a budget.

Open-ground surface reconnaissance, as conducted in western states or in more exposed areas of Plains states, depends upon coordination of available maps with GPS positioning of survey crews. Because no subsurface testing is involved, fewer person-hours are usually required to cover the same size tracts of land as compared with shovel-test surveys. The

amount of labor needed will vary depending on the nature of the terrain, the expected site density, and the level of detail required in recording the sites. One commonly used rule of thumb in the western United States, however, is that in general, one person can cover about forty acres per day. Obviously, this rate can be adjusted upward or downward, depending on the project specifics. Some projects may require that artifact analysis be done in the field; if so, this should obviously be taken into account when making labor estimates. Alternatively, controlled surface collections may be required, in which the artifacts are systematically collected and returned to the firm's headquarters for analysis. Labor estimates for controlled surface collections, as well as for urban Phase I subsurface field work, is made on a case-by-case basis.

"Analysis" labor estimates vary by region. Compared with computing most field testing estimates, there are even fewer rules of thumb for estimating labor needs for analysis, since the amount of laboratory processing labor will vary by SHPO or equivalent regulatory office protocols (including labeling and records requirements), by the normal artifact yield for sites in the region, and by in-house laboratory procedures. Our experience in the eastern and midwestern United States can give some sense of scale: Most Phase I projects require about one hour of analysis time for a laboratory technician for every four to five hours of total field time, plus one hour of laboratory supervisor time for every sixteen hours of field time. Any additional sample analysis and testing costs should be added.

Labor estimates for "Report Preparation and Delivery" take into account the actual writing, the production, any special illustrations and figures, and delivery or presentation of the report. The "final" report is a physical hard copy, even if the draft report was approved without need for revision and was submitted electronically.

Budgets and labor estimates for the Phase I project—like Phase II testing and Phase III data recovery projects—include allowances for revising and reproducing the draft report. The amounts of time and costs associated with this last part of the Phase I project usually are about the same as the labor time and costs for the initial, start-up phase of the project. If artifacts are collected and the project is not to be continued into the Phase II or III process, costs of curation must also be factored in. (If the project is to be continued, then the curation of the artifacts can be rolled into the curation of artifacts recovered from the Phase II or III investigations.)

Staffing Needs

Phase I projects require both nonfield and field support. In larger firms, different people may be used for those staffing needs; in smaller firms, many of the same people will do both. Having a wide assortment of skills in addition to those associated with basic archaeology is important both to the employee and to the firm. This also applies to the state and Federal government workplace, where agency personnel fill a variety of roles.

Staffing needs include

- *secretarial*: preparation of correspondence, coordination of project communications, maintenance of office records, including travel vouchers, work orders, and payroll, and scheduling;
- *project management*: coordination and assignment of project personnel, preparation and monitoring of the project budget, execution of the research design, personnel management, logistical management, writing of the report, client and agency relations;
- *field labor*: all aspects of standard field work as well as equipment assembly and maintenance;
- *laboratory labor*: all tasks, from the cleaning of artifacts through their identification and tabulation to coding into a master database, conservation tasks as needed, preparation for turnover to a permanent curatorial facility;
- *graphics*; and
- *cultural backgrounds*: background research into the history and prehistory of the project vicinity, which includes site file searches, maps, and research on the history of the project vicinity.

Staffing needs are met either by assigning in-house personnel or by hiring outside personnel to assist in-house employees. Temporary outside help, referred to as "project hires," is drawn from a professional migrant population that shifts from one project to the next in a manner very similar to that found in the construction industry. Project hires usually are needed only for the field work portion of a project, and then only if the scale of the project is such that it cannot be completed using permanent employees of the firm.

Much of the information about the day-to-day activities in archaeology in the United States is communicated through the project-hire community. They know which firms are fair and equitable, and which are not. The labor force must meet applicable Federal or state standards for education and work experience. In many cases, the lowest level of expertise for field operations will be a person with a college background in anthropological archaeology; it is not unusual for Federal contracts to specify that field workers have a completed college degree along with a year or two of supervised field experience.

Field Logistics: Housing, Per Diem, Transport

Many Phase I projects are done within a two-hour round trip of the main office. In situations where the project is at too great a distance to commute, issues of housing and per diem come up. "Per diem" refers to money allocated to field workers to reimburse room and board costs while in the field.[5]

Housing arrangements vary by firm. Some firms arrange housing beforehand; others leave it to the employees. In some remote areas, employees may be expected to camp out during field sessions.

Transportation to the project area on a per diem project usually is the responsibility of project hires. For permanent employees, the firm provides transportation or reimburses transportation costs to and from the project area. Once at the staging area for the per diem project, the firm is responsible for getting crew to and from the actual site of field work.

Equipment and Supply Needs

Some firms issue to each crew member most of the equipment listed in table 4.1; other firms expect crew members to supply equipment. The crew chief or field supervisor will also have the equipment listed in table 4.2.

Depending on the area and terrain, it may be important to have an extra set of vehicle keys, good spare tires, a good road map, and a shared plan for emergencies. (Federal contracts require a developed safety plan with a designated safety officer.) Often, it is assumed that the crew has had first-aid training, including CPR, or that at least one person is certified in emergency responses. This is a requirement for Federal contracts. OSHA (Occupational Safety and Health Administration) regulations address these issues.

Table 4.1. Equipment Required by Each Crew Member for Phase I Survey

All types of survey:

- Range-finder compass
- Two colors of flagging tape
- Retractable metric hand tape (three-meter, locking)
- Shovel testing or surface survey field note forms
- Pencil
- Clipboard (shielded metal)
- Simple hand-held calculator
- Hard hat if working on a construction site or highway corridor
- Safety vest if working along a highway or other high-profile area
- Personal gear, including day pack and water

For surveys involving subsurface testing:

- Bags
- Indelible ink marker
- Trowel
- Round-nose shovel or a square shovel with sharpened edge
- Small screen (mesh size varies by state, site, and field conditions)

Table 4.2. Equipment Carried by Crew Chief or Field Supervisor

All types of survey:

- Project map or copy showing planned shovel-test or collection area locations
- First-aid kit with snakebite kit (if far from the field vehicle)
- Hand-held GPS unit
- Cell phone (as needed)
- Cameras (not always needed for Phase I; however, some states require soil profile or general landscape photographs); sometimes black and white film and color slide film are used in two cameras; sometimes a digital camera is used
- Bags
- Indelible ink markers

For surveys involving subsurface testing:

- Munsell soil color book

Setting Up

After the project has been awarded and a budget and schedule are in place, the Phase I project must be set up. "Setup" refers to all of the preparatory steps undertaken to make sure that the project is done properly and within time and budget limits. Part of this will involve securing maps of the project as planned/conceived as well as of the project area; part of this will involve planning out how the land will be checked by surface examination and, if appropriate, subsurface examination.

Project Maps

All projects are accompanied by a map showing the location of the project area. In cases where the project area involves large tracts of land—for example, when surveys are to be conducted on Federal lands in advance of prescribed fires or in advance of large land transfers—the project area will usually be indicated on a USGS topographic map. In these cases, the scale of the map will usually be either 1:24,000 (7.5-minute map) or 1:62,500 (15-minute map). Large surveys such as these typically occur in western states, where Federal agencies manage large tracts of lands.

When the project involves smaller tracts of land—for example, when surveys are conducted in advance of construction projects—the project map often is in the form of a design drawing. These maps, necessary for permitting approval if not construction, are usually submitted for courtesy or mandatory review to a local planning board. Such maps eventually form the basis for the plans that will be used to actually do the project itself. The scale of such a planning map is at 1 inch to 50 feet, 1 inch to 100 feet, or 1 inch to 200 feet and typically shows what will be done as part of the construction project. Such maps have landscape features shown, as well as other survey marks.

As planning tools, design-drawing maps attempt to capture current information. However, they may contain errors, and the archaeologist's field measurements may contradict the information on the project map supplied by the client. While archaeologists also make mistakes, in our ex-

TIP: Project Map Terminology

What is a *preliminary project map*? Government agencies use specific terminology for the type of map and what stage it represents in the planning process for an undertaking. The terminology varies quite a bit by agency, and there are no universal definitions.

The category of map is generally determined by the least-precise data recorded. Thus, if the map is concerned with possible route corridor selection, the terrain may be mapped fairly accurately, yet the map will be labeled something like *Preliminary planning—not for construction*. Negotiation may help in obtaining a project map with the types of information needed for the archaeology if the designers see providing this information as helpful to a particular route or design. A proper Phase I archaeological survey requires only enough finalization of design to properly identify the project area, anticipate disturbances and their nature, and locate cultural and natural features.

perience the majority of design maps supplied to us by clients have had errors of varying degrees, such as mistakes in distances or feature locations. The proper procedure is to verify one's field measurements as closely as possible, make notes, inform the client where important, and continue.

Subsurface Survey: Planning Shovel-Test Transects

In the western and southwestern parts of the country where surface visibility is good, aggradation is rare, and soils are inactive,[6] subsurface testing rarely is done—except in depositional settings—as part of Phase I. However, for most of the country, Phase I site identification will involve some form of subsurface testing. The most common method by far is shovel testing.

Shovel tests are widely spaced, often rather small tests that are, as the name suggests, little more than a few shovelfuls of fill removed to a depth of maybe forty centimeters (size and shape of shovel tests vary by state). Unit and transect spacing varies by state/jurisdiction, project area conditions, and probability of subsurface remains being present. Many, such as Maryland, typically recommend as a default a twenty-by-twenty-meter grid of thirty-centimeter-diameter, forty-centimeter-deep shovel tests. During the setup stage of the Phase I project, it is useful to figure out where in the field those shovel tests will be done.

Shovel tests are set out in parallel, usually straight-line transects, with the shovel tests placed at intervals determined by review agency protocol and by budget. Typical shovel-test planning involves setting up a gridlike pattern on the project map before testing begins. This normally is done by hand, using an engineer's rule to work out scale, a set of dividers (like those used for navigation) to make evenly spaced marks on the map, and a protractor to work out what the compass bearings will be when the lines drawn on the map are brought to operational reality in the field. The transects themselves are then penciled onto the project map. Setting things up like this before getting into the field not only makes the project move along more smoothly, it also helps the person directing the field part of the Phase I project to know just how many shovel-test units will be needed and, by extrapolation, how long the field time should last.

Something that might be noted when Phase I transects are ruled out on paper: the project map may already have north set out as a true—as

opposed to magnetic—bearing. If you are working off of magnetic bearings, it is tricky, and not really more efficient, to try to figure out from the project map the true bearing of the baseline or of the transects set at right angles to it. It is better to wait, enter the field, then simply use uncorrected, magnetic bearings, using large-scale landscape features that the land surveyors already have recorded. These features will be more accurately placed than the archaeologist could do using a hand compass or a GPS instrument.

Phase I shovel testing assumes that archaeological debris will be spread about in a sheet, referred to as "sheet litter." The individual shovel tests are meant to puncture that sheet and document the horizontal extent of any site present. The shovel tests represent individual points from which a coarse image of the site can be discerned. The denser the points, the better the resolution and definition of the image. This illustrates the advantages of a formal grid pattern as opposed to a haphazardly distributed series of shovel tests.

An implicit assumption about archaeological sites in planning a testing pattern is that cultural materials are distributed within a site as continuous sheet litter. There might be areas of high artifact concentra-

Figure 4.2. Setting up Phase I shovel-test transects on a project map.

TIP: Cautions on Using Compasses

Although GPS (global positioning system) instruments are increasingly used for Phase I positioning, the standard hand-held, range-finder compass remains the most common piece of positioning equipment. Compasses are inexpensive and dependable; the commonly used range-finder type forces the field worker to sight on a physical object in the distance and walk to it, rather than depend upon a screen reading. However, compass users should be aware that any electromagnetic fields in the vicinity of the compass can alter readings. That is, power lines, transformers, and microwave transmitters can affect the compass needle and therefore the direction in which the person is walking off for a transect. Always remember to look around—especially up where those power lines may be—before choosing references and bearings. And always remember to set the declination on your compass in accordance with the topographical map.

tions and of low concentrations, but the transitions from one to the other are assumed to be gradational, not discontinuous. Another assumption is that there is a threshold density for sites that would meet the data potential criterion in 36 CFR 60.4. One artifact recovered from a thirty-centimeter-diameter, forty-centimeter-deep shovel test (cylindrical volume: 0.028 cubic meters; parabolic volume: 0.019 cubic meters) represents an artifact density of 52.6 artifacts per cubic meter. Finally, it is assumed that there is a threshold area for sites that would meet the data potential criterion in 36 CFR 60.4. The largest circular area that can be missed by a grid of points is ½π times the distance squared between shovel-test intervals. For example, a twenty-meter testing interval could conceivably miss a site of around 628 square meters (about the size of a modest suburban residential lot).

If the boundaries of the project are not clearly marked, it becomes even more important to mark and plan the transects so that adequate shovel testing will occur. Existing roads and other landscape features can help in orienting the grid. All Phase I exercises must be set up as if someone else will have to come back in and relocate the shovel tests.

The setup for field work should include a health and safety "tailgate" meeting to review and prepare for potential hazards. Personnel should be familiar with procedures ranging from treatment for snakebites to urban traffic control, depending on the circumstances of the project area.

Surface Survey: Planning Traverses

In areas where vegetation is sparse and archaeological remains are visible on the ground surface, sites can be identified without subsurface testing. In these instances, survey is carried out by systematically walking across the project area and recording any archaeological sites encountered. If the project right-of-way is narrow and linear, one person may be able to walk the area alone. More frequently, however, the survey is carried out by crew members lined up at set distances apart.

As with subsurface surveys, prior to beginning the project it should be determined how many transects will be required, how long they will be, and where and how they should be set up. Penciling the transects onto the topographic map helps determine how many transects will be needed and how many can be walked per person per day. If the project area is large, transects will often be walked on due north-south or east-west lines to aid in mapping. Alternatively, if the topography is rugged, the archaeologist in charge may elect to have the transects follow the natural contour lines.

In remote areas, where the project area is not defined by roads or previously marked right-of-ways, the field director will need to determine how the project area will be identified on the ground. In some instances, it may be necessary to park the vehicles and walk to the survey area. By studying the topographic map before leaving for the field, the archaeologist can identify the best place to park and can use a protractor and ruler to determine the bearing and distance that must be walked to get to the starting point of the survey. In western states, land ownership often follows the Township and Range system, which divides the land into square-mile tracts (termed "sections") oriented due north-south and east-west. On the ground, these sections are often bounded by fences. Because project boundaries often coincide with section-line boundaries, fences can often be used to aid in locating project boundaries.

Field

Although Phase I is termed "shovel testing," "inventory," "reconnaissance survey," or even misleadingly "cultural resources inventory,"[7] much is done during this stage of the field work. The order in which the work is done does not matter too much since everything is completed quickly. Most non-Federal Phase I surveys involve comparatively small areas and can be

done within a week. Surveys over large tracts, such as pipelines, Federal forests, or military installations, take considerably longer.

Three sets of data are retrieved during field work: Vegetational, pedological, and archaeological. The first two, which chronicle depositional integrity, will indicate whether the third has any meaning in terms of the National Register criteria.

Landscape History: Vegetational and Pedological Data

Landscape history is derived from two data sets: vegetation and soils. Together, these data can answer most initial questions about past land use and therefore the likelihood that the project area lacks near-surface depositional integrity. The vegetation, especially tree cover, records the sequence of land-use events over the past one hundred years or so; the actual time depends upon the part of the country. The soil augments the interpretation of the vegetation and serves as a bridge to understanding the impact of past land-use activities on the archaeological deposit, if such is present.

Land-Use History Based on Vegetation

Almost no forested area in the eastern/midwestern United States and few in the western United States escaped lumbering activities sometime in the past two hundred years (see Neumann 1985, 1989a, 1995; Neumann and Sanford 1987; Sanford and Neumann 1987; Russell 1997). East of the Mississippi there are few stands of trees present that are older than 100–150 years; most are less than fifty years old. Nearly all of the landscape represents vegetation communities that have emerged subsequent to land clearance. The original land clearance could have been from lumbering, cultivation, pasture, charcoal production, or even military encampments like those east of Manassas Junction in Virginia. Subsequent human activity often included cycles of use that resulted in land disturbance.

The vegetation community present at the time of the Phase I survey represents what has succeeded over the landscape after the last landscape modification took place (figure 4.3.). Some of the plants present come from locally available seed sources; others from intentional plantings, as in the case of the even-aged stands of longleaf and loblolly pines in the Georgia Piedmont, planted for erosion control. Understanding the plants and their origins helps reconstruct landscape history and can indicate depositional integrity.

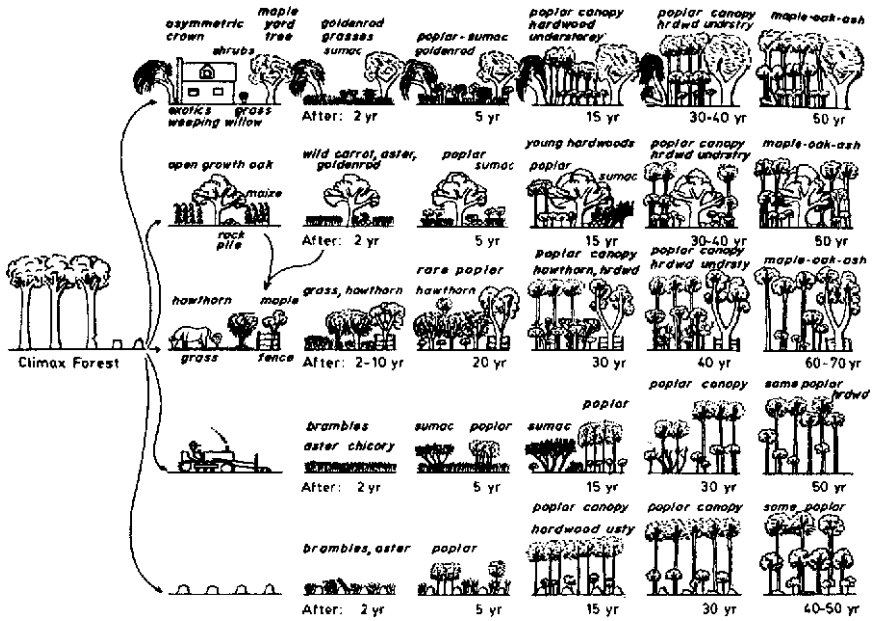
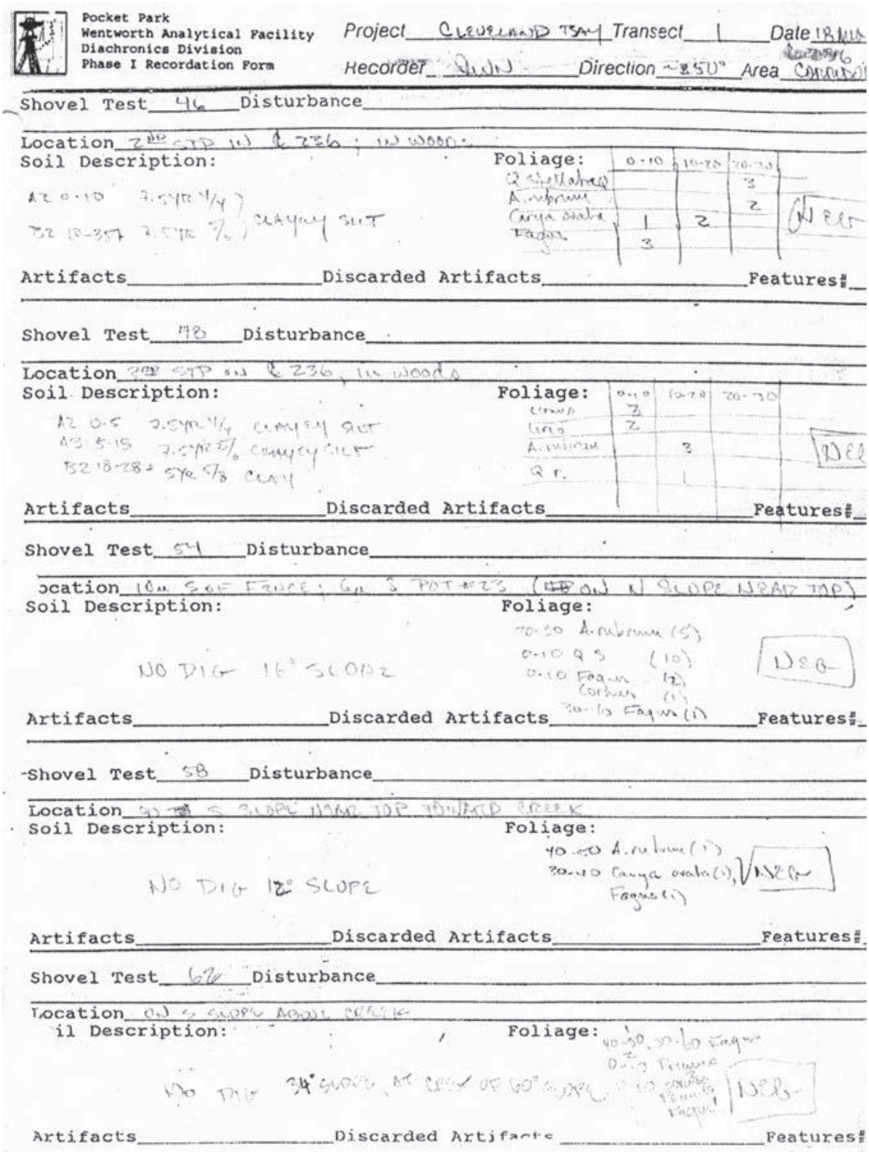


Figure 4.3. Generalized categories of vegetation succession for central New York (after Neumann and Sanford 1987:121). Similar sequences have been developed for other local environmental settings (Neumann 1989a; Neumann, Sanford, and Warms 1993; Neumann and Williams 1990; Neumann and Williams 1991; Sanford et al. 1994; and Sanford, Neumann, and Salmon 1997). Succession is a somewhat loose concept that has been criticized for its deterministic nature (e.g., Drury and Nisbet 1973; Russell 1997), but for archaeologists working in localized environmental settings, it remains a convenient tool for a generalized sense of landscape history.

The easiest way to reconstruct the land-use history is to document vegetation succession for the project area, particularly the tree cover if such is present (Neumann and Sanford 1987). Tree demographics can be used as a rapid method to document vegetation succession if a few assumptions are made. The field work itself consists of noting the *diameter at breast height* (dbh; about 1.2 meters from the ground surface) of the tree, the kind of tree (genus and, if useful or possible, species), and the form of the tree (open-growth or closed-canopy growth). It is necessary only to record those diameters in ten-centimeter increments.

Information is collected on all trees within a given radius, say, three meters, of the shovel-test unit or some regular point along a transect (figure 4.4). "All," in this case, means those numerous little saplings just as much



Pocket Park
Wentworth Analytical Facility
Diachronics Division
Phase I Recordation Form

Project CLEVELAND TSA Transect 1 Date 18 ... Recorder ... Direction ~850° Area ...

Shovel Test 46 Disturbance
Location 2ND STP W ℄ 236; IN WOODS
Soil Description: A2 0-10 7.5YR 4/4; B2 10-35+ 7.5YR 5/6 CLAYEY SILT
Foliage: 0-10 | 10-20 | 20-30
Artifacts Discarded Artifacts Features#

Shovel Test 48 Disturbance
Location 3RD STP ON ℄ 236, IN WOODS
Soil Description: A2 0-5 7.5YR 4/4 CLAYEY SILT; A3 5-15 7.5YR 5/6 CLAYEY SILT; B2 18-28+ 5YR 5/8 CLAY
Foliage: 0-10 | 10-20 | 20-30
Artifacts Discarded Artifacts Features#

Shovel Test 54 Disturbance
Location 10m S of FENCE; 6m S POT #23 (ON N SLOPE NEAR TOP)
Soil Description: NO DIG 16° SLOPE
Foliage:
Artifacts Discarded Artifacts Features#

Shovel Test 58 Disturbance
Location ON S SLOPE NEAR TOP TOWARD CREEK
Soil Description: NO DIG 12° SLOPE
Foliage:
Artifacts Discarded Artifacts Features#

Shovel Test 62 Disturbance
Location ON S SLOPE ABOVE CREEK
Soil Description: NO DIG 34° SLOPE, AT CREST OF 60° SLOPE
Foliage:
Artifacts Discarded Artifacts Features#

Figure 4.4. Example of shovel-test record form with information entered on tree types and size classes observed within three meters of the particular shovel test.

as the larger trees. This is a point sample, similar to how foresters survey a stand of timber. The advantage of tying the tree and vegetation data to the shovel-testing regime is that it allows the investigator to discern changes

in past land-use activities *within* the project area. Many Phase I exercises involve project areas larger than twenty hectares; often, those project areas once were farms where some of the land was pasture and some of the land was cropped. If vegetation can be linked to shovel-test grid, the local cultural geography and attendant land disturbance may be reconstructed.

Trees can be sorted by diameter class; usually ten-centimeter dbh increments is sufficient resolution (figure 4.5). Under most circumstances, one can assume that the age of a tree, in years, is roughly the same as its diameter in centimeters. In some cases, this rule does not hold; the growth rate will vary in poor soil, in stressed conditions, or in fertilized areas. Individual, local chronologies can be developed for comparison and interpretation, but this crude rule of thumb will facilitate a quick, initial vegetative assessment. Fast-growing, high water table trees like cottonwood, sycamore, tuliptree (sometimes called "tulip poplar" or "yellow poplar"), and willow tend to be half as old as their diameter in centimeters. Trees that emerged under closed-canopy conditions, like oak or holly or dogwood in a forested track, may be half again to twice as old as their

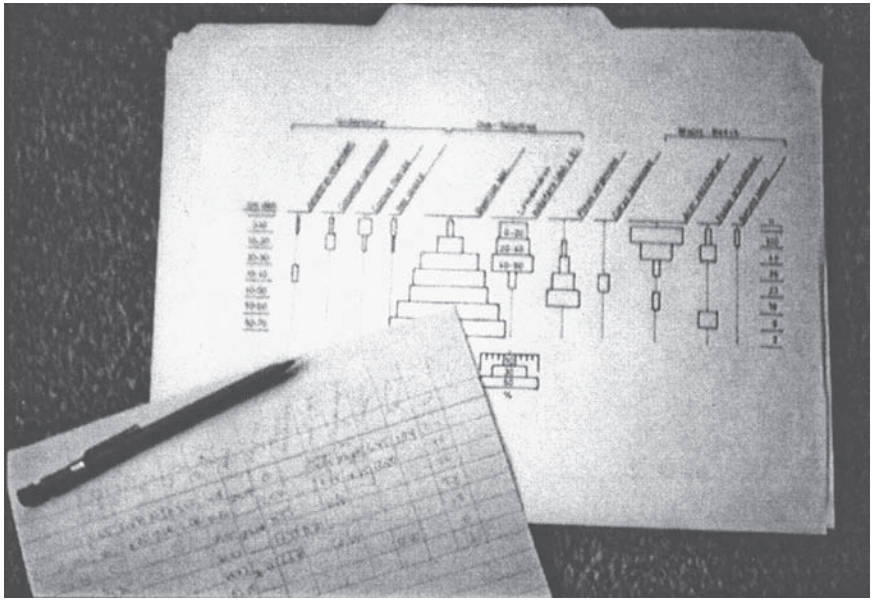


Figure 4.5. Recording tree demographics and then assessing how land use has changed requires first that the field data be converted to percentages and then graphed. This is a seriation exercise.

Fig. 13. Residential yard cut from abandoned pasture. Isolated trees are live oak; specimen in left foreground around 20 cm dbh. Pasture associates include prickly pear and, along right margin, Ashe juniper growing in a straight line.

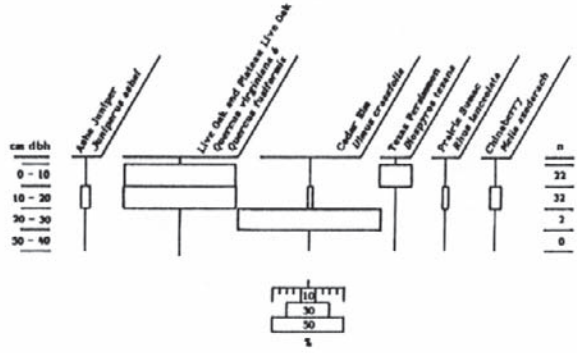


Fig. 14. Demographic profile of trees on a residential lot developed from abandoned pasture. The elms in this sample probably were closer to 20 years old than to 30 years old; the pasture probably was taken out of use in the 1970s. Most of the junipers originally present were removed; residents in this part of Texas prefer oaks over junipers, and the latter usually are removed. In a natural, emerging stand, the number of trees decrease exponentially as the diameter increases. Here, the fact that the largest number of trees is in the 10–20 cm dbh range suggest selection against the saplings that would otherwise be present.

Figure 4.6. Presentation of field data. The figure shows how the final product relates to what was originally seen in the field. The data here came from a residential lot in south Texas, where the largest trees were twenty- to thirty-centimeter dbh cedar elms (*Ulmus crassifolia*). These were joined a decade or so later by various live oaks (*Quercus virginiana and Q. fusiformis*) along with a mix of secondary species. In this case and using the rule of thumb where a tree is about as old in years as its diameter in centimeters, the field data would be consistent with the land being taken out of use and the residential development being started between twenty and thirty years ago. In point of fact, the land was developed into a residential community twenty-four years earlier.

diameter in centimeters. Wherever possible, stumps and other cuts—even limb cuts—should be used to estimate growth rate relative to age rate, since that "centimeter-a-year" rule is an approximation that varies by part of the country, tree species, and growing conditions.

Also recorded are growth characteristics and patterns. For example, the trees will be open- or closed-canopy in their growth habit. Trees that emerged along fence lines when the land was open and under cultivation will be open growth, with spreading limbs relatively low on the bole. The age of those trees gives an estimate on the age of the fence line; the age of the surrounding woodlot community gives an estimate on when the field was abandoned. Since the diameter of the trees is strongly correlated with the age of the trees, the diagram can be used to estimate dates of changes in the woodlot community structure (figure 4.6).

Plotting out the above information in matrix form is the first step. The next step is assessing what that information means and using the summary of the data as a vehicle to support the Phase I conclusions. This essentially is a seriation chart, where the tree genera are like ceramic types and the changes in their frequency often reflect changes in the use of the land. Different vegetation communities, especially forest communities, are associated with different uses of the land (e.g., Watts 1975, Wessels 1997; for an extensive, albeit dated, list of sources, see Firth 1985). Many parts of the United States have handbooks and manuals on local plants and on local land-use history. From this point, it is only a matter of tying the field data into the known landscape ecology to provide some sense of how the land was used in the past and whether any kind of disturbance—say plowing—had occurred.

Land-Use History and the Soil Profile

An application of soil development principles helps confirm the land-use history, first worked out with the vegetation survey, in those parts of the country where Phase I involves shovel testing. The soils information is often needed to justify arguments about a lack of depositional integrity in the project area.

Just as most of the land east of the Mississippi has been cut over, much of that land also was once plowed. It should not be assumed that the land, because it looks untillable today, had not been plowed in the past. The

reason many tracts of land no longer are farmed today is because people learned in the past, through the failure of farms, that some land could not be used. For example, the Root River basin in southeastern Minnesota is filled with abandoned farmsteads left from people in the 1870s–1920s who plowed the forty-degree to sixty-degree slopes only to have the hillsides wash into the bottomlands. Many small stream valleys in the eastern and midwestern United States have over (sometimes an order of magnitude over) one to two meters of sediment deposited within the past 120 years as a product of those erosion-prone farming practices. Thus, the land surface seen now may not be the aboriginal surface, and the lack of evidence at shallow depths is misleading.

An understanding of how soil horizons and boundaries change will aid in interpretation. Forest soils generally have A horizons only ten centimeters thick or so. Historic plowing often was as deep as thirty-five centimeters (fourteen inches) before the 1930s; most plowing generally is twenty to thirty centimeters deep (eight to twelve inches). However, while the plowzone or Ap horizon is visible in the soil profile for several years after plowing ends, its visibility and, technically, its existence as a soil horizon will eventually disappear. The transition from a farm field soil profile with its clear Ap horizon to a forest soil profile can occur within thirty to forty years of the field being abandoned and allowed to become overgrown.

It should be noted at this point that there are two soil horizon description systems used by archaeologists in the literature. One represents a system that began well before 1938 and continued through 1981 (Rice and Alexander 1938:889; see also Soil Science Survey Staff 1951, 1975; Olson 1976). The second is a modification of that system that was set out in 1981 (Soil Science Survey Staff 1981:4-39–4-50; see also Foss, Miller, and Segovia 1985:5–7). The basic aspects of these two systems are compared in table 4.3.

In the pre-1981 system, the initial Arabic numeral following the horizon letter referred to a particular characteristic of such a horizon. The second Arabic numeral, if one was used, had ordinal meaning. In the 1981 system, Arabic numerals exist for purposes of order only. Subordinate distinctions in horizons, previously designated by numerals, are now represented by one of twenty-two lowercase letters (Soil Science Survey Staff 1981:4-43–4-47). The only major horizon designation, commonly encountered or needed by archaeologists, that did not change was "Ap," which still means a plowed horizon or "plowzone."

Table 4.3

Pre-1981 Designation	*1981 Designation*	*Meaning*
A1	A	Humus near/at the surface
A2	E	Eluviated, leached soil just below the A
A3	AB	Transitional boundary, more like an A than a B
B1	BA	Transitional boundary, more like a B than an A
B2	B	Subsoil
B3	BC	Transition from B to unconsolidated material that may or might not be the parent of the B

The majority of county soil survey books use the pre-1981 system, primarily because the data were assembled well before the 1981 changes. Much of the archaeological literature and most of the engineering reports treated by the practicing archaeologist will also use the pre-1981 system. Recently trained archaeologists know and use the current descriptive system. However, the practicing archaeologist should be fluent in both systems and be clear about which system is being used.

One other point: soil horizons are not, in themselves, strata. That is, the color of the soil may change as one goes deeper, but that represents the changes through the soil in the concentrations of things like organics. The soil profile for any one soil is a developmental continuum, and excepting for Ap horizons (which *are* strata in the strict sense of the term), is best removed by the archaeologist in arbitrary levels and not by homogeneity of soil color/horizon.

Soils are active, dynamic, three-dimensional ecological systems. Knowing the dynamic nature of soils helps in appreciating the movement of artifacts within the soil.[8]

The movement of artifacts within an active soil is much the same as if the soil itself were behaving like a very thick fluid. The thickness or viscosity of that fluid varies by how biologically active the soil itself is, that is, how much in the way of ants and worms and so on are present within the soil, something that has been recognized and documented since Darwin's (1881) work on the subject.

Because they vary both in texture and biological activity, each soil horizon may be thought of as having a different viscosity. The A or E horizon is more fluid than the B horizon; a plowzone—the Ap horizon—is more fluid than a pasture soil. For this reason, one will observe in the field

We learned about archaeology from that . . . Sub-Plowzone Components and Sinking Artifacts

An urban floodplain project in West Virginia illustrates the importance of knowing how artifacts move around in an active soil. The Phase I work had been done by another firm, and we were providing Phase II testing.

Most of the area around the small town was under cultivation. Several fields contained prehistoric artifacts, and a series of new sites had been identified for the overall project area. The Phase I report noted that many had undisturbed, sub-plowzone archaeological components in addition to archaeological materials contained within the plowzones themselves.

Obviously, artifacts found in the plowzone could have come from any place between the surface and the maximum plowing depth. It is also reasonable to assume that any material found below the plowzone had been undisturbed by modern human activity. However, it is not safe to assume that the artifacts themselves originated in the undisturbed subsoil, nor that they would therefore represent a separate and undisturbed component.

Many SHPOs specify excavation through the Ap horizon into *culturally sterile* subsoil, meaning fill that does not contain artifacts or features. The hidden assumption in that specification is that prehistoric artifacts, between the time they were deposited and the time the site was plowed, did not move down through the soil to a depth below where the plow eventually cut. Further, it assumes that the artifacts could not have moved from the plowzone into the subsoil after plowing commenced. Both assumptions are wrong.

In the situation of the small town and the myriad prehistoric sites with undisturbed components, it proved relatively easy to demonstrate statistically that the artifacts that came from immediately below the Ap horizon actually had originated from the assemblage still located within the Ap horizon. This was done by subdividing the artifacts into functional classes and raw material classes and then running a chi-square statistic between the Ap and the upper B horizon populations. In all cases, it was found that there was no reason to consider the two to be independent sets. This was something that really should have been done as part of the Phase I investigation, *before* it was argued that the sub-plowzone material represented a separate, undisturbed component.

The point to remember here is that active soils behave a lot like very thick fluids as far as artifacts are concerned. Generally, artifacts will keep sinking through those "fluids." Just because artifacts are found in unplowed contexts below the plowzone does not automatically mean that the artifacts are in situ. Prehistoric artifacts have had a great deal of time to shift before plowing commenced. Before a recommendation is made that the artifact population is independent (a separate component) from that found in the plowzone, the supposition must be tested statistically. In the case at hand, only one component was present. The artifacts recovered from the B horizon actually were not located in their original vertical positions.

that artifacts will tend to "bunch up" at an E/B horizon (A/B horizon) interface or Ap/B horizon interface.

There is another issue here: because artifacts sink, and because prehistoric sites existed in an area long before plowing was present, finding artifacts below the Ap horizon in the B horizon is no indication that one is dealing with a second, undisturbed component. Rather, it is just as likely that the top of the deposit has been clipped and churned by plowing, while the lower end of the vertical spread of artifacts, slowly sinking over the centuries, has managed to settle below plowing depth and has not been disturbed. Whether or not a sub-Ap horizon assemblage represents a separate occupation can be tested statistically. If such a spread of artifacts between a plowzone and sub-plowzone is found in the field, then that vertical distribution must be tested statistically before the Phase I report is submitted.

Field Methods

Three general categories of field methods are used during Phase I investigations: (1) shovel testing or test pitting; (2) ground-surface examination; and/or (3) heavy equipment testing. Shovel testing is the most common method used in the eastern United States and in settings with restricted ground-surface visibility. Heavy equipment testing, usually using a backhoe, is generally used in urban areas as well as in situations warranting deeper testing through sediments, as in a floodplain.

Ground-surface examination with no subsurface testing and often no artifact collecting is common in many areas of the western and southwestern United States where the ground surface is visible.[9] Very often in these areas as well, the values of the Indian cultures discourage testing or artifact collecting. This may mean greater attention must be paid to background research, but it can also reduce the cost of the survey if there is no collection to curate. On the other hand, if surface collections are not made, it becomes very important to describe the artifacts noted on the field carefully since they will not be analyzed later in the laboratory.

Archaeological surface reconnaissance has been discussed often in the literature (see Fish and Kowaleski 1990; Renfrew and Bahn 2000:63–69; Sharer and Ashmore 1993:186–192, 196–201, 237; Feder 1997:54–55), with topics ranging from field procedures to regional sampling. Archaeology involving large structures and urban or built-up settings also has been discussed, although perhaps not as often in terms of using heavy equip-

Site #26Ck8411/Temporary Site #LAME 08-001 (House 46)

IMACS SITE FORM

PART A: Administrative Data

INTERMOUNTAIN ANTIQUITIES COMPUTER SYSTEM
Form approved for use by
BLM- Utah, Idaho, Wyoming, Nevada
Division of State History- Utah, Wyoming
USFS- Intermountain Region
NPS- Utah, Wyoming

1. State No. 26Ck8411
2. Agency No.
3. Temp No. LAME 08-001

4. State: Nevada County: Clark
5. Project: Lost City Survey- Year 2
6. Report No.: Lake Mead CRP #08-006/WACC Project #LAME 2006 E
7. Site Name/Property Name: Harrington's House 46 (Shutler 1961)
8. Class: [x] Prehistoric [ ] Historic [ ] Paleontologic [ ] Ethnographic
9. Site Type: Virgin Anasazi Habitation
10. Elevation: 357 m (1,162 ft)
11. UTM Grid (NAD 27) Zone 11 743291 m E 4056110 N (Site Datum)
12. Meridian: Mt. Diablo
14. Map Reference: Overton Beach, Nevada. 7.5" USGS Quadrangle (Provisional Edition 1983)
15. Aerial Photo:
16. Location and Access: At the intersection of Jones Street and Elm Avenue, turn west onto Smith Street and continue for approximately 2.4 miles until the road intersects with an unnamed gravel road. Turn north on the gravel road and follow for approximately 100 meters, then turn west on unnamed dirt road. Follow dirt road 250 meters until it dead ends. From this spot, walk southeasterly at a bearing of 115 for a distance of 250 meters. The site is located on the floodplain.

17. Land Owner: National Park Service
18. Federal Administrative Units: Lake Mead National Recreation Area.
19. Location of Curated Materials: Two obsidian artifacts were collected for geochemical source analysis (Ref #15-B, Ref #10-C). Current documentation is on file at Lake Mead National Recreation Area, Boulder City.

20. Site Description: This is a large Virgin Anasazi habitation site that contains the remnants of at least three roomblocks (Features 1-2, 5), two fire-affected features or hearths (Features 3-4), and thousands of artifacts. It resides on a loosely consolidated silty-sandy substrate on the floor of the Muddy River floodplain. This site corresponds to M.R. Harrington's House 46, based on maps published in Shutler (1961) and Lyneis (1992). The three remnant roomblocks (Feature 1, Feature 2, Feature 5) consist primarily of sandstone rubble pavements and/or semi-dispersed scatters, although Feature 1 also contains a short, arc-shaped, wall alignment. There are two fire-affected features (Features 3 and 4). Feature 4 is a sandstone lined hearth that may be historic or modern in temporal affiliation. The artifact assemblage consists of thousands of artifacts including various ceramic wares, lithic tools and debris (cores, flakes), Groundstone, and fire-cracked rock.

21. Site Condition: [ ] Excellent [ ] Good [x] Fair [ ] Poor
22. Impact Agents: lacustrin effects (inundation, sedimentation, recession), cattle effects (trails, tampling, dung), Aeolian erosion, casual recreation and collection, institutional excavations/collections
23. National Register Status: [x] Significant [ ] Non-Significant [ ] Unevaluated
Justify: This site falls within the Pueblo Grande de Nevada National Register District (26Ck2148). Therefore its location is listed on the National Register of Historic Places.

Figure 4.7. First page of the site form commonly used in the western United States. (Note: The locational information on this form has been changed to protect the site's position from becoming publicly known.)

ment in urban areas (see Renfrew and Bahn 2000:91; Sharer and Ashmore 1993:275–276; Hester 1997:73–77).

During surface survey, crew members traverse the project area in parallel lines, or transects. To ensure that all crew members are oriented from true north, compass declinations should be set before starting off. The appropriate declination can be found at the bottom of the topographic map. The distance between crew members (or transects) can vary, but typically it is between fifteen and twenty meters. When artifacts or features are encountered, all crew members will stop, look around, and determine whether the materials are sufficiently dense to meet the criteria for site definition. Most states and agencies have guidelines to aid in this determination. For example, in Arizona, to be classified as a site an area should have at least thirty or more artifacts of a single class (for example, thirty sherds or thirty lithics) within an area measuring fifteen meters in diameter. Alternatively, areas can be identified as a site if they contain twenty or more artifacts from two or more classes in the same size area, or two or more temporally associated archaeological features. When sites are encountered, they are given a temporary field number, their boundaries are determined by noting where artifacts or features begin to drop off, a site form filled out, and a map prepared. The site form (figure 4.7), which is provided by the state or agency, records basic information about the site such as its location, the vegetation found in its vicinity, the number and types of artifacts and features observed, whether the site appears to be disturbed, and so on. The site map is attached to the site form and shows the location of the site relative to modern constructions or natural features (such as streams or ridge edges) and the location of any archaeological features or artifact concentrations found within the site boundaries.

Shovel testing is rarely discussed in the literature with the same attention given to more tradition archaeological methods, yet it is the primary procedure for collecting field data during Phase I surveys in the majority of states. A shovel test is a limited subsurface excavation that provides information on the presence or absence of artifacts while doing minimal damage to a site and requiring minimal labor. It emulates the effects of a plow and historically is derived from that and the associated data retrieval that would come from surface collecting a plowed field. Usually, a shovel test is a circular excavation about thirty centimeters in diameter and about forty centimeters deep, although this can vary by state or agency protocols.

TIP: Using UTM Coordinates

Most site forms require that the geographic location of the site be recorded using the Universal Transverse Mercator (UTM) coordinate system. In the UTM system, the earth's surface is divided into a series of zones, and coordinates indicate the location of a point within any particular zone. Positions are measured in northings and eastings, with the northings increasing in number as one moves north of the equator and decreasing as one moves south. Eastings are numbered within each zone so that the numbering system starts over when one moves to a new zone. Thus, to know where a point is located on the surface of the earth, one needs to know not only its northing and easting, but what UTM zone it is in and whether it is north or south of the equator.

However, there is another piece of information that also must be known. All UTM coordinates are fixed in space by reference to a datum, so to know where a particular site is located, one must also know what datum was used to establish the coordinates. There are many different datums in use throughout the world, but the two used most commonly in the United States are the North American Datum established in 1927 (referred to simply as NAD 27) and the North American Datum established in 1983 (referred to as NAD 83). Most USGS topographic maps are referenced to NAD 27, but those that have been revised recently use NAD 83. Which datum was used is indicated at the bottom of each topographic map.

Thus, if one wished to relocate a site recorded at N 4044069 and E 193210, one would first need to know on what side of the equator these coordinates were located, what zone they were in, and what datum was used. Luckily, it is obvious whether the area of interest is in the northern or southern hemisphere, and it is also usually easy to figure out what zone it is in, since the zones encompass such large areas of land. However, it is not so easy to figure out which datum was used. The difference between coordinates recorded in NAD 27 and NAD 83 is generally on the order of only a couple of hundred meters or so. Thus, if a crew was trying to relocate a site recorded in NAD 27, but the GPS unit being used was unknowingly set to NAD 83, the archaeologists could end up several hundred meters from the intended destination. While this might not seem like such a long distance, at the end of a hot day it can be very frustrating to realize that you have walked several hundred meters out of your way and spent a good part of the afternoon looking for a site in the wrong place. There are several important points here: first, always pay attention to whether your GPS unit is set to NAD 27 or NAD 83, and always pay attention to the datum that was used to record the site in the first place. If you are recording the site for the first time, take care to ensure that the datum information is recorded along with the zone and the northings and eastings.

Shovel tests are normally dug along straight-line transects at some preset interval, such as fifteen meters, twenty meters, or thirty meters.

Figure 4.8. Standard Phase I shovel-testing equipment, which includes round-nose shovel, small screen, compass, trowel, clipboard with shovel-test forms, flagging tape for marking where shovel-tests were dug, and backpack.

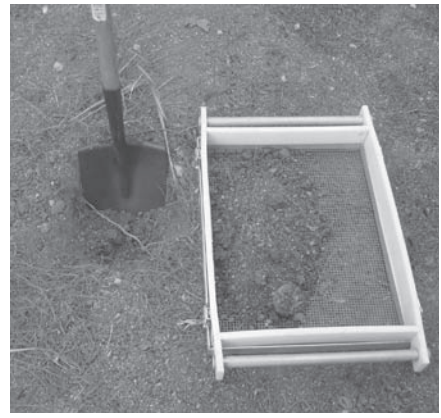


Figure 4.9. Excavation of typical thirty-centimeters-across, forty-centimeters-deep shovel-test unit.

Figure 4.10. Finished shovel-test unit. The fill will be screened, while soil horizon characteristics, including texture, color, and horizon thickness, will be recorded.

Many states have established default protocols for shovel testing. These protocols usually are available on the Internet. They specify the size and form of the shovel test, the kind of screening to be done, the default shovel test and transect intervals, and the maximum slope on which testing must be done. In some states, such as Arkansas, Louisiana, and Kentucky, it has been acceptable to shovel-sort the fill; in most other states where screen-

ing is expected, fill must be screened through 1/4-inch (0.635-centimeter) mesh, although in Idaho and Montana, 1/8-inch (0.318-centimeter) mesh is required, while in Maryland 1/2-inch (1.270-centimeter) mesh may be used on industrial sites. To put this into some perspective, we have found that shovel sorting alone will recover approximately 20 percent of what would be recovered with a 1/4-inch screen (Neumann and Sanford 1985).

Supplemental testing, or second-pass testing, should be done after the main transects are completed. This involves testing between shovel tests with artifacts ("positive shovel tests") and shovel tests without artifacts ("negative shovel tests") around the perimeter of the artifact spread represented by any cluster of "positive" shovel tests. The purpose is to refine the edges of a possible archaeological site.

Field Notes and Records

The field notes are the primary documentation of the field investigation. Often the person writing up the report is not the person who wrote the field notes. Consequently, those notes need to be especially thorough, comprehensible, and accurate. They should include sketches, observations, and field conditions. The disconnect between the excavators and the people who actually write the report remains a fundamental complaint in the CRM world. Cryptic notes widen this gap. High-quality notes imply high-quality field work and do much to improve the career of the crew member.

Field notes should be kept in a three-ring, D-ring binder. Round-ring binders should be avoided since the back pages get torn due to the shape of the rings and how the pages move—or do not—as the binder is set flat and opened. Again, this may seem like a rather trivial remark, but it is not. This is one of those things that no one bothers telling students about until it is too late: using round-ring binders results in pages tearing out where the holes are punched and field notes being lost.

Phase I field notes have four categories of information (see figure 4.11):

- general project information, maps, scope of work;
- the general field notes kept by the field supervisor;
- the specific shovel-test field notes kept by the crew and the supervisor; and
- the field specimen sheets (bag inventory).

We learned about archaeology from that . . . **False Positives: Manure Spreaders and Phantom Sites**

Artifacts do not always indicate a site, even if they are spread over a large area in great density or concentrated in clusters. Consider. . . .

A once-cultivated field was slated for residential development. During the 1800s, a little community grew up in its vicinity and, until the 1960s, a local kiln had operated on a parcel next to it. The setting suggested a high probability for prehistoric and historic archaeological remains; local code required a Phase I survey.

Phase I shovel testing revealed a light scattering of historic artifacts—bottle and plate glass and common nineteenth-century ceramics—over the entire project area, along with a few prehistoric artifacts and three heavier concentrations of historic artifacts. The plowzone contained heavy concentrations of historic artifacts dating from 1880 to 1925. The dates corresponded to the landscape history indicated by the vegetation of the now overgrown field.

The artifact assemblage and distribution had some interesting characteristics. Each of the three heavy, localized concentrations were near a corner of the farm field: one near a road, another near where the kiln property was, and a third opposite the original, still standing, farmhouse. Statistical comparison of frequency and type among the three showed that each had the same ratio of bottle glass to ceramics to bone to plate glass to lamp glass. Further, while an assortment of common and occasionally expensive ceramics was present, there was no repetition in ceramic type.

There were no soil discontinuities. There was a twenty-five to thirty centimeter Ap horizon over a C horizon. There were no apparent foundations and almost no evidence of other architecture-related artifacts such as bricks, foundation stones, or mortar.

The possibility of unknown historic sites, coupled with the background history and artifact inventory, led the agency reviewer to request additional testing around the artifact concentrations to locate any structures. However, the most likely source of the artifacts and their occasional concentrations was a manure spreader. Although additional testing was done, this explanation was eventually accepted.

A manure spreader was (and remains) standard farm equipment. On farms with livestock, barns would be cleaned out and the manure tossed into the spreader. Periodically, the contents would be spread over the fields. However, the manure spreader also received kitchen scraps and waste, and occasional small bits of household trash and debris. In many ways, the manure spreader served as the dumpster for the whole farm.

The agency reviewer was right in that the debris was the signature of a residence. However, it had been carried into the field and spread over it. The concentrations represented starting, crossing, and excess dumping points for the spreader. The

similarities in artifact assemblage represented the blurring together, over about fifty years, of the common kinds of household accidents that individually would be distinct: a broken windowpane, a shattered plate, remnants of a Sunday roast, empty medicine bottles.

This incident illustrates the importance of understanding the behaviors that took place on the land when it was in use, as well as the signatures of such behavior.

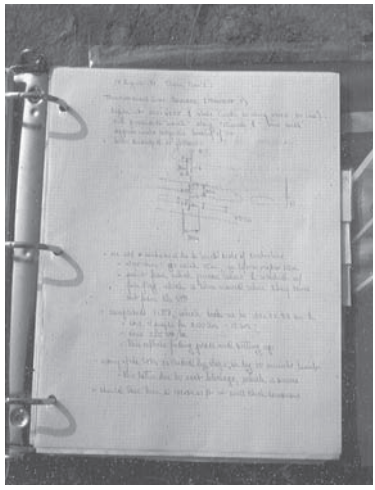


Figure 4.11. Example of Phase I field notes.

Each of the above categories has sections within the notebook. Not always, but often, the field notebook will become the project notebook. It will be the core reference for completion of the project and will include most of the project documentation that will be turned over to the client at the end of the project.

Included within the project notebook should be the SOW (scope of work), draft figures for the final report, and other bookkeeping and project management items—tables, figures, list of tables, list of figures, contact sheets, other maps, and pretty much anything else made out of paper that has even a passing bearing on the project. These will be added into the notebook after the project has come out of the field.

Table 4.4 presents the core information that should be included in the field notes, arranged in the recommended order. These notes will be kept by the project manager or field supervisor; the project manager is responsible for the field notes, even if those notes are kept by the field supervisor. We include this in part because we have often found students, interns, and even new hires to be at a loss about how to set all of this up. However, it is also included, including the remark on D-ring binders, because the field notes from Phase I—or from any research project—represent primary evidence in court. Professional archaeology is like any other compliance or

Table 4.4. Basic Structure of Phase I Field Notes

This table presents the core information that should be included in the field notes, arranged in the recommended order. The information in the field notebook has the strength of primary evidence if any issue involving the field work comes to trial. The notebook is a "discoverable document" in a legal proceeding, which is why it is important that students understand how to set one of these up.

Section 1. General Project Information

- SOW (scope of work)
- Logistics, including work orders from management and hour allocations for the tasks concerned:

  For the purposes of the field notes, the logistics should identify how many person-hours have been allocated to the particular project, based upon specific tasks.
- Project maps and figures

  Reduced versions of project area maps, including those showing shovel-test locations and transects, are put in this subsection. Often the scope of work will have project area drawings; copies should be included in this section. Additional maps in this part of the field notes include a photocopy of the appropriate section of the relevant USGS 7.5-minute quadrangle, along with a copy of the distance scale. A photocopy of the appropriate sheet from the county soil survey may be included.
- Right-of-entry materials

  The project manager should have in this part of the notebook copies of returned and signed right-of-entry letters; whenever possible, whoever is in the field should make certain that the landowner is contacted again just prior to entry onto the property.
- Records of interviews and communications

  Any kind of discussion that occurs between project personnel and people commenting on the project should have a written summary put into this section of the notebook.

Section 2. General Field Notes

The narrative part of the field notes ties things together by giving an idea of what transpired. In addition, the narrative section of the field notes contains a detailed description of the landscape as encountered in the field. This description includes trees, ground cover, soils, water bodies, exposed rock, gullies, and fences and other cultural features.

Section 3. Specific Field Records

- Individual shovel-test records, arranged by transect; or individual surface collection area records
- Site forms
- Feature inventory
- Photographic records

Section 4. Bag Inventory/Field Specimen Sheets

- Numbered
- Inventoried

contracting profession: there are parties with other interests and agendas; there are contracts that may not be honored. The field notes from projects become important pieces of evidence in legal proceedings.

Post-Field

Phase I surveys are the bread and butter of most archaeological firms. To be cost effective, many things need to be done at the same time. This does not impinge on quality, but it does require attention to logistics. After the field work is completed, the following steps are initiated:

- any artifacts collected, along with a copy of the bag inventory, go to the lab for processing and analysis;
- draft figures for the report are prepared;
- site forms are prepared as quickly as possible and submitted to the state for a site number; and
- the body of the report, such as the general opening, cultural and environmental background, and similar sections, is drafted.

Level of Analyses Expected

The Phase I exercise is not a sustained, interpretive analysis of the archaeology or the history of the project area. Rather, Phase I is the field part of a good-faith identification exercise to see whether there is anything present that may warrant closer examination. The Phase I report, then, provides sufficient information to agency reviewers so that they can decide whether archaeological sites might be present that *might* be eligible for listing on the National Register.

The principal interpretative analysis takes place within the report and addresses issues required to assess the eligibility of a site for listing on the National Register, as specified in 36 CFR 60.4. These issues are the integrity of any archaeological deposit and the deposit's association (e.g., with an important person, event, design) or the potential of the deposit to contribute information to the study of history or prehistory (i.e., "data potential").

The information collected during the Phase I survey may be capable of dealing with some evaluation questions. For example, the information may be sufficient for the lead agency to determine that a site does not

merit listing on the National Register and requires no further testing because it lacks integrity and is less than fifty years old.

Generally, artifact analysis is limited to identification, typological classification, frequency count, and distribution across the site or project area. For example, South's (1977) activity-set approach merely requires classification of the historic assemblage into like sets and consideration of how those artifacts are distributed over the project area.

Unlike historic artifact classification, some of the prehistoric artifacts require examination under low magnification to correctly assign function. For example, a dissecting microscope helps separate the microliths in an assemblage from the unused flakes. However, anything beyond simple recognition is overdoing it; if the site is that important, more will be evident during the Phase II testing. Thus, counts, depths, soil horizon, and rough classification are all that are needed for Phase I. The purpose is merely to figure out what is there and roughly how much is present.

Addressing Basic Phase I Issues

Many Phase I projects do not contain archaeological sites that satisfy 36 CFR 60.4 criteria for listing on the National Register. In many cases, archaeological materials are present but are sporadic, common, undiagnostic, or contained within disturbed matrices.

A case for whether or not more testing (Phase II evaluation) is recommended is based on apparent integrity of the deposit, the presence or absence of any features, the nature of the apparent artifact assemblage relative to what is already known archaeologically, and—for shovel-test surveys—statistical tests for patterning.

General Structure of Report

The general structure of archaeological compliance reports is given in chapter 7. The Phase I report is a form of analysis, just as the work in the laboratory—if it was needed—was a form of analysis. In the "Results" section, evidence is given and then interpreted to give reasons why the review agency and the SHPO should or should not continue with a Phase II investigation.

Site Forms

After coming in from the field and while artifacts are processed in the laboratory, site forms should be completed. If a site was previously recorded

for part or all of the project area, then submit an updated site form to the state. A new site form is required if unrecorded sites were encountered.

Review agencies prefer or require that the site number be used in the final report. This means getting the site form filed as soon as possible. A few states also ask that the collections be labeled with the site number. The turnaround time for getting a site number varies by state and by workload; the archaeologist should know how long it usually takes for the particular state in question.

For sites encountered during surface survey projects, the site form will already have been initiated in the field. For sites encountered during shovel-test surveys, the site form is not usually begun until after the field work is completed. The reason for this difference is that where surface visibility is good, it is possible to determine while in the field whether you have encountered a site and what the boundaries of that site are. Where archaeological remains are encountered only or primarily in shovel tests, however, it may not be possible to determine the existence or boundaries of a site until the quantity and distribution of the recovered artifacts are studied.

Although 36 CFR Part 63 (IV, A, 2) defines a site as any "location of prehistoric or historic occupation or activity" (see chapter 2), there is no firm definition of what this actually constitutes. After all, this is hardly a precise definition. However, Phase I surveys are intended to see whether sites are present that might satisfy criteria for listing on the National Register of Historic Places. This means that a consistent, operational definition is needed. For example, does one shovel test having five artifacts in it mean a site? What about two adjacent shovel tests with two artifacts each?

The decision should be consistent with the needs and opinions of the state. Some states have explicit definitions of what constitutes a site (e.g., Alabama and Louisiana). More often, the state leaves this to the judgment of the archaeologist. One approach we have used is:

1. if a feature is found, even in one shovel test, call the area a site;
2. if at least three shovel tests within an interval of twenty meters have more than two artifacts each, call the area a site.

Calling the deposit or spread of artifacts a site does not mean that it is significant in National Register terms. It is merely a way of keeping

track of clusters of debris over the landscape. It allows the practicing archaeologist to decide whether site forms should be submitted. If the state disagrees with the archaeologist's definition or threshold, then the state can provide operational criteria.

Many states now require that a completed site form be submitted and be in their possession before a site number is given. The practicing archaeologist should have blank site forms on hand. Getting the forms, if such already is not present, is easy: Just call the state review agency or visit its Internet website.

Chapter Summary

The Phase I process is the first step in archaeological compliance work. It represents the first part of the "good-faith effort" required of Federal agencies to identify possible historic properties (possible cultural resources eligible for listing on the National Register). That first part is to see whether cultural resources—in the case here, archaeological sites—are present. The second part, called Phase II, will be to see whether those sites are eligible for listing on the National Register.

In practice, Phase I is essentially a site survey or site reconnaissance exercise. The idea is not to locate every site, that is, do a site inventory of an area. Rather, the idea is to make a reasonable attempt to see whether historic or prehistoric sites are present. This means that in addition to checking the state site files to see whether sites already are known for the area, the professional archaeologist also must physically check to see whether sites are present that have yet to be recorded.

The most common archaeological compliance project is a Phase I survey. Phase I surveys provide a significant part of a firm's cash flow. As with all aspects of professional archaeology, attention must be given to correctly estimating the labor required for the project, locating suitable staff if such are not already employed by the firm, and providing field logistical support. Although to stay in business the firm must turn a profit, it cannot do the work in such a way that it fails to pass peer review by the lead agency archaeologists or by the SHPO/THPO archaeologists. A very common misunderstanding is that professional archaeologists will sacrifice basic research quality to increase profit. That is quite incorrect. If the Phase I work does not pass review, it will have to be continued or redone until it

does. Failure to do good Phase I work can result in delays for the archaeologist's client, cost overruns for the archaeologist's own firm, and sufficient negative publicity within the client's business community that future work is doubtful. All of those mean a very short business life indeed.

Phase I projects include background research on the project area. Some of that background work sees what has been done to date, archaeologically, in the project area, as well as what is generally known about the history and prehistory of the region in which the project is located. Some of that background work involves general understanding of the area's ecology (including the various soil types). And some of that background research can include interviews with local people about the project area. When tribal or other aboriginal lands are involved, Federal code requires that tribal or native organizations be consulted. Indeed, such entities will be major players in the assessment process.

Phase I field work consists broadly of two parts: assessment of landscape history using vegetation and soil indicators, and archaeological survey. The type, growth habit, and location of vegetation over the project area provides information about how the land has been used in the past and, at times, when that use took place. This is important for knowing whether there has been any land disturbance that would compromise any archaeological sites that might be present. Soils information can also indicate disturbance, particularly whether plowing has been done in the recent past.

The Phase I archaeological field component differs across the country, depending upon vegetation cover. In those states with extensive vegetation cover, Phase I includes some form of subsurface testing, generically referred to as shovel testing. This is a limited test excavation that is widely spaced over the project area. This is the default procedure in thirty-five states. In states with large areas of sparse vegetation or exposed ground surface, surface collecting and reconnaissance are done instead of subsurface excavation. This is the default procedure in fifteen, mostly western states. However, both procedures are meant to be good-faith efforts that go beyond just looking in the site files to see whether archaeological sites (or, for that matter, any undocumented cultural resources) are present. Regardless of how "important" the assessed area seems to be, thorough field notes are essential.

After the field work is completed, any archaeological data collected will be analyzed. Those data will be combined with the background information and vegetation/soils data and then submitted as a detailed

technical monograph to the government agency held responsible for the compliance work. The initial draft of that report will be reviewed by agency archaeologists (and sometimes by SHPO/THPO archaeologists), revised as needed, and then resubmitted as a final report.

The report serves as the eyes for both the government agency and for the SHPO/THPO. The professional archaeologist will make recommendations in the report about whether any archaeological sites should be further tested to see whether they are eligible for the National Register, or whether any sites encountered could for reasons like extensive disturbance not be eligible for the National Register. Those are recommendations only; the government agency will make the final decision, and that decision will need to be agreed to by the SHPO/THPO or (if there is disagreement and the Phase I is part of a Section 106 project) reviewed by the Advisory Council on Historic Preservation.

If more information is needed about the Register eligibility of any archaeological sites present, one recommendation in the report may be for further testing. That testing, which is part of the Phase II process, is discussed in chapter 5.

Additional Reading of Interest

Brady, Nyle C., and Ray R. Weil. *The Nature and Properties of Soils*. 14th ed. Upper Saddle River, N.J.: Prentice Hall, 2007. Comprehensive introduction to soils that also serves well as a shelf reference.

Burke, Heather, Claire Smith, and Larry Zimmerman. *The Archaeologist's Field Handbook: North American Edition*. Walnut Creek, Calif.: AltaMira Press, 2008. Provides guidance on archaeological fieldwork techniques.

Chesterman, Charles W. *The Audubon Society Field Guide to North American Rocks and Minerals*. New York: Knopf, 1979. Well-illustrated and -organized field manual of service in identifying lithic raw material.

Collins, James M. *Archaeological Survey*. Archaeologist's Toolkit #2. Walnut Creek, Calif.: AltaMira Press, 2003. Reviews the stages of the survey process, from the background research through the writing of the final report.

Hester, Thomas R., Harry J. Shafer, and Kenneth L. Feder. *Field Methods in Archaeology*. Walnut Creek, Calif.: Left Coast Press, 2008. This standard text contains a clear, serviceable introduction to the range of site survey methods.

Firth, Ian J. W. *Cultural Landscape Bibliography*. National Park Service/Southeast Region. Washington, D.C.: U.S. Government Printing Office, 1985. This

bibliography of sources on cultural landscapes includes older sources that might not appear on Internet-based literature searches.

Foss, J. E., F. P. Miller, and A. V. Segovia. *Field Guide to Soil Profile Description and Mapping*. 2nd edition. Moorhead, Minn.: Soil Resources International, 1985. Excellent and readable introduction to field description of soils, written for the practicing archaeologist by individuals who have worked long and in the field with professional archaeologists.

Neumann, Thomas W., and Robert M. Sanford. The use of vegetation successional stages in cultural resource assessments. *American Archaeology* 6 (1987):119–127. The first reading-the-landscape paper written by archaeologists for use by archaeologists, especially those doing Phase I surveys.

Sanford, Robert M., Don Huffer, Nina Huffer, Tom Neumann, Giovanna Peebles, Mary Butera, Ginger Anderson, and Dave Lacy. *Stonewalls & Cellarholes: A Guide for Landowners on Historic Features and Landscapes in Vermont's Forests*. Waterbury, Vt.: Department of Forest, Parks, and Recreation, 1994. http://historicvermont.org/programs/stonewall%20and%20cellarhouse_pub_screen.pdf (Jan. 1, 2009). This general guide to cultural landscape evidence written for the lay reader has application for people doing landscape interpretation in other states.

Watts, May Theilgaard. *Reading the Landscape of America*. Revised and expanded edition. New York: Collier, 1975. Charming and engaging collection of Watts's papers treating how landscape use has changed in the United States. Watts not only provided excellent drawings, she took pains to make sure it was clear how outbuildings, gardens, and landscape plantings changed over the years. A volume that one pulls down again and again simply for the joy of wandering through the world portrayed; rather like E. B. White meets cultural geography.

CHAPTER FIVE

THE PHASE II PROCESS

TESTING AND EVALUATION

Testing and Evaluation

Once sites are known to exist within the area to be impacted by the project, the next step is to determine whether any of them are eligible for the National Register. Sometimes, this evaluation can be done with the information obtained during the Phase I survey. More often, however, additional investigations are needed. In this case, the Phase II process of limited testing and evaluation is initiated.

The purpose of Phase II testing and evaluation is to see whether archaeological sites identified during the Phase I survey satisfy criteria for listing on the National Register of Historic Places (36 CFR 60.4). As discussed in chapter 2, for a site to be National Register eligible it must have both *significance* and *integrity*. A site possesses significance if it is associated with important events (criterion a) or people (criterion b); if it possesses high artistic value, represents the work of a master, or embodies craftsmanship of a type, period, or construction method (criterion c); or if it is able to contribute information important in prehistory or history (criterion d). Although archaeological sites do exist that meet one or more of the first three criteria, most sites that are eligible for the National Register do so because of their research potential. The Phase II process discussed here, therefore, deals primarily with evaluating a site's ability to yield data, that is, whether or not the site meets criterion d.

Phase II testing is an evaluative step. Following from the Secretary of the Interior's *Guidelines for Evaluation* [48 FR 44723], the results of a Phase II study are meant to provide the review agencies with enough information to determine whether or not the site could be listed on the National Register.

Phase II is concerned with the nature of the site itself, as well as how that site might relate—functionally and temporally—to other sites in the region. The process can also yield substantive data in its own right, even if the site itself turns out to be ineligible for listing on the National Register.

If Phase II involves excavation, only enough of the site is dug to enable a recommendation to be made. The excavations may be small test units, exposing no more than 0.2–0.5 percent of the site area. They may be done as larger-area tests, exposing more of the site but not as deeply. Or, the site may be intentionally plowed for purposes of Phase II, a controlled surface collection done, and a small portion of that plow-zone stripped to expose and map features. In some instances, backhoe trenches will be dug to evaluate any deeply buried occupation layers. The idea of Phase II field work is to get just enough information to adequately assess National Register eligibility. Thus, scoping and efficiency are important aspects of Phase II.

Deciding how to carry out the testing depends on a host of factors, including the suspected nature of the site and protocols in the given states, funds available, and agreements between the SHPO/THPO and the agency or client. Phase II refines or clarifies impressions of depositional integrity, cultural affiliation, vertical extent of the cultural deposit, and site function derived from the Phase I survey work.

Archaeological testing has a long history in archaeology. In academia, test excavations are often conducted to gather preliminary information about a site before full-scale excavations are initiated. The purpose of this type of testing is to gather information about the quantity and distribution of subsurface remains, information that is then used to help structure subsequent excavation efforts. Testing conducted as a part of Section 106 is similar to academic testing but differs in three ways:

1. there will exist a previous study, equivalent to a Phase I survey, indicating the general horizontal bounds of the site and general artifact distribution;
2. there will be a predetermined number of test units of a predetermined size to be excavated; and
3. the goals of the testing are to resolve any questions about site eligibility for listing on the National Register.

Of these three factors, the last is the most significant. Because the goal of Phase II testing is to evaluate the site for National Register eligibility, excavations during this stage will be as small as possible. Only enough of the site will be dug to allow the evaluation to be made. To distinguish Phase II field work from academic testing, it is sometimes called "eligibility testing."

The depth of test units varies by several factors, including state requirements, agency protocols, nature of the deposit, and nature of the project and its possible effects. For example, 1 × 1-meter units seldom can be excavated deeper than 1.0 meter, simply because of the limitations imposed by the length of the shovel handle, which bangs into the unit walls when drawn back to remove fill. However, digging much deeper than thirty centimeters may be pointless if the site involves the backyard of a historic structure, since what will be of concern or interest may be the layout of garden beds and walkways and the past presence of wells and outbuildings. The U.S. Army Corps of Engineers (COE), in some districts, requests testing to 2.0 meters below the surface, which requires at least one horizontal dimension of the unit to be around two meters for excavation by shovel. Beginning at 4.0–5.0 feet (1.2 meters–1.5 meters), depending upon jurisdiction, state safety and OSHA (Occupational Safety and Health Administration) regulations require some kind of shoring of the walls; these are spelled out in the U.S. Army Corps of Engineers *Safety and Health Requirements Manual* (2003). Proper anticipation of this requirement means designing the units to accommodate shoring hardware. Environmental conditions such as soil type and moisture content also affect shoring and may be factored into the applicable regulations.[1]

The Phase II testing is the first opportunity to study the structure of an archaeological deposit because a sizeable profile or window on that deposit is opened. Archaeologists dig to answer questions: if the site is so limited and fragile that testing removes most or all of the deposit (called "testing out of existence"), then a good argument probably could be made that it did not possess the quality of significance as defined in 36 CFR 60.4, simply because data potential was so limited (but, of course, that would depend upon the situation). In most instances, to be National Register eligible means that site data are sufficiently robust and redundant to withstand Phase II testing.

Evaluating Significance and Integrity

The concepts of significance and integrity are necessarily subjective. All sites have the potential to yield information, but that information must be *important* for the site to qualify for the National Register. Obviously, the kinds of information considered important can vary between researchers and over time. The concept of integrity is similarly open to interpretation. In general, under criterion d, anything that has reduced the intactness of a site can be said to have detracted from its integrity. Factors that can negatively impact integrity include the displacement of artifacts and sediments through plowing and bioturbation, damage caused by looting or erosion, and the deterioration of remains due to poor preservation. All sites are impacted by these or other factors to some degree. In terms of National Register eligibility, however, the question is: has the integrity of the site been sufficiently compromised to make the site ineligible for the National Register?

A lot of ink has been spilled over this issue (Butler 1987; Hardesty 1995; Hardesty and Little 2009; Raab and Klinger 1977; Tainter and Lucas 1983), and there is no cookbook approach to answering the question. Although factors such as uniqueness, the presence of stratified deposits, and a minimum of disturbance will enhance the likelihood that a given site will be considered eligible, studies have shown that important information can also sometimes be derived from surface sites (Sullivan 1998), commonplace historic sites (Wilson 1990), and sites located in disturbed plowzones (Hawkins 1998).

For National Register purposes, significance is assessed within the framework of a *historic context*. A historic context consists of a theme (for example, migration or trade), a time, and a place. Under criterion d, for each historic context, specific research questions or data gaps are identified, as are the data requirements needed to address those questions. This framework is intended to ensure that the research questions used to evaluate the significance of archaeological sites are not frivolous.

This procedure requires that the eligibility of each site be evaluated against what is already known; thus, the archaeologist must be familiar with the data gaps for the region and area under study. For example, the presence of well-preserved corn from prehistoric contexts may or may not be sufficient to make a site eligible. If the corn comes from a habitation site located in northeastern Arizona and dating to AD 1000, its presence alone may not

be sufficient to meet criterion d. This is because it has long been known that the prehistoric people of this region and period cultivated corn. However, if the corn was recovered from a habitation site in the same area that dated to several centuries before the time of Christ, these remains would be sufficient to make the site significant because they have the potential to inform on the unanswered question of when corn first arrived in this area.

Integrity similarly must be evaluated on a case-by-case basis. Under criterion d, integrity refers to the ability of the property to convey information about the past. Integrity is examined by first identifying the types of data or physical remains needed to address the relevant data gaps and then determining whether those remains are present at the site. For example, one unresolved question in southern Nevada is when the Paiute Indians arrived in the region, and particularly whether they arrived before or after the region had been abandoned by the Puebloan Indians. A site that contained evidence of both Paiute and Puebloan occupation potentially could address this question. However, it would be necessary to be able to date the Paiute and Puebloan occupations relative to each other. A site that had no datable remains or that was completely deflated such that it was impossible to determine how the two occupations related to each other chronologically would lack sufficient integrity in regard to this question. Thus, even though the site dated to the correct time period and was associated with the appropriate cultures for addressing this data gap, a lack of integrity would make the site ineligible, at least in terms of this research issue.

Project Structure and Pre-Field Preparation

Phase II testing is initiated in response to one of two situations:

- a Phase I survey has identified an archaeological site of sufficient size, character, or depositional integrity that further examination was needed to see whether it could be listed on the National Register; or
- the site was already known and considered ineligible for listing on the National Register, but new information (such as new methods or changing knowledge of the area's prehistory) warrants a reexamination of this conclusion.

The Conundrum of the National Register in the Context of Section 106

The intent of Section 106 is to ensure that important places are not harmed without justification and without reasonable attempts being made to offset losses that may result from any damage. In terms of archaeological sites and criterion d, this generally means that important sites will be studied before they are destroyed.

The conundrum comes in by the connection of Section 106 with the National Register. Under the law, effects must be considered only for those sites that are eligible for the National Register. If a site is deemed ineligible, for management purposes it ceases to exist. No information must be retrieved from such sites, and no efforts must legally be made to try to avoid their destruction. The law is thus black and white: a site is either eligible and must be considered in management decisions, or it is ineligible and no protection efforts are required at all. No shades of gray are possible.

The problem with this approach, of course, is that nearly all sites have some information potential. Furthermore, a site considered lacking research potential today may prove useful to questions being addressed in the future, either because of advances in methods or because of changes in the types of questions being asked.

Tainter (1998:174) considers the problem of how to decide which archaeological deposits are worthy of preservation or study to be "one of the central conundrums of archaeology today." Sites considered eligible for the National Register are generally those that are either relatively unique or have unusually rich deposits. The problem with this "National Geographic" mentality, as it is called by Tainter (1998), is that it results in a systematic bias in our archaeological interpretations. For example, in New Mexico some 95 percent of the archaeological record comprises artifact scatters, yet most prehistoric interpretations are based on the 5 percent that contain architectural remains (Sullivan 1998). As studies by Sullivan (1995, 1996) have shown, the omission of surface artifact scatters from archaeological interpretations can result in a dramatically incorrect picture of the prehistoric adaptations of a region.

One solution might be to call all archaeological sites eligible for the National Register. However, this solution would create a management nightmare for SHPOs and Federal Agencies charged with decision-making responsibilities. The intent of Section 106, after all, is to help land managers decide how and where to allocate their energies. Furthermore, as a practical matter, public support for Section 106 would undoubtedly erode if all archaeological sites were deemed National Register eligible.

Fortunately, there is another solution. Most of the sites deemed ineligible for the National Register are those that are either surficial, small, heavily disturbed, or lacking good preservation of perishable remains. These same site types can generally be quickly and efficiently studied. Because they do not require large-scale excavation or expensive supplemental analyses, retrieval of information from such sites is usually inexpensive. Commonly, such studies can be easily rolled into either the Phase I identification or Phase II evaluation study. If sites are deemed ineligible during the

Phase I process and subsurface testing was not conducted, a small sample of surface artifacts can be collected or in-field analyses quickly carried out in the field. By taking a little extra time to document ineligible sites during the Phase I or Phase II processes, archaeologists can avoid losing key information from a region.

In the vast majority of the cases, the site was first encountered during a Phase I survey. Consequently, data and results from that Phase I report are critical to structuring the Phase II testing effort. Recommendations in the Phase I report may have helped structure the SOW for the Phase II testing. In any case, these recommendations should be carefully considered in planning the Phase II approach.

Research and Sampling Strategies

Phase II testing is somewhat similar to much of the cultural historical archaeology done in the United States prior to the 1960s, although the reasoning behind it is much different. While both investigate the range of materials in the site, how abundant those materials are, what their cultural and temporal affiliations are, and how intact the deposit is, the similarity ends there.

The Phase II sampling strategy normally builds upon that of Phase I and must address its limitations. In the eastern and midwestern United States, Phase I subsurface sampling normally examines the first forty centimeters below the surface, depending upon the jurisdiction and protocol. The Phase I field work may have been a surface collection of a plowed field; it often will be the results from a shovel-testing regime. In the western United States, subsurface testing during Phase I is rare because most sites are visible from the surface.

Surface survey and shovel testing are often sufficient to delimit the horizontal extent of shallow archaeological sites in nonaggrading settings. However, areas with well-developed soils (meaning deep solums) may have prehistoric materials that have now sunk too deep to be found with shovel or plow.

Sites in aggrading settings, being deep, are difficult to reach with shovels. These settings usually involve floodplains, although locations susceptible to colluviation—slope wash—also qualify. The only ways to find out whether deeper cultural materials exist is to dig trenches or use

Phase II Testing and Sampling Strategies

Phase II eligibility testing is a sampling exercise designed to obtain information about the nature of the subsurface deposits. The goal of this testing is to obtain just enough information to determine whether the deposits have the significance and integrity to address important research questions. Although many archaeologists will also want to know something about the distribution of the deposits to help plan for the Phase III data recovery, unless these more extensive test excavations have been reviewed by the SHPO/THPO and approved by the Federal Agency, testing for this purpose will have to wait until Phase III.

There are three basic types of sampling strategies. The first of these is a systematic sampling strategy, in which test units are placed at regularly spaced intervals across the site. This method provides equal coverage across the area but does not take advantage of information obtained from the Phase I field work concerning the differential distribution of remains across the site. When such information is available, this method is more likely to miss rich areas of the site compared with other sampling techniques.

Random sampling is a second strategy that can be used. In this technique, the site is gridded off into units, and individual areas are randomly selected for excavation using a random number table. The advantage of this sampling method is that it is less biased than the other methods, that is, each unit has an equal chance of being excavated as any other unit. This method provides the best idea of the overall site structure but also is likely to miss areas known to contain rich deposits from the Phase I work.

In judgmental sampling, excavation units are judgmentally placed in areas thought to have higher probabilities of containing rich subsurface remains. The goal of this method is to use the information obtained during the Phase I work to maximize the likelihood of encountering the richest, or "best," deposits. The advantage of this method is that it provides the highest probability of encountering informative deposits with a minimum of money, time, and damage to the overall site. However, the information obtained from a judgmental sampling strategy will be biased in that not all areas of the site will be equally represented.

Because the goal of eligibility testing is to evaluate the significance and integrity of the site, most Phase II projects rely on judgmental sampling. Alternatively, if the budget is available, it may be advantageous to combine random or systematic sampling of the entire site with additional judgmental units placed in selected high-probability areas. As with so many decisions in archaeology, the specifics of the sampling method used will depend on a variety of factors, including the nature of the site, the density and distribution of the cultural materials, and the amount of funding and time available to carry out the study.

some form of remote sensing. If remote sensing is used, it may need to be accompanied by some kind of excavation for physical verification.

If the Phase I investigations encountered archaeological materials, the Phase II test units should focus on those areas having higher-than-average artifact concentrations or culture indicators. It is necessary to get a sound idea of the potential range of artifacts in the site while disturbing as little of the site as possible. Further, areas of high artifact concentrations often are associated with heavily used areas of an archaeological site and are more likely to contain features.

Features—those nonportable human alterations of the site fabric—show site depositional integrity while also serving as data repositories. Features have very high behavioral-information contents. Clues may suggest the presence of features. For example, the habitation areas of open-air prehistoric sites often are indicated by fire-cracked rock. If Phase I testing indicated a confined area of fire-cracked rock, then it makes sense to test the area, since there may be associated evidence of prehistoric dwellings.

Historic sites have a greater range of feature indicators. For example, signs of structures include remains associated with buildings, such as daub, plaster, nails, mortared brick, tiles, roofing nails or slate fragments, and plate/window glass (however, see chapter 4, "We learned about archaeology from that . . . False Positives: Manure Spreaders and Phantom Sites").

Site and Regional Documentation

The Phase II process, like Phase I, requires review of previous archaeological information. This includes examining the state site files and, as with Phase I, constructing a list of sites and site features located within a given distance of the Phase II site. This examination provides information about what the Phase II deposit may be like while also revealing what is already known, archaeologically, about the area.

The decision about Register eligibility is, to a degree, a comparative decision in the sense of what already is known and what sites already exist. If the site is being considered in terms of Register eligibility because of its ability to contribute new knowledge, it may be that it really does not or cannot do that. This is one reason for checking the site files. That comparative "what already is known," though, will be on a state-by-state basis, just as it will be on a site-type-by-site-type basis. Part of the purpose

of the background research is to get some sense of what is or is not known already (see also chapter 3).

Contacts, Public Relations/Education

Prior to initiating the field project, any of several groups of people may need to be contacted. If the project is on Federal land and there is a reasonable expectation that Native American human remains and funerary objects may be encountered, a plan of action (POA) must be developed [43 CFR 10.3 (c)(2)]. The POA will spell out the procedures that will be followed should these remains be encountered.

If the project is on private land, or if it requires access through private land, the affected landowners should be contacted. Phase II testing can be extensive and disruptive: while some people may not mind a 1 × 1-meter unit being placed in their yard, they can be uneasy when they actually see the size of the associated backdirt pile. That unease, and the friction that may come with it, can be offset to some degree by good public relations.

Good public relations are important for another reason. In addition to making interactions with the local residents go more smoothly, the public is supposed to be apprised about what is going on: the Section 106 Process specifically requires public involvement [36 CFR 800.2 (d)(1), 800.3 (e), and 800.6 (a)(4)]. It is the lead agency's responsibility to attend to that.

Contacting landowners becomes a three-step process for Phase II:

- actually contacting and speaking face to face with both the landowner and/or resident;
- providing a clear explanation about what will be done, the extent of disruption, and how long that condition will last; and
- describing what will be done to restore the land to its original condition and, if needed, compensate for damages.

Usually, the client has already obtained written permission from the landowners (called "rights-of-entry forms") to allow archaeological work to be done. The archaeologist should have copies of those completed forms, as well as the names of owners and locations of property.

Landowners and residents should be asked about any archaeological collections that they may have from the site area or any previous knowl-

edge that they may have about land use. Artifact collections from their property should be examined. Part of this is because of the information value of that collection. Part is because of good public relations: if the people have bothered to gather and curate those artifacts, then those artifacts are important to the people themselves.

Landowners and residents should be asked about past buildings, gardens, flood deposits and other land-altering activities, locations of sewer lines, septic field lines and tanks, and field tile systems, among other local details. Excepting more rural areas, subsurface infrastructure like water and gas lines should have been marked by the utility company or some utility-locating clearinghouse. Phase II testing has a much greater chance of damaging buried utilities than Phase I survey work.

As in Phase I subsurface investigations, utility locations should be identified. The clearinghouse then contacts the various utilities, and crews mark the locations of any underground service lines in the project area (for example, in Pennsylvania, call the Pennsylvania One Call System, Inc.). Other states may have similar requirements; it is the professional archaeologist's responsibility to check about this. Most states have buried-utilities clearinghouses to call; in many, the law requires that such clearinghouses be contacted and the land cleared before any kind of excavation is done (see chapter 4). Be aware that such services cannot always be relied on for precise locations and may not always have records of water lines, fiber-optic cables, and other buried service utilities.

Crop damage and loss of agricultural use may require compensation. Pasture situations will require reassuring the farmer that the test units will be fenced off. The last thing anyone wants is for the crew to arrive in the morning to find that a prime dairy cow has somehow fallen into the test unit late the previous afternoon.

Some contracts require a public education component as part of good public relations. In such cases, the archaeologist may give a talk at a local historical society, the state archaeological association, or during the state's "archaeology week" or "archaeology month" (Society for American Archaeology 2005). In such cases, the archaeologist needs to consider site security and the landowner's feelings about publicity and privacy.

Finally, the owner or resident needs to be aware of the time of day that the field crew will show up, where they will park, and generally when they will leave. And as a way to reassure landowners about how their property

will be restored after testing is done, photographs from previous tested and restored Phase II sites may help reduce the qualms people would have about what will happen after the testing crews leave.

Labor Estimates and Planning

Phase II testing projects have the same five broad budget categories found for Phase I projects. The Phase II may well require an extended field stay far from the home office, and arrangements may be needed for where the crew will stay.

A variety of factors influence field work labor estimates:

- the requirements for mapping;
- terrain;
- the number of test units or size of the field to be collected;
- how deep the test units are to be dug;
- whether a backhoe or other heavy machinery will be used;
- how heavy the soil is and what the screen size requirement is;
- the type of site and the abundance and type of artifacts on or in the site;
- density and nature of any features that may be present;
- any sampling/surveying protocols not covered above; and
- weather.[2]

Labor estimates for mapping depend upon the characteristics of the site, the kind of equipment used, and field conditions. Two people can secure around ninety readings in a day in an open setting with an optical transit. Using a "total station" instrument usually cuts the time needed in half.

A fair estimate of labor for standard test units where the fill is screened through 1/4-inch (0.635 centimeter) mesh is 1.3 to 2.0 person-days per cubic meter. However, this estimate can vary, depending upon the nature of the soil (dried clayey soils, for example, may well triple the amount of time needed), site, and weather conditions.

Labor estimates for controlled surface collections depend upon the collection method used, field conditions, and the abundance of artifacts. Most of the labor involved will be either in setting out control points for the collection or in picking stuff up from the surface. We have found that a controlled surface collection using a twenty by twenty-meter grid requires about a person-day of labor for every 0.25 hectares, but a lot of that has to do with establishing that control grid. Again, though, estimates vary by region, site type, capability of the field workers, and other factors.

Post-field costs include the cost of artifact and other specialized analyses, writing the report, and curation. Labor estimates for post-field work vary by region, type of site, SOW, and agency requirements for labeling, curating, and specialized analyses. However, a good estimate to start with allows an hour of post-field labor time for every 2.0–3.0 hours of field time. The actual number is going to vary by a number of factors, but this should give some sense of scale.

The budget usually has three pay grades assigned to the analysis step: project manager, laboratory director, and laboratory technician. Small firms often have field technicians doubling up as lab technicians, and in really small firms, everybody does everything. For anticipated high-yield sites, considerable time may be spent cleaning, labeling, and cataloguing artifacts; this needs to be considered in preparing the budget.[3]

Phase II may also require analytical specialists (for example, ceramic, lithic, or faunal analysts) who have their own time scales and estimates. Those figures are worked into the budget either as a line-item cost estimate or converted for the sake of the bid into an hourly rate.

The analysis step is meant to provide all of the basic measurements and descriptions of artifacts and of the deposit. This includes a full range of descriptive measurements; low-magnification examination of prehistoric flakes for microliths and pottery for temper identification, for example; use-wear analyses; typological classification of diagnostics, including all of the subtle variations in colored glass and glazed ceramics found in collections of historic artifacts; and even flotation processing if the SOW so requested.

By the time analysis is finished, the artifacts should be labeled, bagged, and inventoried with all measurements, weights, counts, and typological decisions made. The artifacts should be in acid-free containers ready for turnover to a curatorial facility.

The fourth step in the Phase II project is the preparation of a draft report. The amount of time needed for this varies greatly by the nature and scale of the project. Writing the report includes the data analyses themselves, meaning the assessment, interpretation, and syllogistic application of the analytical data.

Artifact photographs, especially of diagnostics, will be placed in the report. Most firms allow the graphics department three person-hours per illustration, less if it is a photograph. Some firms maintain a permanent desktop publishing person, assigned either to graphics or to a general administrative staff, who will merge texts and illustrations and assemble the document. Other firms leave this process up to the project manager and the office staff.

The final step in the Phase II project is production of the final report and then turnover of materials. The review agencies will have commented on the draft report, and those comments must be addressed in the final report. Sometimes these are cosmetic, sometimes extensive. Only experience can give insight into estimating accurate times for getting the final report accepted.

Closing out the project includes submission of the final version of the report to the agency as well as to the SHPO/THPO and the other consulting parties, and then the turnover of the collections, field records, and laboratory records to an appropriate curatorial facility. Note, however, that in most states, the artifacts remain the property of the client and/or the landowner even after being transferred to the curation facility, as is the case under Section 106 [see 36 CFR 79.3 (a)(1)].

Staffing Needs

Most firms have the in-house staffing capability of supplying the core needs for a Phase II project. A small company or partnership will have a few people doing all the tasks. In a larger firm, those people will include

- *project managers*, who will have the responsibility of overseeing all aspects of the project from its inception until turnover, and who will be responsible for coordinating all field, analytical, and report tasks;
- *laboratory staff*, managed by the laboratory director and responsible for each firm's project needs and for the management of all material products of the project;

- *field employees*, including both field supervisors as well as basic technicians, who will be responsible for the extraction of the information contained within the archaeological deposit;
- *graphic artists*, who may also assume other roles in the project; and
- *secretarial and administrative staff*, who will be responsible for coordinating the production of the Phase II report as well as for all of the managerial paperwork approved by the project manager.

Nonfield support personnel (usually permanent employees) assist with the startup of the project, do the laboratory analyses, prepare collections for curation and turnover, create figures and illustrations, and produce the report.

Specialists may be needed for three basic sets of information:

- structure and interpretation either of the soils or of the sediment of the site;
- detailed analyses, such as hydration analyses, ethnobotanical analyses, faunal analyses, or high-magnification use-wear analysis of a prehistoric lithic applications industry or ceramics; and
- advanced statistical analyses pertaining to site depositional integrity and presence/absence of components.

Some firms reproduce the specialist's contribution as an appendix; others incorporate the results into the appropriate analysis section. The specialist might even be a coauthor of the report.[4]

Most firms maintain a core population of permanent employees in sufficient numbers for most Phase I surveys but insufficient for larger Phase II testing projects. The world of archaeology is very small, with no more than a few degrees of separation, so if a project needing additional people is coming up, the archaeologist usually will call colleagues in other firms to see whether they have crew who may soon come free because a project is about to end. These represent "project hires," and they will work in the field for the duration of that part of the project. Sometimes, when there is a critical labor shortage relative to time, local

colleges may be contacted, or notices may be posted on archaeology Internet sites (see chapter 1 "Tip: Where and How Positions in Archaeology Are Announced").

Field Logistics: Housing, Per Diem, Transport

Some firms make advance arrangements for housing. In these situations, the firm covers the cost of the lodging and may deduct a corresponding amount from the overall per diem of each crew member. In other situations, the crew—who may consist mostly of project hires—find their own places to live. The per diem is meant to cover room and board; the Internal Revenue Service has established expected per diem rates for localities. Federal projects are expected to adhere to those rates as minimums, often as a precondition of contract award.[5]

Transportation costs and arrangements depend upon the firm. Project hires use a staging area or arrive at the work site on their own. Some firms expect employees to use their vehicles but will reimburse mileage. If the firm is small and the project lengthy, it may choose to rent vehicles.

Equipment and Supply Needs

The equipment for a Phase II project is the same as that of any archaeological excavation. Any number of standard textbooks supply lists of needed equipment, and the reader is directed to those sources. Nearly all firms supply the basic field equipment needed for the Phase II project. This includes the excavation tools, the screens and/or sorting tables, the bags and indelible markers, and the record-keeping materials.

More expensive, less-often-used equipment may be rented. This is especially true for survey equipment but also applies to water pumps, trench shoring materials, and other seldom-needed or expensive-to-maintain items.

Setting Up

Setting up the Phase II testing operation requires attention to logistical needs, equipment needs, and field needs. Field needs include mapping and deciding where traverses for surface inspection will occur or where testing will be done. The testing may be carried out using actual test units, in which case decisions will need to be made about where to dig. Or the

testing may be done by plowing with limited plowzone removal, in which case the land will need to be prepared.

Phase II testing usually requires a formal site map. The client may have provided a topographic map of the project area, and this may be just fine. Archaeological maps serve both to keep track of where things were found and units dug and to allow others in the future to come back and relocate where earlier work was done. Often, though, the project maps supplied by clients are insufficient for archaeological needs since the mapping resolution is too coarse. This is going to be very much of a case-by-case matter, but the archaeologist will need to have a map of the site that satisfies archaeological research needs and will need to record GPS location data.

Phase II mapping may require placing a permanent datum, or it may make use of a frequently mapped permanent feature as a datum. The idea of a datum is to have some mapped feature that others in the future can relocate and use to figure out where the archaeological work was done. Nothing fancy is needed—whatever provides a reference will probably be just fine for the needs of a Phase II project.

The Phase II map also needs to show, if at all possible, any previous site explorations, especially any Phase I subsurface work. This means that Phase I mapping referents need to be identified. Flagging tape may mark shovel-test locations, for example. Or previous transects may be located using a GPS unit along with compass bearings and the original Phase I project map.

Some firms save time and money in Phase I by only marking shovel tests that yield artifacts or features. In this case, preparing for Phase II requires recreating the original shovel-test pattern or grid. Fortunately, most Phase I shovel-test regimes are properly spaced within a meter (which is better than the ability of GPS receivers even after the Selective Availability restriction was lifted in May 2000).

Previous field locations of Phase I sampling are important because part of Phase II is meant to get a better idea of the contents and structure of the site. This often is best accomplished by digging in areas with high artifact concentrations, since it often will be in those areas that features or portions of features survive. The presence of archaeological features like hearths and trash pits may indicate that the site is comparatively undisturbed and therefore may have a great deal of data potential.

Field

Three elements need attention in the field part of the Phase II testing project. The first will be verifying landscape history based on current vegetation and the soil profile. The second will be the archaeological field work itself. The third will be the field notes and records.

Landscape History: Vegetational and Pedological Data

The Phase I report should have provided a detailed account of vegetation in the project area, land-use history based upon that vegetation, and discussion of the soils within the project area. This information should be verified or updated for Phase II. Land-use history based on current vegetation is critical. The importance of understanding soil development—and distinguishing soils from sediments—cannot be overemphasized. Past land use, especially agricultural activities that could have disturbed the site, will be evident in the soil profile. Phase II testing also requires that the soil horizons be recorded for each test unit.

Field Methods

Phase II testing usually involves one of two approaches: (1) excavation of test units or blocks; or (2) controlled surface collection and plowzone removal.

Excavation of Test Units, Trenches, or Blocks

Phase II subsurface testing often corresponds to the type of test-unit excavation taught in field schools. Test units normally will be one by one meters, one by two meters, or two by two meters, depending on project needs and the structure of the site. Units, especially on prehistoric sites, normally will be taken to thirty centimeters below the last level containing cultural materials, or until C horizon material is encountered. The phrase often used is "thirty centimeters into culturally sterile soil." The actual final depth depends upon the nature of the site as well as the testing policies of the SHPO and agency. This will be specified in the SOW.

When test units are excavated, fill will be removed by arbitrary levels within natural levels and then screened, as is normally the case in most formal archaeological excavations. Although it depends on the area, site, and SOW, usually the Ap horizon will be removed as one level, with arbitrary

We learned about archaeology from that . . . Using Landscape History to Understand Phase II Results: The Case of Heather Heights

The Heather Heights project began with a Phase I in a Maryland woodlot. Many Late Archaic (about four thousand years old) artifacts were recovered from an apparently undisturbed context. The SHPO recommended Phase II testing, and we came in to help with the analysis.

Most of the Phase II artifacts came from within thirty centimeters of the surface, but the frequency of artifacts decreased exponentially below that. Given that no Ap horizon was noted, the surface slope was conducive to sheet erosion, and the artifact frequency peaked near the surface, we concluded that the deposit was "plow truncated" and too disturbed to be considered eligible for listing on the National Register. However, the SHPO, armed with the Phase I report, the impressive amount of artifacts from the Phase II, the absence of field evidence for a plowzone, and the rarity of undisturbed Late Archaic sites in this part of the country, argued otherwise. The SHPO recommended Phase III data recovery.

The Phase I survey described the tree cover and soils but had not addressed land-use history. The Phase I report suggested that the site was in an undisturbed woodlot, which everyone equated with undisturbed land. The lack of an apparent Ap horizon in the Phase I and Phase II field work reinforced this interpretation.

We reviewed the Phase I field notes, looking at the nature of the tree cover. The woodlot contained thirty- to forty-centimeter dbh oaks and hickories. Since oaks can live six hundred years and hickories three hundred years, the woodlot was far from a climax forest. Since there were no large trees or stumps present, the woodlot likely began during World War II or a little after.

We also reexamined the Phase I and Phase II notes on the soil profile. The soil profile was not that of a forest soil, which has a thin A horizon over the B horizon. At this site, there was a series of transitional soil horizons that, added to the extant A horizon, would be close to the depth of a plowzone. It helped to know that thirty to forty years of continuous forest cover will erase most visible evidence of an Ap horizon. The age of the trees and the depth and character of the horizon transition suggested that the site had been plowed, with the plowing having ended sometime around World War II.

The final proof of historic age involved a discussion of soil mechanics—artifacts sink through active soils—combined with a simple series of statistical tests. Those tests demonstrated that all of the material encountered in the B horizon had originated in what had been an Ap horizon.

The reasoning was presented to the SHPO, which then waived the Phase III requirement (another $50,000 of work). The client was grateful, and the SHPO was impressed with the firm; both situations were good for business. The lesson here is to always make sure to use the vegetation and soils to formulate a land-use history of the site area.

levels used thereafter. (As a caution, note that except for the Ap horizon, soil horizons are not, in themselves, natural levels or strata.) Depth measurements can be taken either in reference to the original land surface or in reference to a vertical grid system. If taken in reference to the original land surface, the plane of the unit floor should be parallel with the original land surface of the unit. If taken in reference to the vertical grid system, the unit floor should be at the same depth at each of the four corners and its midsection, regardless of the slope of the original land surface.

A backhoe may be used to excavate large test trenches when the site is deeply buried or when it encompasses a large area horizontally. Although such trenching can be destructive, it may be necessary when the site extends over a large horizontal and vertical area. Trenches are usually excavated to a depth of about 1.0-1.5 meters, although in some instances they may need to be deeper. (But note that, under OSHA regulations, trenches excavated any deeper than this will need to shored up or excavated in a stepped fashion to prevent cave-ins.) Because the fill sediments are removed by backhoe, they are not screened as they are removed, though sometimes a sample of the backfill subsequently will be screened to obtain information about the type and density of the artifacts. Once excavated, the walls of the trench will be "faced," or cleaned with a trowel to provide a clean, smooth surface. This surface will then be examined carefully for evidence of cultural deposits, artifacts, and features. If the features are ephemeral or do not stand out clearly from the sterile deposits, it may be necessary to reexamine the trench walls at various times of the day, under different lighting conditions, and under different degrees of wetness and dryness.

In some situations, Phase II testing will involve large, shallowly excavated areas or blocks, rather than deeper units with somewhat smaller areas of exposed surface. This often is the best way to approach deposits around historic structures. Much archaeological information on a historic-period property is in the past landscaping and building foundations, and that information is contained in the first thirty centimeters or so of the deposit. Rarely does one actually recover lots of artifacts or patterned artifacts from the yards of historic residences (wells and privies are exceptions). It makes little sense to open a small "excavation window" like a one- by one-meter or one- by two-meter unit and then go deep into a landscape where most of the material and associated features will be closer to the surface. Landscape archaeology provides a better option.

Landscape archaeology focuses on the cultural layout of the landscape, most often in terms of gardens, compounds, and similar landscaping and outbuilding exercises (e.g., Kelso and Most 1990; Yamin and Metheny 1996). Remember that archaeology is concerned ultimately with understanding how people lived in the past and thus needs to look at the patterning of the world that people left behind. For many historic sites, that patterning will not be artifacts only, but also the features in the landscape.

Some projects assign a number and/or letter to each excavation unit; others use grid coordinates. If both are available, it is best to use both, especially when labeling artifact bags. Where grid coordinates are used, all coordinate numbers should be given, not the coordinates of just one stake. For example, a one- by one-meter unit placed roughly fifty meters north and twenty meters east of the datum should be labeled on the bag and in the field notes as N50–51/E20–21. Use of all coordinates helps eliminates confusion, since the choice of stake used to identify a unit varies across the country as well as over time.

Figure 5.1. Example of shallow Phase II test units defining garden features in the yard of a historic residence. (Photo courtesy of R. Jerald Ledbetter and Southeastern Archeological Services, Inc.)

Controlled Surface Collection and Plowzone Removal

The other common Phase II procedure is a controlled surface collection. In parts of the country where ground-surface visibility is good and soil or sediment accumulation is not an issue, a site can be surface-collected as soon as the control system is established. In parts of the country where ground visibility is not good or where there is or has been an active soil, Phase II procedure may call for plowing and then harrowing the site, followed by selective plowzone removal. This is done only if there is evidence of previous plowing, and only if it is reasonably possible to do. In most cases, the field itself will be plowed, harrowed, mapped, gridded off, and then collected. A portion of the plowzone may then be removed, based upon the results of that surface collection. In these situations, the archaeologist is seeing where cultural materials are concentrated and whether any features—trash pits, hearths, postholes, foundation markings—survive beneath the plowzone.

If the plowzone is to be removed, mechanical means usually are used. Although the plowzone does contain archaeological information, stripping might still be better, justified on the basis of the overall needs of the project and consideration of the information to be gained by the stripping.

Most sites plowed for a controlled surface collection have a history of having been plowed. Thus, the artifacts already are out of horizontal and vertical position. If one thinks of artifacts as pixels in an image, then plow-

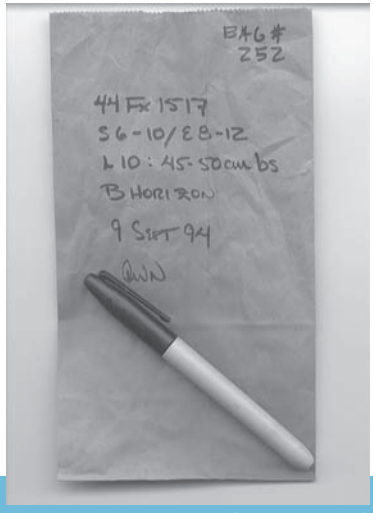


Figure 5.2. Example of a labeled artifact bag. The "field specimen" bag number has been added to the upper right-hand corner. All bags are to be labeled sequentially, with the labeling done each day.

TIP: Small Backhoes and Stripping Plowzone

Phase II and Phase III compliance projects may require using heavy earth-moving equipment. In areas where plowing is common, selective stripping of the plowzone may be done. Machinery should be selected based on size, type, and cost.

Some equipment may need modification. The most common piece of equipment used by an archaeologist will be a backhoe. "Backhoe," for an archaeologist, is the comparatively small, scorpionlike device that has a bucket end-loader at one end and a sixty-centimeter-wide bucket on a four-meter arm at the other. "Backhoe," in the construction industry, ranges from those small Bobcat™-like things that fit on the end of a pick-up truck to the large, track-tread machines used to dig foundations and move ore out of strip mines. The machine that is desired is termed on the West Coast a "backhoe-loader," the kind of backhoe, with tires, one would use to put in a sewer line.

Figure 5.3. Small backhoes often are used to dig deeper test units, strip areas, and even help backfill. Rental usually is by the day or half-day, depending upon the area, with the cost including both the equipment and the operator. The kind pictured here is most common; the bucket arm will reach fourteen feet (a little over four meters). Bucket width usually is sixty centimeters. (Photo courtesy of R. Jerald Ledbetter and Southeastern Archeological Services, Inc.)

Most backhoe buckets are toothed. When used, the teeth gouge a series of parallel grooves two inches deep. To avoid that damage to the site, a steel plate or cleanup

blade can be spot-welded to the teeth of the backhoe bucket. This is easier than removing the teeth. Doing this in effect converts the machine to the equivalent of a Gradall™, but at one-third the rental cost and with considerably greater maneuverability. (One has this set up by first explaining to the equipment owners what is needed and then asking them to spot-weld a plate or change out the teeth. They will be more than willing to do so if it can be done within reason. Construction people are very practical and equally intrigued by the archaeology. They will both help out with what is needed and will advise in how to best use their equipment to achieve your goals. Solicit their comments, and then listen to them.)

Figure 5.4. As crew members shovel-scrape, they are expected to recognize feature stains or patterns and then to place pin flags in those stains. After the area has been stripped, crew members will return to the pin flags, clean up the area, photograph it, and map the feature. (Photo courtesy of R. Jerald Ledbetter and Southeastern Archeological Services, Inc.)

People are fascinated by archaeology, and it is not unusual for a firm to give the task of working with the archaeologist to the senior equipment operator. The capacity of the operators we have worked with to use a backhoe with a cleanup blade is remarkable. We have seen them shave a centimeter from a three-meter strip.

The backhoe operator will remove most of the plowzone, perhaps all but a centimeter. The field crew will use flat-nose or cut-nose shovels to scrape away the remaining plowzone and define any existing features.

ing has blurred that image. Pulling back the plowzone to see what, if any, features may have been associated with—or even been a source for—those artifacts becomes an exercise in documenting site depositional integrity and a first step in assessing the behavioral-information potential of the site. The SOW will indicate whether any features are to be recovered, but normally when this is done for Phase II, features are only mapped and documented.

Most Phase II exercises of this kind will require that the stripped area be backfilled. It may be over a year before anyone returns to the site. Locating those reburied features will be difficult enough even with GPS coordinates and sound field notes. Therefore, mapping must be detailed and precise.

Nature of Field Recordation

Field recordation for Phase II excavation units is more parsimonious than in academic excavations. For example, unit floors usually are not photographed and usually are cut cleanly enough with a flat-nose shovel so that troweling is not needed. Unit walls will be cut by shovel, not by trowel; at this stage, what is important is that the walls are flat and plumb. Only one wall will eventually be troweled, but that will not be done until it is time to draw and photograph the unit profile. Measured field drawings will be done of features in unit floors, of the features themselves when excavated, and of a wall profile. With respect to photographs, representative or typical unit wall profiles will be done for each unit. And all features, of course, will be photographed.[6] There will also be a series of general-area photographs showing the lay of the land and perhaps the nature of the field work.

Traditionally, field photographs involved film cameras. Now, electronic cameras with digitally recorded images are affordable substitutes. Note, though, that low-end digital cameras give a false sense of clarity. Their initial images are coarse-grained compared with camera film. The image is made "clearer" by interpolating what image should exist between the pixels by using the surrounding bit of image as the base for fractals. The fractal is then used to fill in the blanks. However, tiny memory cards are welcome replacements to bulky, temperamental rolls of film. And laser printers can make multiple copies of reports containing digital color images. Nevertheless, in some cases it may still make sense to use film cameras in the field; after all, archaeologists do have an affinity for the

Figure 5.5. Panoramic view of project area. Panoramic views are made by overlapping photographs and give a much better sense of the landscape than do photographs with wide-angle lenses, since the perimeter of the image is not distorted. (The overlap is intentionally made apparent here to illustrate the process.)

past. Whatever is used, when taking field photographs, a menu board or white board should be used for detail photographs (figure 5.6), but not for general views of the project area.

Color photographs and negatives fade in a few decades, and black-and-white film is increasingly hard to obtain. However, digital images present an archiving problem as well. Some magnetic disks might last as long as thirty years, and some optical media might last as long as one hundred years. Already the media storage outlasts the technology that accesses it, and therefore there is a need to create long-term storage that will not depend on obsolete equipment (Hedstrom 1997; LeFurgy et al. 2005). Current practices include use of external long-term storage via Internet repository sites as well as on-site storage on hard drives, in addition to archiving paper copies of the reports and associated data.

Field Notes and Records

The field notes for the Phase II testing exercise should be kept in a three-ring, D-ring loose-leaf binder. Phase II field notes consist of the following:

- general project information, including maps, the SOW, and the permit (if applicable);
- general field notes as kept by the field supervisor;
- specific unit and unit-level notes kept by *each* test-unit crew;

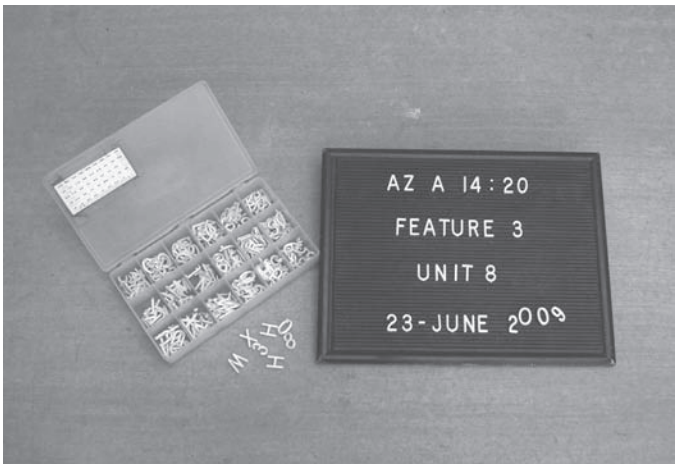


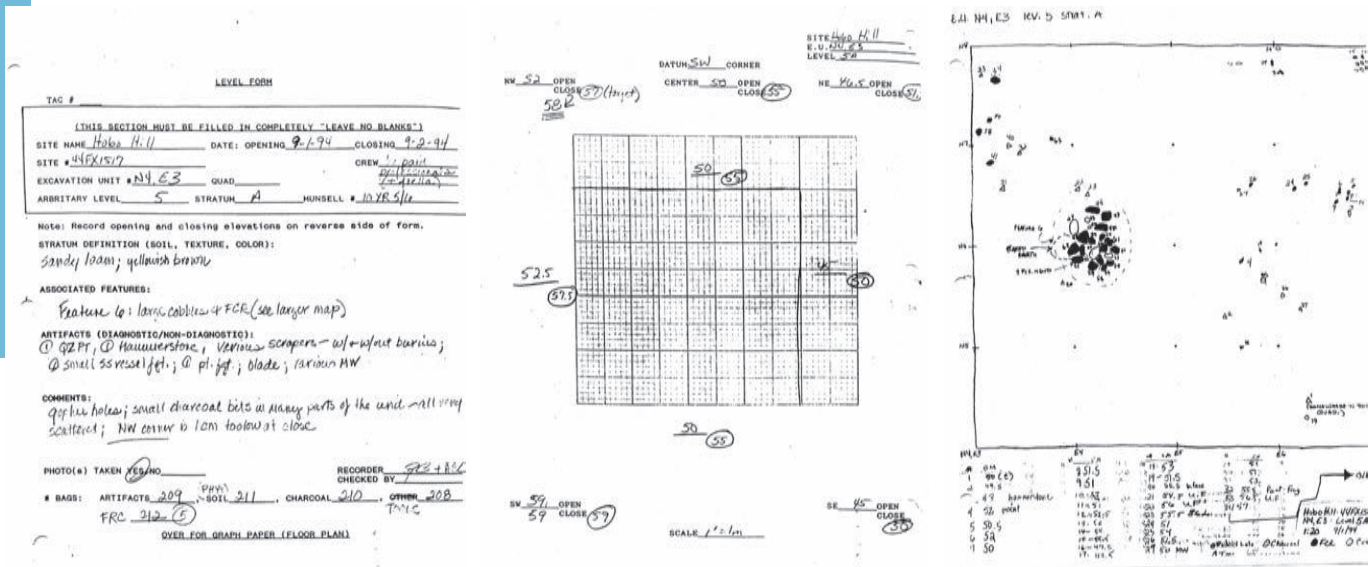
Figure 5.6. Photo menu board, along with presorted words.

- feature records; and
- other records, inventories, and logs.

Each of those information sets will be a general subsection within the field notes binder. At the end of the project, the binder will have proprietary corporate information removed and the rest of the information copied. Eventually, the original notes will be turned over to the client or a suitable curatorial facility, along with photographs, artifact collections, and a copy of the Phase II report.

The Phase II notebook will end up containing draft figures and tables to be used in the final report, progress reports, management summaries, and anything written on paper that has a bearing on the project. For larger projects, the Phase II notes may include other binders devoted to photographs, slides, drawn figures, and perhaps even tables. The notebook will be accompanied by a site map showing the locations of test units, controlled-surface-collection areas, and other relevant items. (Usually, a photo-reduced version will be placed in the binder.)

Each test unit has a specific series of field notes particular to it and maintained by the crew members assigned to that unit. Those records usually consist of standardized forms that the crew members fill out, often consisting of a cover sheet or form for each level. The forms will indicate



LEVEL FORM

TAG #

(THIS SECTION MUST BE FILLED IN COMPLETELY "LEAVE NO BLANKS")

SITE NAME Hobo H.11 DATE: OPENING 9-1-94 CLOSING 9-2-94

SITE # 46FX157 CREW

EXCAVATION UNIT # N4 E3 QUAD

ARBITRARY LEVEL 5 STRATUM A MUNSELL # 10YR 5/6

Note: Record opening and closing elevations on reverse side of form.

STRATUM DEFINITION (SOIL, TEXTURE, COLOR):

Sandy loam; yellowish brown

ASSOCIATED FEATURES:

Feature 6: large cobbles + FCR (see larger map)

ARTIFACTS (DIAGNOSTIC/NON-DIAGNOSTIC):

① QZPT, ② Hammerstone, various scrapers - w/+w/out barbs; ③ small ss vessel fgt.; ④ pt. fgt.; blade; various NW

COMMENTS:

Gopher holes; small charcoal bits in many parts of the unit - all very scattered; NW corner is lam toolsy at close

PHOTO(s) TAKEN YES/NO RECORDER CHECKED BY

BAGS: ARTIFACTS 209 (PHV) SOIL 211 CHARCOAL 210 OTHER 208 (TYPE)

FRC 212 (5)

OVER FOR GRAPH PAPER (FLOOR PLAN)

SITE Hobo H.11
E.U. N4 E3
LEVEL 5A

DATUM SW CORNER

NW 52 OPEN CLOSE 57 (Tan, P) 58

CENTER 50 OPEN CLOSE 55

NE 46.5 OPEN CLOSE 51

50 55

52.5 57.5 50

50 55

SW 59 OPEN CLOSE 59

SE 45 OPEN CLOSE 56

SCALE 1" = 1m

E.U. N4, E3 LEV. 5 STRAT. A

Figure 5.7. Example of a test unit/excavation unit record form. Such forms usually will be used both for Phase II and Phase III excavation. Here, the reverse side of the form is gridded for providing a scaled map of the unit floor. Store-bought graph paper serves as continuation sheets.

FEATURE FORM

SITE NAME (NUMBER) Hobo Hill 44FX1517 FEATURE NUMBER 5

DEFINITION (GENERAL SHAPE AND APPEARANCE) Post mold w/heavy charcoal inclusion

SCREENED? N MESH SIZE QUADS SAVED FOR FLOT Bag 189 for Flot.

E.U. S5W7 LEVEL 13C STRATUM

DEPTH OF TOP BELOW E.U. DATUM 102cm BELOW SITE DATUM

DEPTH OF BOTTOM BELOW E.U. DATUM 1/2 114cm BELOW SITE DATUM

MAX. LENGTH ca 15cm DIRECTION roughly circular MAX. WIDTH DIRECTION

MAX. VERTICAL THICKNESS OR DEPTH 12cm

ASSOCIATION WITH OTHER FEATURES None

NATURE OF FILL Dark brown fill with heavy charcoal inclusion

Bisection pit depth - 117cm

~~LINING~~ See excavation map for plan

Profile on back

SECONDARY FEATURES

ASSOCIATED ARTIFACTS

INTERPRETATIVE COMMENTS - Appears to be a post mold - the mold tapers at the bottom not to a point but rounded

PHOTOGRAPHS: (COLOR) (B/W) L. Moore

DRAW HORIZONTAL AND VERTICAL PLAN AND PROFILE

EXCAVATED BY BB DATES 8/25 THRU 8/26

RECORDED BY BB DATE 8/26

BAGS: ARTIFACTS____ FLOTATION 189 SOIL 188 CHARCOAL 187, 186 OTHER____

Bikin

0074J

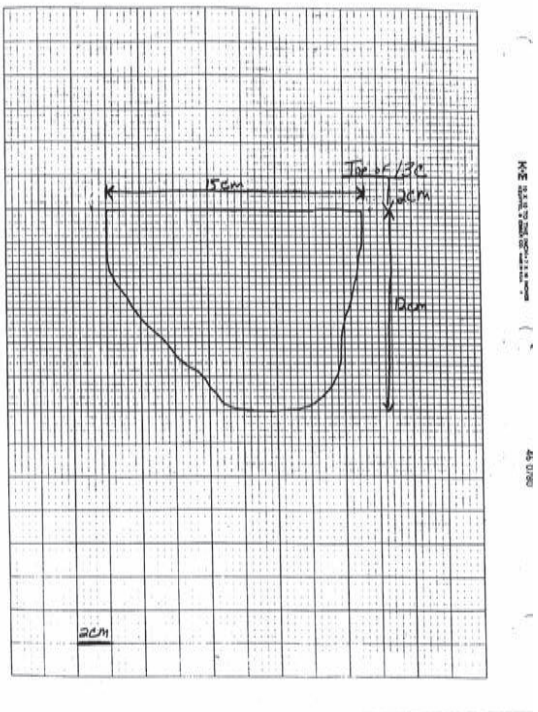


Figure 5.8. Example of a feature form. Features usually will be recorded separately in addition to whatever mention is made of them on the standard excavation unit form. Again, the same feature form normally will be used for anytime a feature is encountered, be it Phase II, Phase III, or even in those rare cases where Phase I shovel testing bumps into something. The reverse side of the form is gridded for scaled plane drawings and profiles.

site number, date, unit number, unit coordinates, level number, level depth, soil color/texture, associated features, notable artifacts, photograph numbers, elevation, and recorders.

If controlled surface collections are done, forms should be used for each of the collection areas. The form should include the collector's impression of where large concentrations of artifacts were located.

Feature records are treated similarly. A feature inventory sheet lists feature number, unit location, level and depth where first defined, date, and nature of feature. Other notes such as Munsell colors may be recorded as well.

Transit and mapping notes should be presented on a standard page form in the project binder. Most Phase II testing exercises generate a large number of photographs. Those photographs include general views of the project area as well as specific photographs of unit walls and of features. The photo log needs to include roll number and film type (for film cameras), exposure number/frame number, and nature of image. Direction of view should always be indicated, as should the metric scale in the image.

A bag inventory is essential. Each artifact bag should be assigned a bag number or field specimen number. There should be a master list in the field notebook that coordinates those numbers with the unit, level, and/or feature. The list may include empty bags, with a note alongside saying "empty" or "no artifacts recovered." This forces each test unit excavator to turn in a number of artifact bags equal to the number of levels removed and helps avoid bags being misplaced.

If soil, pollen, or flotation samples were taken, these should be tracked in the same manner as artifact bags.

Post-Field

The post-field phase of the project is similar to that of any traditional archaeological research effort, except that it must be finished by a fixed date not of the investigator's choosing. It also may have many people working on different parts of the project at the same time. On returning from the field, the tasks to be done are similar to those for a Phase I project. The biggest differences are in analyses and the literature review for the background research.

Discard Protocols

Not everything brought back from the field can be, or should be, kept. Some items need only to be counted and maybe weighed. After that, those items will be discarded, depending upon the nature of the project, SHPO/THPO and SOW requirements, and the concerns of the project manager.

A Federal SOW typically requires that all artifacts recovered in the field be retained, regardless of their age, size, or abundance. Further, Federal regulations prohibit discarding artifacts that have been accessioned. Therefore, some Federal agencies frequently allow the materials collected in the field to be culled before accessioning. This can make quite a difference, especially on historic sites. For example, we once encountered twenty-centimeter-thick lenses of broken window glass when doing a Phase II testing project, the site being the debris cleared from when the town burned in the 1860s. The glass represented approximately 1,120 kilograms for each of the six test units. We spoke with the Federal agency about the lack of need for the world to curate almost seven metric tonnes of broken plate glass. The agency agreed and suspended its artifact retention policy, and the bulk of the glass was discarded on-site.

In many areas of the country, fire-cracked rock will be counted, weighed, and then discarded. For some projects, though, it may be important to first track the kind of stone involved. In areas of the country with huge volumes of prehistoric pottery, sometimes any body sherd smaller than a certain size is weighed and discarded.

All projects and firms will have a discard policy. It is important to know not only what that policy is, but what it is meant to accomplish relative to the needs of the project.

Level of Analyses Expected

The Phase II analysis is a detailed interpretive analysis of a given archaeological site, in terms of its depositional structure, its archaeology, and its place in local and regional culture history. The testing performed rarely is sufficient to provide final answers to standing research questions as set forth in the state historic preservation plan or present in the literature, but the results *are* sufficient to contribute to the basic understanding of the region's history or prehistory. As such, new knowledge will be produced and presented in the report, knowledge that furthers understanding of the area's past. It is possible that the information will be redundant and lack the potential to provide a unique contribution to our understanding of the past, but it is just as possible that it will have such potential. The only way to tell is if the analysis itself is sufficiently detailed.

The analysis should provide the following:

- detailed treatment of the site matrix so that questions of depositional integrity can be addressed;
- identification of diagnostic artifacts, including relation to a specific period or culture, and depositional context;
- basic measurements and descriptions of appropriate artifacts;
- location of components vertically and horizontally across the site, often with the distributions verified statistically;
- if appropriate, statistical relationships among artifacts and features; and
- relationships between the contents of the site and the larger body of research about the history or prehistory of the region, including linkages to standing research questions in the literature and in the State Plan.

Specialized analyses may be warranted to advance particular analytical sets. For example, high-magnification use-wear analyses may be done on the lithic applications industry to relate tool use to site function and to intrasite activity areas. Questions of seasonality and settlement pattern may be handled through the specialized analysis of flotation samples if such samples were specified in the SOW. Radiocarbon dates may have been requested as well.

Addressing the Basic Phase II Issues

The basic Phase II issue is whether or not the site is eligible for listing on the National Register. Broadly speaking, there are two sets of criteria. One has to do with the site's integrity relative to the reasons it would be listed. The other set of criteria is the nature of the site's association with the past. The determination of Register eligibility will be made by the lead agency. The field archaeologist does *not* determine significance but provides the data for the Federal Agency, in consultation with the SHPO/THPO, to make a determination.

As mentioned in chapter 2, integrity is a complex issue. For Register eligibility purposes, it basically means how true the cultural resource is to

the reason it might be considered for listing. For example, is this really the log cabin in which Abraham Lincoln was born? Is the log cabin really where it was originally located?

For buildings and such being considered for listing on the National Register, integrity may well have to do with how true the cultural resource is to what it originally was like. For archaeological sites being considered in terms of being archaeological sites, the issue gets a bit fuzzier, since one aspect that differentiates an archaeological site from a mishmash of stuff is that the site has the artifacts and features in their original context and association. Integrity, then, can and often does involve the question of how undisturbed the archaeological deposit is.

Site depositional integrity usually forms the independent criterion in making a recommendation about Register eligibility. In situations where Register eligibility involves the site's ability to contribute to research questions, then integrity often has to do with how intact or undisturbed the deposit is. If the integrity of the deposit has been compromised, then the information potential of that deposit is likely compromised to some degree. The question is, though, is it sufficiently compromised to make the site unable to address the research gaps identified?

Integrity is a two-variable issue. The first is physical disturbance, which would include plowing, fill events, and similar disruption. The second issue for integrity is that of relativity. How disturbed is the site *relative to* other examples? A heavily plowed late prehistoric site in Alabama, where only the bottom ten centimeters of some posthole stains survive and everything else is in the plowzone, probably would not be recommended for listing on the Register. There are plenty of much-less-disturbed examples already known. A Paleoindian site with exactly the same physical attributes *would* likely be eligible, since Paleoindian sites that have even partially intact deposits are unusual in the eastern United States. Depositional integrity partly depends on knowledge about similar sites within the jurisdiction of the SHPO.

Culture resources are managed at the state or local government level, and comparisons need to be made based upon those bounds. Eligibility is on a case-by-case basis; evaluation of the merits of a property does not hinge on consideration of other historic properties. This might seem to contradict what we just said about "relative integrity," so we had better clear that up.

We learned about archaeology from that . . . Providing Adequate Documentation: Secondary Deposition at Cowanesque

The Cowanesque Reservoir in extreme north-central Pennsylvania is maintained by the U.S. Army Corps of Engineers. Expansion necessitated Phase I, Phase II, and Phase III projects, mostly conducted by different firms. We directed a Phase II project that illustrates the importance of substantiating conclusions presented within the compliance report.

Two Phase I surveys had indicated the presence of a prehistoric site with what seemed to be data potential on a floodplain terrace about two meters above the Cowanesque River. Each had recommended Phase II testing, although it appeared that the site was indeed Register eligible. The SHPO agreed with that recommendation, and it fell to us to do the Phase II and examine the potential Register eligibility of the site.

Testing consisting of shovel tests and small units, recovered prehistoric waste flakes and historic coal, window glass, and ceramics, from the upper thirty centimeters of the units closest to the edge of the terrace. We concluded that the site lacked data potential or integrity: all of the cultural material came from what had been the plowzone, and that material was not diagnostic. The site was not, in our view, eligible for the Register. We then reported that, concluding that no further work was needed.

These results contradicted the Phase I reports, and the Pennsylvania SHPO legitimately challenged them: how could *two* Phase I reports conclude that the site had data potential and integrity, while our Phase II assessment concluded the opposite? Our draft report was returned to be revised in accord with Phase I conclusions. Clearly, more details were needed.

A total of fifty-three artifacts were recovered, forty-one (77 percent) of which came from the Ap horizon. We found that their average weight was between 0.1 gram and 0.2 gram (0.01 gram to 0.3 gram range). Further, none of the materials recovered in Phase I were in their original context. We, therefore, argued that the prehistoric and historic cultural materials had been carried downstream by the river and redeposited on the terrace during a flood, and that this had occurred after valley clearance and the start of cultivation. The reason that all of the artifacts, regardless of age or material, weighed the same was that they had been size-sorted during the flood and deposited at the same time.

The materials were found together in the plowzone because historic land clearance increased runoff and river velocity sufficiently for floods to have enough force to pick up and move cultural materials. When water crossed the terrace at the end stages of the flood, the flow velocity decreased, and the larger particles, like the flakes and glass, dropped out. This also explained why everything was in the plowzone. The event or events carrying the prehistoric and historic materials downstream had happened *after* Euroamerican settlement of the watershed.

This is a cautionary tale. The response of the SHPO to the Phase II draft report was proper. It is the responsibility of the Phase II project to supply thorough documentation on why the site is or is not eligible for the National Register.

Just because a given type of site is already listed on the National Register—say that undisturbed Mississippian site we just mentioned—does not mean that other undisturbed Mississippian sites are not Register eligible. They most likely would be. It is sort of like an unspoken threshold exists that, once reached, means that the site can join the others in the glory of National Register-dom. However, to carry that threshold image a little further, severely disturbed sites simply would not merit consideration, since equivalent undisturbed sites do exist.

Comparisons with other properties become even more of a factor in dealing with mitigation. Just because a site or other historic property is listed on the National Register does not mean it cannot be destroyed. Rather, it means that its existence needs to be taken into account before work proceeds. If there is no way to avoid destroying that property, then usually the recommendation will be to recover enough information about the property—be it an archaeological site or a standing structure (colloquial sense)—before it disappears. But if there is a situation where there is limited funding and more than one Register-eligible archaeological site that will be lost, the decision—a triage decision, really—may be to abandon to fate the site or sites for which there are a lot of equivalent examples elsewhere.

After treating the question of data potential, the second broad issue is whether the information content of the site could contribute to what is known about the past, be it people, events, ways of making or doing things, or how people lived. Historic sites usually involve any of those four options; prehistoric sites usually involve only the last, also called "data potential."

The professional archaeologist does not make a determination of National Register eligibility but does make a recommendation of what the lead agency should do. The agency generally will follow the archaeologist's advice. The issue comes down to this: is the site worth a full-scale data recovery excavation? If funding is limited, the answer may be "no" if there are comparable sites with similar or better information already known; the answer may be "yes" if there are no comparable sites.

General Structure of Report

The Phase II report contains background information, methods, analyses, results, and recommendations. The general structure of a report is addressed in chapter 7.

The two options for recommendations are that the site is eligible for listing on the National Register, or it is not. If the site appears eligible, the report indicates whether or not the proposed project would compromise that eligibility, that is, create an adverse effect. For example, putting an asphalt parking lot over a site that is forty centimeters below the surface might do more to protect the site than damage it and might not be seen as an adverse effect at all. Thus, the question is whether there will be adverse effects from the undertaking. If the property is not eligible, then any impacts to it are not "adverse" in the regulatory sense.

If the project would have an adverse effect on a site, the options are either to redesign the project to avoid damaging the site or to recover enough information from the site so that the continued existence of what remains will be redundant in terms of data. The adverse effects can be resolved or mitigated through changes to the project or through data recovery.

Sometimes the project cannot be redesigned to avoid adverse effects. In that case, the Phase II report will recommend Phase III data recovery to mitigate the adverse effects of the project. Again, however, it should be remembered that the contracting archaeologist simply makes the recommendations—any decisions about what to do are made by the Federal Agency, in consultation with the SHPO/THPO and any Indian tribes that attach cultural or religious significance to the site.

Chapter Summary

The Phase II testing and evaluation process is the second part of the good-faith effort expected of agencies in their required accounting for cultural resources—here, archaeological sites—that could be listed on the National Register. With Phase I, the professional archaeologist will have gone over the area that could be adversely affected by the proposed undertaking. Some archaeological sites may have been previously reported; others, heretofore unknown, may have been found. The question now is this: Are any of those eligible for the National Register?

Phase II testing is similar in many ways to traditional archaeological site testing. Some background research will be done, but that research will be focused more on the kind of site that will be examined and less on the region as a whole. The broader work would—or should—already have been done during Phase I. The background issues now are those specifically associated with questions of Register eligibility as summarized in 36 CFR 60.4 [a–d]: Association with nationally, regionally, or locally important events [36 CFR 60.4 (a)] or people [36 CFR 60.4 (b)]; an exemplary example of a style or craftsman's work [36 CFR 60.4 (c)]; and/or potential to address important research questions [called "data potential"; 36 CFR 60.4 (d)]. Phase II might best be thought of as a diagnostic step; the background research provides the context for the diagnosis.

Preparation for a Phase II project differs a little from that for a Phase I survey. Most Phase I surveys are short and done close to the home office. Phase II testing exercises often take more time and may end up being done a long way from the office. Logistics planning often includes billeting and per diem as well as transportation both for equipment and crew. In those respects, a Phase II project is like a traditional archaeological excavation project, although smaller and briefer.

The field component of a Phase II testing exercise is similar to any archaeological testing regime. The only differences—aside from how quickly the work will be done—involve a need to confirm any landscape history based upon vegetation and soils, and often a bias toward digging the more artifact/feature-rich parts of the site. Of the four National Register criteria listed in 36 CFR 60.4 [a–d], the first three—association with events, people, craftsmanship/style—often can be resolved with historical research. When they cannot, the issue turns essentially forensic and evidentiary, and in many respects data needed to address that turn of argument are the same as those needed to assess research potential. Put a bit more simply, the idea is to get as much information on the artifacts, features, and matrix of the site as can be had that may have a bearing on why the site might be Register eligible, but with the least amount of digging. Thus, Phase II testing often tries to dig in the richest—in terms of artifacts and features—part of the site.

The analysis done on a Phase II archaeological site is the same as for any full-scale excavation, although usually there is a lot less to worry about. The detail and resolution of analyses are the same. Thus, radiocar-

bon dates are not uncommon, nor is high-magnification use-wear analyses of prehistoric lithics. The resultant Phase II report is usually comparable to a standard archaeological site monograph. Phase II site monographs normally represent primary empirical excavation data for the archaeology of their region.

However, the main reason that Phase II testing is done is to evaluate a site, identified during Phase I, to see whether it might be eligible for listing on the National Register. The report, while also reporting the research archaeology, still is slanted to addressing—yea or nay—that core compliance question.

The Phase II report will contain all of the information, along with the archaeologist's own sense of what is present, to allow the government agency to make a determination of Register eligibility. As with the Phase I report, a draft will be submitted to the agency (and often, with prior agency approval, to the SHPO/THPO as well) for substantial in-house peer review. And, as with Phase I, payment of a portion of the contract award will depend upon approval by *both* the agency and the SHPO/THPO (another reason why the rather simplistic protests that professional archaeology is enslaved by profit are naive; it is the agency and the SHPO/THPO that will decide whether the work is adequate and therefore whether the contract has been satisfied).

The archaeologist in the Phase II report will conclude either that the site does not have the quality of significance as defined in 36 CFR 60.4 [a–d] and therefore is not eligible for listing on the National Register; or the archaeologist will conclude that the site does meet those criteria and should be considered eligible. If the agency and the SHPO/THPO agree the site is not eligible, the compliance issue ends; the artifacts, field notes/records, and final report are turned over to an appropriate curatorial facility; and the project is over.

If the agency and the SHPO/THPO agree that the site is eligible, the process becomes much more formal and deliberate. With a Register-eligible site, the issue is to "take it into account," meaning work around it if at all *practical*, and recover from it enough information to make the existence of the threatened portion redundant if avoidance is *not* practical. The Phase II report will contain recommendations about how to proceed. Those recommendations will become the basis of any Phase III data recovery plan.

Additional Reading of Interest

Internal Revenue Service (IRS). *Per Diem Rates*. Internal Revenue Service Publication 1542. Washington, D.C.: U.S. Government Printing Office. http://www.irs.gov/publications/p1542/ (Jan. 5, 2009). Per diem can become a real issue for field workers. Any student who goes on to work in professional archaeology will likely be dealing with per diem. Since project hires may be receiving a per diem roughly equal to three–five hours of work per day, it is important to understand how much of that per diem is really tax-free.

Kelso, William M., and Rachel Most, eds. *Earth Patterns: Essays in Landscape Archaeology*. Charlottesville, Va.: University Press of Virginia, 1990. Not all Phase II test excavations need to go deep; historic sites have comparatively shallow deposits, and all that may be needed is to open a large area to see whether there are signs of outbuildings or gardens. Kelso and Most have assembled here a wonderful introduction into how landscape archaeology—in the sense of digging to understand how landscapes were set up—can be done. Kelso, by the way, is the person who found the original Jamestown settlement (see www.apva.org).

National Park Service. *Guidelines for Evaluating and Registering Archeological Properties*. National Register Bulletin. Washington, D.C.: National Park Service, 2000. http://www.nps.gov/history/nr/publications/bulletins/arch/nrb36.pdf (Jan. 1, 2009).

U.S. Army Corps of Engineers. *Safety and Health Requirements Manual*. EM-385-1-1. Washington, D.C.: U.S. Government Printing Office, 2003. http://www.cdc.gov/eLCOSH/docs/d0100/d000100/d000100.html (Jan. 1, 2009). Unlike Phase I survey work, Phase II testing can and often does go deep into the ground. This raises issues of shoring and ground stability. The *Manual* sets out much of what is needed to be known about excavation shoring. The *Manual* also provides basic information on project/construction site safety. Such procedures need to be followed on Federal projects anyway. Good managers will follow them even on non-Federal projects.

CHAPTER SIX

THE PHASE III PROCESS

MITIGATION THROUGH DATA RECOVERY

Initiation of a Phase III Process

If the Phase II testing leads to a determination that the archaeological site is eligible for listing on the National Register, the Section 106 Process calls for a series of formal steps (36 CFR 800):

- determinations of adverse effect;
- distribution of past assessment results (often, Phase I and Phase II reports) to all consulting parties and invitation for public comment;
- production of a Memorandum of Agreement (MOA) specifying steps to mitigate or resolve any adverse effects of the undertaking; and
- mitigation of those adverse effects, either through redesign of the project (avoidance) or through archaeological data recovery.

Phase III data recovery commences when avoidance is not reasonably possible and when excavation or comparable archaeological investigation is deemed the most appropriate way to mitigate or offset the adverse effects. Phase III attempts the recovery, analysis, and dissemination of the anthropological (human behavioral) information stored within the threatened part of the site matrix. The idea is to make the continued existence of the portion of the threatened site *redundant* (a rather controversial idea).[1] If successful, the site's information potential is captured by the process and contained in the archaeological assemblage, field records, laboratory analysis records, and report.

Phase III data recovery is similar to the formal, full investigation of a site conducted by researchers from a university or museum. However, it differs in three ways. First, the Phase III site has been selected for data recovery by circumstances (e.g., a pending development or undertaking) rather than because it could address a pre-existing research design held by a particular investigator. The site will be examined because it, or part of it, soon will be destroyed.

The second difference is limits on funding and time. Not everything that one might want to do can be done. Funding and time are limited by many factors, such as accruing interest on loans and planning variances. Instead, it is almost always best to stick to the tasks outlined in the SOW, since the work or level of analysis stipulated there was designed and then bid to take into account the time and funding limits of the project. The professional must also remember that it is the client who is underwriting the exercise and who has set budget relative to the Phase III SOW. The archaeologist does the best that can be done given the limits in funding and time.

The third major difference is in the consequences faced if the work done is not exceptional. Like archaeologists in a university or museum, the private-sector archaeologist accepts responsibility for what he or she has produced. Unlike them, errors in the private sector, even errors made in good faith, are much more likely to result in immediate and tangible penalties, ranging from delays in final payment on the project to major suits and fines. Similar penalties exist for failure to finish a project within the schedule outlined in the SOW.

Responsibilities and Perspectives

It is well at this stage to make some comments on how Phase III data recovery, as both a compliance exercise and a research project, works. There has been some misunderstanding among academic archaeologists about this, a confusion that has been passed to students and that has surfaced time and again among new hires—especially those with advanced degrees—in private-sector firms and in government agencies. Cultural resources archaeology practiced in a professional setting is so unlike the way in which archaeology has been taught that some remarks are needed.

First, it is important to remember that the client is the entity underwriting the data recovery exercise. The client is doing so—from its

perspective—as part of the overall permitting process. Costs are not being borne to satisfy the archaeologist's intellectual whims of inquiry; costs are being borne by the operating margin built into the client's overall financial structure. Accordingly, sometimes a plat notation or a protective covenant, resulting in no further construction, will make better economic sense than funding a Phase III exercise in order to continue the project. In cases like that, the developer or contractor can take the reduced value of the property (because its development potential is limited) as a business loss.

However, no developer or contractor is in the business of taking losses. Further, the line between built-in operating costs and profit margin is very thin; some Federal agency contracts, for example, limit the profit that government contractors can take. If costs become prohibitive, the client may just cut and run. This is, perhaps, a real-world application of Lewis's *limited good*: there will come a point where every dollar spent by a client to work around a compliance problem will be a dollar taken from payroll. No company wants matters to reach that point. A good company manager will want to avoid endangering employees.

Scheduling and finance limits result in the data recovery being designed to get the maximum information from the imperiled resource with the available means. Into this will enter the SHPO/THPO or analogous agency, charged with protecting the cultural resource database. The

Some Options for Avoiding Adverse Effects

Phase III data recovery is also called mitigation because full-scale excavation is seen to mitigate or offset the adverse effects of the proposed undertaking. However, an excavated site is still a destroyed site, even if much of the information is saved. Data recovery is always to be viewed as the option of last resort; if there is a way to avoid having the site or its threatened portion destroyed, then it is preferable to adopt that strategy. There are many options. Some of the more common involve

- redesigning the project so that it does not damage the site;
- restructuring the use of the property so that the site cannot be damaged;
- trading one portion of the property to the public jurisdiction in exchange for another portion; or
- selling or giving the land to a land trust or other conservator.

SHPO/THPO is made up of people with agendas often at variance with those of the developer, sometimes at variance with those of the private-sector archaeologist and the Federal Agency, and—rarely—even at variance with those of the ACHP.

Professional archaeology has been at a crossroad ever since the Section 106 Process emerged. There are serious issues involved, and this is as good a place as any to mention them. A common statement among the academic community for many years, seldom mentioned in print, was that the professional was "in the pay of" a particular client and therefore would do what needs to be done to get the client to avoid paying any more than necessary. While it might still be found in a number of archaeology and introductory anthropology text books, that charge reflected an ignorance of how the entire process works. This danger was anticipated when the regulations found in 36 CFR 800 were first worked out; it has never really become a problem.

How is this potential conflict of interest avoided? It is avoided primarily through the review process. There are two issues here that get mixed up: doing what is best for the client in terms of costs, and doing what is best for the client in terms of how the client's actions will be judged by the review agencies. The potential conflict is avoided by separating the steps in the decision-making process while at the same time keeping the client's interests and needs at heart.

What is best for the client in terms of costs is always what is best in terms of how the archaeologist's work, as a subcontractor, will reflect on the client. For the client's project to continue generally requires that the archaeological work performed by the professional archaeologist be completely approved by the state's or the tribal land's apologist for the cultural resources: the SHPO or the THPO. And to be so approved requires not only completion of a stringent peer review by the SHPO/THPO archaeologists, but often an equally stringent peer review by Federal Agency archaeologists. The review agencies have the power to pull permits; the review agencies have the power to stop the client. The client already has locked into bank loans and has people on payroll. The client cannot afford to sit still. The professional archaeologist must provide a research design (for the Phase III data recovery), an analysis, and a report that will meet the requirements of the review agencies. The better the report, the faster the review and consequent permitting. The final arbiter in the compliance

process is the government review agency; the archaeologist works and writes not simply for the client, but on the client's behalf for the review agency, which then will decide the client's fate.

As a professional, the archaeologist has a responsibility to the resource base. This includes consideration of artifact processing, analysis, and storage. The responsibility extends beyond filing of the report and approval of the project. In planning the Phase III, the archaeologist must be considering how the recovered materials are to be treated and where they end up, ensuring they will be archived in an accessible and stable manner. Such ongoing responsibilities may be difficult for a client to understand, especially in terms of the time and effort needed to accomplish them. Thus, the archaeologist has to be an advocate for the follow-through requirements of the profession and strategize accordingly.

Memoranda of Agreement (MOAs)

A major element entering the scene when Phase III mitigation is envisioned is the Memorandum of Agreement. A Memorandum of Agreement, or MOA, is a signatory contract regarding the continued pursuance of the cultural resource process. It is meant to be a formal agreement between the agency and the SHPO or the THPO

1. stating that a Register-eligible site or sites were identified during the Phase II process (or agreeing that the site already is listed or eligible for listing on the National Register),
2. considering whether the planned undertaking will have an effect on that site or sites, and then
3. summarizing what needs to be done to mitigate the effects on the site or sites from the undertaking, should those effects be considered adverse.

An MOA is executed when cultural resources eligible for listing on the National Register were identified within the area of potential effects during the Phase II testing process. In such a situation, the Criteria of Adverse Effect [36 CFR 800.5 (a)] will be applied by the Federal Agency, working with the SHPO/THPO. This ultimately results in one of two

conclusions: the undertaking will significantly change the character of the resource (that is, have an adverse effect), or it will not.

If the agency and the SHPO/THPO agree on the effects of the undertaking (adverse or not) as well as on any necessary actions, then an MOA will be composed, a copy along with any other summary documentation sent to the Advisory Council for Historic Preservation (ACHP), and the undertaking will continue. In this situation, the agency and the SHPO/THPO are signatories to the MOA.

If the SHPO/THPO disagrees on the terms of the MOA or refuses to sign the MOA, then the agency will ask the ACHP to join the consultation. The ACHP must receive documentation relevant to the situation for a 30-day review period while the Federal Agency advises the SHPO/THPO.

In the case where the SHPO/THPO cannot agree and/or refuses to sign, the MOA can go into effect as long as it is signed by the ACHP and the agency. If the ACHP agrees with the Federal Agency (or suggests changes that the Federal Agency accepts), then the Federal Agency needs only to comply with whatever the MOA (with any changes) set out. The ACHP instead of the SHPO/THPO becomes one of the two signatories to the MOA, and in effect the SHPO/THPO will be overruled. If the ACHP and the Federal Agency cannot agree, the Federal Agency retains the final decision-making authority, and the project can proceed without an MOA. However, this course of action is rare; most agencies will be reluctant to proceed with a project against the wishes of the ACHP since this makes the agency legally vulnerable.[2]

Only the signatories—the agency, the SHPO/THPO, and/or the ACHP—have the power to amend, execute, or end an MOA. Other consulting parties may be invited to sign as well ("invited signatories"), but their refusal to concur or to sign the MOA does not invalidate the MOA. However, good problem-solving policy calls for inviting signatory parties early in the consulting process.

In nearly all cases, the Federal Agency and the SHPO/THPO will be in agreement. Both will work together to develop a way that offsets what otherwise would be adverse effects to the character of the cultural resources. That solution may be a redesign of the project, or it may be some kind of data recovery. The agreement incorporates into the MOA and initiates the formal process of Phase III data recovery or other appropriate response to the project.

Data Recovery Plan

The *data recovery plan* may be developed in the Phase II report, or it may be a separately assembled, stand-alone document. If it is the latter, then it may have been solicited through a competitive RFP. The data recovery plan forms the basis for the Phase III RFP and SOW.

The data recovery plan addresses six topics, usually in this order:

1. an outline and background of the project history;
2. a brief review of the environmental setting for the site and project area;
3. a summary of the discovery and exploration of the site thus far;
4. a summary of the prehistory and history as they pertain to the site;
5. a detailed description, probably repeating the Phase II arguments, of how this particular site can address the research questions listed; and
6. a plan for actually getting the data from the site to address the research questions.

Project History and Background

A data recovery plan begins by summarizing the history of the undertaking, the structure of the local and regional environment, and the previous archaeological research. The history of the undertaking puts the proposed data recovery in the context of the larger project design. It shows why data recovery and not redesign of the project is the best way to mitigate adverse effects.

The data recovery plan also presents a synopsis of the environmental setting. What is the nature of the vegetation? The faunal community? The soils? The geology? What were these like in the past, especially around the time the site was occupied? What are conditions like now? The environmental background does two things. First, it puts the archaeological information into a broader ecological context so that past life can be best understood. Second, it details the physical structure of the site and the nature of the deposit.

Finally, the background section of the data recovery plan summarizes previous investigations of the site. What work has been done at the site? When was it done? Who did that work? What were the conclusions? What was the nature of the deposit? What work has been done to consult with Indian tribes and other cultural groups? This part of the data recovery plan generally is not very long. It naturally organizes itself in the chronological order of the site investigations. The methods of previous investigations are covered: What was the nature of the Phase I or Phase II programs? What are the field conditions for the site? If prior subsurface work was done, how much was excavated, to what depth, and in what way? How and where were the test units or shovel tests placed? How was the fill processed? What was found? In addressing those questions, the archaeologist reviews everything previously written and discussed about the site.

Place of Site in Overall History/Prehistory

With the background reviewed, the data recovery plan then details how the site fits into the overall understanding of the greater area's history and/or prehistory. What kind of site is it? How old is it; or more specifically, with what cultural historical period is its Register eligibility associated? How does it relate to standing questions about the past, such as seasonal movements, expansion of settlement frontiers, or structure of emerging social classes? This involves assembling a refined background on the history and prehistory that pertains to the contents of the site. This will require

- reviewing the standard local, regional, and national journals;
- examining monographs and other book-like publications in professional or academic libraries;
- contacting the local libraries for manuscripts and other records that may have a bearing on the site; and
- accessing the compliance reports, located at the appropriate SHPOs/THPOs or state site files, of similar sites (a substantial part of the existing literature on the archaeology of an area is now located in compliance reports).

Assembling this part of a data recovery plan is just a standard scholarly literature search.[3] The data recovery plan requires a detailed discus-

sion of what is known about the archaeology for the cultural-historical period with which the site is associated. For single-component sites, this is comparatively easy. For multi-component sites, this approaches a sustained synopsis of what is known for the period—and associated cultures—represented by the site. Compliance reports are a particularly valuable source since they contain the bulk of information gathered in modern field research. The literature review for the data recovery plan requires more than locating and sensing the contents of previously written material. The material must be drawn together into a cogent whole relative to the site being considered.

Research Issues

The status of a site's known historical or prehistoric archaeology sets a context. How does the site itself relate to that context? What questions does it appear capable of answering? The two issues addressed at this point by the data recovery plan are the nature of the site relative to standing research questions and the core reasons why this particular site is considered significant in terms of the Section 106 Process.

Having reviewed what the site is known to contain and the history or prehistory relevant to the site, the next step is to explain what the site could do to expand our understanding about the past. This step depends on the literature search and on the research issues in the state historic preservation plan.

The Phase II report gives the reasons why the site is eligible for listing on the National Register. The report also should have identified the research questions that can be addressed by the site and a general idea of the types of data (for example, lithics, macrobotanical remains, materials that can be radiocarbon dated, etc.) needed to answer those questions. In the data recovery plan, these issues are expanded to clearly articulate how the data will be gathered and manipulated to address the specific research questions posed. The research questions will help structure what types of field and analytical methods are most appropriate. It is never possible to collect everything there is to collect from a site; neither is it possible to conduct all types of analyses on all of the recovered remains. Therefore, it becomes important to be explicit about the questions that are to be investigated for any given project and what methods are most important for addressing those questions. The importance of a carefully thought-out

We learned about archaeology from that . . . Matching Field Methods to Research Design

La Ciudad de Los Hornos is a prehistoric village site located in what is now Tempe, Arizona. The site was excavated by SWCA, Inc., Environmental Consultants, to mitigate the effects of a planned road construction project (Chenault et al. 1993). A testing phase conducted prior to the initiation of the Phase III project indicated that the site had been occupied nearly continuously between about 300 and 1150 AD. Test excavations, which exposed less than 3 percent of the site, uncovered 145 features. Because of the small area encompassed by the testing, the total number of features in the project area was undoubtedly far greater.

In the absence of an unlimited budget, the archaeologists recognized that they would have to make decisions about what areas of the site would be excavated and what level of effort would be put into those excavations. Through data obtained during the testing phase, it was already known that the uppermost sediments contained little or no archaeological information. The cultural deposits began in Strata III; above this was a layer of plowed sediments (Strata II) capped by sterile fill brought in during the historic period. Accordingly, the uppermost sediments were removed by mechanical stripping, which continued until the features were visible in plain view.

Excavation focused on fifty-eight architectural features as well as a number of nonarchitectural ones. Because it was not possible to excavate all features, efforts were focused on those structures that exhibited a high degree of preservation and exhibited a high likelihood of revealing information relevant to the research questions that had been posed. Excavation techniques were designed to balance the need to excavate as many structures as possible with the need to obtain as much information as possible from each structure. Although all of the fifty-eight structures that were excavated were fully dug, only the fill from one-quarter of each structure was screened. The remaining deposits were unscreened until the floor fill level was reached, at which point all floor fill sediments were screened. All screening was conducted using a quarter-inch screen.

However, even by screening the floor fill it was recognized that some cultural information was being lost. The loss of information was particularly significant for one structure, Feature 66. This feature was a large, oversized room, typical of rooms found on other sites that had been identified as communal structures. But this identification rested entirely on the structures' sizes; their actual function had never been evaluated. To address this issue, the researchers wanted to investigate how Feature 66 had been used. Was it a habitation room, perhaps for an "elite" family of the village? Or had it been used for communal storage? Or, perhaps, had communal ritual activities been conducted there?

To address this question, artifacts associated with the use of the structure were needed. Unfortunately, however, the room had been cleared out upon abandonment;

no intact floor assemblage was found. To overcome these problems the researchers selected to conduct microsampling of the structure's floor. Samples of the floor plaster were taken, which were then subjected to a combination of microscopic examination, flotation analysis, and pollen analysis. The results indicated the presence of microlithics and microbones, indicating that lithic production and food production or consumption had been carried out in the room. These data were similar to what was found in other habitation rooms, suggesting that Feature 66 had been used for everyday domestic activities. Although the findings did not rule out that the room was also used for other purposes, it did help address the question of how the room was used.

This project demonstrates the importance of carefully considering the research design when developing the methods to be used. As is always the case, compromises had to be made. Some information was sacrificed to obtain other information. Rather than sticking to a "standard" excavation methodology, the researchers elected to modify the methods—even using experimental, nonstandard methods—to the specific site and research questions at hand. Of course, this meant that some information was lost. For example, by not excavating all of the features at the site, certain questions about intrasite and interhousehold relationships could not be addressed. However, the methods that were used ensured that the most information would be retrieved, given the project budget and the information gaps identified.

data recovery plan cannot be overemphasized; the research questions selected influence not only the types of analyses recovered but how the site should be excavated.

Physical Characteristics of Site and Data Recovery Plan

The last section of the data recovery plan sets out a detailed procedure to extract the data that will address the research questions that have been identified for the site. Two factors are addressed:

- the nature of the site matrix (this is the physical structure of the medium for which the archaeologist must develop a data extraction strategy); and
- the best approach for recovering the archaeological data contained within that matrix.

The first issue involves the structure of the site itself and how the actual excavation should proceed: What has previous work revealed about

the physical character of the deposit? What was indicated about the horizontal dimensions relative to the overall project area? The vertical dimensions? Will shoring be needed because deposits extend below 1.2–1.5 meters? What is the height of the water table in the wettest season? How should the fill be processed: dry-screening, water-screening, air-screening? What is the nature of preservation? Is the site contained within a soil, is it contained within a buried soil, is it contained within a cultural or natural sediment? Did anyone check to see the extent to which artifacts sank through the soils at the site?

All of the information on the physical characteristics of the site should be contained in the Phase I and Phase II reports. This may be augmented by reference to soil survey reports and perhaps engineering boring logs or percolation tests, especially if there is an issue of a shifting or high water table.

The second issue involves engineering the archaeological methods needed to extract the information relevant to the research questions to be addressed. The data recovery plan will propose specific field methods that are best suited for recovering the archaeological data contained within the site. Although there exist some generally agreed-upon techniques that most archaeologists usually follow (for example, use of quarter-inch screens, excavation in a ten-centimeter arbitrary level, etc.), the specific methods to be used will vary by project. Many decisions will need to be made. Will all fill be screened, or should some sediments (perhaps noncultural overburden) be removed without screening? Will a quarter-inch screen be used, or is a smaller screen warranted by the nature of the remains and/or the research questions to be addressed? Will fire-cracked rock be collected or discarded? Does the level of preservation warrant the collection of soils for flotation samples, and, if so, how much soil should be collected? What areas of the site will the excavations focus on? At this point in the data recovery plan the archaeologist makes extensive use of the method-and-theory literature as it bears upon data recognition and recovery. This is the topic of numerous texts as well as of standard archaeological method-and-theory and field courses.

Post-Field Analyses

Finally, the data recovery plan should spell out the types and methods of analyses that will be conducted on the recovered remains. These analyses

will again be tied to the research questions outlined earlier in the data recovery plan. By thinking these issues through before the field work is initiated, the archaeologist can ensure that the client—and the project—receive the best value. For example, if the research questions deal with issues of exchange and interaction, it may be important to set aside monies to determine the source of lithics or ceramics through chemical analyses. On the other hand, if the archaeologist has elected to focus efforts on other questions, these types of analyses might not be necessary. By considering which analyses are most important to addressing the identified data gaps, the archaeologist can avoid the all-too-common problem of finding that expensive and time-consuming analyses were carried out but that little useful information was obtained.

Project Structure and Pre-Field Preparation

Developing a concerted plan for archaeological methods best represents the kind of military-campaign approach to archaeology formulated and advocated by General Pitt-Rivers (see Daniel 1962) and Sir Mortimer Wheeler (1954). Everything is considered in a strategic fashion. It is all too easy to get caught up in the field work and to forget about committing sufficient time and resources to processing recovered material.

Site and Regional Documentation

The Phase III data recovery project requires an intimate understanding of the current status of research as it would apply to the site considered for investigation. Addressing this requires that the professional archaeologist perform a two-part background research exercise prior to performance of the work.

The first part of the background research centers on basic culture-history applicable to the site. The second part involves the identification and investigation of the research questions that the site could address.

For example, the core question for a region might be the impact of climatic change on population size. A site, as an undisturbed sixteenth-century example, may well indicate whether the particular culture was collapsing under the combined impact of the Neo-Boreal climatic minimum and European-introduced smallpox. Yet ancillary questions may include, for example, the nature of the prefired ceramic technology (an

unresolved question for prehistoric North America north of Mexico), persistence of a microlithic compound tool industry (a major issue in lithic applications technology throughout the midwestern and eastern United States), and frequency of elk in the deposits (critical for further supporting Kay's [1994, 1996, 1997] argument about aboriginal overkill and National Park Service wildlife management practices in the Rocky Mountains).

The archaeologist must know about the human history/prehistory as it pertains to the site and be at least aware of the immediately related issues involving wildlife and plant ecology, climatic change, soil science, and similar disciplines whose research questions might involve information stored within the archaeological site.

Local Contacts, Public Relations/Education

Phase III data recovery represents full-scale archaeological investigation of a particular site or sites. The scale is quite large and potentially disruptive. However, the nature of the archaeology itself often is captivating and compelling. People are fascinated with archaeology, especially with the kind of work involved with most Phase III projects. The Phase III project, then, does not just require sound local contacts and good public relations, it can greatly benefit from such efforts.[4]

In terms of public contacts, Phase III may require expanded contact with local or regional officials as well as Federal, state, and local government archaeology regulators. The Section 106 Process emphasizes the importance of consultation between Federal Agencies and Indian tribes, Native Hawai'ian organizations, and other cultural groups [36 CFR 800.2 (c)(3) and other subsections]. As suggested for Phase II excavations, a plan of action should be obtained if there exists the likelihood that Native American human remains or funerary objects will be encountered. Consultations should also take into account issues of cultural/religious sensitivity. For example, some tribes may request that Native American monitors be on site during the excavations or may request that certain ceremonies be conducted before the excavations are initiated. Such issues should be considered during the planning stages for data recovery.

In terms of publicity, the public relations/education requirements will vary by the nature of the project and the wishes or policy of the

government agency, local officials, the landowner, and the client. For example, many people do *not* want to put up with the fuss of television reporters wandering about over their property, much less want to have it widely known that a large archaeological project is being done across their backyard. Further, additional publicity may create a security problem for the client. Collectors and looters very likely could descend upon the site and pillage it, particularly if there are chances of old bottles or early prehistoric projectile points being present. How publicity will be handled needs to be planned ahead of time.

Note that Federal Agencies normally prohibit public discussion of Phase III (or even Phase I or Phase II) projects, except by authorized personnel under predetermined conditions. The U.S. Army Corps of Engineers maintains a general policy that no one may discuss any aspect of the project with nonagency personnel. Exceptions to this, such as planned media days or public briefings, are specified in the SOW or the RFP. For tribal lands, the THPO will have specific requirements and protocols for public relations and education.

In non-Federal situations, public discussion may be a less controversial issue: for example, the landowner may not mind, or the location of the project may be such that this publicity is no problem, while the agency or SHPO may have agreed to publicly discuss the work. For example, Vermont and some other states ask their archaeologists to give public presentations on their work to local town officials, historical societies, and the like. Such actions represent notable public relations/education opportunities.

In the end, what is done in the way of publicity will depend upon the nature and circumstances of the project. A large Phase III project in a small community may attract and benefit from the interest of local government officials. However, a comparatively small Phase III project mitigating the adverse effects of a rural bridge may draw little attention and have no special public relations needs.

Labor Estimates

As with Phase I and Phase II, the proposal budget prepared for the Phase III data recovery provides the figures for estimated labor. Phase III projects have the same basic five project stages found in Phase I and Phase II (start-up, field work, analysis, draft report preparation/review, and final

report delivery/curation). The firm will have basic figures applicable to Phase III work, but each Phase III is different.

The Phase III may involve more extensive field work than previous phases. Arrangements may be needed for any environmental permitting associated with the data recovery process and plans for public education programs requested by the SOW or for public relations exercises, scheduling site security, and arranging for sanitation facilities for the crew while they are in the field. Federal projects and some states require that a safety plan be in place.

Phase III also involves more in the way of analysis, and often labor estimates include outside specialists. The labor estimates for specialists are based upon their individual rate schedules combined with a sense, from the Phase II work, of how much of their efforts will be needed. These estimates may be given as line items, set in the same general category as radiocarbon dates and other kinds of specialized processing, or converted into hourly rates for the sake of the original bid.

Staffing Needs

Phase III staff categories are similar to those for Phase II, although usually the amount of labor needed is much greater. Phase III projects require assembling a research team. The core personnel will come from within the firm; however, additional field technicians and analytical specialists often will be hired from the outside.

It will be the duty of the project manager to identify specific project needs and then locate people to fulfill those needs. This will need to be done within a given budget and within a given time frame. Equally important is personnel management. The project manager not only handles the project, he or she must handle the team assembled to accomplish the goals of that project.[5]

Field Logistics: Housing, Per Diem, Transport

The logistical needs for the field portion of the Phase III project often involve arranging field accommodations and transportation for crew. A per diem allowance may well be needed, particularly if people will be billeted for any period. This can be true even if the site itself is close to the office, since many Phase III projects require adding staff for the duration of the field work. Otherwise, field logistical needs are identical to those outlined for Phase II projects.

Equipment and Supply Needs

As with a Phase II testing project, the equipment and supply need categories of a Phase III data recovery project are similar to those of a full-scale archaeological excavation. The differences between Phase II and Phase III project needs are in the scale of the exercise, the time commitment for the equipment, a possible requirement for special equipment, and the proportional greater amount of material to be processed. A long stay in the field requires on-site equipment maintenance. Large shelters may be needed to work during inclement or harsh weather. Ramps may be required. Large, open areas may need temporary plywood covers. The project may require items specific to data recovery, such as intake hoses for a water screen, pumps to remove water from units, shoring materials, and space heaters. Finally, preparations must be made for on-site initial processing and stabilization of recovered materials.

Field

The field part of a Phase III data recovery differs in four ways from traditional academic research work. First, it is a continuation of a larger compliance process. Second, the field technique is abbreviated because of time and budget limits. Third, usually some, if not all, of the unexcavated part of the affected deposit will disappear after the Phase III work ends. Last, the entire Phase III project, from field work through analysis to submission of a peer-reviewed final report, must be done under externally determined, preset budget and time limits.

Preparatory Work

Four sets of information need to be consolidated and understood before the Phase III field work is started or at least well under way:

1. reconciling of previous historic and excavation maps with the current physical site;
2. mapping;
3. history of land use where the site is located; and
4. site and deposit dynamics.

Together, these summarize the conditions that the professional archaeologist will face as the data recovery plan is implemented in the field.

Previous maps of the site need to be brought into line with the physical existence of the site itself. Since the planning for the Phase III project is often based on where things were said to be located in the Phase II testing (and the Phase I survey), it is important to make sure where those mapped land features actually are. To save time and the costs of having a crew on standby, the maps should be reconciled at the start of the project.

As with any excavation, a site map is needed. Even though a Phase II map should exist, unless the Phase III project is being done by the same firm, a new map must be prepared. Except in cases where previous test units must be relocated or a plowzone must be removed, site mapping can be done as the field work itself begins.

Land-use history in Phase II helps assess site integrity and assists in devising a data recovery plan. For Phase III data recovery, land-use history is used to understand specifics about the deposit. This can range from the obvious issue of past plowing to the archaeology of how the land was used, such as formal gardens, orchards, and pastures. Further, the history may reveal other important information such as undocumented hazardous waste dumps either on the site or sufficiently close to the site that ground-water contamination may create safety problems for the crew.

The fourth body of information required for Phase III is a knowledge of the site's physical structure. The county soil surveys and the Phase I and II reports should have most of this information. There are three issues to consider:

1. how the deposit will affect the mechanics of excavation, both digging and matrix processing;
2. how internal processes in the site matrix have influenced the data quality of the site; and
3. what the engineering parameters are for the excavation.

The physical characteristics of the site matrix will determine the rate at which fill is processed as well as the appropriate way to process it: Dry-screening? Water-screening? Air-screening?

The second issue involves data integrity: Is the deposit conducive to good bone preservation? Has it been below the water table, resulting in good organic preservation? To what extent have artifacts continued to sink in the semifluid represented by the soil?

The third issue involves engineering the archaeological data recovery. What are the structural properties of the site matrix? This alone will determine the nature of any shoring needed. At what depth does ground water appear? This influences both excavation wall strength as well as need for pumps. Does the ground-water level fluctuate (usually indicated by soil horizon mottling)? That will influence not only artifact preservation but also the potential for ground water seepage at levels closer to the surface than perhaps encountered during Phase II testing.

Excavation Management

Effective excavation management is a skill acquired by experience. Essentially, it requires:

- a thorough understanding of the problem being addressed (structure of the site and research issues involved),
- knowledge of the physical characteristics of the site,
- awareness of the logistical limits on excavating the site, and then
- carrying out a data recovery plan.[6]

The excavation management plan provides a schedule of tasks. It must consider the budget, contingencies such as weather, and a change in site or deposit characteristics. Each detail of the Phase III work should be considered. These range from logistics through supply to processing the deposit. Much of this should exist in the excavation plan that was prepared in response to the Phase III RFP. Considerable managerial expertise is required in dealing with the excavation crew, the support and technical staff, and the general public.

Field notes are organized in the same manner as for Phase II projects. There will be substantially more information devoted to features and to tracking matrix/flotation samples. If the project is very large or has multiple sites, there will be multiple field note binders. Quality field notes are

We learned about archaeology from that . . . The French Drain

Our most humorous data recovery experience was at the Weston site in central New York, where a proposed development contained an early historic Onondaga refugee camp. The land had been plowed, and the soil was seasonally wet and characterized by perched water tables. The Phase III field procedure was to strip the plowzone from six parallel east-west trenches, shovel-scrape them to expose features and posthole stains, and then map and recover exposed features.

In the southernmost trench, we detected posthole stains from the walls of four houses and a narrow cobble band roughly parallel to one of the house's walls (figure 6.1). The band ran across the trench and appeared to be set into a narrow ditch. In several places, there was dark earth, suggestive of postholes, instead of cobbles. "Wall trenches," long trenches into which vertical posts for longhouse walls are placed, were known for contemporaneous sites in southern Ontario and middle Mississippian sites but were unknown in central New York. We imagined a village surrounded by a narrow, cobble-packed ditch into which the main stockade wall posts were placed.

Figure 6.1. Detail of French drain showing base construction. Flat stones were placed over these cobbles. Ground water draining into the drain system originally flowed under the flat rocks. The area between the cobbles was silted in when exposed, but the water continued to flow across the top surface of the flat stones. Trowel points north; scale is 1.0 meters.

Anticipating that the cobble band continued on a straight line, we projected where it would appear in the trenches to the north and followed the bands we found. Over

4.5 hectares, we traced a W-shaped pattern of cobble-filled ditches merging into one that continued downhill. We took apart the lower section of cobbles and ditch and discovered that we had been tracing . . . a French drain system. A French drain is a sloped trench dug below the normal height of the water table and filled with gravel and cobbles to collect water and carry it away.

We should have asked ourselves, given soil known to be seasonally wet and containing perched water tables, how the developer had gotten a building permit and how the field ever got cultivated productively. Had we thought about the landscape clues, we should have anticipated a subsurface drain system. Lessons learned from this experience include *thinking* about the implications of landscape features and taking things apart. It also reinforced the importance of understanding landscape history, knowing historic land management practices, and recognizing the archaeological signatures of those practices.

Official Site Visits

Phase III data recovery projects may receive visits by agency and SHPO/THPO archaeologists. Some will show up with video or film cameras. This is quite appropriate. Part of a regulatory archaeologist's role, and certainly the purpose of such a visit, is to make sure that public money is being properly used and that the project is being performed at a high standard.

Since field visits are likely to occur, and to occur on short notice, it is important that an air of professionalism be maintained about the site, particularly in terms of appearance. The issue is not so much one of being fussily fastidious as it is being neat and organized. Sir Mortimer Wheeler's maxim that "an untidy excavation is a bad one" works in reverse as well: a project area in order suggests that the archaeology also is sound.

At the end of such a visit or inspection, the project manager and field supervisor each should complete detailed written accounts of what occurred. Those accounts will be placed in the field notebook under "Records of Communications."

even more important for Phase III projects than for Phase I or II because even the unexamined part of the archaeological deposit soon will be destroyed by the activities associated with the undertaking. The site—or at least the portion compromised—will exist only in the form of the assemblage recovered, the field notes, and the final report.

Reviewing Field Notes

The field notes from a project are one of three sets of permanent records, the other two being the photographs from the site and the artifacts recovered. Even then, the artifacts become virtually useless unless the field notes are sound.

Field notes are crucial for all phases of the compliance process, of course, but they are most critical for the Phase III data recovery project. This is because, unlike in Phase I or Phase II, the portion of the site undergoing mitigation through data recovery will cease to exist. Field notes must be kept to the highest standard possible. Daily review of notes is not micromanagement. Rather, it reflects the intense and irreversible nature of the archaeological data-recovery process. Review provides a second pair of eyes looking out after the quality of the work.

Closing Field Operations

The Phase III project is the last field step. Phase I and Phase II work really is diagnostic and evaluative work; the idea is to get a sense of what is present and then, if appropriate, recommend additional work. Closure of the field part of the Phase I or II project usually is little more than backfilling.

Closing the field aspect of a Phase III project presents different issues. Not only is there the physical closing of excavation and the returning or refurbishing of equipment, there also will be the demobilizing of project hires along with the reassigning of permanent employees who served as field staff.

Field closure can vary by what is going to happen next with the overall undertaking. Sometimes the excavation is backfilled and the land returned to its original condition. However, just as often the excavations are left open and serve for the planned construction as a head start in its own excavation needs.

The end result with the closing of a Phase III project is that there will be a lot of equipment and supplies that will need to be returned, stored, or dealt with somehow. And there will be a lot of people who will also need to be reassigned. It is the project manager's responsibility to attend to the needs represented by both.

Post-Field

At the end of the field portion of the Phase III data recovery, there are four tasks that need to be handled. First, the field equipment needs to be

refurbished, stored, and/or reissued. Second, the field personnel need to be reassigned or, in the case of project hires, hopefully directed to continued employment with another project or firm. Third, the field notes and other records need to be consolidated. And last, the materials from the site need to be analyzed and a final report on the project produced.

The final tasks of the Phase III project are to produce a detailed written analysis of the archaeological site that meets compliance needs as set forth in the SOW and to prepare the artifacts and site/analysis records for permanent curation.

Collections Processing

Phase III data recovery projects return from the field with three general categories of physical data: artifacts, fill or matrix samples intended for additional processing, and field records. Coordination of the first two, which represent the collection from the site, is the responsibility of the laboratory director. The project manager is responsible for the third.

Artifact processing will involve cleaning (when appropriate), cataloguing, labeling, and then rebagging. The laboratory will also produce a master artifact inventory at this time.

The processing of flotation and matrix samples depends upon their nature and upon requirements in the SOW. Such samples may be from features or from general excavation fill. Flotation samples may be reduced in-house to light and heavy fractions that are then sent to subcontracted specialists for detailed study. Matrix samples are fixed-volume samples removed in their entirety from the excavation unit. These samples aid in understanding the physical properties of the deposit. Matrix samples may be sent in their unprocessed entirety to a subcontracted specialist for detailed analysis, or they may be curated and not processed at all.

Analysis and Report Production

The last step is the analysis of the archaeological materials and then assembly of the final report. Analysis corresponds to what is expected of any full-scale, formal excavation. This is what is discussed throughout the method-and-theory literature (e.g., Renfrew and Bahn 2000).

Phase III reports are comprehensive site monographs. In addition to reporting the standard research results, the Phase III product must address any and all issues raised in the SOW and in the corresponding data

recovery plan. The Phase III report is a thorough analysis of the portion of the archaeological site examined. It is not always an exhaustive analysis, nor is that the goal. However, additional work sometimes can be squeezed in within the budget limits; many project managers will check and recheck the status of their analysis budget to see what more can be done to make the report as thorough as possible. The general structure of the Phase III report is outlined in chapter 7.

Chapter Summary

Phase III is the last stage in the compliance process. Variously referred to as data recovery, mitigation, or resolution, the purpose of the Phase III work is to offset pending destruction of the Register-eligible property—here, the archaeological deposit—through some kind of data recovery. A phrase often used that captures, albeit colloquially, what is desired at this stage is "to achieve data redundancy." That is, in theory at least, by doing full-scale excavation on an archaeological site, not only will the adverse effects of the project be offset or *mitigated*, but the continued existence of that part of the site will be *redundant* given having done that data recovery. In practice, of course, complete redundancy is never achieved. Additionally, this perspective cannot always fully account for all the values of a site (e.g., locations sacred to indigenous peoples).

Phase III data recovery projects begin with the determination by the lead agency, in light of the Phase II testing results, that the site is eligible for listing on the National Register. With such a determination, the process becomes more formal. One of the first steps involved, at least with the Federal Section 106 Process, will be the execution of a *Memorandum of Agreement* or *MOA* between the lead agency and the SHPO/THPO.

The MOA will set out that the parties agree that the site is eligible for the National Register, that the undertaking will have adverse effects, and that the only practical solution to mitigate or resolve those adverse effects will be some kind of data recovery. Although other parties may be invited to comment and even to sign the MOA, only the Federal Agency, the SHPO/THPO, and/or the Advisory Council on Historic Preservation have authority to amend, execute, or end the MOA.

Phase III data recovery will also have a *data recovery plan*. The data recovery plan will provide a detailed research design for doing the Phase III

data recovery. That design will vary by nature of the site but will include research questions to be addressed just as much as recommended field and laboratory procedures to collect the needed data.

Phase III archaeological work is similar to what one would expect for any kind of full-scale archaeological excavation. The staff tends to be larger than for testing exercises; the amount of time in the field can be long; and there usually will be a large collection as a result. Like all full-scale excavations, the actual field strategy—and the tactical options used to achieve strategic goals—vary for each Phase III project.

The Phase III project is a sustained effort, and often it will be done at a distance from the home office. There will be a need in most firms to hire on additional personnel for the duration of the field work; there will be a need to arrange for crew billeting. In some particularly large and long-running projects, there may be a need to establish a field laboratory. In most Phase III projects, there will be a need to plan for the huge number of artifacts and site matrix samples that will descend on the laboratory back at the home office and to address their curation.

Phase III data recovery, as a compliance exercise, does differ from the more traditional archaeological excavation in five important ways. The first difference is that excavation is restricted to the parts of the site within the overall project area. Archaeologists who have not faced this kind of limit before find such a "boundary restriction" to be quite unsettling. The Phase III data recovery project does not excavate beyond project boundary limits.

The second difference is that field work must be finished by a specified date. The general contractor will have scheduled subcontracting tasks for the overall land-alteration project in such a way that the archaeology people are expected to be out of the way by a given date. If that does not happen, the contractor has a large number of people standing idle, has the project completion date pushed back, and faces cost overruns and additional interest on the business loan enabling the work.

The third difference is that Phase III data recovery will be done regardless of most weather conditions. Being able to work under conditions that, in noncompliance situations, result in a sensible suspension of field work requires that the archaeologist have a very good understanding of what the archaeological data are and what can or cannot be done in the field to retrieve those data without compromising them. This is why com-

pliance archaeology is so professionally demanding and is so appealing to archaeological generalists: flexibility and adaptation are the keys; there is selection against specialization.

The fourth difference between more traditional archaeological excavation projects and the Phase III data recovery project involves funds. Most contract awards for compliance work are paid out in increments, say, when a given stage of the project is done or at the end of a given period, provided the work has been finished. Accordingly, the compliance firm may well have to underwrite the project for a short period until work is done or the month ends. The money for that has to come from somewhere. If it is not yet coming in from the agency or firm paying for the overall Phase III mitigation project, then it will have to come from the archaeology firm's own cash reserves, from a business loan, or from the pockets of the workers until such time as they can be reimbursed.

The last difference is unemployment. When the field portion of the project is over, those hired for that stage of work will need to find employment. Normally a firm's staff is sufficient to handle the analysis and reporting parts of the project and in any case has as its primary obligation continuing employment of its full-time people.

Again, as with traditional large excavation projects, the Phase III data recovery project requires collections to be cleaned, labeled, catalogued, and analyzed. The procedures will be pretty much the same; the specifics will be quite a bit different. Those differences come down to time, available funds, and curatorial requirements. The analyses must be done by a given date, which means that only those analyses set out in the original data recovery plan normally will be done. Further, the finished project report must be submitted to the Federal Agency and to the SHPO by a given date, and that date usually is within (often quite well within) a calendar year. As a result, Phase III analyses are basic in the sense of routine-sophisticated-for-any-full-excavation analyses. The idea is that, if more could be done with the material, the collections and field notes will be there for whoever wants to work on them.

That brings up the issue of curation. Private-sector firms do not curate collections. Rather, they prepare collections for curation and then get them out the door just as quickly as professional standards and project schedules allow. The collections need to be prepared for curation in accord with current museum curatorial guidelines; if generated from a Federal

project, they will need to be curated in a facility that meets criteria set forth in 36 CFR 79. All that will be left of the archaeological site after Phase III will be the field records, the analysis records, and the collections. Their curation is a paramount issue.

Finally, like any archaeological field project, there is a required report for the Phase III exercise. Perhaps here is the greatest difference with noncompliance archaeological research. Archaeological ethics require that any excavation—Phase I, Phase II, or Phase III—be written up. This is as true of the academic world as it is of the professional work and is a legacy of WPA archaeology, when sites rarely were written up after being dug.

However, for the Phase III report, it must not only be a complete, stand-alone archaeological research document, it must (as must Phase I and Phase II reports) survive extraordinarily stringent peer review, first from the lead agency and then from the SHPO/THPO. It is stringent not just in terms of the quality of the work; it is stringent because final payment on the contract award will not be received until a peer-acceptable document is in the agency's and SHPO/THPO's hands.

Further, more often than not, that report—in what would be called "camera-ready condition"—must be done within a year of the end of field work, all the while that the same principals compiling that report are compiling a number of others. Assembly of compliance reports is discussed in chapter 7.

With the acceptance of the report, the Phase III project ends with a turning over of the collections, field and laboratory notes, the final report, and other related documents to an appropriate curatorial facility.

Additional Reading of Interest

Bentley, R. Alexander, Herbert D. G. Maschner, and Christopher Chippindale (eds.). *Handbook of Archaeological Theories*. Lanham, Md.: AltaMira Press, 2008. This is a comprehensive and useful guide to theories and research by leading archaeologists.

Hester, Thomas R., Harry J. Shafer, and Kenneth L. Feder. *Field Methods in Archaeology*. Walnut Creek, Calif.: Left Coast Press, 2008. This is the latest avatar of what began in 1949 as *A Manual of Archaeological Field Methods* put together by a bunch of undergraduates and graduate students at University of California, Berkeley (including chapters by W. Y. Adams, Chester Chard, Robert Heizer, and William C. Massey).

King, Thomas F. *Federal Planning and Historical Places: The Section 106 Process*. Walnut Creek, Calif.: AltaMira Press, 2000. A comprehensive discussion of the Section 106 Process from the planning perspective, including detailed advice on assembling things like Memoranda of Agreement (MOAs).

Neumann, Thomas W., and Robert M. Sanford. *Practicing Archaeology: An Introduction to Cultural Resources Archaeology*. Walnut Creek, Calif.: AltaMira Press, 2001. The section on Phase III investigations contains a discussion on personnel management, both in terms of general staff and in terms of professional personnel.

Renfrew, Colin, and Paul Bahn. *Archaeology: Theories, Methods, and Practice*. 3rd ed. London: Thames & Hudson, 2000. Although not anthropological in orientation nor written with Americanist archaeology in mind, this is one of best overall method-and-theory texts available. It presents the various interpretive and conceptual tools required of archaeologists designing and interpreting full-scale excavations.

Zimmerman, Larry J., and William Green (series eds.). *Archaeologist's Toolkit* (seven volumes: Vol. 1, *Archaeology by Design*; Vol. 2, *Archaeological Survey*; Vol. 3, *Excavation*; Vol. 4, *Artifacts*; Vol. 5, *Archaeobiology*; Vol. 6, *Curating Archaeological Collections: From the Field to the Repository*; Vol. 7, *Presenting the Past*). Lanham, Md.: AltaMira Press, 2003. This series, focused on North America, is a valuable reference for all archaeologists.

CHAPTER SEVEN
REPORT PREPARATION AND PRODUCTION

Purpose and Objectives

Two sets of overlapping tasks take place after the field portion of a compliance project: processing and analysis of the recovered materials, and preparation and submission of the project report. Processing and analysis overlap due to timing and efficiency requirements in getting the project completed. The preparation and submission overlap because the report is peer-reviewed and the acceptance process may require some revisions.

The Laboratory: Structure, Processing, Analysis

All firms that do professional archaeology maintain an in-house archaeology laboratory. The purposes of that laboratory are to provide space and facilities for analysis, as well as space for temporary collections storage. For every person-hour of labor spent in the field, we have found that another two to three person-hours will be spent in the laboratory. Much of the work that will be done will be similar to what is found in any standard archaeology laboratory. With a couple of qualifications unique to the professional workplace, the purposes will be the same as well: to identify, record, label, and arrange to curate the archaeological collection; to answer questions about the site/project area *relative to* the compliance needs of the particular project; and to provide a basic analysis and interpretation of any archaeological deposits encountered.

The idea of the processing and analysis steps is to leave the collection in such a state that future workers can come into the assemblage

and, armed with the field and laboratory notes, pick up the research from where it left off. This, too, is very much a reaction to how collections were left during WPA archaeology.

Basic Laboratory Structure

Corporate archaeology laboratories provide facilities for processing the materials as they come in from the field (which includes washing and labeling), very basic analyses, and short-term storage until the collections can be turned over to a permanent curatorial facility.

The amount of physical space involved varies by corporation, both in terms of its physical plant and its internal division of labor. Some firms devote upwards of a third of their floor space to the laboratory, and nearly all analytical work will be done there (figure 7.1). Other firms use the laboratory more for cleaning, labeling, and inventorying, while much of the actual artifact analyses are done at the desks of the analysts.

Regardless of how the firm goes about allocating space, all firms will have the basic tools needed to get through fundamental analyses. Thus, scales, micrometers, dissecting microscopes (figure 7.2), and similar items will be available. On occasion, the corporate laboratory will have an in-

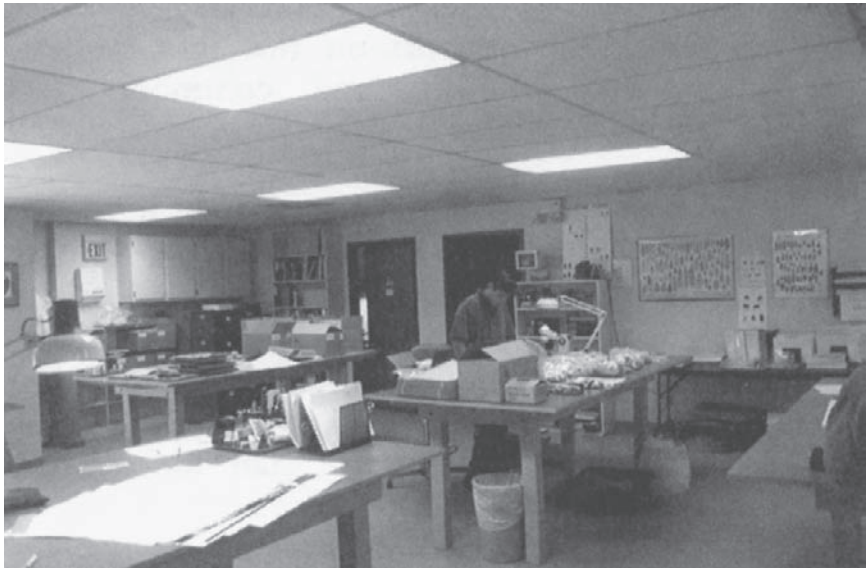


Figure 7.1. Interior of typical corporate laboratory. (Photo courtesy of Paul Brockington and Brockington and Associates, Inc.).

house electrolysis system for stabilizing small metal (meaning iron in most cases) artifacts before they are finally prepared for curation. Most will have the capacity to process flotation samples, at least to the light-fraction (botanical organics)/heavy-fraction (everything else that does not float) stage.

Because the lab is not meant to be all things to all people, more sophisticated analysis normally will be contracted out. Some firms do have the capacity to do high-magnification lithic use-wear analyses or to do sophisticated paleoethnobotanical analyses; most, however, do not. Usually what will happen, especially with Phase III data recovery and some more intensive Phase II evaluation exercises, is that a virtual laboratory will be put together. This is where the project director or principal investigator will assemble a set of research specialists to handle different parts of the analysis. It is a virtual laboratory because it exists only on paper (or electronically) and only for the duration of the project: the specialists themselves usually live in widely scattered locations and may be strangers to one another. Those independent subcontractors, each with the expertise and equipment needed, will be sent materials for analysis.

Corporate archaeology laboratories usually have excellent access to field vehicles (figure 7.3). The labs also serve as a kind of garage-equipment-storage-cum-general-gathering-place. In most firms, though, the lab is "back" in the facility.

Processing Materials from the Field

Collections brought in from the field will come under the jurisdiction of the laboratory director. The director will first make sure that the artifact-

Figure 7.2. Certainly for Phase II and Phase III analyses, all prehistoric flakes should be examined under a dissecting microscope. Approximately 15 percent of flakes classified as "unmodified" from prehistoric archaeological sites in the eastern United States are, in fact, heavily used microliths.

Figure 7.3. More often than not, the typical archaeology firm is located in an office park. (Photo courtesy of Paul Brockington and Brockington and Associates, Inc.)

bag inventory matches the actual bags handed over. With that accomplished, the next step is to process the collections.

How the collection is "processed"—meaning cleaned or otherwise prepared for analysis and ultimately curation—depends on instructions given in the SOW. Those instructions will have been dictated in part by agency protocol and in part by state/SHPO/THPO protocol. Sometimes all of the artifacts will be washed; sometimes only some will be, with the remainder left uncleaned in the hope that future researchers might be able to get more information from what was left on the surface of the object (residue and phytolith analyses come to mind). It will be at this stage that whatever conservation/stabilization measures are needed will be done.

With the artifacts cleaned or otherwise "processed," the artifacts and other parts of the collection, such as matrix samples, will be labeled. Labeling will be done according to museum archiving standards. At the same time that labeling is being done, a general artifact inventory will be prepared as well.

With the collections cleaned and labeled, the collection will then be placed in archivally stable bags (usually 4-mil clear-plastic pressure-locking bags, within which will be labeling and provenance information

On Cleaning Artifacts

Whether or not artifacts are cleaned, and how they are cleaned, depends upon the guidelines of the SHPO as set forth in the SOW. Traditionally, artifacts are washed under running water with gentle brushing and then set to one side to dry. However, some contracts specify that a percentage of prehistoric applications-industry tools (e.g., utilized flakes or projectile points) or unflaked stone tools (e.g., palette stones or metates) *not* be washed. This restriction is meant to permit future residue or phytolith analyses.

Artifacts can be cleaned either by dry brushing, by brushing under running water, or by soaking in a deflocculating solution like sodium hexametaphosphate (e.g., Calgon). The deflocculant process is usually faster and potentially less damaging than scrubbing in water (Neumann and Sanford 1998).

Figure 7.4. It is critical that the archaeology laboratory be accessible to field vehicles. Office parks are designed for this. In this picture, the "garage door" is the right-hand opening. The equal-sized area to the left is the tinted glass for the firm's laboratory, shown in figure 7.1. (Photo courtesy of Paul Brockington and Brockington and Associates, Inc.)

written on an equally stable material), which in turn will be placed in archivally stable boxes that are well labeled. All of this attention to curation also is in reaction to some of the incredible curatorial disasters that attended the WPA collections.

Figure 7.5. Example of a labeled artifact. The best kind of artifact labeling system is one that provides all of the basic provenance information. Here, the artifact is labeled with the site number, unit stake number, and ordinal level number. Even lacking the field notes, a person could make some sense of the labeled assemblage.

Figure 7.6. Labeled artifacts will be placed in 4-mil self-locking plastic bags for curation. The bags will be labeled by site, unit, and depth, as well as by type of artifact. Inside the bag that same information will have been written on an archivally stable label slip.

Levels of Analysis

There are two steps in the analysis of any archaeological assemblage. The first involves recording the information about the artifacts and other materials recovered and will be done in the laboratory or at the principal investigator's desk. The second involves manipulating that body of information. That second step uses the records generated in the laboratory and manipulates those data, and it will be done as part of the process of preparing the written report.

Laboratory Recordation

All laboratory analyses will do basic identification of the artifacts, including classificatory and typological assessment. All will do counts. Beyond that, the level of analysis done depends upon the nature of the compliance project.

For Phase I survey projects, the laboratory analyses are meant to provide sufficient information on the archaeological assemblage to allow its cultural-historical placement, number of components (horizontal, or vertical within testing depth), and basic site function. Generally, analyses for Phase I sites rarely involve anything more complicated than identification, classification, counting, and, where appropriate, weighing. It is with the identification of many temporally sensitive artifacts that some kind of provisional date or cultural-historical association can be given to the archaeological site.

Phase II testing exercises require more detailed analyses. Many of the questions involve structure of the site, how the site was used in the past, and what the information potential of the site is relative to our knowledge of the past of which it was a part. Thus, laboratory analyses are similar to what one would find in an abbreviated full-scale archaeological investigation: Artifacts will be measured, identified, and classified. On prehistoric sites, high-magnification lithic use-wear analyses may be done, and, if flotation samples were recovered and processed, paleoethnobotanical analyses will be done. On historic sites, the fine details of historic glass or historic ceramics will be presented. Most Phase II analyses are capable of standing on their own as finished, complete archaeological research reports. And they are meant to be approached that way so that questions about Register eligibility can be answered on behalf of the lead agency.

Phase III data recovery analyses are comprehensive analyses limited only by the SOW and the budget. The laboratory aspect will vary by the kind of site, nature of the assemblage, and resources to do the work. The comprehensive nature reflects in large measure the realization that the deposit will be severely compromised—if not disappear entirely—after field work is done. The Phase III report will be the final narrative on the deposit.

Data Manipulation

The laboratory analyses provide a condensation of the artifactual evidence from the site. The information in effect is transformed from individual physical elements to a series of inventories and tables representing classes of objects. Some of that will be produced by the laboratory staff; a fair amount will be generated by the principal investigator and any specialists hired for the project. All of that information will then be consolidated into the "Results" section of the report. That will require data manipulation. It does not hurt to think of this step being the scientific equivalent of an exercise in rhetoric, since the goal is not just to make a recommendation but to justify it.

For Phase I and II projects, the data manipulation is meant to address the compliance needs of the project just as much as it is meant to make archaeological sense of the site. For Phase I projects, the primary questions are: (1) can depositional integrity be ruled out; (2) what is the cultural-historical affiliation; and (3) what is the horizontal and, with limited subsurface testing, vertical extent of the deposit? Behind all of this is the basic question: should we have someone come back out and check to see whether this site really *is* Register eligible?

Although abbreviated in analysis, Phase I data manipulation requires that the professional archaeologist substantiate claims about the deposit. For example, one does not just say "the site is disturbed" and leave it at that, or "the site has artifacts in the B horizon under the plowzone." Rather, one notes that the vegetation and soils, along with historic records, indicate that the site had been extensively plowed, or again, that while artifacts were found in the B horizon, a chi-square statistical test indicated that there was no reason to think the sub-plowzone assemblage independent of what was found in the plowzone.

For Phase II, the primary questions will be the physical integrity of the site, the cultural-historical affiliation, and the vertical/horizontal distribution of the artifacts. However, the analysis also will explore in its own right the nature of the artifactual patterning as well as site function and internal dynamics. All of this is aimed at being able to recommend—yea or nay—to the lead agency that the site is eligible for listing on the National Register.

Phase III data recovery analyses are as sophisticated and thorough as the project budget allows. The kind of data manipulation expected for a Phase III project is what normally is described in method-and-theory texts for the analysis of a site.

Turnover

The actual last step in the entire compliance project is *turnover*. Turnover is the term used for the handing over of the archaeological collections, field records, analysis records, and copy of the final report to an appropriate curatorial facility. Turnover takes place when the final report for the project is accepted and produced.

In situations where the Federal government is also the client, the collections belong to the Federal government—meaning they belong to us as citizens. This in turn means that the collections belong to the nation writ large. In situations where the project was Federally enabled but actually done by private parties, whoever owns the land generally owns the artifacts (and probably whoever paid to have the field and analytical work done also owns those parts of the collection, too). This varies by state, by the way, and it is wise to check with the SHPO or equivalent agency. Similarly, states have analogous procedures for projects where the state is the client.

When collections have been generated by a Federally enabled undertaking, the location for curation must conform to the criteria set out in 36 CFR 79. This is stipulated in 36 CFR 79.3 (a). Those requirements focus on physical plant capabilities, such as fire suppression systems, regular and thorough pest management, security, and climate control. However, they also require the presence of an individual with at least three-years' experience equivalent to museum curation overseeing the curation of those collections.

With turnover completed and all project materials turned over to a curatorial facility, the final bill for the project will be submitted to the

client for payment. Except for financial management issues involving the project—outstanding bills, per diem reimbursement, and the like—payment of that final bill marks the "official" end of the project as far as most archaeologists will be concerned.

The Report: The Final Product

The last step in the cultural resources project will be the production of a final report. The final report does two things: it gives government regulators sufficient information for determinations of effect/adverse effect and/or of Register eligibility to be made; and it provides a stand-alone results-of-research document.

The last delivered product will be the final project report. However, the cultural resources process requires reporting on the results of the field work. Often the principal investigator provides short reports on the status of the project. These are variously called *progress reports*, *management letters*, or *management summaries* and will be sent out to the client or the agency at given stages in the project, say, when a monthly bill is submitted or when field work is completed.

Written reports, be they short or long, are referred to as *deliverables*. These physical products will have been requested within the SOW and are to be finished physical products before any payment is made on the contract. Other deliverables include education materials, digital/electronic copies of reports, videos, and even community service activities.

The discussion here focuses on final report assembly and production. Management summaries and the like really are like long letters. In fact, some contracts call for "Letters from the Field" or "Field Letter" to get a quick report on the findings in advance of filing the report.

The compliance report not only treats cultural resource management and basic research issues, it also provides long-term information storage of the archaeological deposit. The report is a summation of the archaeological research. Federal regulations, particularly 36 CFR 79 and the Secretary of the Interior's *Standards and Guidelines*, list the compliance report as part of the overall archaeological collection. The report produced must be sufficient in detail and quality such that agency and SHPO/THPO archaeologists particularly can judge for themselves the merits of the conclusions reached by the authors. This is because the Federal Agency will base its

determinations, such as of Register eligibility, mainly on the conclusions of that report, while the SHPO/THPO will assess the legitimacy of those agency determinations by what it has understood from that same report.

The compliance report is not only a regulatory and planning document, it is also an archaeological research document. The report must be sufficient to allow another investigator, armed with the field notes, to continue research on the deposit from the point where the report ends. To do this, the report will contain details regarding site location, condition, pedology and/or stratigraphy, and field and analytical methods. The maps have to be accurate enough to enable another person to locate the previous surface collection areas, test units, shovel tests, or whatever examination was employed.

From an archaeological perspective, the compliance report is a fundamental source of information. Indeed, it is now impossible to do adequate archaeological research in the United States without referring extensively to the compliance reports for the particular region or cultural-historical tradition. But that is only part of the reason that such a document exists. The primary reason that the compliance report exists is because, as a consequence of the Section 106 Process or its counterpart at the state or local level, it represents a planning tool and a form of compliance documentation.

Overall Report Structure

An archaeological compliance report consists of three pieces that are all brought together. There is the background information, like the history and prehistory of the area, assembled before the field work began. There are the results from the field work and subsequent laboratory analyses. And there are all of the figures and photographs meant to further illustrate the points made in the report. Bringing all of these pieces together into a cogent report requires that the principal investigator or project director be adept at managing people, be familiar with what each task requires, and be keenly aware of what those pieces are meant to do relative to the purposes of the compliance report.

How all of this is meant to work can best be understood by having a sense of what the final product will contain. Table 7.1 summarizes the contents of a basic archaeological compliance report.

Compliance reports will begin in a quasiformal manner. That is, there will be ways in which the cover and title are expected to be done. The

Table 7.1. Basic Contents of a Compliance Archaeology Report

Cover, Title Page, Contents, Forms: In addition to the title, author(s), firm or organization, client, and date, the cover of the compliance report sometimes requires specific information in accordance with the sponsoring agency. It also contains the contract number and a clearance statement, such as "Confidential Archaeological Site Information," or "Unclassified. Distribution is unlimited." Most cover pages require the signature of the principal investigator.

Abstract: Summarizes the nature of the project and its conclusions; this will be the first section of the report that the agency reviewers will read, the second section being the "Conclusion" section.

Acknowledgments: Lists the agency and client personnel contacted, along with local individuals and resources checked. Includes a list of professionals involved in the project.

Introduction: States where project is located, what kind of impact activity is planned, and who the contracting/review agency or agencies are, and identifies the laws and regulations necessitating or governing the report. The research design may be included here and/or in the "Methods" section.

Environmental Background: Summarizes the vegetation, soils, geology, and other noncultural elements of the region and the project area. The focal point is always the project area, and this is essentially an exercise in physical geography.

Cultural Background: Summarizes the history and prehistory of the region, with special reference to the project area; it may include a map and table showing locations and nature of known historic and prehistoric sites/structures within a set distance—usually two kilometers—of the project area.

Methods: Outlines the field and laboratory methods and also states where materials, project documentation, and other items will be curated.

Results: Presents in detail the results of the background investigations and of the field work as they bear upon the particular compliance exercise; there will be an interpretive discussion here as well.

Conclusions and Recommendations: Summarizes the report's conclusions and reasoning leading to those conclusions; this section will be the second section agency reviewers will read in the report. Phase I reports need to recommend whether or not further examination is needed of any identified sites. Phase II reports need to state whether or not the examined site or sites satisfy criteria for listing on the National Register. Phase III reports should describe what information was recovered during the project, that is, how study of the site has contributed to our knowledge of prehistory or history.

References Cited: References usually are cited in standard anthropological literature format and will include informants and maps along with the more traditional types of sources used.

Appendices: Includes new or amended site forms; tabulation of artifacts recovered (if any); and for some projects, summary of interviews, a copy of the scope of work, and qualifications of project personnel.

A Class III Archaeological Inventory at Pueblo Grande de Nevada, A Virgin Anasazi Community along the Lower Muddy River in Southeastern Nevada

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December 5, 2008

Great Basin Cooperative Ecosystems Studies Unit
Task Agreement No. J8R07060013
Cooperative Agreement No. H8R07010001

WACC Project No. LAME 2006E
LAME CRP No. 06-043

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Figure 7.7. Example of a typical compliance report title page. Information includes agency for which the work was done, the contract number, and similar administrative information. Some contracting agencies require a title page signature of the individual who served as principal investigator for the project.

expectations may be corporate; they may be agency or SHPO/THPO protocols. Nevertheless, the information on the cover and on the title page will be formalized.

Unlike archaeology articles and monographs in more traditional publications, archaeological compliance reports may require the signature of the principal investigator on the cover page (figure 7.7). Some Federal Agencies also use a form that summarizes the nature of the document.

Some mention should be made about titles. There are a variety of ways to title reports. The title page should contain the site number, county, and state. A descriptive title or subtitle is helpful, for example:

Phase II Archeological Investigation of the Johnson's Spring Site (21HU35), Houston County, Minnesota

or

Test Excavations of a Late Archaic Base Camp: Phase II Archeological Investigation of the Johnson's Spring Site (21HU35), Houston County, Minnesota

Titles in this style allow people doing literature searches to quickly get a basic idea of what the report treats, the level of the investigation, and where the site is or was located.

Normally, the first chapter will be a variation on the SOW, since it will address why the project took place and what was hoped to be accomplished.

The next chapters deal with background information. Sometimes these are combined into one chapter; at other times or in other firms, they are not. Most of the background information will have been prepared in advance of the project. For firms with historians on staff (and most firms, even stand-alone archaeology firms, employ a few B.A. or M.A. historians), those people will have written up some sort of historical background.

One purpose of this background chapter is to show how the work that was done at the site relates to standing research questions about the past. Where appropriate, the research design should be discussed at this point in terms of the state historic plan as well as research questions raised by the literature or identified in the SOW.

A lot of the background material eventually gets repeated from report to report. This reused material is called *boiler plate* and usually is lifted in toto from one report and dropped, with a few modifications,

into the next. There is nothing wrong with this, by the way, always providing that people make sure that those parts that were specific to the previous project have been removed or changed relative to the current project. But the boilerplate should not look like it was simply pasted in, and it should not be a substitute for proper attention to the specifics of the project at hand. The project director/principal investigator will be responsible for making sure that these sections are "clean" before the draft is submitted for agency review.

The "Methods" chapter is often a mixture of new material and boilerplate. The new portions usually involve the specifics of the field work itself. The boilerplate almost always includes how the laboratory analyses were done and how curation was handled. Like the background sections, much of this will already exist in some form from previous projects. The principal investigator will cull and rework for the new project's needs; the lab director, who will be responsible for the laboratory methods part, will do the same.

Normally, there will be a "Results of Investigations" chapter or chapters separate from the "Summary and Recommendations" chapter. Both will be assembled new for the project report. The former will be a results report just like any basic archaeological results section of a traditional site report. On larger projects, the results portion may take the form of several chapters; for example, one chapter may deal with the results of the lithic analysis, another with the faunal analysis, and so on.

The recommendations chapter, though, will differ. The recommendations follow from the summary. The chapter will draw on the results of the field and laboratory work and then recommend in light of what was mentioned at the start of the report (and in the SOW) what the client's next steps should be relative to the archaeological resource. Based upon the results of the field investigation, and following from what was revealed during the background research, the archaeologist makes recommendations (*never* determinations; see 36 CFR Part 63—Determinations of Eligibility for Inclusion in the National Register of Historic Places). Likely recommendations are summarized in table 7.2.

Scattered throughout the report will be figures and other illustrations meant not only to further clarify the research arguments, but also to serve as basic research reporting. The more basic kinds of figures are listed in table 7.3.

Table 7.2. Summary of Recommendation Options for Compliance Reports

Phase I:

- No materials present and no further work is needed (Agency interpretation: Therefore, no possible adverse effects); or
- Materials present, but the disturbed physical context and/or absence of data potential indicates that the site does not satisfy criteria for listing on the National Register, and therefore no further work is warranted (Agency interpretation: Therefore, no adverse effects); or
- Materials present, and there is sufficient evidence to suggest that the site might satisfy criteria for listing on the National Register; either further testing is recommended (Phase II) or the project should be redesigned to avoid the site (Agency interpretation: Therefore, there may be adverse effects); or
- Materials present reflecting the previously documented presence of a listed or eligible site; either further testing is recommended (Phase II) or some kind of project redesign is needed to avoid the site (Agency interpretation: There may be adverse effects).

Phase II:

- Further testing from the Phase I project indicates that the site does not satisfy the criteria for listing on the National Register, and no further work appears warranted (Agency interpretation: There will be no adverse effects); or
- The site does satisfy criteria for listing on the National Register, and either data recovery (Phase III) is recommended to mitigate those adverse effects, or the project needs to be redesigned (Agency interpretation: Therefore there *will* be adverse effects).

Phase III:

- The primary recommendation given in a Phase III report occurs when a portion of the site still exists and will survive the project going forward. In such cases the recommendation usually involves protecting in perpetuity the undamaged portions of the site.

Most firms, regardless of whether the archaeology is the entirety of the company or just a division among a bunch of architects, engineers, geologists, and environmental scientists, will have a graphics department. The graphics department will be responsible for making the camera-ready figures for the compliance report.

Production and Assembly of the Draft Report

Looking back at what we have written so far in this text—and not just this chapter—we perhaps have neglected to mention something about compliance archaeology that has a lot to do with report production. In any firm at any given moment, the people—be they the field or lab techs with their recent undergraduate degrees or the senior people with masters or doctorates—will all be working on a number of projects at the same time. For the

Table 7.3. Basic Figures Commonly Included in Reports

General Location of the Project or Undertaking: All reports will have a figure showing where the project was located within the state. This will consist of a general map of the state as an inset, and a more detailed locale map, usually based on the USGS quadrangle map.

Map or Plans for the Proposed Project: All reports have a map of the proposed undertaking. This usually is a photocopy reduction of the developer's or agency's plans.

Regional Map Showing Locations of Known Cultural Resources: Some SHPOs want a regional map showing eligible or listed structures and sites, since it gives a sense of what is known in the area. Others do not want such a map made, since it may compromise the privileged information contained in the site files. If there is to be such a figure, often it will be complemented by a table listing the sites shown on the figure, along with their cultural-historical affiliation, National Register status, and previous investigations and reports. Alternatively, the report might be prepared in two formats, with a nondisclosing one for the public.

Map of State or Regional Physiographic Provinces: Sometimes, a map of the state or region's physiographic provinces is included in the section of the report treating the environmental background. Some states request such inclusion; others do not.

Historic Maps: Historic maps document the presence or absence of possible historic structures and archaeological sites. Usually such maps are expected as part of Phase I highway corridor surveys and bridge replacements.

Historic Photographs: Photographs showing previously standing structures or land use are particularly useful for historical archaeological sites.

Map of the Project Area Showing Locations of Field Investigation Units: The map of the project area usually doubles as a base map showing locations of surface/subsurface examination areas (such as excavation units or surface collection units) and approximate site boundaries if appropriate.

Unit Profiles and Feature Drawings/Photographs: Unit wall profiles are drawn and photographed for Phase II and Phase III reports. In addition to feature documentation, some states also require a line drawing or photograph of a typical shovel-test profile for Phase I survey projects.

Artifacts: Examples of all diagnostic artifacts should be photographed for all reports.

principal investigator, there may be as many as six to ten projects each year, each of which will require a final report. Traditionally, when archaeology was still the sole province of universities and museums, the archaeologist worked on one site or project at a time and would finish off one monograph before starting another (not always, but this has long been what those of us in university settings ideally expected to happen). That is not true in the professional workplace. The private-sector archaeologist will turn out several full-length archaeological monographs each year. Some will be co-authored with one or two other people; many will be single-authored.

In addition to all of that multiple monograph writing, project directors and principal investigators often produce two or three conference papers along with a few research articles each year, too.

The mechanics in assembling a report under contract deadlines require fine choreography. The pieces break down into the writing, the figure production, the table production, the report layout/production, the duplication and assembly, and finally the delivery.

Writing and table generation are exercises in word processing. Figure production has been mentioned. By the way, one pleasant advantage for manuscript production enjoyed with archaeological reports is that nearly all archaeologists are excellent at producing camera-ready graphics and therefore can readily determine what the graphics division/department needs to do. Many Federal agencies have a preferred formatting style for the draft report, including line spacing, placement of headings and page numbers, and margin sizes. All of this normally will be mentioned in the SOW.

Report layout and production really is an exercise in desktop publishing. In smaller firms, this task may be coordinated either by the office secretary or by the principal investigator. In larger firms, there often will be an in-house editor-cum-desktop-publishing-specialist who will be responsible for taking the different pieces of the report and putting them together into a physical whole. Each section needs to mesh with the others—reports with stylistic variations from one section to the next imply a lack of overall structure to the field work as well as the report itself. Since one of the most common complaints by colleagues about entry-level personnel is the lack of report-writing skills, it makes sense to ensure that everyone understands what the final product will be and how good field notes contribute.

The compliance report is planned to be produced in two stages: A draft report to be reviewed by the agencies and hopefully the SHPO/THPO; and a final report, which will be the report curated with the collection. The specifics of report production will be outlined in the SOW. In some cases, the report will be produced as a physical hard copy that will then be taken to the client or the agency and, often enough, to the lead archaeologist staffing the SHPO/THPO. Notwithstanding the normal chain-of-command and business-etiquette protocols, the more comments by the SHPO/THPO handled early on, the more likely the project will be completed to everyone's satisfaction. In some cases, the draft report

will be submitted electronically—an increasing trend. Submittal format depends upon jurisdiction, the firm's and the state's computer capabilities, and review protocols.

The Review Process

The archaeological compliance project is both a research exercise and a regulatory/planning exercise. The work done and the report produced to represent it will be subjected to a rigorous peer review. Part of that review will involve the scientific merit of the report, be it in the methods used or the results presented. A goodly measure of that review, though, will focus on the core compliance issues. These will depend upon whether the project is a Phase I survey, a Phase II testing and evaluation, or a Phase III data recovery exercise.

Section 106 Review

For Section 106 projects, the lead agency will have staff archaeologists or a historic preservation specialist who will review the draft report. The draft report will be returned to the firm with comments. Those comments will be addressed, either through changes in the report or a detailed explanation of why they were not made.

A second and usually final report will be prepared that meets agency conditions. That report will be passed along to the SHPO/THPO. The SHPO/THPO has thirty days to comment if the agency argues a finding of no adverse effect. If no comment is received in thirty days, then the SHPO/THPO is deemed to have accepted the results "without comment," and the agency has satisfied its obligations under Section 106 [see 36 CFR 800.5 (c)]. This comment period holds true for notification to any other consulting parties.

If the finding is of an adverse effect, and the SHPO agrees, the situation moves along smoothly with the drafting of a Memorandum of Agreement (MOA) (36 CFR 800.6; see also King 2000).

Non–Section 106 Review

The review procedure for non-Federal regulations and projects varies by the jurisdiction involved. Typically, a compliance report for a private-sector or a non-Federal government agency client is presented on behalf

of that client to the state or Federal Agency archaeologist or a state/local government planning commission.[1] Often, a formal presentation is made by the professional archaeologist before a local regulatory body such as a community planning board. The non-Federal situation is generally less structured but has wide latitude in the range of questions and type of authority.

Final Report and Dissemination

With completion of agency reviews and the return of the draft report along with the comments on it, the final report is ready to be put together. The SOW will have specified how many copies were to be made of the report. In some cases, that may also include an unbound copy so that the agency or client has a master copy available for future production.

Finally, the report is distributed. A core requirement of Federal guidelines is that the compliance report be made available to the interested public (e.g., Secretary of the Interior's *Guidelines for Archeological Documentation*: "Results must be made available to the full range of potential users" [48 FR 44737]). How this distribution is done varies by the nature of the agency and its policies and the nature of the state. Usually, hard copies of the report will be distributed at a minimum to the client, the lead agency, the SHPO, the state site files (if separate from the SHPO), the curatorial facility (since a copy of the report is to be part of the collections turned over to that facility), authors/contributors, and the principals identified in the acknowledgments section of the report. In some cases, additional copies will be distributed to an electronic or "snail-mail" list of professional and academic archaeologists within the state. Copies might also go to local public and college libraries.

A word of caution is in order here. In some cases, the Federal Agency will distribute the report, while in other cases the contract firm may distribute them on its own. When distributing them on their own, however, firms should be careful that they have the approval of the Federal Agency to do so. In particular, care must be taken to ensure that sensitive site location is not distributed without the approval and knowledge of the agency and SHPO. Some Federal Agencies may require that certain pages or maps be blacked out, to avoid giving away the locations of sites, before the reports are given to libraries or the media. As a substitute, they might have the archaeologist prepare a condensed version of the report for public

TIP: Hearings

The archaeological project may require a presentation before a planning commission on behalf of the client. The archaeologist, as a specialty witness, should be prepared to inform the public about a subject often shrouded in mystery and misconception. Here are a few tips for presentations ranging from formal hearings to informal public meetings:

- If using additional witnesses, prepare a list of them in addition to a short summary of yourself. All witnesses should be identified in terms of their affiliations, qualifications, addresses, telephone numbers, and availability to answer questions.
- All witnesses should have been to the project location or archaeological site. This is true even for experts on a particular analytical technique, such as thermoluminescence, who may have been brought in to assist at the hearing. The public (and other decision makers) appreciate the real-world connection.
- Prepare a written and oral outline of the presentation and testimony. Include the main points to be covered and by whom.
- All potential witnesses and speakers should participate in a dress rehearsal. This is particularly reassuring to the client, plus it lets you see whether or not the team members can communicate effectively and credibly.
- Witnesses and speakers should use references and plans that illuminate main points or help the audience get its bearings.
- Practice the viewing distance for interpreting maps, photos, and drawings. Typically, information is presented at too small a scale for effective viewing for an audience member in the back row. One approach is to make photos of large drawings and illustrations. These can be handed out (and included in the official exhibits in the case of evidentiary hearings).
- Prepare an 8 1/2 × 11-inch copy of your reports and testimony. Offer to email an electronic version.
- Prepare a single-page fact sheet of critical information about the archaeological aspects of the project. This background information can help the reader interpret your testimony.
- Prepare proposed draft *findings of fact* to help the members of the hearing panel determine whether the project meets the applicable regulations.
- Bring extra copies for alternates, staff, clerks, and the audience, including the opposition.
- Visit the hearing room to determine acoustics, behavioral issues, and availability of presentation equipment. Locate a place to stand where the audience and the decision makers will be addressed simultaneously.

We learned about archaeology from that . . . The Surprise Article

Archaeology is a profession based on the creation of data and knowledge. The reputations of professionals and firms are based on how well they do in pulling together and disseminating the archaeological information that they collect. Often, information is presented not only in the compliance reports generated, but at archaeological conferences, in public talks, and in professional publications. As an information-generating field, it is important that archaeologists conduct themselves with the highest ethical standards when it comes to giving appropriate credit to work done by others. Unfortunately, this is not always the case.

This lesson was brought home recently when one of us opened a newsletter to discover, much to our surprise, an article printed on a project that we had developed and directed for several years. The article was "written" by one of our former students, who had worked on the project as a field assistant. The student was listed as the principal investigator of the project, and the article itself was lifted nearly verbatim from the original research design that had been written by us.

Fortunately, we were able to provide a copy of the permit that listed the correct principal investigator as well as original copies of the research design showing the appropriate authorship. As a result, the newsletter voluntarily published a correction in the succeeding issue.

From our perspective, this incident resulted in little damage—the record was set straight, and no real harm was done. From the former student's perspective, however, the incident has resulted in public embarrassment and damage to his professional credibility.

We would like to be able to say that this is an isolated incident. Unfortunately, while such blatant examples of plagiarism are rare, the appropriation of other people's ideas and writings in the field of archaeology is not as uncommon as it should be. The lesson here is twofold. First, as a researcher, you should always protect yourself by maintaining copies of your written documents, including original and edited versions. If there is any question at all about who will receive authorship on a given document, it should be clarified in writing. Email correspondence is a quite useful method for keeping track (i.e., proof) of such issues.

Second, as a professional, you should conscientiously guard your reputation as an ethical researcher. Archaeology is a small field, and your reputation—good or bad—will likely precede you wherever you go. This does not mean that you cannot discuss work conducted by other archaeologists. Particularly on large projects, where many people have contributed to the project conclusions, it is often useful to be able to discuss the findings generated by your colleagues. In these situations, most archaeologists are happy to have their ideas shared with others. However, the ethical archaeologist will always give the appropriate credit. If there is any question whether you should be sharing data or whether your use of others' data constitutes plagiarism, the best thing to do is ask. You don't want to look up one day and realize that your misdeeds have become fodder for a box published in an archaeological textbook.

relations/education use. This reduces controversy over seeing blacked-out words or noticing that pages are missing.

Some agencies maintain a publication series that distributes some or all of the studies: the Georgia Department of Transportation, for example, maintains its *Occasional Papers in Cultural Resource Management*. In other cases, the reports are available online or by mail for the cost of duplication and shipping.

For most states, the SHPO will serve as a de facto if not formal clearinghouse for access to compliance reports. There should be a list of the reports available (hence the importance of providing a descriptive and suitable title).

Chapter Summary

Two overlapping tasks take place after the field portion of the compliance project ends: processing and analysis of what was found; and preparation and then submission of the project report.

All archaeology firms maintain an in-house archaeology laboratory. That laboratory is designed to handle basic processing and analysis tasks. Thus, the laboratory has facilities for cleaning and then labeling artifacts and for cataloguing those artifacts. Most professional laboratories also have the equipment needed to deal with the more common archaeological analyses. Present, then, will be binocular dissecting microscopes, various mensuration aids, and a large number of computers. Less common will be the equipment required of specialized analyses such as high-magnification lithic use-wear analyses. If a need for such analyses comes up, specialists will be contacted to do the work.

The nature of analysis varies by the demands of the project relative to compliance needs. While protection of the resource is important, the compliance exercise exists as part of a larger planning process. The work done must see to those planning issues. For Phase I analyses, the needs are cultural-historical and classificatory. For Phase II analyses, the needs are documenting data potential or, if historical research has failed to do so, establishing association with important people, events, or designs/styles. And for Phase III analyses, the needs are to make substantial headway into what the deposit tells us about how people lived in the past.

Underlying much of the analysis and reporting stages of professional archaeology is what happened with many sites dug up as part of WPA archaeology: A lot of *things* were found, but frequently they were neither cleaned, catalogued, summarized, nor worked up in a written report that a person could take years later and continue research into the site.

The lab also serves as a place for short-term storage before the material associated with the archaeological site is turned over. Part of the responsibility of the person running the archaeology lab is to prepare the collection for long-term storage, that is, to prepare it for *permanent curation*.

The last step in a cultural resources project is the production of a report, which is then peer-reviewed. In its final form, the project report serves as a planning document as well as a research document. As a planning document, it will provide sufficient information to government regulators and managers so that determinations of Register eligibility as well as effect/adverse effect can be made without them having to do the field work themselves. As a research document, the final report presents the data and conclusions from the cultural resource recordation process. For archaeological research, the final report consists in large measure of an archaeological research monograph. It is from the research conclusions reported in the monograph that the reasoning for planning recommendations, made by the authoring archaeologist, can be appreciated by the government regulators.

For an archaeological project, the final report will be one of five sets of records of the cultural resources investigation.[2] The other records will be various project documents like the SOW, the field notes, the field photographs, and the laboratory notes and artifact inventory. The final report ties all of those other records together and represents a cogent summation of what the entire project was about. This, too, is a legacy of WPA archaeology, when so many archaeological sites were excavated but never written up. Every archaeological compliance project ends with a written report. Further, that written report will have first undergone a very thorough and stringent peer review by agency and SHPO archaeologists, and their recommendations for changes will have been addressed and normally incorporated before it was produced in final form.

Most of the archaeological research done after the late 1970s in the United States is reported in compliance reports. It is now the core location for basic empirical research in the field.

Compliance reports assemble project background information (see chapter 3), results from field investigations and subsequent analyses (see chapters 4–6), and various figures and other graphics. The reports themselves are organized in pretty much the same way, regardless of the nature of the project or area of the country. Broadly speaking, the report will have

- a front section with title, cover, contents, abstract, and acknowledgments;
- a chapter summarizing the nature of the project and reasons for why it was done;
- a chapter or sometimes two chapters reviewing past and present ecological systems as well as the prehistory and history associated with the project area or site;
- a chapter explaining field and laboratory methods;
- a chapter or chapters presenting the results of the field investigations and laboratory analyses;
- a chapter summarizing the project and then taking the results of the research and using them to justify recommendations made to the agency or client regarding the project area and any associated cultural resources;
- a list of references; and
- a set of appendices.

The first and last chapters generally are the main part of the report's role as a planning document. The interior chapters that set the research up and then report on it form the heart of the report as a research document.

The actual assembly of a compliance report involves writing, figure and table generation, compilation as a publishable document, duplication and assembly, and then delivery. Most of the writing, figure production, and table generation will be done at the same time by different members of the research project in association with office staff. Compilation as a publishable document is an exercise in desktop publishing and may be done by a specialist on staff, by the secretarial staff, or by the project manager.

The report usually will go through two stages: a draft report that is reviewed, followed by a final report. It will be the draft report that the client or agency will receive; this is usually also shared with the SHPO/THPO. The idea of the draft report is to make sure that everything is sorted out, while also letting all of the formal consulting parties know how things look to turn out. The agency and the SHPO/THPO will comment on the report and send their comments back to the professional archaeologist. Those comments will be addressed, a final report will be assembled, and with the delivery of that report and the other parts of the project (notes, collections, and so on), the project will end.

It is more and more common for draft reports to be submitted electronically. This facilitates distribution, saving time and money. However, final reports represent a curated part of the final archaeological collection and will be produced in hard-copy form even if there is a final electronic version.

Additional Reading of Interest

Allen, Mitch. Reaching the Hidden Audience: Ten Rules for the Archaeological Writer. Pp. 244–251 in *Public Benefits of Archaeology*, edited by Barbara J. Little. Gainesville: University Press of Florida, 2002.

Hacker, Diana. *A Writer's Reference*. 6th ed. Boston, Mass.: Bedford, 2006. This is one of many excellent grammatical references updated periodically.

Kintigh, Keith W. Writing Archaeology: Analyses and Archaeological Argumentation. The SAA Archaeological Record. September 2005, 33–35. http://www.public.asu.edu/~kintigh/Kintigh2005WritingArchaeology.pdf (Jan. 12, 2009). This short article has good general advice for archaeological writers.

McLean, Ruari. *The Thames & Hudson Manual of Typography*. London: Thames & Hudson, 1997. In a thorough discussion of how to present text on a page, McLean considers issues of typeface readability (serif typefaces are usually best for extensive text), how text is read (people read entire words, and they read those words generally based upon the upper halves of the letters), number of words per read line (eight words or fewer is best; otherwise, the eye gets confused), and the history and structure of typefaces. This is a useful volume for the desktop publishing world.

South, Stanley. *Methods and Theory in Historical Archaeology*. New York: Academic Press, 1977. Essential reading for anyone facing historic deposits.

Perhaps dated in some way, but South originated the basic ways in which the assemblages from historic sites can be handled relative to the people—or society—that produced and then used those assemblages.

Sutton, Mark Q., and Brooke S. Arkush. *Archaeological Laboratory Methods: An Introduction*. 5th ed. Dubuque, Iowa: Kendall/Hunt, 2009. This text provides discussion on all aspects of basic archaeological laboratory procedure, including how to design and run a university archaeology laboratory.

Vitelli, Karen D., and Chip Colwell-Chanthaphonh, eds. *Archaeological Ethics*. 2nd ed. Lanham, Md.: AltaMira Press, 2006. Ethical issues frequently arise in archaeology. Some of these issues arise in the context of preparing the professional report, and they might be addressed in this collection of articles.

NOTES

Chapter 1: An Overview of Professional Archaeology

1. Throughout this text, we also use "professional archaeology" to describe the archaeology done outside of the university or museum.

2. The use of the term "professional" in this text follows accepted American Association of University Professors (AAUP) usage, where scientists in higher education are labeled as "faculty" or "academics." Scientists working in the same field in industry or government are labeled "professionals" (e.g., Hamermesh 1996:32). Similar usage of "professional" is found throughout Federal code (e.g., 36 CFR 61 Appendix A), in national (e.g., Registry of Professional Archaeologists) organizational titles, and in regional professional organizations (e.g., Georgia Council of Professional Archaeologists).

3. The terms "Phase I," "Phase II," and "Phase III" are used in at least thirty-five of the nation's fifty states as labels for the "identification," "evaluation," and "mitigation" or "resolution" stages in the archaeology done in response to the Section 106 Process or in response to its state or local counterparts. The student should know that there are archaeologists who prefer not to use these terms (e.g., King 2000, 2008). However, archaeologists generally know what is being talked about when the term "Phase I" (or whatever) is used. The widespread understanding of these terms, combined with the implied sense of sequential conditional steps and the matchup with the use of phases in other fields of environmental assessment, are what make these terms so commonly used.

4. However, King (2000, 2008) rightly points out that "cultural" means much more than just "archaeological," and he argues against using the term "CRM" alone to refer to compliance archaeology.

5. Perhaps the best history of Americanist archaeology is Willey and Sabloff's (1993) *History of American Archaeology*. We draw on its cultural-historical

framework here. Willey and Sabloff are thorough in presenting the factors that, from the perspective of our discussion here, led to modern professional archaeology. Patterson's 1995 *Toward a Social History of Archaeology in the United States* focused on the social dynamics of the discipline in a manner similar to, but with considerably more detail than, what is presented here. It is an excellent study of how attitudes found in modern archaeology developed, especially toward compliance archaeology.

6. Some saw the aboriginal peoples to be of European origin. For example, Thomas Jefferson and Meriwether Lewis felt it very likely that the Mandan were the descendants of Welsh explorers and instructed the Corps of Discovery to be particularly alert for "Welsh Indians" (Ambrose 1996:77, 154). Others believed that the people encountered by Europeans in the Western Hemisphere were descendants of a pre-Adam creation and that therefore they were not fully human. Indeed, sixteenth-century British law and custom equated socially inferior people with animals, indicating that such people were indeed little more than beasts, with the corresponding lack of rights (Thomas 1983:41–50).

7. The country was less than seventy years old, and George Washington was venerated in a matter that might seem startling today.

8. See also Patterson 1995. Patterson (p. 79) observed that it was "[w]ith WPA archaeology still fresh in their minds" that the Committee on the Recovery of Archaeological Remains was formed in 1944 (see Johnson, Haury, and Griffin 1945). A major goal was to improve the quality of archaeological research. The committee was instrumental in the design and structure of the Missouri Basin Surveys.

9. Just as in a previous world the term "armchair anthropologist" was a pejorative phrase, so, too, for archaeologists is the phrase "like WPA archaeology."

10. All compliance reports are reviewed by agency archaeologists and by state regulatory archaeologists and must meet those review conditions before the final report is produced. Further, some states and agencies send reports to outside peer reviewers. The reluctance of the academic community to accept professional reports as a legitimate part of the archaeological literature continues to be a source of resentment among practicing professionals, including those working within university-based cultural resources programs.

11. To do the archaeology, the Smithsonian created the Department of River Basin Surveys within the Bureau of American Ethnology. The Missouri Basin Project became an administrative unit within the River Basin Surveys. In 1964, the Bureau of American Ethnology combined with the U.S. National Museum's Department of Anthropology into the Smithsonian's Office of Anthropology. The terms "Missouri Basin Project," "Missouri Basin Survey," and "River Basin Surveys" have now come to be used interchangeably by archaeologists.

12. Lehmer (1971:17) noted that another contribution of the Missouri Basin Project was formalization of the Plains archaeological term "feature," which was first used in 1938. A *feature* refers to some artificial yet nonportable aspect of a site, such as a storage pit or hearth, structure foundation, and so on. Features are excellent signatures of site depositional integrity, one of the basic criteria for a site's eligibility for listing on the National Register.

13. It was the first legislative action prescribing archaeological salvage on a national level, allowing mitigative measures to offset adverse effects of an undertaking (Fish 1980).

Chapter 2: Laws, Regulations, and Guidelines

1. In law, legislation provides authority, regulations set required procedure, and guidelines give advice and guidance needed to accomplish the intent of the legislation on a day-to-day basis.

For a discussion of cultural resources legislation, see King (2008). For a discussion of the Section 106 Process, see King (2000; 2007). Federal entities, notably the Advisory Council on Historic Preservation (ACHP), offer short courses on the Section 106 Process and its particulars (e.g., see http://www.achp.gov/106essentials.html). The National Preservation Institute (NPI) offers three seminar courses on Section 106: the introduction course's overview is at http://www.npi.org/sem-106i.html (all NPI seminars can be found listed at http://www.npi.org/seminars.html). The National Association of Environmental Professionals (NAEP) and other groups offer training at annual conferences.

2. There are three levels of field investigations, discussed in chapters 4, 5, and 6. For the eastern and most of the midwestern United States, "Phase" terminology is used. In the western United States and in some parts of the Midwest, descriptive terms like "inventory," "survey," "identification," "reconnaissance and intensive survey," "testing," or "evaluation" drawn from the Secretary of the Interior's Guidelines are used.

Chapter 3: Preparing the Project Background

1. See chapter 3 of Neumann and Sanford, *Practicing Archaeology* (the longer version of *Cultural Resources Archaeology*), for more details on locating contract opportunities, structuring bid proposals, and generally responding to RFPs and other announcements.

2. "Failure to adequately describe the project" is one of the most commonly cited flaws of individual NEPA environmental impact statements (EISs).

3. The interview process merits particular attention. In addition to structured interview formats, open-ended questions might also be used. How people respond to questions varies, among other things, by part of the country and by social class relative to the interviewer. For example, in New England and to some extent in southern Appalachia, it is common not to volunteer information unless asked. In rural areas of the upper Midwest, especially in Iowa and Minnesota, as well as in similar settings in Wisconsin and Michigan, a general statement of what is of concern and why you need to know it will likely result in people volunteering information and suggesting other people to contact. In those areas, as well as in the South, custom dictates the importance of first chatting about things in general before getting to the point.

4. It probably would be thematically more proper to place any paleoenvironmental and paleoecological studies at this point. However, we have always placed such synopses in with the prehistoric or historic background narratives. This is because the paleoecological conditions represent the setting within and to which the past cultures adapted, and it has always seemed to us a better idea to place the discussion of any past physical world side by side with a discussion of the culture, and especially the technology that was a response to that world.

5. Not all states have current, up-to-date Plans. To determine whether your state has such a Plan, contact the SHPO office. If you are working in an area without a State Plan or one with an inadequate or out-of-date Plan, you will need to identify research gaps and themes yourself. In this case, research gaps can be identified by reviewing other archaeological reports for the region. The goal will be to identify important unanswered questions that your project or site is likely to be able to address.

6. It is all too easy for archaeologists to undervalue this recent history. Interestingly, much of the fairly immediate past seems to drop from the cultural memory, leaving seemingly mysterious structures such as root cellars to be misinterpreted as ancient Viking houses; bore holes for splitting boulders as ancient Viking ship-docking sites; tobacco cleavers as ancient Viking battle axes; and neatly stacked field stones by immigrant farmers from southwest Ireland as ancient aboriginal burial cairns (see Feder 2006).

7. This is why professional archaeologists often choose a regional archaeology conference over a national one: it provides more information of immediate need. This cost-benefit issue is another main reason why private-sector attendance at the annual SAA meetings is proportionately low compared with that of the academic sector. And in recent years it is becoming harder for academics to afford to attend. National conferences cost three to four times as much to attend as regional conferences. In addition, few businesses can justify having a large number of employees absent for the time that a national conference takes.

Chapter 4: The Phase I Process: Identification of Possible Historic Properties

1. "Phase I" is the term used in most parts of the eastern and midwestern United States; "reconnaissance survey" and/or "intensive survey" (or, in Colorado and Wyoming, "Class III Cultural Resources Inventory") are the terms used instead of "Phase I" in many parts of the western United States. We use "Phase I" here because it is widely used and understood, it is used in other environmental impact assessment processes, and it implies a conditional step in a *sequential* evaluation process.

2. For a detailed discussion of corporate archaeology, cash flow, and structure, see Neumann and Sanford 2001.

3. Many people are unaware that such requirements exist. If a buried utility search is to be done, the property owners and residents need to be informed, especially if it will involve any kind of physical alteration to their property. Similarly, the archaeologists and anyone else digging need to notify the utilities. The Dig Safely Campaign of the Common Ground Alliance provides notification contacts for each state (http://www.digsafely.com/contacts.htm, April 18, 2009).

4. Effective labor estimates are the product of experience. However, there are various sources that can help, such as the U.S. Department of Labor and professional associations. For example, ACRA (American Cultural Resources Association) often posts information on its website and in its newsletter on how to estimate costs (http:/www.acra-crm.org). For details on structuring competitive bids on public-sector and private-sector contracts, see also Neumann and Sanford 2001.

5. Per diem is a critical topic and represents substantial cash flow along with IRS tax issues. While beyond the scope of this text, anyone looking to work in professional archaeology might benefit from our discussion of this in Neumann and Sanford 2001:121–122.

6. Ten states currently (2009) require little, if any, subsurface testing during Phase I or an equivalent inventory/survey: Arizona, North Dakota, California, Oregon, Hawai'i, South Dakota, Nebraska, Utah, Nevada, and Wyoming. Another eight states currently have discretionary subsurface testing protocols: Idaho, Missouri, Kansas, New Mexico, Massachusetts, North Carolina, Mississippi, and Wisconsin. The remaining thirty-two states require shovel testing to be done in some kind of interval fashion or require such testing when certain terrain conditions apply, such as when surface visibility is below a certain percentage.

7. The term "inventory" is misleading because the purpose of any kind of Phase I identification exercise is not to "inventory"—that is, locate all existing—cultural resources, be they archaeological sites or standing buildings. Rather,

the purpose is to make a "good faith effort" to see whether properties eligible for listing on the National Register might be present. This may seem trivial; it really is not. The student will come across, time and again, archaeologists and historic preservation people who should know better thinking that the intent of the Phase I identification process is to "find sites" or to "locate all of the sites" in a given area. That is not the idea at all. Thus, Phase I is not an inventory—stuff will probably get missed. Rather, Phase I is, along with the background work we talked about in chapter 3, *part* of the good-faith effort required to see whether Register-eligible properties might be present.

8. For additional references as well as a detailed discussion of soil fluidity as it applies to archaeological deposits and the sinking of artifacts through soil horizons or cultural sediments, see Thomas W. Neumann, Soil Dynamics and the Sinking of Artifacts: Procedures for Identifying Components in Non-Stratified Sites. *Journal of Middle Atlantic Archaeology* 9 (1993):94–108. The mathematics for flotation-sized particle movement are given in: Thomas W. Neumann, A Model for the Vertical Distribution of Flotation-Size Particles. *Plains Anthropologist* 23 (1978):85–101.

9. Not surprisingly, there is a strong correlation between the extent to which a state is forested and the expectation that shovel testing will be done as part of Phase I. Based on standard forest/vegetation maps, there is a very strong positive correlation between forest cover and shovel testing as a default requirement ($r = +0.85$, df: 39; $p << 0.001$ that there is no correlation).

A second issue to be aware of is the dynamic nature of soils as three-dimensional matrices that function over time like extremely viscous fluids. Artifacts placed on their surfaces will, given enough time, sink through them. Soils in arid or semi-arid areas not only are soils now, they may have been much more active in the past. Thus, while the current protocols do not require—and sometimes actively prohibit—Phase I subsurface testing, this does not necessarily mean that all prehistoric artifacts will still be visible on the surface.

Chapter 5: The Phase II Process: Testing and Evaluation

1. The COE and other agencies specify that contractors conform to the agency health and safety standards and practices. Applicable regulations and associated standards and practices are generally available at the agency Internet sites and may also be appended into contract documents. For a discussion of shoring and related safety issues, see also Neumann and Sanford 2001:189.

2. Archaeologists work under almost all field conditions. Many firms continue working through subzero (Fahrenheit) conditions, either thawing the ground on an as-needed basis or keeping it thawed with some kind of unit-

specific shelter. Extreme heat hampers field work in part because of the associated heat stress and partly because the ground is baked and difficult to dig or screen. Shelters also protect sites while allowing continued work during periodic or light rain. Sustained heavy rain is probably the one condition most likely to end the day's field work.

3. It depends upon the Agency, the SHPO or THPO, the eventual curatorial facility, and the firm's practices, but often all diagnostic artifacts will be labeled individually, while some percentage of nondiagnostics will be labeled for each unit-level artifact class. For example, all projectile points from a prehistoric deposit would get labeled, but perhaps only one in ten of the unmodified flakes would be labeled. Those will be mixed in with the unlabeled flakes in the bag used to curate the material, along with an identifier on acid-free paper.

4. Although not clearly spelled out in archaeology, the listing of who is an author is a matter of professional ethics in most fields as well as in Federal service. In Federal service (and therefore presumably Federal contracts) as well as in the medical and science fields, authorship credit is to be based only on substantial contributions to (a) conception and design, or analysis and interpretation of the data; (b) drafting the article or revising it critically for important intellectual content; and on (c) final approval of the version to be published. All three of these conditions *must* be met. Participation solely in the acquisition of funding or the collection of data does not justify authorship; nor does editing, the general supervision of the research group, or being the head of the division or firm that produces the report.

5. For a more detailed discussion about per diem and tax obligations, see Neumann and Sanford 2001:121–122.

6. The area to be photographed should be clean and tidy. Any extraneous leaves and debris should be removed from around the surface; footprints should be swept away, and roots in profile walls should be clipped. Care should be taken to make sure that the area to be photographed is not partially obscured by shadows; nothing is more distracting in a photograph than a shadow cast over a portion of the image. If possible, photographs should be taken at midday, when few shadows are cast. Otherwise, a large tarp or cloth can be held up to shade the area to be photographed. Rightly or wrongly, the subconscious assessment of the quality of the work done will be based in part upon how neat and tidy the unit photographs are. Many of the unit profile photographs will be presented in the Phase II report, and unlike the profile drawings (which will be redrawn at the office), the photographs taken in the field will be used in the final product. While software can edit those pictures, it is best to get it right the first time, in the field.

Chapter 6: The Phase III Process: Mitigation through Data Recovery

1. Of course, it is never possible to recover all of the information from a site, thus the concept of redundancy is more of a theoretical construct than a reality. No matter how carefully one excavates, some information is never recovered.

2. Section 106 is a procedural law; as long as the Federal Agency follows the process set forth in 36 CFR 800, it has fulfilled its legal obligations under this law. The roles of the ACHP and SHPO/THPO are purely advisory; they cannot compel the agency to follow any particular course of action. However, the agency can be found legally liable under the Administrative Procedures Act if its decisions are determined to be "arbitrary" or "capricious." To protect themselves against this charge, most agencies will make every possible effort to resolve any differences with the SHPO/THPO or ACHP before proceeding with an undertaking.

3. The advent of Internet access has altered what is meant by "standard scholarly literature search." A "standard literature" search means locating as many as possible of the published sources that directly treat the particular issue at hand. In the past, this meant wandering into the university library or the SHPO report files, as well as pulling down all of your own professional journals and then patiently going through the journal table of contents or the titles on the SHPO shelves to see whether there was something that had a bearing on the issue at hand.

Unfortunately, at some point this will still have to be done anyway, despite Internet capabilities. This is because journal and compliance report files listed on the Internet are not complete. Older monographs probably will not be present at all. Internet journal listings are notorious for stopping after ten years before the year in which the search is being done. This means that the field work published in the 1930s or the 1960s or the 1980s, which often remains critical to understanding the archaeology of an area, will be missed. Reviewers tend to be familiar with *that* literature, meaning that those earlier sources are expected to be cited in the report; if important earlier citations are absent, then the entire report may be sent back for correction.

4. For detailed discussion on public relations as they bear upon Phase III compliance projects, see Neumann and Sanford 2001:212–214.

5. Personnel management and the management of professionals is required throughout all of archaeology, and especially in the Phase III process. A discussion of this is given in Neumann and Sanford 2001:218–220, 222, and 230–233.

6. For a detailed discussion of Phase III excavation management, see Neumann and Sanford 2001:233–239.

Chapter 7: Report Preparation and Production

1. The SHPO/THPO shouldn't be involved if it is not a Section 106 project. However, often the same individuals review 106 projects and state-mandated projects—they just switch their hats depending on what jurisdiction their review is under.

2. A sixth set of records, comprising the organization's time sheets, mileage records, and so on, rarely is available for inspection, even within private-sector firms. This information is privileged information, and professional etiquette limits its distribution. However, such information should not be necessary for outsiders since the essentials of any time-motion database should be present somewhere within the field notes.

REFERENCES

Advisory Council on Historic Preservation (ACHP). *Treatment of Archaeological Properties: A Handbook*. Washington, D.C.: National Park Service/Department of the Interior, 1991.

———. *Federal Historic Preservation Case Law, 1966–1996*. Washington, D.C.: National Park Service/Department of the Interior, 1996. http://www.achp.gov/book/COVER1.html (Jan. 1, 2009).

———. *Federal Historic Preservation Case Law Update, 1996–2000*. Washington, D.C.: National Park Service/Department of the Interior, 2000. http://www.achp.gov/book/COVER1.html (Jan. 1, 2009).

Allen, Mitch. Reaching the Hidden Audience: Ten Rules for the Archaeological Writer. Pp. 244–251 in *Public Benefits of Archaeology*, ed. Barbara J. Little. Gainesville: University Press of Florida, 2002.

Ambrose, Stephen E. *Undaunted Courage: Meriwether Lewis, Thomas Jefferson, and the Opening of the American West*. New York: Simon & Schuster, 1996.

Balm, Jane, and Alistair Paterson, eds. *Archaeology in Practice: A Student Guide to Archaeological Analysis*. Malden, Mass.: Blackwell, 2006.

Bentley, R. Alexander, Herbert D. G. Maschner, and Christopher Chippindale, eds. *Handbook of Archaeological Theories*. Lanham, Md.: AltaMira Press, 2008.

Black, Stephen L., and Kevin Jolly. *Archaeology by Design*. Archaeologist's Toolkit #1. Lanham, Md.: AltaMira Press, 2003.

Bradley, James W. *The Onondaga Iroquois: 1500–1655: A Study of Acculturative Change and Its Consequences*. Ph.D. dissertation, Syracuse University: University Microfilms International, Ann Arbor, 1979.

———. *Evolution of the Onondaga Iroquois: Accommodating Change, 1500–1655*. Lincoln: University of Nebraska Press, 2005.

Brady, Nyle C., and Ray R. Weil. *The Nature and Properties of Soils*. 14th ed. Upper Saddle River, N.J.: Prentice Hall, 2007.

Butler, William B. Significance and Other Frustrations in the CRM Process. *American Antiquity* 52(4) (1987):820–829.

Chenault, Mark L., Richard V. N. Ahlstrom, and Thomas N. Motsinger. *In the Shadow of South Mountain: The Pre-Classic Hohokam of La Ciudad de Los Hornos, 1991–1992 Excavations, Parts I and II*. SWCA Environmental Consultants Archaeological Report No. 93-30 (1993). Tucson, Ariz.: SWCA, Inc., Environmental Consultants.

Chesterman, Charles W. *The Audubon Society Field Guide to North American Rocks and Minerals*. New York: Knopf, 1979.

Coates, Earl J., and Dean S. Thomas. *An Introduction to Civil War Small Arms*. Gettysburg, Pa.: Thomas Publications, 1990.

Common Ground Alliance. http://www.commongroundalliance.com/ (Jan. 3, 2009).

Council on Environmental Quality. Regulations for Implementing NEPA. Washington, Government Printing Office, 1978 (updated with periodic revisions, available online at http://www.nepa.gov/nepa/regs/ceq/toc_ceq.htm) (Sept. 18, 2009).

Dalla Bona, Luke. *Volume 3: Methodological Considerations. A Report Prepared for the Ontario Ministry of Natural Resources*. Thunder Bay, Ontario: Lakehead University, Center for Archaeological Resource Prediction, 1994.

Daniel, Glyn. *The Idea of Prehistory*. Baltimore, Md.: Penguin, 1962.

Darwin, Charles E. *The Formation of Vegetable Mould, through the Actions of Worms, with Observations on Their Habits.* London: John Murray Publishers, 1881.

David, Bruno, and Julian Thomas, eds. *Handbook of Landscape Archaeology*. Walnut Creek, Calif.: Left Coast Press, 2008.

Davis, George B., Leslie J. Perry, and Joseph W. Kirkley. *Atlas to Accompany the Official Records of the Union and Confederate Armies*. Washington, D.C.: U.S. Government Printing Office. Republished as: Davis, George B., Leslie J. Perry, and Joseph W. Kirkley. Compiled by Calvin D. Cowles. Introduction by Richard Sommers. 1983 [1891–1895] *The Official Military Atlas of the Civil War*. New York: Gramercy Books, 1983.

Drury, W. H., and I. C. T. Nisbet. Succession. *Journal of the Arnold Arboretum* 54 (1973):333–367.

Environmental Data Resources, Inc. http://www.edrnet.com/index.php (Jan. 1, 2009).

Fagan, Brian M. *In the Beginning*. 9th ed. New York: Longman, 1997.

Feder, Kenneth L. Chapter 4: Site Survey. Pp. 41–68 in *Field Methods in Archaeology*, by Thomas R. Hester, Harry J. Shafer, and Kenneth L. Feder. 7th ed. Mountain View, Calif.: Mayfield, 1997.

———. *Frauds, Myths, and Mysteries: Science and Pseudoscience in Archaeology*. 5th ed. New York: McGraw-Hill, 2006.

Firth, Ian J. W. *Cultural Landscape Bibliography*. National Park Service/Southeast Region Office. Washington, D.C.: U.S. Government Printing Office, 1985.

Fish, Paul R. Federal Policy and Legislation for Archaeological Conservation. *Arizona Law Review* 22 (1980):681–699.

Fish, Suzanne K., and Stephen A. Kowaleski, eds. *The Archaeology of Regions: A Case for Full-Coverage Survey*. Washington, D.C.: Smithsonian Institution Press, 1990.

Foss, J. E., F. P. Miller, and A. V. Segovia. *Field Guide to Soil Profile Description and Mapping*. 2nd ed. Moorhead, Minn.: Soil Resources International, 1985.

Fowler, Don D. Cultural Resources Management. Pp. 1–50 in *Advances in Archaeological Method and Theory*, *Volume 5*, ed. Michael Schiffer. New York: Academic Press, 1982.

Fox, Robin. State of the Art/Science in Anthropology. Pp. 327-345 in *The Flight from Science and Reason*, ed. Paul R. Gross, Norman Levitt, and Martin Lewis, Annals of the New York Academy of Sciences, Volume 775, 1996.

Garreau, Joel. *The Nine Nations of North America*. Boston, Mass.: Houghton Mifflin, 1981.

———. *Edge City: Life on the New Frontier*. New York: Doubleday, 1991.

Gero, John M. Excavation Bias and the Woman-at-Home Ideology. Pp. 37–42 in *Equity Issues for Women in Archaeology*, ed. Margaret C. Nelson, Sarah M. Nelson, and Alison Wylie. Washington, D.C.: Archeological Papers of the American Anthropological Association No. 5 (1994).

GoogleEarth. http://earth.google.com/ (Jan. 1, 2009).

Gross, Paul R., and Norman Levitt. *Higher Superstition: The Academic Left and Its Quarrels with Science*. Baltimore, Md.: Johns Hopkins University Press, 1994.

Gross, Paul R., Norman Levitt, and Martin W. Lewis, eds. *The Flight from Science and Reason*. Annals of the New York Academy of Sciences, v. 775. New York: New York Academy of Sciences, 1996.

Hacker, Diana. *A Writer's Reference*. 6th ed. Boston, Mass.: Bedford, 2006.

Hamermesh, Daniel S. Not So Bad: The Annual Report on the Economic Status of the Profession 1995–1996. *Academe* (March–April 1996):14–37.

Hardesty, Donald L. Research Questions and Important Information. *CRM* 18(6) (1995):9–13.

Hardesty, Donald L., and Barbara J. Little. *Assessing Site Significance: A Guide for Archaeologists and Historians*. 2nd ed. Lanham, Md.: AltaMira Press, 2009.

Hawkins, Rebecca A. Coming Full Circle: Plowzone Assemblages and the Interpretation of Fort Ancient Settlement Structure. Pp. 91–109 in *Surface*

Archaeology, ed. Alan P. Sullivan III. Albuquerque: University of New Mexico Press, 1998.

Hay, Conran, James W. Hatch, and J. Sutton. *A Management Plan for Clemson Island Archaeological Resources in the Commonwealth of Pennsylvania*. Harrisburg, Pa.: Pennsylvania Historical and Museum Commission, Bureau of Historic Preservation, 1987.

Hedstrom, Margaret. Digital Preservation: A Time Bomb for Digital Libraries. *Computers and the Humanities* 31(3) (1997): 189–202. http://www.uky.edu/~kiernan/DL/hedstrom.html (Jan. 6, 2009).

Hester, Thomas R. Methods of Excavation. Pp. 69–112 in *Field Methods in Archaeology*, 7th ed., ed. Thomas R. Hester, Harry J. Shafer, and Kenneth L. Feder. Mountain View, Calif.: Mayfield, 1997.

Hester, Thomas R., Harry J. Shafer, and Kenneth L. Feder. *Field Methods in Archaeology*. Walnut Creek, Calif.: Left Coast Press, 2008.

Historic Map Works. http://www.historicmapworks.com/ (Jan. 1, 2009).

Hopke, William E. *The Encyclopedia of Careers and Vocational Guidance*. 9th ed. Chicago: Ferguson Publications, 1993.

Hosmer, Charles B., Jr. *Preservation Comes of Age: From Williamsburg to the National Trust, 1926–1949*. Two volumes. Charlottesville, Va.: National Trust for Historic Preservation in the United States/University Press of Virginia, 1981.

Hothem, Lar. *Indian Artifacts of the Midwest. Volume III*. Paducah, Ky.: Collectors Books, 1999.

Hubka, Thomas C. *Big House, Little House, Back House, Barn: The Connected Farm Buildings of New England*. Hanover, N.H.: University Press of New England, 1984.

Hutt, Sherry, Marion P. Forsyth, and David Tarler, eds. *Presenting Archaeology in Court: A Guide to Legal Protection of Sites*. Lanham, Md.: AltaMira Press, 2006.

Hutt, Sherry, Walter E. Stern, and Stan N. Harris. *Cultural Property Law: A Practitioner's Guide to the Management, Protection, and Preservation of Heritage Resources*. Chicago: American Bar Association, 2004.

Illinois Archaeological Survey. *Professional Standards*. Springfield: Illinois Archaeological Survey, 1983.

Internal Revenue Service (IRS). *Per Diem Rates*. Internal Revenue Service Publication 1542. Washington, D.C.: U.S. Government Printing Office. http://www.irs.gov/publications/p1542/ (Jan. 5, 2009).

Jameson, John H., Jr., John E. Ehrenhard, and Wilfred Husted. *Federal Archeological Contracting: Utilizing the Competitive Procurement Process*. Archaeology & Ethnology Program Technical Brief 7. NPA, February 1992.

Johnson, Frederick, Emil W. Haury, and James B. Griffin. Report of the Planning Committee. *American Antiquity* 9(1945):142–144.

Kanefield, Adina W. *Federal Historic Preservation Case Law, 1966–1996: Thirty Years of the National Historic Preservation Act*. A special report funded in part by the United States Army Environmental Center/Advisory Council on Historic Preservation. Washington, D.C.: U.S. Government Printing Office, 1996.

Kavanagh, Maureen. *Archeological Resources of the Monocacy River Region*. Baltimore, Md.: Maryland Geological Survey, Division of Archaeology File Report No. 164, 1982.

Kay, Charles E. Aboriginal Overkill: The Role of Native Americans in Structuring Western Ecosystems. *Human Nature* 5 (1994): 359–398.

———. Ecosystems Then and Now: A Historical-Ecological Approach to Ecosystem Management. Pp. 79–87 in *Proceedings of the Fourth Prairie Conservation and Endangered Species Workshop*, Occasional Paper 23. Edited by W. D. Wilms and J. F. Dormaar. Alberta, Canada: Provincial Museum of Alberta, 1996.

———. Aboriginal Overkill and the Biogeography of Moose in Western North America. *Alces* 33(1997):141–164.

Kelso, William M., and Rachel Most, eds. *Earth Patterns: Essays in Landscape Archaeology*. Charlottesville, Va.: University Press of Virginia, 1990.

King, Thomas F. *Federal Planning and Historical Places: The Section 106 Process*. Walnut Creek, Calif.: AltaMira Press, 2000.

———. *Doing Archaeology: A Cultural Resource Management Perspective*. Walnut Creek, Calif.: Left Coast Press, 2005.

———. *Saving Places That Matter: A Citizen's Guide to the National Historic Preservation Act*. Walnut Creek, Calif.: Left Coast Press, 2007.

———. *Cultural Resources Laws and Practice: An Introductory Guide*. 3rd ed. Lanham, Md.: AltaMira Press, 2008.

Kintigh, Keith W. Writing Archaeology: Analyses and Archaeological Argumentation. The SAA Archaeological Record. September, 2005, 33–35. http://www.public.asu.edu/~kintigh/Kintigh2005WritingArchaeology.pdf (Jan. 12, 2009).

Kohl, Philip L., and Clare P. Fawcett, ed. *Nationalism, Politics, and the Practice of Archaeology*. Cambridge: Cambridge University Press, 1996.

Krech, Shepard K., III. *The Ecological Indian: History and Myth*. New York: Norton, 1999.

Kvamme, Kenneth. Predictive Cultural Resource Modeling at Pinon Canyon: 1984–1985. Pp. 6–83 in *An Introduction to the Archaeology of Pinon Canyon, Southeastern Colorado, Volume I: Background and Methods*, ed. William

Andrefskey. Denver: National Park Service, Rocky Mountain Regional Office, 1990.

———. A Predictive Site Location Model on the High Plains: An Example with an Independent Test. *Plains Anthropologist* 37 (1992):19–40.

———. "Predictive" Modeling of Archaeological Distributions: Introductory Concepts. University of Arkansas, 2003. http://www.cast.uark.edu/~kkvamme/mnmodel/mnmodel.htm (Jan. 1, 2009).

LeFurgy, W. G., Margaret Hedstrom, T. Pardo, and T. O. Walters. Preserving Information Long-Term: Digital Archiving. *Proceedings of the 2005 National Conference on Digital Government Research* (2005):15.

Lehmer, Donald J. *Introduction to Middle Missouri Archeology*. Anthropological Papers 1. National Park Service. Washington, D.C.: U.S. Department of the Interior, Government Printing Office, 1971.

Maps of the Past, Inc. http://www.historicmapsrestored.com/ (Jan. 1, 2009).

McAlester, Virginia, and Lee McAlester. *A Field Guide to American Houses*. New York: Knopf, 1986.

McLean, Ruari. *The Thames & Hudson Manual of Typography*. London: Thames & Hudson, 1997.

McVarish, Douglas C. *American Industrial Archaeology: A Field Guide*. Walnut Creek, Calif.: Left Coast Press, 2008.

National Park Service. *How to Apply the National Register Criteria for Evaluation*. National Register Bulletin 15. Washington, D.C.: National Park Service, 1995a. http://www.nps.gov/history/NR/publications/bulletins/nrb15/nrb15_8.htm (Jan. 1, 2009).

———. *How to Complete the National Register Form*. National Register Bulletin 16. Washington, D.C.: National Park Service, 1995b. http://www.nps.gov/history/nr/publications/bulletins/nrb16A/ (Jan. 1, 2009).

———. *Guidelines for Evaluating and Registering Archaeological Properties*. National Register Bulletin. Washington, D.C.: National Park Service, 2000. http://www.nps.gov/history/nr/publications/bulletins/arch/nrb36.pdf (Jan. 1, 2009).

Neumann, Thomas W. A Model for the Vertical Distribution of Flotation-Size Particles. *Plains Anthropologist* 23 (1978):85–101.

———. Human-Wildlife Competition and the Passenger Pigeon: Population Growth from System Destabilization. *Human Ecology* 13 (1985):389–410.

———. Human-Wildlife Competition and Prehistoric Subsistence: The Case of the Eastern United States. *Journal of Middle Atlantic Archaeology* 5(1989):29–57.

———. *A Phase I Archeological Investigation of Catoctin Furnace (18 FR 29), Cunningham Falls State Park, Frederick County, Maryland*. State of Maryland/

Office of Engineering and Construction/Department of General Services, Baltimore, Md., 1989.

———. The Physiographic Variables Associated with Prehistoric Site Location in the Upper Potomac River Basin, West Virginia. *Archaeology of Eastern North America* 20 (1992):81–124.

———. Soil Dynamics and the Sinking of Artifacts: Procedures for Identifying Components in Non-Stratified Sites. *Journal of Middle Atlantic Archaeology* 9 (1993):94–108.

———. The Structure and Dynamics of the Prehistoric Ecological System in the Eastern Woodlands: Ecological Reality versus Cultural Myths. *Journal of Middle Atlantic Archaeology* 11 (1995):125–138.

Neumann, Thomas W., Brian D. Bates, and Robert M. Sanford. Chapter 15: Setting Up the Basic Archaeology Laboratory. Pp. 343–358 in *Archaeological Laboratory Methods: An Introduction*, 2nd ed., by Mark Q. Sutton and Brooke S. Arkush. Dubuque, Iowa: Kendall/Hunt Publishing, 1998.

Neumann, Thomas W., William C. Johnson, Jennifer Cohen, and Neal H. Lopinot. *Archeological Data Recovery from Prehistoric Site 36Fa363, Grays Landing Lock and Dam*. U.S. Army Corps of Engineers, Pittsburgh District, Pa., 1990.

Neumann, Thomas W., and Robert M. Sanford. *A Cultural Resource Assessment of the Proposed Onondaga Senior Center*. Prepared by Neumann and Sanford Cultural Resource Assessments for the Syracuse–Onondaga County Planning Agency, N.Y., 1985.

———. *The Weston Site: Phase III Cultural Resource Mitigation of the Southeast Area*. Prepared by Neumann & Sanford Cultural Resource Assessments, Syracuse, New York, on behalf of Goodfellow Construction, Inc., Jamesville, N.Y., 1987.

———. Cleaning Artifacts with Calgon™ (sodium [hexa]metaphosphate). *American Antiquity* 63 (1998):157–160.

———. *Practicing Archaeology: An Introduction to Cultural Resources Archaeology*. Walnut Creek, Calif.: AltaMira Press, 2001.

Neumann, Thomas W., Robert M. Sanford, and James F. Palmer. Managing Archaeological Cultural Resources as Environmental Resources: An Aid for Local Governments. *The Environmental Professional* 14 (1992):117–125.

Neumann, Thomas W., Robert M. Sanford, and Richard L. Warms. *Using Vegetation Successional Stages to Reconstruct Landscape History for Cultural Resource Assessments in South-Central Texas*. Lilburn, Ga.: Wentworth Analytical Facility, 1993.

Neumann, Thomas W., and Martha R. Williams. *A Phase 1 Archeological Investigation of the Novak Property, Anne Arundel County, Maryland*. Prepared by

R. Christopher Goodwin & Associates, Inc., for Brown & Brown Builders, Ltd., Crofton, Md., 1990.

———. *Phase 1 Archeological Investigation of the 230-KV Transmission Line Corridor and Proposed Access Road Corridor, Clover Generating Plant, Halifax County, Virginia*. Prepared by R. Christopher Goodwin & Associates, Inc., for Old Dominion Electric Cooperative, Glen Allen, Va., 1991.

New York Archaeological Council. *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State*. Albany: New York Archaeological Council, 1994.

Noël Hume, Audrey. *Archaeology and the Colonial Gardener*. Colonial Williamsburg Archaeological Series No. 7. Williamsburg, Va: The Colonial Williamsburg Foundation, 1974.

Noël Hume, Ivor. *Digging for Carter's Grove*. Colonial Williamsburg Archaeological Series No. 8. Williamsburg, Va: The Colonial Williamsburg Foundation, 1974.

Ohio Historical Society. *Archaeology Guidelines*. Columbus: Ohio Historical Society, 1994.

Olson, Gerald W. *Criteria for Making and Interpreting a Soil Profile Description: A Compilation of the Official USDA Procedure and Nomenclature for Describing Soils.* Kansas Geological Survey Bulletin 212. Lawrence: University of Kansas Publications, 1976.

Osborne, Glendee Ane. *Prehistoric Settlement and Land Use: A Predictive Model of the Shivwits Plateau, Northwest Arizona*. Prepared for the National Park Service, Lake Mead National Recreation Area, Boulder City, Nevada, 2008.

Overstreet, Robert M. *The Overstreet Indian Arrowheads Identification and Price Guide*. 5th ed. New York: Avon Books, 1997.

Patterson, Thomas C. *Toward a Social History of Archaeology in the United States*. Fort Worth, Tex.: Harcourt Brace College Publishers, 1995.

Phillips, Bruce G. *Data Recovery at AZ U:5:33(ASM) within the Pima Freeway Corridor, Phoenix, Maricopa, Arizona*. Tempe, Ariz.: Archaeological Consulting Services, 2001.

Poirier, David. *The Environmental Review Primer for Connecticut's Archaeological Resources*. Hartford: Connecticut Historical Commission, 1987.

Raab, L. M., and T. C. Klinger. A Critical Appraisal of "Significance" in Contract Archaeology. *American Antiquity* 42 (1977):629–634.

Renfrew, Colin, and Paul Bahn. *Archaeology: Theories, Methods, and Practice*. 3rd ed. London: Thames & Hudson, 2000.

Rice, T. D., and L. T. Alexander. The Physical Nature of Soil. Pp. 887–896 in *Soils and Men: Yearbook of Agriculture, 1938*, ed. Committee on Soils. Washington, D.C.: U.S. Department of Agriculture, Government Printing Office, 1938.

Richman, Jennifer R., and Marion P. Forsyth, eds. *Legal Perspectives on Cultural Resources*. Lanham, Md.: AltaMira Press, 2004.

Rogers, Lori M. FERC Hears Gas Industry Concerns, Announces Transco Settlement. *Public Utilities Fortnightly* (July 1, 1991):36–37.

Rosenberg, Ronald H. Archaeological Resource Preservation: The Role of State and Local Government. *Utah Law Review* 4 (1981):727–802.

Russell, Emily W. B. *People and the Land through Time: Linking Ecology and History*. New Haven, Conn.: Yale University Press, 1997.

Sabloff, Jeremy A. *Archaeology Matters: Action Archaeology in the Modern World*. Walnut Creek, Calif.: Left Coast Press, 2008.

Sanborn. Sanborn Fire Insurance Maps. http://www.sanborn.com/products/fire_insurance_maps.asp (Jan. 1, 2009).

Sanford, Rob, Don Huffer, Nina Huffer, Tom Neumann, Giovanna Peebles, Mary Butera, Ginger Anderson, and Dave Lacy. *Stonewalls and Cellarholes: A Guide for Landowners on Historic Features and Landscapes in Vermont's Forests*. Waterbury, Vt.: Vermont Agency of Natural Resources, Department of Forests, Parks and Recreation, 1994. http://historicvermont.org/programs/stonewall%20and%20cellarhouse_pub_screen.pdf (Jan. 1, 2009).

Sanford, Robert M., and Thomas W. Neumann. The Urban Tree as Cultural Artifact. *Northeastern Environmental Science* 6 (1987):46–52.

Sanford, Robert M., Thomas W. Neumann, and Gary F. Salmon. Reading the Landscape: Inference of Historic Land Use in Vermont Forests. *Journal of Vermont Archaeology* 2 (1997):1–12.

Scovill, Douglas H., Garland J. Gordon, and Keith M. Anderson. Guidelines for the Preparation of Statements of Environmental Impact on Archaeological Resources. Pp. 43-62 in *Conservation Archaeology*, ed. M. B. Shiffer and G. J. Gumerman. New York: Academic Press, 1977.

Sharer, Robert J., and Wendy Ashmore. *Archaeology: Discovering Our Past*. 2nd edition. Mountain View, Calif.: Mayfield, 1993.

Sloane, Eric. *American Barns & Covered Bridges*. New York: Harper & Row, 1954.

———. *Our Vanishing Landscape*. New York: Harper & Row, 1955.

———. *American Yesterday*. New York: Harper & Row, 1956.

———. *Eric Sloane's America*. New York: Promontory Press, 1982.

Society for American Archaeology, Archaeology for the Public. http://www.saa.org/public/resources/ArchMonth_2005.html (Jan. 6, 2009).

Soil Science Survey Staff. *Soil Survey Manual*. USDA Handbook No. 18. Washington, D.C.: U.S. Government Printing Office, 1951.

———. *Soil Taxonomy*. USDA Handbook No. 436. Washington, D.C.: U.S. Government Printing Office, 1975.

———. Chapter 4 from the unedited text of *Soil Survey Manual*. Washington, D.C.: Soil Conservation Service, U.S. Government Printing Office, 1981.

South, Stanley. *Method and Theory in Historical Archaeology*. New York: Academic Press, 1977.

Squier, E. G., and E. H. Davis. *Ancient Monuments of the Mississippi Valley*. Smithsonian Contributions to Knowledge, Volume 1. Washington, D.C.: Smithsonian Institution, 1848.

Stapp, Darby C., and Michael S. Burney. *Tribal Cultural Resource Management: The Full Circle to Stewardship* (Heritage Resources Management Series, V. 4). Lanham, Md.: AltaMira Press, 2002.

Stapp, Darby C., and Julia Longnecker. *Avoiding Archaeological Disasters: Risk Management for Heritage Professionals (Techniques and Issues in Cultural Resource Management)*. Walnut Creek, Calif.: Left Coast Press, 2008.

Sturtevant, William C., ed. *Handbook of North American Indians*. Washington, D.C.: Smithsonian Institution, 1978–present.

Sullivan, Alan P. III. Artifact Scatters and Subsistence Organization. *Journal of Field Archaeology* 22 (1995): 49–64.

———. Risk, Anthropogenic Environments, and Western Anasazi Subsistence. Pp. 145–167 in *Evolving Complexity and Environmental Risk in the Prehistoric Southwest*, ed. Joseph A. Tainter and Bonnie B. Tainter. Reading, Mass.: Addison-Wesley, 1996.

Sullivan, Alan P. III. (ed.). *Surface Archaeology*. Albuquerque: University of New Mexico Press, 1998.

Sutton, Mark Q., and Brooke S. Arkush. *Archaeological Laboratory Methods: An Introduction*. 5th ed. Dubuque, Iowa: Kendall/Hunt Publishing, 2009.

Tainter, Joseph A. Surface Archaeology: Perceptions, Values, and Potential. Pp. 169–179 in *Surface Archaeology*, ed. Alan P. Sullivan III. Albuquerque: University of New Mexico Press, 1998.

Tainter, Joseph, and G. John Lucas. Epistemology of the Significance Concept. *American Antiquity* 48 (1983):707–719.

Thomas, Cyrus. *Twelfth Annual Report of the Bureau of Ethnology 1890–'91*. Washington, D.C.: Smithsonian Institution, 1894.

Thomas, Dean S. *Cannons: An Introduction to Civil War Artillery*. Gettysburg, Pa.: Thomas Publications, 1985.

Thomas, Keith. *Man and the Natural World: Changing Attitudes in England 1500–1800*. Oxford: Oxford University Press, 1983.

Transco Settles Claims in Alabama. *New York Times*, May 31, 1991, D4.

Trimble, Michael K., and Thomas B. Meyers. *Saving the Past from the Future: Archaeological Curation in the St. Louis District*. St. Louis, Mo.: U.S. Army Corps of Engineers, St. Louis District, 1991.

U.S. Army Corps of Engineers. *Safety and Health Requirements Manual*. EM-385-1-1. Washington, D.C.: U.S. Government Printing Office, 2003. http://www.cdc.gov/eLCOSH/docs/d0100/d000100/d000100.html (Jan. 1, 2009).

Vitelli, Karen D., and Chip Colwell-Chanthaphonh, eds. *Archaeological Ethics*. 2nd ed. Lanham, Md.: AltaMira Press, 2006.

Ward, Geoffrey C., and Ken Burns. *Baseball: An Illustrated History*. New York: Knopf, 1994.

Watts, May Thielgaard. *Reading the Landscape of America*. New York: Collier, 1975.

Wauchope, Robert W. *Archaeological Survey of Northern Georgia with a Test of Some Cultural Hypotheses*. Society for American Archaeology Memoir 21. Washington, D.C.: Society for American Achaeology, 1966.

Weichman, Michael S. *Guidelines for Contract Cultural Resource Survey Reports and Professional Qualifications*. Columbia, Mo.: Missouri Department of Natural Resources, 1986.

Wessels, Tom. *Reading the Forested Landscape: A Natural History of New England*. Woodstock, Vt.: Countryman Press, 1997.

Westmeyer, Paul. *A History of American Higher Education*. Springfield, Ill.: Charles C. Thomas, 1985.

Wheeler, Mortimer. *Archaeology from the Earth*. Baltimore, Md.: Penguin, 1954.

White, Gregory G., and Thomas F. King. *The Archaeological Survey*. Walnut Creek, Calif.: Left Coast Press, 2007.

Whittlesey, Stephanie. The Sociology of Gender in Arizona Archaeology. Pp. 173–182 in *Equity Issues for Women in Archaeology*, ed. Margaret C. Nelson, Sarah M. Nelson, and Alison Wylie. Washington, D.C.: Archaeological Papers of the American Anthropological Association, 1994.

Willey, Gordon R., and Jeremy Sabloff. *A History of American Archaeology*. 3rd ed. New York: Freeman, 1993.

Wilson, J. S. We've Got Thousands of These! What Makes an Historic Farmstead Significant? *Historical Archaeology* 24(2) (1990):23–33.

Yamin, Rebecca, and Karen Bescherer Metheny, eds. *Landscape Archaeology: Reading and Interpreting the American Historical Landscape*. Knoxville, Tenn.: University of Tennessee Press, 1996.

Zeder, Melinda A. *The American Archaeologist: A Profile*. Walnut Creek, Calif.: AltaMira Press, 1997.

Zimmerman, Larry J., and William Green (eds.). *Archaeologist's Toolkit* (7 volumes: Vol. 1, *Archaeology by Design*; Vol. 2, *Archaeological Survey*; Vol. 3, *Excavation*; Vol. 4, *Artifacts*; Vol. 5, *Archaeobiology*; Vol. 6, *Curating Archaeological Collections: From the Field to the Repository*; Vol. 7, *Presenting the Past*). Lanham, Md.: AltaMira Press, 2003.

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